PATERSON GROUP

Phase I Environmental Site Assessment

3252 Navan Road and Spring Valley Phase 5

Ottawa, Ontario

Prepared for Claridge Homes

Report: PE4588-4
September 26, 2025

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EXECUTIVE SUMMARY

Assessment

A Phase I-Environmental Site Assessment (ESA) was carried out for 3252 Navan Road and a contiguous parcel of land referred to as Spring Valley Phase 5, in the City of Ottawa, Ontario. The purpose of the Phase I-ESA was to research the past and current use of the Phase I Property and Phase I Study Area and to identify environmental concerns with the potential to have impacted the Phase I Property.

The Phase I Property was first developed for residential purposes circa 1945 prior to the conversion of the site to commercial landscaping depot in approximately 1983. The former presence of two diesel AST locations used in conjunction with this activity are on-site PCAs that are considered to result in two APECs on the Phase I Property.

Fill material of unknown quality was identified in the northern half of the Phase I Property during previous investigations. Stockpiles of fill material were also historically present in the western portion of the Phase I Property the origin of which is unknown. The presence of fill material in these locations are on-site PCAs that are considered to result in two APECs on the Phase I Property.

The neighbouring lands have historically consisted primarily of residential use land (dwellings), with landfill operations (industrial use) commencing at 3354 Navan Road around 1965 and continuing to the present day. It should be noted that the landfill does not take domestic waste and solely accepts construction and demolition waste. Off-site landfilling activity is a PCA considered to result in an APEC on the Phase I Property. A railway line was historically present approximately 80 m south of the Phase I Property until it was removed around the mid 1970s. Based on the separation distance, the former rail line is not considered to result in an APEC on the Phase I Property.

Following the historical review, a site visit was conducted. The Phase I Property is being used as a construction site office and for the storage of miscellaneous construction materials, with the remainder consisting of unused former agricultural land.

The neighbouring properties are primarily used for residential purposes with the Navan Road landfill located on the adjacent property to the east, previously discussed. No additional off-site PCAs were identified within the Phase I Study Area.

Recommendations

Based on the findings of the Phase I-ESA, it is our opinion that **a Phase II-ESA is required for the Phase I Property.**

Based on the age of the subject building (circa 1945), asbestos-containing materials (ACMs) are potentially present in the subject structure. The potential ACMs observed during the site visit include drywall joint compound and vinyl floor tiles. A Designated Substance Survey (DSS) of the building must be conducted in accordance with Ontario Regulation 278/05, under the Occupational Health and Safety Act, prior to any major renovation or demolition activities.

1.0 INTRODUCTION

At the request of Claridge Homes, Paterson Group (Paterson) carried out a Phase I-Environmental Site Assessment (Phase I-ESA) of 3252 Navan Road and an adjacent unaddressed parcel referred to as Spring Valley Phase 5, in the City of Ottawa, Ontario. The purpose of this Phase I-ESA was to research the past and current use of the site and study area to identify any environmental concerns with the potential to have impacted the subject property.

Paterson was engaged to conduct this Phase I-ESA by Ms. Victoria St. Pierre of Claridge Homes. Ms. St. Pierre can be contacted via her mailing address at 210 Gladstone Avenue, Ottawa, Ontario, K2P 0Y6.

This report has been prepared specifically and solely for the above-noted project which is described herein. It contains all of our findings and results of the environmental conditions at this site.

This Phase I-ESA report has been prepared in general accordance with Ontario Regulation 153/04, as amended by O.Reg. 269/11 (Environmental Protection Act), and also complies with the requirements of CSA Z768-01 (reaffirmed in 2022). The conclusions presented herein are based on information gathered from a limited historical review and field inspection program. The findings of the Phase I-ESA are based on a review of readily available geological, historical, and regulatory information and a cursory review made at the time of the field assessment. The historical research relies on information supplied by others, such as local, provincial and federal agencies and was limited within the scope-of-work, time and budget of the project herein.

2.0 PHASE I PROPERTY INFORMATION

Address:	3252 Navan Road, and unaddressed parcel, Ottawa, Ontario.
Property Identification Numbers:	04352-0307, 04352-1331
Location:	The Phase I Property is located on the south side of Navan Road, east of Spring Valley Drive. The Phase I Property is shown on Figure 1 - Key Plan following the body of this report.
Latitude and Longitude:	45° 25' 34" N, 75° 30' 31" W

Site Description:

Configuration:	Irregular
Site Area:	12.7 ha (approximate)
Zoning:	DR – Development Reserved Zone
Current Use:	The Phase I Property currently consists of undeveloped land being used as a construction staging area for adjacent development. The property use as defined by O.Reg. 153/04 is Commercial Use, based on the properties previous use.
Services:	The Phase I Property is located in an area of mixed municipal and private services.

3.0 SCOPE OF INVESTIGATION

The scope of work for this Phase I – Environmental Site Assessment was as follows:

- ❑ Determine the historical activities on the subject site and study area by conducting a review of readily available records, reports, photographs, plans, mapping, databases, and regulatory agencies;
- ❑ Investigate the existing conditions present at the Phase I ESA Property and study area by conducting site reconnaissance;
- ❑ Conduct interviews with persons knowledgeable of current and historic operations on the Phase I ESA Property, and if warranted, neighbouring properties;
- ❑ Present the results of our findings in a comprehensive report in general accordance with the requirements O.Reg. 153/04 as amended under the Environmental Protection Act and in compliance with the requirements of CSA Z768-01;
- ❑ Provide a preliminary environmental site evaluation based on our findings;
- ❑ Provide preliminary remediation recommendations and further investigative work if contamination is suspected or encountered.

4.0 RECORDS REVIEW

4.1 General

Phase I-ESA Study Area Determination

A radius of approximately 250 m was determined to be appropriate as a Phase I ESA Study Area for this assignment. Properties outside the 250 m radius are not considered to have impacted the Phase I Property, based on their significant distance from the site.

First Developed Use Determination

Based on a review of aerial photographs and available historical information, the Phase I Property is considered to have first been developed with a residential dwelling (Residential Use) prior to 1945.

Fire Insurance Plans

Fire Insurance Plans (FIPs) are not available for the area of the Phase I Property.

City of Ottawa Street Directories

City directories at the National Archives were reviewed in approximate 10-year intervals from 1980 (Phase I Property first appears at this time) to 2011 (last listed date) as part of the Phase I ESA.

The property addressed 3252 Navan Road (Part of the Phase I Property) was listed in the directories as occupied by Andre Taillefer Ltd. (topsoil and landscaping materials) from 1980 until 2011. The remaining portion of the Phase I Property (Spring Valley Phase 5; unaddressed parcel) was not listed.

Properties in the Phase I Study Area were listed primarily as residential or vacant with one exception. The property addressed 3354 Navan Road was most recently listed as BFI Canada and was formerly listed as Waste Services Inc. and Huneault Waste Management (Navan Road Landfill).

This landfill activity to the east represents a potentially contaminating activity (PCA) resulting in an area of potential environmental concern (APEC) on the eastern portion Phase I Property.

Chain of Title

Paterson requested a Chain of Title for the portion of the Phase I Property addressed 3252 Navan Road, during a previous assessment from Read Abstracts Limited in 2019.

This parcel was originally registered in 1881 to a private individual. Private individuals owned the property until 1946 when the property was registered to The Director of the Veterans Land Act. In 1965, the property was transferred to private individuals and has been held privately ever since. The last listed registered owner in the chain of title is Ih Chu and Shih Ping Sun in 1982.

A separate Chain of Title search was completed for the remainder of the Phase I Property (Spring Valley Phase 5 parcel). This portion of the Phase I Property was originally registered in 1811 to private individuals, and was owned by various private individuals until 1964 when it was registered to Perrodale Farms Limited. The parcel was then transferred to Claridge Homes (Carson) Inc. in 2004 (current owner).

No environmental concerns were identified during a review of the Chain of Title searches. A copy of these searches has been provided in Appendix 1.

Plan of Survey

A plan of survey, dated 1982 and amended 1984, prepared by J G Payette Ontario Land Surveyor, was provided to Paterson for review. The survey plan shows the portion of the Phase I Property addressed 3252 Navan Road in its current configuration.

A plan of survey, prepared by Annis, O'Sullivan, Vollebekk Ltd., was reviewed as part of this assessment. The survey plan consists of a draft plan of subdivision dated January 30, 2009. The survey plan shows the entire Spring Valley development property, including the Phase 5 portion of the Phase I Property, in its current configuration.

A copy of the provided plans of survey are included in Appendix 2.

4.2 Environmental Source Information

Environment Canada

A search of the National Pollutant Release Inventory (NPRI) was conducted electronically on September 16, 2025. The Phase I Property was not listed in the NPRI database however, the property to the east (BFI Navan Road Landfill) was listed in the NPRI database for the disposal and discharge to the air of various materials including friable asbestos.

PCB Inventory

A search of the provincial PCB waste storage sites was conducted on September 16, 2025. No PCB waste storage sites were identified within the Phase I Study Area.

MECP Waste Disposal Site Inventory

The Ontario Ministry of Environment document titled "Waste Disposal Site Inventory in Ontario, 1991" was reviewed as part of the historical research. This document includes all recorded active and closed waste disposal sites, industrial manufactured gas plants and coal tar distillation plants in the Province of Ontario.

Based on the available information, there is one active landfill site within the Phase I Study Area, present on Parts of Lots 3 and 4, Concession 4, Gloucester Township (currently Waste Connections of Canada landfill). No other waste disposal sites were identified within the Phase I Study Area.

As previously discussed, the existing landfill on the property to the east represents a PCA resulting in an APEC on the Phase I Property.

Ontario Ministry of Environment, Conservation and Parks (MECP) Instruments

A request was submitted to the MECP Freedom of Information office for information with respect to records concerning environmental incidents, orders, offences, spills, discharges of contaminants or inspections maintained by the MECP for the site or adjacent properties.

The response from the ministry included the 2021 landfill operating and monitoring report. Paterson reviewed the provided report in full and a brief summary of the findings are presented in the “Previous Engineering Reports” section.

MECP Coal Gasification Plant Inventory

The Ontario Ministry of Environment, Conservation and Parks document titled "Municipal Coal Gasification Plant Site Inventory, 1991" was reviewed to reference the locations of former plants with respect to the site. No coal gasification plants were identified on the Phase I Property or within the Phase I Study Area.

MECP Incident Reports

A request was submitted to the MECP Freedom of Information office for information with respect to records concerning environmental incidents, orders, offences, spills, discharges of contaminants, or inspections maintained by the MECP for the subject or neighbouring properties. No records pertaining to incidents on the Phase I Property were included in the response provided by the MECP.

A copy of the MECP FOI response is provided in Appendix 2.

MECP Waste Management Records

A request was submitted to the MECP Freedom of Information office for information with respect to waste management records for the subject property. No records pertaining to waste management records for the Phase I Property were included in the response provided by the MECP.

A copy of the MECP FOI response is provided in Appendix 2.

MECP Submissions

A request was submitted to the MECP Freedom of Information office for information with respect to reports related to environmental conditions for the Phase I Property. No records pertaining to MECP submissions for the Phase I Property were included in the response provided by the MECP.

A copy of the MECP FOI response is provided in Appendix 2.

MECP Brownfields Environmental Site Registry

A search of the MECP Brownfields Environmental Site Registry was conducted electronically for the Phase I Property and for properties located within the Phase I Study Area.

An RSC was filed for a larger parcel, including a small portion of the Phase I Property, in 2017 (Spring Valley Development, Phase 3). The RSC was based on a Phase I and II ESA to assess APECs associated with fill material of unknown quality in various locations, and potential impacts from the nearby landfill. The Phase I and II ESA were completed for a larger parcel then the RSC was filed for, which included the Spring Valley Phase 5 portion of the current Phase I Property. The relevant information from this previous reporting has been incorporated into the relevant sections of this report.

Two RSCs were identified within the Phase I Study Area and are associated with the properties addressed 3317 Navan Rd, Gloucester dated May 2009 and the adjacent property to the west that did not have a municipal address at the time of submission. No impacted soil or groundwater was identified during the Phase II – ESA completed as part of the RSC on the adjacent property to the west and as such, the submitted RSC is not considered to represent an environmental concern to Phase I Property. The RSC for 3317 Navan Road did not require the completion of a Phase II ESA and is also not considered to represent an environmental concern to the Phase I Property.

Areas of Natural and Significance Interest

A search for areas of natural significance and features within the Phase I Study Area was conducted electronically via the Ontario Ministry of Natural Resources and Forestry (MNRF) website. The Mer Bleue Bog conservation area is located approximately 100 m south of the Phase I Property.

Technical Standards and Safety Authority (TSSA)

The TSSA, Fuels Safety Branch in Toronto was contacted electronically, to inquire about current and former underground storage tanks, spills and incidents for the site and neighbouring properties. According to the TSSA response, no records were identified on the Phase I Property.

Several records pertaining to active fuel service appliances and gaseous fuels were documented for the landfill on the property to the east addressed 3354 Navan Road (Waste Connections of Canada).

As previously discussed, the active landfill on the property to the east is a PCA that is considered to result in an APEC on the Phase I Property.

A copy of the TSSA correspondence is included in Appendix 2.

City of Ottawa Old Landfill Sites

The City of Ottawa's Former Landfills online map, last updated July 29, 2025, was reviewed as part of this assessment. This map identifies 123 former landfills through the City of Ottawa's Old Landfill Management Strategy (OLMS 2004) and includes location, ownership, periods of operation and waste type for 82 sites identified as previously owned/operated either fully or in part by former municipalities and townships within the boundaries of the City of Ottawa.

A review of this map on September 17, 2025, identified the landfill located at 3354 Navan Road (Waste Connections of Canada) as Huneault Waste Management, Waste Disposal Site. This waste disposal site is currently active and has been previously identified as a PCA resulting in an APEC on the Phase I Property.

City of Ottawa Historical Land Use Inventory (HLUI)

A search of the City of Ottawa's Historical Land Use Inventory (HLUI) database was conducted as part of this assessment.

The response to the HLUI listed the previous use of the eastern portion of the Phase I Property (3252 Navan Road) as Andre Taillefer Ltd., noting heavy equipment rental, sand, crushed stone, and topsoil operations. Records pertaining to the landfill on the adjacent property to the east were included in the HLUI response. As previously discussed, the landfill on the adjacent property to the east is considered to represent a PCA that results in an APEC on the Phase I Property. No additional PCAs were identified through a review of the HLUI response. A copy of the HLUI response form is provided in Appendix 2.

Previous Engineering Reports

The following reports were reviewed prior to conducting this assessment:

<u>Spring Valley Phase 5 (southwestern portion of the Phase I Property)</u>

- ‘Phase I Environmental Site Assessment, Vacant Land, Spring Valley Development, Phase 3, Ottawa, Ontario’, prepared by Paterson Group, dated January 17, 2014.

A Phase I ESA was completed in 2014 for a parcel that included a portion of the Phase I Property (Spring Valley Phase 5, southwestern portion of the Phase I Property). According to historical research conducted as part of the 2014 Phase I

ESA, this property was vacant and/or used for agriculture from earliest available record. During the Phase I ESA, no on-site PCAs were identified.

Three off-site PCAs were identified based on historical research and observations during the site reconnaissance. The BFI Canada Navan Road Landfill, located approximately 100 m to the east, has been present since the 1970s. A rail line was also considered as an off-site PCA. The property adjacent to the east, being operated as Andre Taillefer Landscaping Products, contributed to an off-site PCA (part of the current Phase I Property). The two off-site PCAs, Navan Road Landfill and Andre Taillefer Ltd. were considered to have potential to represent Areas of Potential Environmental Concern to Phase I Property.

Based on the findings of the Phase I ESA, a Phase II ESA was recommended for the Phase I Property.

- ‘Phase II Environmental Site Assessment, Vacant Land, Spring Valley Development, Phase 3, Ottawa, Ontario’, prepared by Paterson Group, dated October 17, 2016.

The purpose of the Phase II ESA was to address the areas of potential environmental concern identified in the Phase I ESA, due to presence of two off-site PCAs. The report summarizes the findings of subsurface investigation completed at the site in 2002, 2007, and 2008, subsequent sampling events, and a groundwater and methane monitoring program completed between November 2008 and December 2009.

Soil samples were submitted for laboratory analysis of BTEX, PHCs, metals, and PAHs. Concentrations of vanadium at BH2-07-SS5 and BH3-07-SS6 marginally exceeded MECP Table 3 standards. In the absence of a specific source of vanadium and based on experience with similar sites in the Ottawa area, the vanadium exceedances are considered to be naturally occurring. All other parameter concentrations were in compliance with MECP Table 3 standards.

Groundwater samples were obtained from the monitoring wells and submitted for analysis of PHCs, metals, inorganic parameters, VOCs, and PAHs. All parameter concentrations were in compliance with MECP Table 3 standards.

Methane monitoring conducted between November 2008 and December 2009 presented elevated reading from the fill material formerly present along the eastern site boundary. The elevated methane concentrations were considered to be the

result of the fill material, which was removed, and were not indicative of methane migration from the Navan Road Landfill.

Based on analytical results in Phase II ESA, no impact to the site soils or groundwater was identified resulting from the identified Areas of Potential Environmental Concern. Furthermore, no potential for future impacts to the subject site were anticipated based on the geology, hydrology, and the configuration of the landfill. No further assessment was recommended.

- ‘Phase I Environmental Site Assessment Update, Phase 5 Residential Development - Spring Valley, Ottawa, Ontario’, prepared by Paterson Group, dated March 21, 2018.

An update letter was completed for Phase 5 of the Spring Valley residential development, covering the southeast portion of the previously assessed property (part of the current Phase I Property). Based on the updated records review and the site reconnaissance, Navan Road Landfill was considered to have resulted in Area of Potential Environmental Concern.

Based on the findings of the Phase I ESA, a Phase II ESA was recommended for the Spring Valley Phase 5 property.

- ‘Phase II Environmental Site Assessment, Spring Valley Phase 5 – Vacant Land, Ottawa, Ontario’, prepared by Paterson Group, dated March 21, 2018.

A Phase II ESA was carried out for this parcel to assess potential impacts resulting from the off-site landfill to the east.

Phase II ESA consisted of the drilling of three (3) boreholes and the installation of three (3) groundwater monitoring wells to assess soil and groundwater quality at the subject site. Soil samples were selected for analysis of PHCs F1-F4, VOCs and metals. All results were in compliance with the MECP Table 3 standards, with the exception of vanadium. Based on the lack of any potential sources of vanadium on the property, the detected vanadium was considered to naturally occurring and is not considered to be a contaminant of concern.

Groundwater samples were submitted for analytical testing for PHCs F1-F4, VOCs and metals. All analytical test parameters were found to be in compliance with site standards. No further work was recommended at the time of Phase II-ESA.

3252 Navan Road (eastern portion of the Phase I Property)

- ❒ "Phase I – Environmental Site Assessment Update, 3252 Navan Road, Ottawa, Ontario", prepared by Paterson Group Inc., dated December 9, 2019.

A Phase I ESA was previously completed for the portion of the Phase I Property addressed 3252 Navan Road (eastern portion of the Phase I Property). Based on the findings of the 2019 Phase I ESA Update, four APECs were identified on this portion of the Phase I Property in the form of fill material of unknown quality in the northern and central portions of the property, one former above ground diesel storage tank (AST), two existing ASTs (colored and clear diesel) and an active landfill on the adjacent property to the east.

The presence of APECs on the Phase I Property resulted in the recommendation and completion of a Phase II – ESA.

- ❒ "Phase II – Environmental Site Assessment Update, 3252 Navan Road, Ottawa, Ontario", prepared by Paterson Group Inc., dated February 21, 2020.

The subsurface investigation was conducted in two phases. The first phase consisted of drilling nine boreholes, all of which were instrumented with groundwater monitoring wells.

Soil impacted with VOCs (bromomethane and chloroform) was identified in BH7 which was located in the southern half of the Phase I Property. Additionally, metals (cobalt and vanadium) exceedances were identified in BH7 and BH8, as well as off-site locations relative to the current Phase I Property, to the south. The cobalt and vanadium concentrations were determined to be naturally occurring based on the soil type (native silty clay) present throughout the Phase I Property, and are not considered to be contaminants of concern.

Groundwater impacted with tetrachloroethylene was identified in BH1 in the first phase of the subsurface investigation.

The second phase of the subsurface investigation involved the advancement of four additional boreholes, all of which were instrumented with groundwater monitoring wells.

No additional impacts were identified with respect to the soils on the Phase I Property.

Tetrachloroethylene impacts were identified in the second groundwater sample obtained from BH1 but the concentration was substantially lower. Four monitoring wells were placed to delineate the tetrachloroethylene impacted groundwater and the analytical test results indicated that the impacts were limited to the immediate area of BH1, as no tetrachloroethylene concentrations were identified in these locations.

Based on the results of the Phase II – ESA, it was recommended that further delineation of the impacted soil within BH7 be completed. It was determined that the impacted groundwater with BH1 was sufficiently delineated and that the groundwater monitoring wells should be maintained for future monitoring purposes.

- ❒ "2021 Landfill Monitoring, Waste Connections of Canada, 3354 Navan Road, Ottawa, Ontario", prepared by WSP Golder Inc., dated March 2022.

WSP Golder completed a 2021 landfill monitoring report for the Navan Waste Recycling and Disposal Facility that was issued in March of 2022.

The report is used to support the annual site operations and monitoring report and highlights the results of groundwater, surface water, leachate and sediment monitoring completed at the landfill.

Various leachate indicator parameters were analysed as part of the assessment. Based on the analytical test results, the leachate generated at the Navan Road Recycling and Disposal facility remains relatively unchanged from previous monitoring activities, in that it is considered to be weak wastewater in comparison to leachate generated from municipal landfills.

The analysed groundwater in two monitoring well locations exhibited concentrations that showed an increasing trend that was beyond the background range. The elevated concentrations were in the form of manganese and ammonia identified in monitoring wells in the southern portion of the landfill property. The manganese concentration was observed in a monitoring well immediately south of the waste disposal area and the ammonia was observed in a well located at the southern boundary of the waste disposal area.

The elevated concentration of magnesium indicating an increasing trend, was above the maximum concentration identified at a leachate sampling site. As such, it was determined that the exceeding concentration of manganese was not the cause of further landfill leachate migration and a contingency action in addition to

the voluntary actions already being implemented by the landfill, was not deemed necessary.

Based on the identified elevated ammonia concentration occurring in two consecutive sampling events, it was recommended to increase the trigger concentration if future results do not demonstrate an upward trend and the data is considered to be accurate. The recommendation was provided in the scenario where the groundwater quality at the monitoring well location remains considered to be unimpacted by landfill leachate.

The groundwater flow direction is considered to be north to south in the monitoring report and as such, the wells exhibiting the increasing trend beyond the background range are considered to be cross gradient from the Phase I Property. The leachate collection system and perimeter collection trench located along the west and south edges of the waste footprint also serve as a prevention mechanism to reduce the potential for off-site migration of the leachate. As such, the potential for groundwater impacts resulting form the landfill is considered to be negligible.

Environmental Risk Information Service (ERIS) Report

An ERIS (Environmental Risk Information Service) Report was obtained for the Phase I Property and properties within the Phase I Study Area.

Based on the ERIS report, there was one record documented for the Phase I Property.

The documented record pertains to an ERIS Historical Search completed on the Phase I Property in May of 2020. The identified record is not considered to represent an environmental concern on the Phase I Property.

Sixteen (16) total records from various databases were identified in the ERIS search within the 250 m search radius, all of which pertain to Environmental Compliance Approvals for municipal and private sewage work approvals as well as municipal drinking water systems approvals.

As previously discussed, an RSC was submitted for the adjacent property to the west and based on details contained within the RSC submission, it is not considered to represent an environmental concern to the Phase I Property.

No additional PCAs were identified through a review of the ERIS Database Report.

4.3 Physical Setting Sources

Aerial Photographs

Historical air photos from the National Air Photo Library and/or the City of Ottawa GeoOttawa website were reviewed in approximate 10-year intervals. The review period dates back to the first available air photos for the site. Based on the review, the following observations have been made:

1945 The Phase I Property consists of agricultural fields and vacant forested areas, with a farmhouse and outbuilding present on the northern portion of the property. Navan Road can be seen in its current configuration immediately north of the Phase I Property and a railway line exists to the south. Residential dwellings can be seen fronting onto Navan Road to the east and west of the Phase I Property.

1953 No significant changes appear to have been made to the Phase I Property or neighbouring properties since the previous photograph.

1965 No significant changes appear to have been made to the Phase I Property since the previous photograph. The landfill to the east of the Phase I Property is in the initial stages of development and use.

1976 No significant changes have been made to the Phase I Property since the previous photograph. The landfill to the east of the Phase I Property has been further developed and now extends to the south and east. The adjacent property to the west appears to be in the initial stages of development as the northern portion has been excavated and graded. The railway to the south no longer appears to be in use.

1991 The northern portion of the Phase I Property has been graded and stockpiled material is now present in this area. The landfill on the adjacent property to the east extends to the north and south towards Navan Road and the railway, respectively. Additional residential development has occurred further north of Navan Road.

2002 Additional stockpiles of soil are present on the northern portion of the Phase I Property and extend on to the adjacent property to the west. The landfill on the adjacent property to the east has now expanded further west, encroaching upon the eastern property boundary of the Phase I Property.

2011 No significant changes appear to have been made to the Phase I Property or neighbouring properties since the previous photograph.

2017 Additional stockpiles of soil and equipment have been placed in the northern portion of the property. The neighbouring properties appear to be unchanged since the previous photograph.

2023 No significant changes appear to have been made to the Phase I Property since the previous photograph. The adjacent property to the west has been developed for residential use.

Copies of selected aerial photographs reviewed are included in Appendix 1.

Topographic Maps

Topographic maps were obtained from Natural Resources Canada – The Atlas of Canada website and from the City of Ottawa website. The topographic map indicates that the Phase I Property is approximately 80 m above sea level and that regional topography generally slopes down towards the south towards the Mer Bleue conservation area.

Physiographic Maps

A Physiographic Map was reviewed from the Natural Resources Canada – The Atlas of Canada website. According to this physiographic map, the site is located in the St. Lawrence Lowlands. According to the mapping description provided: “The lowlands are plain-like areas that were all affected by the Pleistocene glaciations and are therefore covered by surficial deposits and other features associated with the ice sheets.” The subject site is located in the Central St. Lawrence Lowland, “where the land is rarely more than 150 m above sea level, except for the Monteregian Hills, which consist of intrusive igneous rocks”.

Geological Maps

The Geological Survey of Canada website on the Urban Geology of the National Capital Area was consulted as part of this assessment.

Based on the information from NRCAN, bedrock in the area of the site consists of shale, limestone, dolostone and siltstone of the Billings Formation. Based on the maps, both the thickness and composition of the overburden vary across the site. The northern portion of the Phase I Property consists of granular glaciomarine sediments with an overburden of approximately 50 m.

The central portion of the Phase I Property consists of colluvial deposits, and the southern portion of the Phase I Property consists of fine-grained glaciomarine sediments with a drift thickness of approximately 30 m.

Water Well Records

A search of the MECP's web site for all drilled well records within 250 m of the Phase I Property was conducted. The search identified two records in the Phase I Study Area. One record detailed a domestic water supply well drilled in 1977 to a depth of 45.7 m located approximately 220 m east of the Phase I Property. The second record pertains to the abandonment of a well located at 3225 Navan Road in 2015, located approximately 30 m north of the Phase I Property.

Groundwater level measurements obtained from monitoring wells installed on the Phase I Property during the previous subsurface investigations were documented to range from 0.05 to 5.95 m below the existing ground surface.

Bedrock was not encountered during the subsurface investigations. Monitoring wells were advanced to a maximum depth of 11.28 m and were terminated in the native grey silty clay layer.

Water Bodies and Areas of Natural Significance

One ditch runs from Navan Road at the northern boundary of the site, along the eastern boundary to the southern portion of the property before heading west and leading to the Mer Bleue conservation area. No other water bodies or areas of natural significance were identified in the Phase I Study Area.

5.0 INTERVIEWS

Property Owner Representative

As part of the previous assessments, Mr. Vincent Denomme of Claridge Homes, was interviewed via email. Mr. Denomme informed Paterson that there is currently no fuel or oil being stored on the Phase I Property and that the property is currently being used as a construction site office. Mr. Denomme stated that the Spring Valley Phase 5 portion of the Phase I Property has never been developed and has always been vacant agricultural land. Mr. Denomme was also unaware of any environmental concerns on the Phase I Property or in the immediate vicinity.

Paterson confirmed with representatives of the Claridge homes, that there have been no additional environmental concerns at the Phase I Property. No new environmental information was provided as part of the updated interviews.

6.0 SITE RECONNAISSANCE

6.1 General Requirements

A site reconnaissance visit was carried out on May 17, 2024, and weather conditions were cloudy with the temperature of 25 °C. Mr. Kuldeep Panchal from the Environmental Department of Paterson Group conducted the site visit. In addition to the site, the uses of neighbouring properties within the Phase I Study Area were also assessed at the time of the site visit.

6.2 Specific Observations at the Phase I Property

Buildings and Structures

One two-storey construction site office is situated on the northern portion of the Phase I Property. The building has a concrete slab-on-grade foundation, and the exterior is finished with vinyl siding and a sloped shingled roof. The building was constructed in approximately 1945 and was previously heated with propane gas.

Site Features

The Phase I Property consists primarily of gravel access roads that traverse the northern portion of the property and are used in conjunction with development activities on the adjacent property to the west.

Stockpiles of miscellaneous construction materials were observed in the northern portion of the Phase I Property. The central portion of the Phase I Property is also occupied by several large stockpiles of fill material.

The southern portion of the property slopes down towards the Mer Bleue Bog.

Potential Environmental Concerns

- **Fuels and Chemical Storage**

  No ASTs or signs of USTs were observed on the exterior of the Phase I Property at the time of the site visit. No staining or unusual odours were noted in the area of the former ASTs.

- **Waste Management**

  The Phase I Property is not currently generating any waste.

- **Polychlorinated Biphenyls (PCBs)**

  No potential concerns were identified with respect to PCBs on the exterior of the Phase I Property.

- **Ozone Depleting Substances (ODSs)**

  Potential sources of ODSs observed on-site during the assessment include fire extinguishers. These appliances should be regularly serviced by a licensed contractor.

Interior Assessment

A general assessment of the interior of the subject building is as follows:

- The floors consisted of concrete and vinyl tile.
- The walls and ceilings consisted of drywall.
- Lighting throughout the building was of fluorescent and incandescent fixtures.

Potentially Hazardous Building Products

- **Asbestos Containing Materials (ACMs)**

  Based on the age of the residential dwelling (prior to 1945), asbestos may be potentially present within certain building materials. The potential ACMs identified at time of the site inspection include the drywall joint compound and vinyl floor tiles. These building materials were observed to be in good condition at the time of the site inspection and do not pose an immediate concern.

❑ **Lead-Based Paint**

Based on the age of the subject building, lead-based paints may be potentially present on any original or older painted surfaces. The painted surfaces within the building were generally observed to be in good condition at the time of the site inspection.

❑ **Polychlorinated Biphenyls (PCBs)**

No potentially PCB containing materials were observed on the interior of the subject building during the site inspection.

❑ **Urea Formaldehyde Foam Insulation (UFFI)**

No signs of UFFI were noted at the time of the site visit, however, it should be noted that interior wall and ceiling cavities were not inspected for insulation type at the time of the site visit.

Other Potential Environmental Concerns

❑ **Fuels and Chemical Storage**

No environmental concerns were identified with respect to fuel or chemical storage within the residential dwelling.

❑ **Wastewater Drainage**

The Phase I Property is not currently generating any wastewater.

Neighbouring Properties

An inspection of the neighbouring properties was conducted from publicly accessible roadways at the time of the site inspection. Land use adjacent to the subject site was as follows:

❑ *North* Navan Road followed by residential dwellings.

❑ *South* The Prescott Russell Trail Link followed by the Mer Bleue conservation area.

❑ *East* Waste Connections of Canada's Navan Road Landfill.

❑ *West* Spring Valley residential development.

As previously discussed, the presence of the landfill immediately east of the Phase I Property is considered to represent a PCA that results in an APEC on the Phase I Property. Land use within the Phase I Study Area is shown on Drawing PE4588-2 - Surrounding Land Use Plan.

7.0 REVIEW AND EVALUATION OF INFORMATION

7.1 Land Use History

The following table indicates the current and past uses of the Phase I Property as well as associated potentially contaminating activities dating back to the first developed use of the property.

Table 1A: Land Use History (3252 Navan Road)

Year	Name of Owner	Property Use	Description of Property Use	Other Observations from Aerial Photos, FIPs, etc.
Prior to 1945	N/A	Undeveloped	Agricultural or Other Use	NA
1945 to 1983	Daniel A. Tisdelle and Laurent Leblanc	Residential	Residential Use	The 1945 aerial photograph shows a residential dwelling in the northern portion of the property.
1983 to 2019	Andre Taillefer Ltd.	Aggregate and groundworks supplier	Commercial Use	Aerial photography from 1991 to 2019 show the grading, excavation, and stockpiling of materials as well as three ASTs on the Phase I Property
2019 to present	Claridge Homes	Storage of Construction Materials and Soil	Commercial Use	2022 Aerial photograph shows Phase I Property as being occupied by sea cans and miscellaneous construction materials

Table 1B: Land Use History – Spring Valley Phase 5 Lands				
Year	**Name of Owner**	**Property Use**	**Description of Property Use**	**Other Observations from Aerial Photographs, FIPs, etc.**
Prior to 1964	Multiple Owners	Vacant undeveloped agricultural land	Agricultural or Other Use	Site is shown as vacant undeveloped land in 1945 and 1953 aerial photos. Site is considered to have been vacant undeveloped agricultural land since the time of its crown patent.
1964-2004	Perrodale Farms Limited	Vacant undeveloped agricultural land	Agricultural or Other Use	Aerial photos and site visit undertaken during this time frame indicate that the subject site is vacant undeveloped land. Navan Road landfill developed to the east of the subject site starting in the 1970s. Grading/excavation of overburden material on Adre Taillefer property to the northeast is underway as of the 1960s.
2004-Present	Claridge Homes (Carson) Inc.	Vacant undeveloped land	Agricultural or Other Use	Aerial photos and site visit undertaken during this time frame indicate that the subject site is vacant undeveloped land. Placement of fill material of unknown quality on northern portion of the subject site is observed in 2022 aerial photo.

Potentially Contaminating Activities (PCAs) and Areas of Potential Environmental Concern (APECs)

Three on-site PCAs consisting of three former ASTs and the importation of fill material of unknown quality, and one off-site PCA in the form of a landfill on the adjacent property to the east, are considered to result in APECs on the Phase I Property. The PCAs and resulting APECs are presented below.

Table of Areas of Potential Environmental Concern					
Area of Potential Environmental Concern	**Location of Area of Potential Environmental Concern with respect to Phase I Property**	**Potentially Contaminating Activity**	**Location of PCA (on-site or off-site)**	**Contaminants of Potential Concern**	**Media Potentially Impacted (Groundwater, Soil, and/or Sediment)**
APEC 1 Fill Material of Unknown Quality	The central to northern portion of the Phase I Property	PCA 30 – Importation of Fill Material of Unknown Quality	On-site	BTEX PHCs Metals As, Se, Sb PAHs	Soil
APEC 2 Former Aboveground Storage Tank	The northern portion of the Phase I Property	PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	BTEX PHCs VOCs	Soil and Groundwater

Table of Areas of Potential Environmental Concern					
Area of Potential Environmental Concern	**Location of Area of Potential Environmental Concern with respect to Phase I Property**	**Potentially Contaminating Activity**	**Location of PCA (on-site or off-site)**	**Contaminants of Potential Concern**	**Media Potentially Impacted (Groundwater, Soil, and/or Sediment)**
APEC 3 Former Aboveground Storage Tank	The northern portion of the Phase I Property	PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	BTEX PHCs VOCs	Soil and Groundwater
APEC 4 Potential Impacts from Navan Road Landfill to the East	Eastern portion of the Phase I Property	PCA 58 – Waste Disposal and Waste Management, including landfilling	Off-site	BTEX PHCs VOCs Metals As, Se, Sb Mercury Cr(VI) PAHs	Soil
				BTEX PHCs VOCs Metals As, Se, Sb Mercury Cr(VI) Chloride Cyanide	Groundwater
APEC 5 Potential Impacts from Fill Material of Unknown Quality	The western portion of the Phase I Property	PCA 30 – Importation of Fill Material of Unknown Quality	On-site	BTEX PHCs Metals As, Se, Sb Mercury Cr(VI) PAHs	Soil

Contaminants of Potential Concern

Based on the APECs identified on the Phase I Property, the contaminants of potential concern (CPCs) are:

Soil

- ❒ Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- ❒ Petroleum Hydrocarbons, Fractions F_1 to F_4 (PHCs);
- ❒ Metals;
- ❒ Hydride forming metals (As, Se, Sb);

- ❒ Mercury (Hg);
- ❒ Hexavalent Chromium (Cr(VI));
- ❒ Volatile Organic Compounds (VOCs);
- ❒ Polycyclic Aromatic Hydrocarbons (PAHs);

Groundwater

- ❒ Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- ❒ Petroleum Hydrocarbons, Fractions F_1 to F_4 (PHCs);
- ❒ Metals;
- ❒ Hydride forming metals (As, Se, Sb);
- ❒ Mercury (Hg);
- ❒ Hexavalent Chromium (Cr(VI));
- ❒ Volatile Organic Compounds (VOCs);
- ❒ Chloride;
- ❒ Cyanide.

In addition to the identified CPCs, leachate indicator parameters were analysed as part of the most recently completed Phase II ESA.

7.2 Conceptual Site Model

Geological and Hydrogeological Setting

The Geological Survey of Canada website on the Urban Geology of the National Capital Area was consulted as part of this assessment. Based on the information from NRCAN, bedrock in the area of the site consists of shale, limestone, dolostone and siltstone of the Billings Formation. Based on the maps, both the thickness and composition of the overburden vary across the site. The northern portion of the Phase I Property consists of granular glaciomarine sediments with an overburden of approximately 50 m.

The central portion of the Phase I Property consists of colluvial deposits, and the southern portion of the Phase I Property consists of fine-grained glaciomarine sediments with a drift thickness of approximately 30 m.

Water Bodies

The nearest body of water is the Mer Bleue Bog located 100 m south of the Phase I Property.

Areas of Natural Significance

The Mer Bleue conservation area lies 100 m south of the Phase I Property.

Well Records

A search of the MECP's web site for all drilled well records within 250 m of the Phase I Property was completed as part of this assessment. The search identified two records in the Phase I Study Area.

One record details a domestic water supply well drilled in 1977 to a depth of 45.7m located approximately 220 m east of the Phase I Property.

The second record pertains to the abandonment of a well located at 3225 Navan Road in 2015, located approximately 30 m north of the Phase I Property.

21 monitoring wells have been installed on the Phase I Property during previous subsurface investigations. The depth to the water table was measured between 0.05 to 5.95 m below the existing ground surface.

Bedrock was not encountered during the subsurface investigation as the monitoring wells were advanced to a maximum depth of 11.28 m and were terminated in the native silty clay layer.

Neighbouring Land Use

Neighbouring land use in the Phase I Study Area is primarily residential to the north (across Navan Road) and west, with Navan Landfill to the east and Agricultural Use land, a former rail line, and the Mer Bleue conservation area to the south.

Potentially Contaminating Activities (PCAs) and Areas of Potential Environmental Concern (APECs)

On-site PCAs resulting in APECs on the Phase I Property include three former ASTs and the importation of fill material of unknown quality. One off-site PCA, a landfill on the adjacent property to the east is considered to represent an APEC on the Phase I Property.

PCAs resulting in APECs are presented on Drawing PE4588- 1– Site Plan.

Contaminants of Potential Concern (CPCs)

Based on the APECs identified on the Phase I ESA Property, the contaminants of potential concern (CPCs) are:

Soil

- ❒ Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- ❒ Petroleum Hydrocarbons, Fractions F_1 to F_4 (PHCs);
- ❒ Metals;
- ❒ Hydride forming metals (As, Se, Sb);
- ❒ Mercury (Hg);
- ❒ Hexavalent Chromium (Cr(VI));
- ❒ Volatile Organic Compounds (VOCs);
- ❒ Polycyclic Aromatic Hydrocarbons (PAHs);

Groundwater

- ❒ Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- ❒ Petroleum Hydrocarbons, Fractions F_1 to F_4 (PHCs);
- ❒ Metals;
- ❒ Hydride forming metals (As, Se, Sb);
- ❒ Mercury (Hg);
- ❒ Hexavalent Chromium (Cr(VI));
- ❒ Volatile Organic Compounds (VOCs);
- ❒ Chloride;
- ❒ Cyanide.

In addition to the identified CPCs, leachate indicator parameters were analysed as part of the most recently completed Phase II ESA.

Assessment of Uncertainty and/or Absence of Information

The information available for review as part of the preparation of this Phase I-ESA is considered to be sufficient to conclude that there are four APECs on the Phase I Property. The presence of APECs was confirmed by a variety of independent sources, and as such, the conclusions of this report are not affected by uncertainty which may be present with respect to the individual sources.

8.0 CONCLUSIONS

8.1 Assessment

A Phase I-Environmental Site Assessment (ESA) was carried out for 3252 Navan Road and a contiguous parcel of land referred to as Spring Valley Phase 5, in the City of Ottawa, Ontario. The purpose of the Phase I-ESA was to research the past and current use of the site and study area and to identify environmental concerns with the potential to have impacted the subject property.

The Phase I Property was first developed for residential purposes circa 1945 prior to the conversion of the site to commercial landscaping depot in approximately 1983. The former presence of two diesel AST locations used in conjunction with this activity are on-site PCAs that are considered to result in two APECs on the Phase I Property.

Fill material of unknown quality was identified in the northern half of the Phase I Property during previous investigations. Stockpiles of fill material were also historically present in the western portion of the Phase I Property the origin of which is unknown. The presence of fill material in these locations are on-site PCAs that are considered to result in two APECs on the Phase I Property.

The neighbouring lands have historically consisted primarily of residential use land (dwellings), with landfill operations (industrial use) commencing at 3354 Navan Road around 1965 and continuing to the present day. It should be noted that the landfill does not take domestic waste and solely accepts construction and demolition waste. Off-site landfilling activity is a PCA considered to result in an APEC on the Phase I Property. A railway line was historically present approximately 80 m south of the Phase I Property until it was removed around the mid 1970s. Based on the separation distance, the former rail line is not considered to result in an APEC on the Phase I Property.

Following the historical review, a site visit was conducted. The Phase I Property is being used as a construction site office and for the storage of miscellaneous construction materials, with the remainder consisting of unused former agricultural land.

The neighbouring properties are primarily used for residential purposes with the Navan Road landfill located on the adjacent property to the east, previously discussed. No additional off-site PCAs were identified within the Phase I Study Area.

8.2 Recommendations

Based on the findings of the Phase I-ESA, it is our opinion that **a Phase II-ESA is required for the Phase I Property.** Based on the Phase I Property's former commercial use, a Record of Site Condition (RSC) is required to be filed with the MECP prior to the change in land use to residential use.

Based on the age of the subject building (circa 1945), asbestos-containing materials (ACMs) are potentially present in the subject structure. The potential ACMs observed during the site visit include drywall joint compound and vinyl floor tiles. A Designated Substance Survey (DSS) of the building must be conducted in accordance with Ontario Regulation 278/05, under the Occupational Health and Safety Act, prior to any major renovation or demolition activities.

9.0 STATEMENT OF LIMITATIONS

This Phase I-Environmental Site Assessment (ESA) report has been prepared in general accordance with O.Reg. 153/04 as amended by O.Reg. 269/11 and meets the requirements of CSA Z768-01 (reaffirmed 2022). The conclusions presented herein are based on information gathered from a limited historical review and field inspection program. The findings of the Phase I-ESA are based on a review of readily available geological, historical, and regulatory information and a cursory review made at the time of the field assessment. The historical research relies on information supplied by others, such as, local, provincial, and federal agencies and was limited within the scope-of-work, time and budget of the project herein.

Should any conditions be encountered at the Phase I Property and/or historical information that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

This report was prepared for the sole use of Claridge Homes. Permission and notification from Claridge Homes and Paterson Group will be required to release this report to any other party.

Paterson Group Inc.

Jesse Andrechek, P.Eng., QP$_{ESA}$

Michael Beaudoin, P.Eng., QP$_{ESA}$

Report Distribution:

- Claridge Homes.
- Paterson Group

10.0 REFERENCES

Federal Records
Air photos at the Energy Mines and Resources Air Photo Library.
National Archives.
Maps and photographs (Geological Survey of Canada surficial and subsurface mapping).
Natural Resources Canada – The Atlas of Canada.
Environment Canada, National Pollutant Release Inventory.
PCB Waste Storage Site Inventory.

Provincial Records
MECP Freedom of Information and Privacy Office.
MECP Municipal Coal Gasification Plant Site Inventory, 1991.
MECP document titled “Waste Disposal Site Inventory in Ontario”.
MECP Brownfields Environmental Site Registry.
Office of Technical Standards and Safety Authority, Fuels Safety Branch.
MNR Areas of Natural Significance.
MECP Water Well Inventory.

Municipal Records
City of Ottawa Document “Old Landfill Management Strategy, Phase I Identification of Sites.”, prepared by Golder Associates, 2004.
Intera Technologies Limited Report “Mapping and Assessment of Former Industrial Sites, City of Ottawa”, 1988.
City of Ottawa Historical Land Use Inventory
The City of Ottawa eMap website.

Local Information Sources
Previous Engineering Reports.
Personal Interviews.

Public Information Sources
Google Earth.
Google Maps/Street View.

Private Information Sources
Chain of Title
ERIS Report
Survey Plan

FIGURES

FIGURE 1 – KEY PLAN

FIGURE 2 – TOPOGRAPHIC MAP

DRAWING PE4588-1 – SITE PLAN

DRAWING PE4588-2 – SURROUNDING LAND USE PLAN

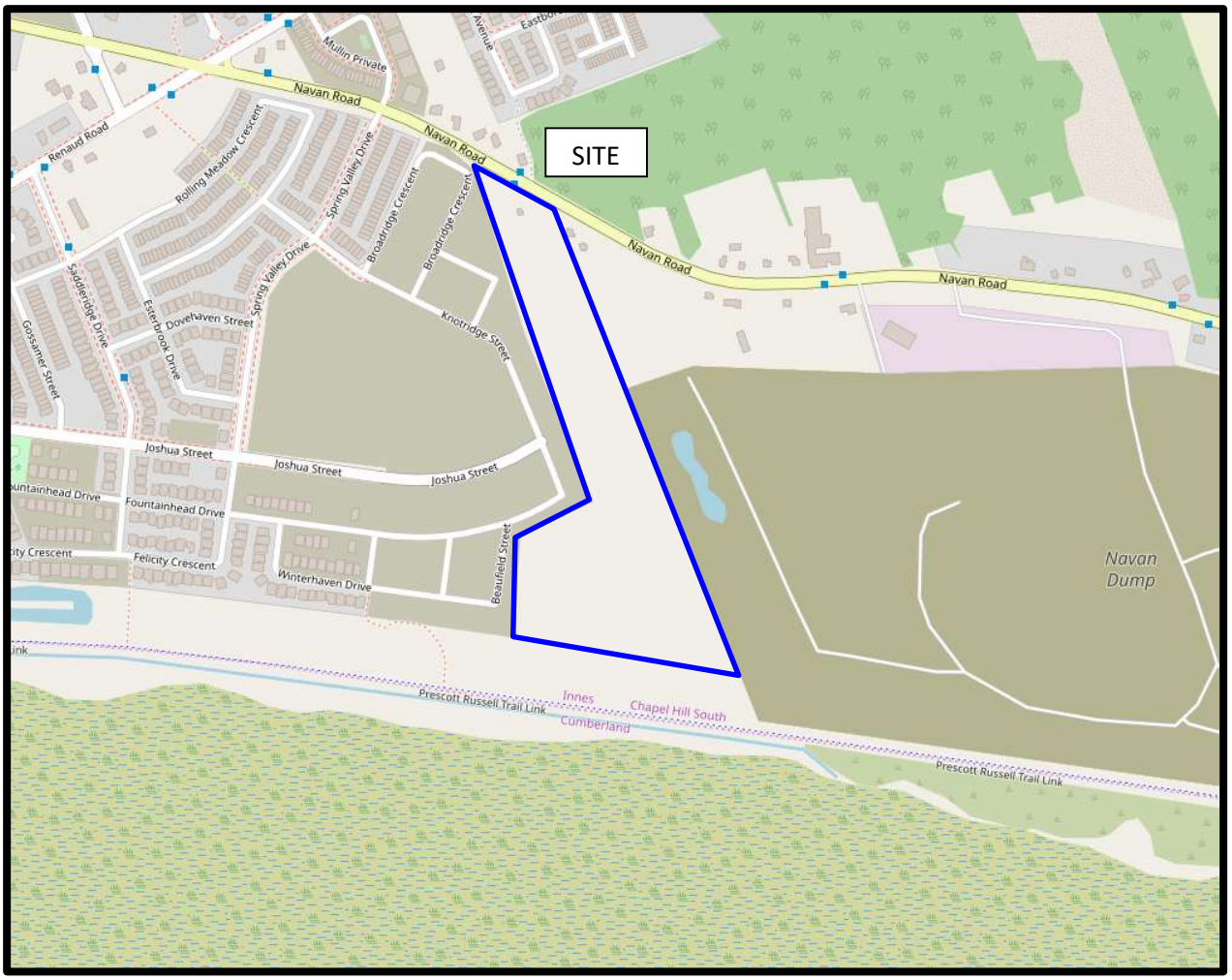


FIGURE 1

KEY PLAN

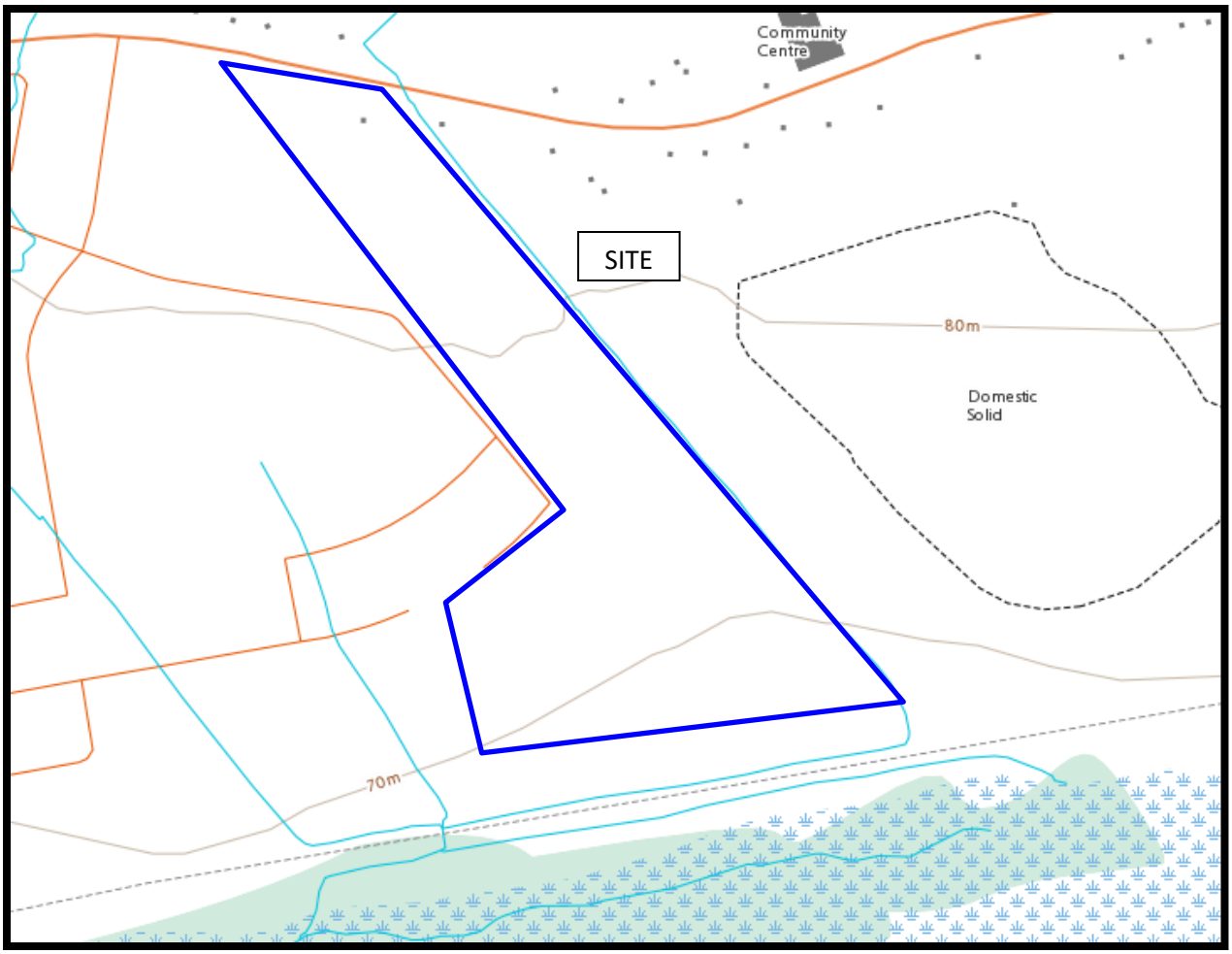
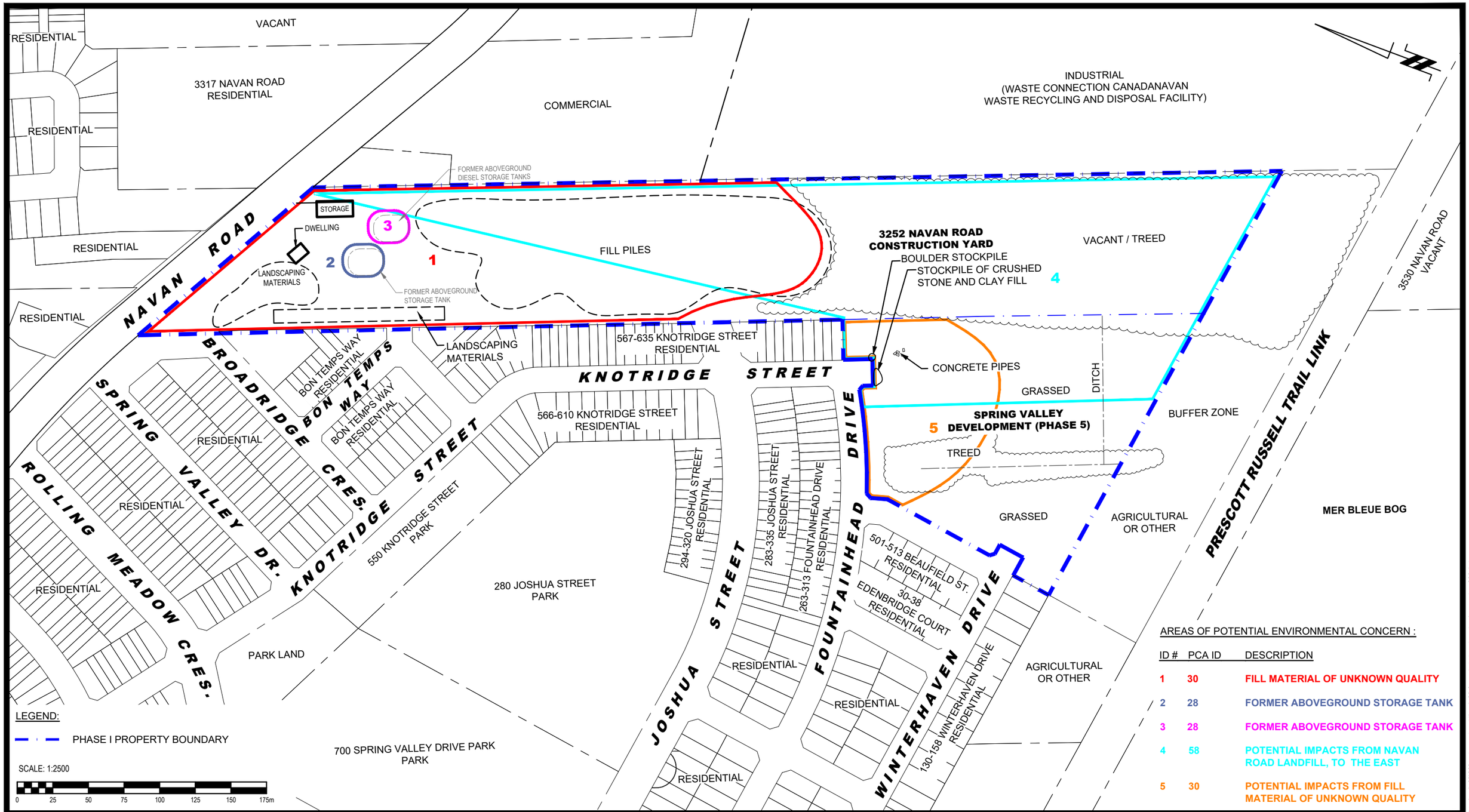


FIGURE 2

TOPOGRAPHIC MAP



LEGEND:

PHASE I PROPERTY BOUNDARY

SCALE: 1:2500

0 25 50 75 100 125 150 175m

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN :

ID #	PCA ID	DESCRIPTION
1	30	FILL MATERIAL OF UNKNOWN QUALITY
2	28	FORMER ABOVEGROUND STORAGE TANK
3	28	FORMER ABOVEGROUND STORAGE TANK
4	58	POTENTIAL IMPACTS FROM NAVAN ROAD LANDFILL, TO THE EAST
5	30	POTENTIAL IMPACTS FROM FILL MATERIAL OF UNKNOWN QUALITY

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

CLARIDGE HOMES (GLADSTONE) INC.

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
3252 NAVAN ROAD AND SPRING VALLEY DEVELOPMENT (PHASE 5)
OTTAWA, ONTARIO

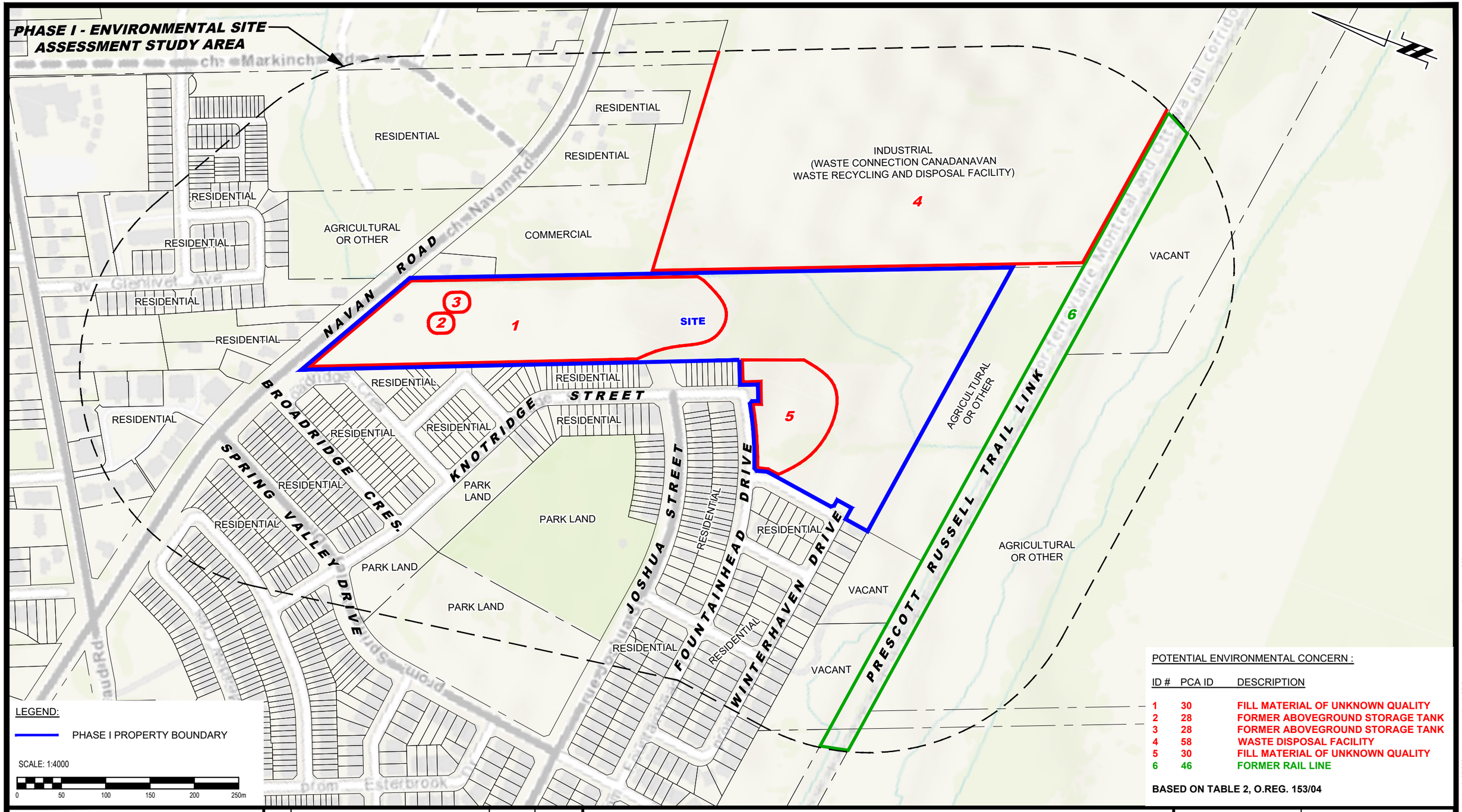
Title:

SITE PLAN

Scale: 1:2500	Date: 09/2025
Drawn by: GK	Report No.: PE4588-2
Checked by: JA	Dwg. No.: PE4588-1
Approved by: MB	Revision No.:

11x17

p:\autocad drawings\environmental\pe45xx\pe4588\2025 phase - i and ii\pe4588-3-test hole location plan (september 2025).dwg



LEGEND:

PHASE I PROPERTY BOUNDARY

SCALE: 1:4000

0 50 100 150 200 250m

POTENTIAL ENVIRONMENTAL CONCERN :

ID #	PCA ID	DESCRIPTION
1	30	FILL MATERIAL OF UNKNOWN QUALITY
2	28	FORMER ABOVEGROUND STORAGE TANK
3	28	FORMER ABOVEGROUND STORAGE TANK
4	58	WASTE DISPOSAL FACILITY
5	30	FILL MATERIAL OF UNKNOWN QUALITY
6	46	FORMER RAIL LINE

BASED ON TABLE 2, O.REG. 153/04

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

CLARIDGE HOMES (GLADSTONE) INC.

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
3252 NAVAN ROAD AND SPRING VALLEY DEVELOPMENT (PHASE 5)
OTTAWA, ONTARIO

Title:

SURROUNDING LAND USE PLAN

Scale: 1:4000	Date: 09/2025
Drawn by: GK	Report No.: PE4588-2
Checked by: JA	Dwg. No.: PE4588-2
Approved by: MB	Revision No.:

11x17

p:\autocad drawings\environmental\pe45xx\pe4588\2025 phase - i and ii\pe4588-2 surrounding land use plan (september 2025).dwg

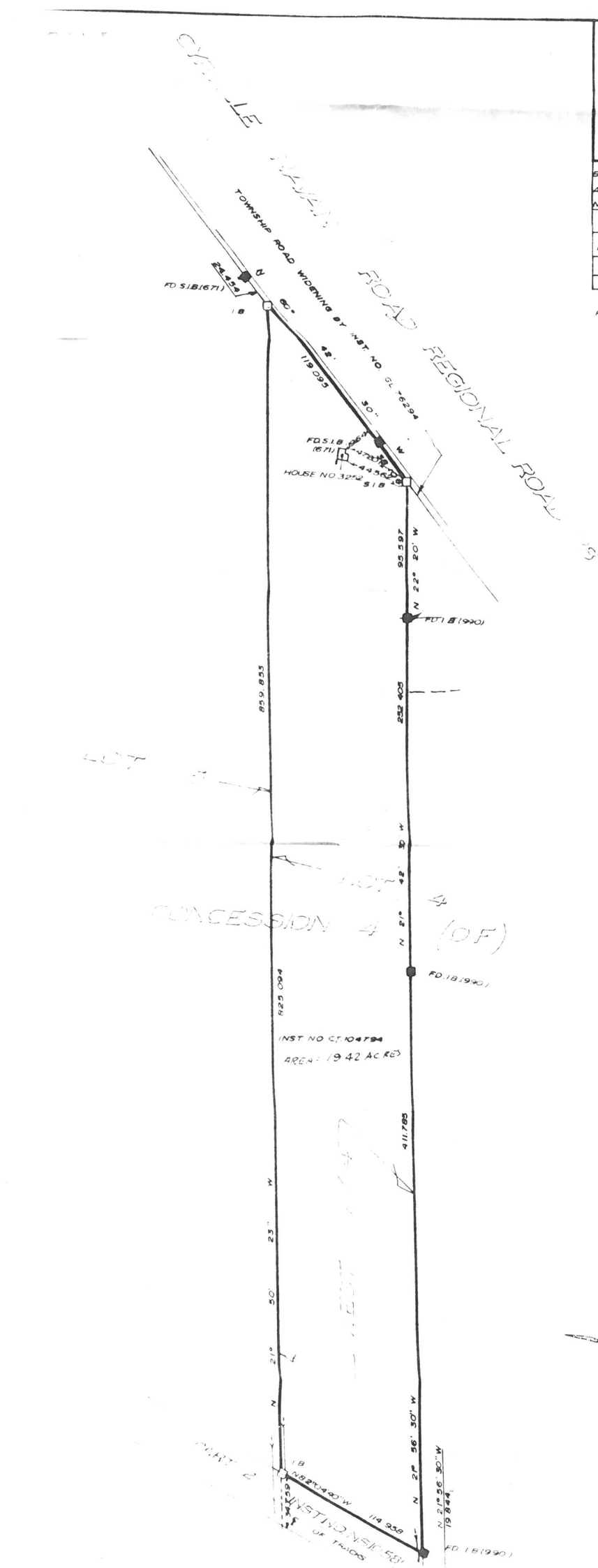
APPENDIX 1

SURVEY PLAN

CHAIN OF TITLE

AERIAL PHOTOGRAPHS

SITE PHOTOGRAPHS



SURVEYOR'S CERTIFICATE

I hereby certify that

1. This survey and plan are correct and in accordance with the Surveys Act and the Registry Act and the regulations made thereunder
2. The survey was completed on Oct 18 19 82

Oct 18 1982

J. G. PAYETTE
ONTARIO LAND SURVEYOR

LEGEND

- IB - DENOTES IRON BAR
- SIB - DENOTES STANDARD IRON BAR
- SSIB - DENOTES SHORT STANDARD IRON BAR
- PIB - DENOTES PLANTED IRON BAR
- CC - DENOTES CUT CROSS
- RB - DENOTES ROCK BAR
- Fd - DENOTES FOUND
- - - DENOTES FENCE

BEARINGS ARE ASTRONOMIC AND ARE REFERRED TO THE SOUTHERLY LIMIT OF REGIONAL ROAD 68 AS WIDENED BY A SURVEY PLAN ATTACHED TO INST. NO. 42036 HAVING A BEARING OF N 60° 42' 30" W IN ACCORDANCE WITH SAID INST. NO. 42036

SCHEDULE

PART	LOT	CONCESSION	INST. NO.
1	4	4 (O.F.)	GL104794
2			

PLAN WAS AMENDED APRIL 2, 1984 J.G. Payette O.L.S.
J.G. PAYETTE O.L.S.

PLAN OF SURVEY OF
PART OF LOT 4 CONCESSION 4 (Ottawa Front) CITY OF GLOUCESTER

REGIONAL MUNICIPALITY OF OTTAWA-CARLETON
SURVEYED BY J. G. PAYETTE O.L.S.

1982

SCALE 1:2500

40 20 0 20 40 METRES

METRIC

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

NOTICE OF APPLICATION
No. OC752811
Amended Notice of Application
Registered as OC779328

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.
DATE: May 29/2008
EDWARD M. LANCASTER
ONTARIO LAND SURVEYOR

PLAN 4R- 22907
RECEIVED AND DEPOSITED
DATE: June 11 2008
L. Iacovitti Assistant
LAND REGISTRAR FOR THE
LAND TITLES DIVISION OF
OTTAWA-CARLETON NO. 4.

SCHEDULE

PART	DESCRIPTION	PIN
1	PART OF LOTS 5 AND 6 AND PART OF THE ROAD ALLOWANCE BETWEEN LOTS 5 AND 6 (AS CLOSED BY BY-LAW 2007-132, INST. OC708828) CONCESSION 4 OTTAWA FRONT	PART OF 04352-1312

PLAN OF SURVEY OF

PART OF LOTS 5 AND 6
AND
PART OF THE ROAD ALLOWANCE
BETWEEN LOTS 5 AND 6
(AS CLOSED BY BY-LAW 2007-132,
INST. OC708828)
CONCESSION 4 (OTTAWA FRONT)
Geographic Township of Gloucester
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 2000
80 60 40 20 0 40 80 Metres

Metric
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

Surveyor's Certificate

I CERTIFY THAT :
1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act, the Land Titles Act and the regulations made under them.
2. The survey was completed on the 13th day of September, 2007.

May 29/2008
Date
Edward M. Lancaster
Ontario Land Surveyor

Notes & Legend

—□— Denotes Survey Monument Planted
—■— " Survey Monument Found
SIB = Standard Iron Bar
SSIB = Short Standard Iron Bar
IB = Iron Bar
IBØ = Round Iron Bar
(WIT) = Witness
(AOG) = Annis, O'Sullivan, Vollebekk Ltd.
Meas. = Measured
UP = Utility Pole
(P1) = Plan 4R-18007
(P2) = Plan 5R-9993
(P3) = Plan 4R-21751
(P4) = Plan 4R-21539
(P5) = Plan 4R-18063
(P6) = Plan 5R-3857
(P7) = Plan 5R-13513
(P8) = Plan 5R-691
(P9) = Plan 5R-5555
(P10) = Plan 4R-18616
(D1) = Inst. CT122799
(D2) = Inst. CT129475

All found survey monuments are (AOG) unless noted otherwise.

Bearings are astronomic, derived from the southerly limit of Part 1 Plan 4R-18007, shown to be N 82°44'30" W thereon.

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
Ontario Land Surveyors
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com

Job No. 8047-07 Oldridge4thLineRd PILts 5 6 CGF IpMap F3 mtl

Y:\CLARIDGE\OTHLINE-ROAD\8047-07\PWL\8047-07 Oldridge 4thRoad\Mtl P1Lts 5 6 CGF OL Mr.lwp Thursday, 03/20/2008 11:37:56 AM

READ Abstracts Limited
331 Cooper Street, Suite 300, Ottawa, Ontario K2P 0A4
Email: search@readsearch.com
Tel.: 613-236-0664
Fax: 613-236-3677

ENVIRONMENTAL SEARCH

January 27, 2014

Patersongroup
Attn: Daniel J. Arnott

Re: PE2990

BRIEF DESCRIPTION OF LAND:

No Municipal Address
Part of Lots 5 and 6, and Part of the Road Allowance between Lots 5 and 6, Concession 4 Ottawa Front, Gloucester.
PIN: 04352-2077

LAST REGISTERED OWNER: CLARIDGE HOMES (CARSON) INC.

CHAIN OF TITLE:

Lot 5, Concession 4 OF, Gloucester

Patent dated August 1, 1811
To Ronald McGillis

Deed RO1280 registered September 26, 1831
From Sheriff MacDonell to George C. Rankin

Deed RO2682 registered April 2, 1838
From George C. Rankin to William Osborne

Deed RO3466 registered July 22, 1842
From Sheriff Treadwell to Simon Fraser

Deed GL883 registered November 17, 1871
From Simon Fraser to George Taillon

Deed GL2407 registered April 27, 1875
From George Taillon to Joseph R. Perrault

Will (Deposit) 1111 registered March 17, 1951
From Joseph R. Perrault to Robert J. Perrault

Deed GL61663 registered July 2, 1959
From Estate of Robert J. Perrault to Louis J Perrault

Deed GL75516 registered October 21, 1964
From Louis J. Perrault to Perrodale Farms Limited

Deed OC38116 registered September 30, 2004
From Perrodale Farms Limited to Claridge Homes (Carson) Inc.

Lot 6, Concession 4 OF, Gloucester

Patent dated August 1, 1811
To John McKenzie

Deed RO1280 registered September 26, 1831
From Sheriff MacDonell to George C. Rankin

Deed RO2682 registered April 2, 1838
From George C. Rankin to William Osborne

Deed RO14336 registered July 1, 1859
From William Osborne to Joshua Bradley

Deed GL1764 registered September 28, 1872
From Joshua Bradley to William Bradley

Deed GL17736 registered March 11, 1904
From William Bradley to Thomas Hand

Deed GL20671 registered March 25, 1909
From Thomas Hand to Onesime Lafontaine

Deed GL34325 registered October 28, 1927
From Onesime Lafontaine to Robert J. Perrault

Probate GR5405 registered May 3, 1929
From Robert J. Perrault to William J. Perrault and Isabella Perrault

Deed N375240 registered February 5, 1987
From Estate of Isabella Perrault to Denis Perrault and John Perrault and Bernard Perrault

Deed OC226943 registered July 31, 2003
From Denis Perrault and John Perrault and Bernard Perrault to Claridge Homes (Carson) Inc.

Part of the Road Allowance between Concession 5 and 6

Deed OC708851 registered April 19, 2007
From City of Ottawa to Claridge Homes (Carson) Inc.

READ Abstracts Limited
331 Cooper Street, Suite 300, Ottawa, Ontario K2P 0A4
Email: search@readsearch.com
Tel.: 613-236-0664
Fax: 613-236-3677

ENVIRONMENTAL SEARCH

February 11, 2016

Patersongroup
Attn: Daniel J. Arnott

Re: PE2990

BRIEF DESCRIPTION OF LAND:

No Municipal Address
Part lot 5, Con 4 Ottawa Front, Gloucester,
part of part 1 on 4R22907
Ottawa
PIN: 04352-2077

LAST REGISTERED OWNER: CLARIDGE HOMES (CARSON) INC.

CHAIN OF TITLE:

Lot 5, Concession 4 OF, Gloucester

Patent dated August 1, 1811
To Ronald McGillis

Deed RO1280 registered September 26, 1831
From Sheriff MacDonell to George C. Rankin

Deed RO2682 registered April 2, 1838
From George C. Rankin to William Osborne

Deed RO3466 registered July 22, 1842
From Sheriff Treadwell to Simon Fraser

Deed GL883 registered November 17, 1871
From Simon Fraser to George Taillon

Deed GL2407 registered April 27, 1875
From George Taillon to Joseph R. Perrault

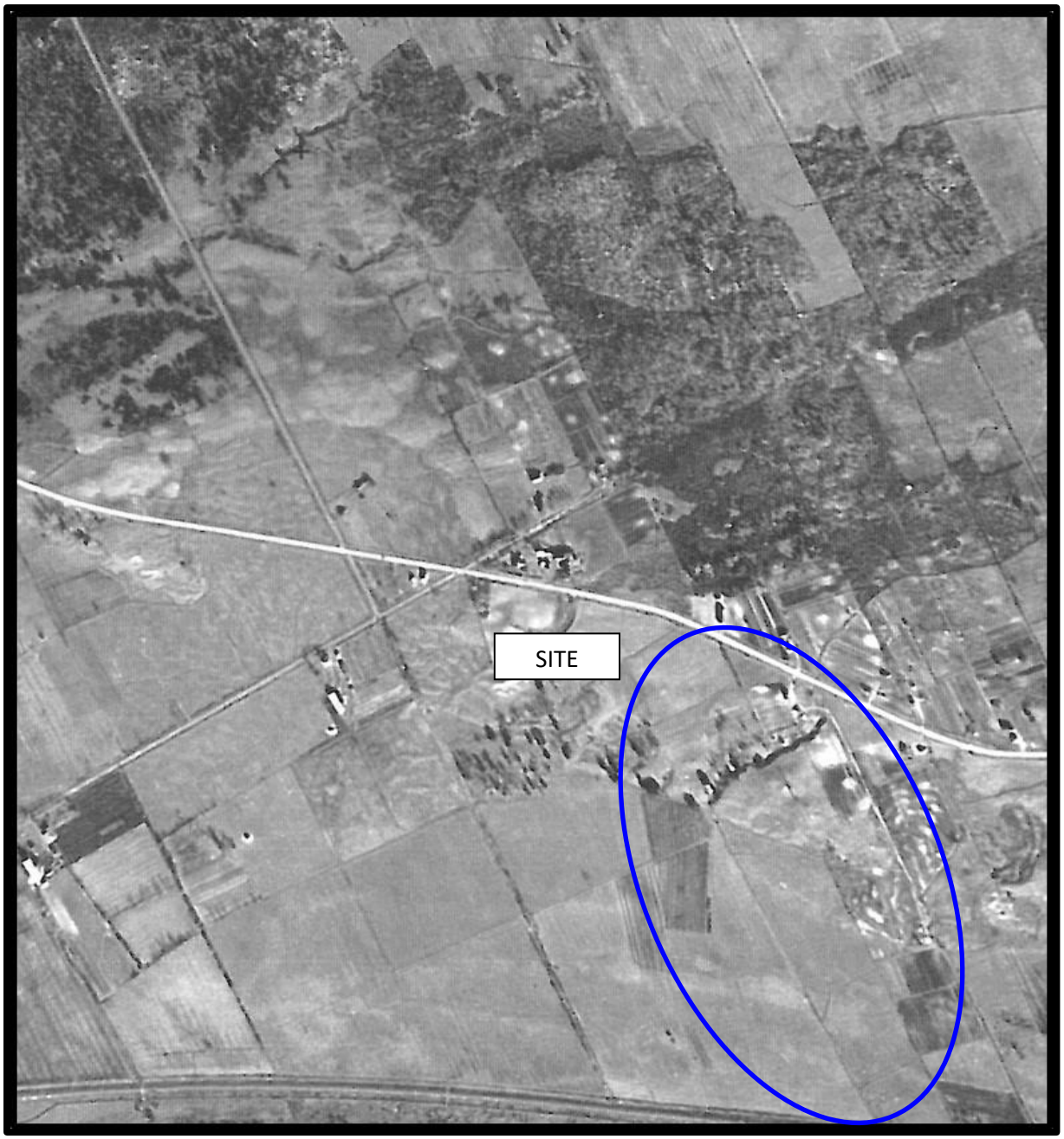
Probate GR5405 registered May 3, 1929
From Joseph R. Perrault to Robert J. Perrault

Deed GL61663 registered July 2, 1959
From Estate of Robert J. Perrault to Louis J Perrault

Deed GL75516 registered October 21, 1964
From Louis J. Perrault to Perrodale Farms Limited

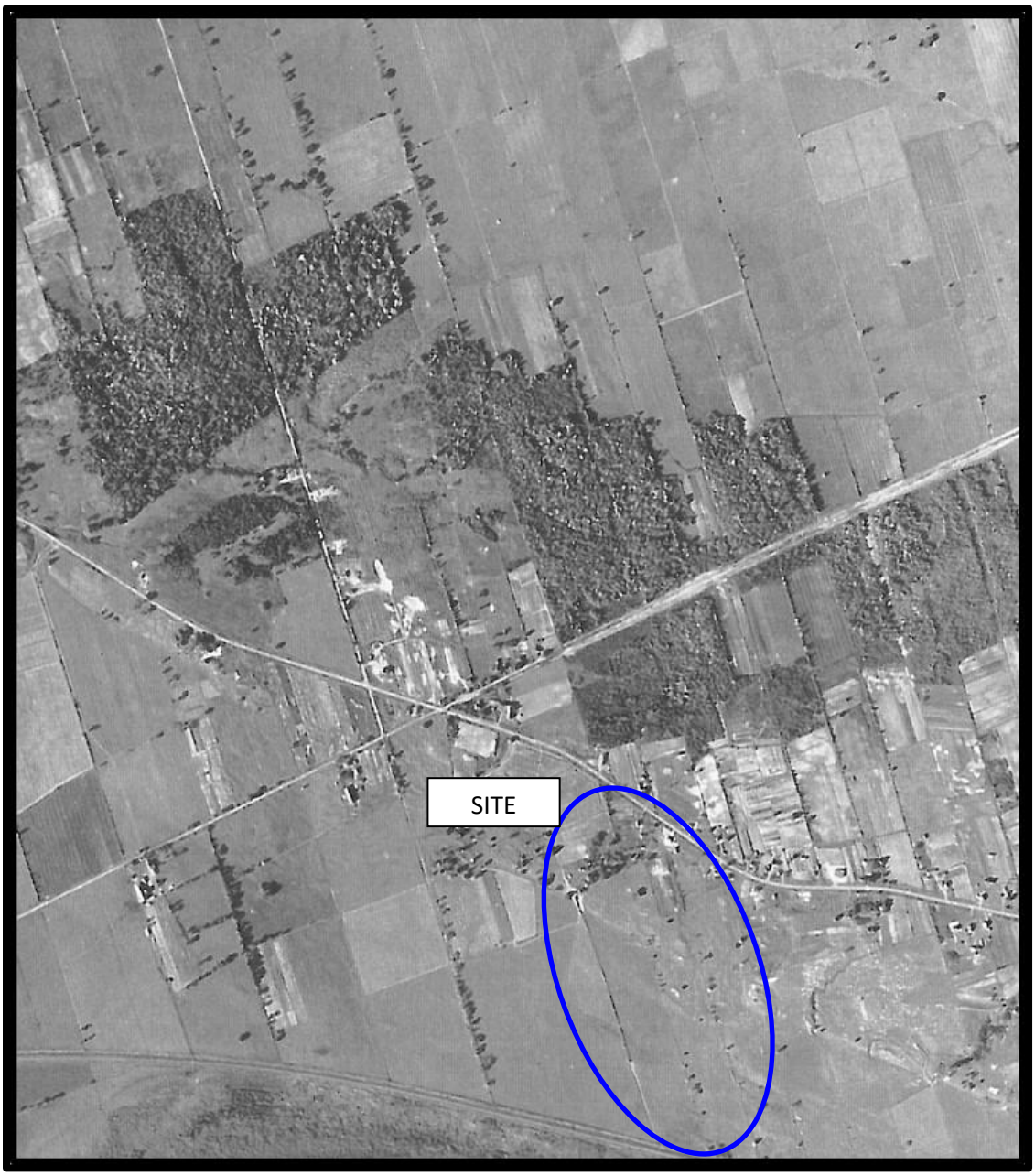
Deed OC38116 registered September 30, 2004
From Perrodale Farms Limited to Claridge Homes (Carson) Inc.

Deed OC722496 registered May 28, 2007
From Claridge Homes (Carson) Inc. to Claridge Homes (Carson) Inc.



AERIAL PHOTOGRAPH
1945

PATERSON GROUP



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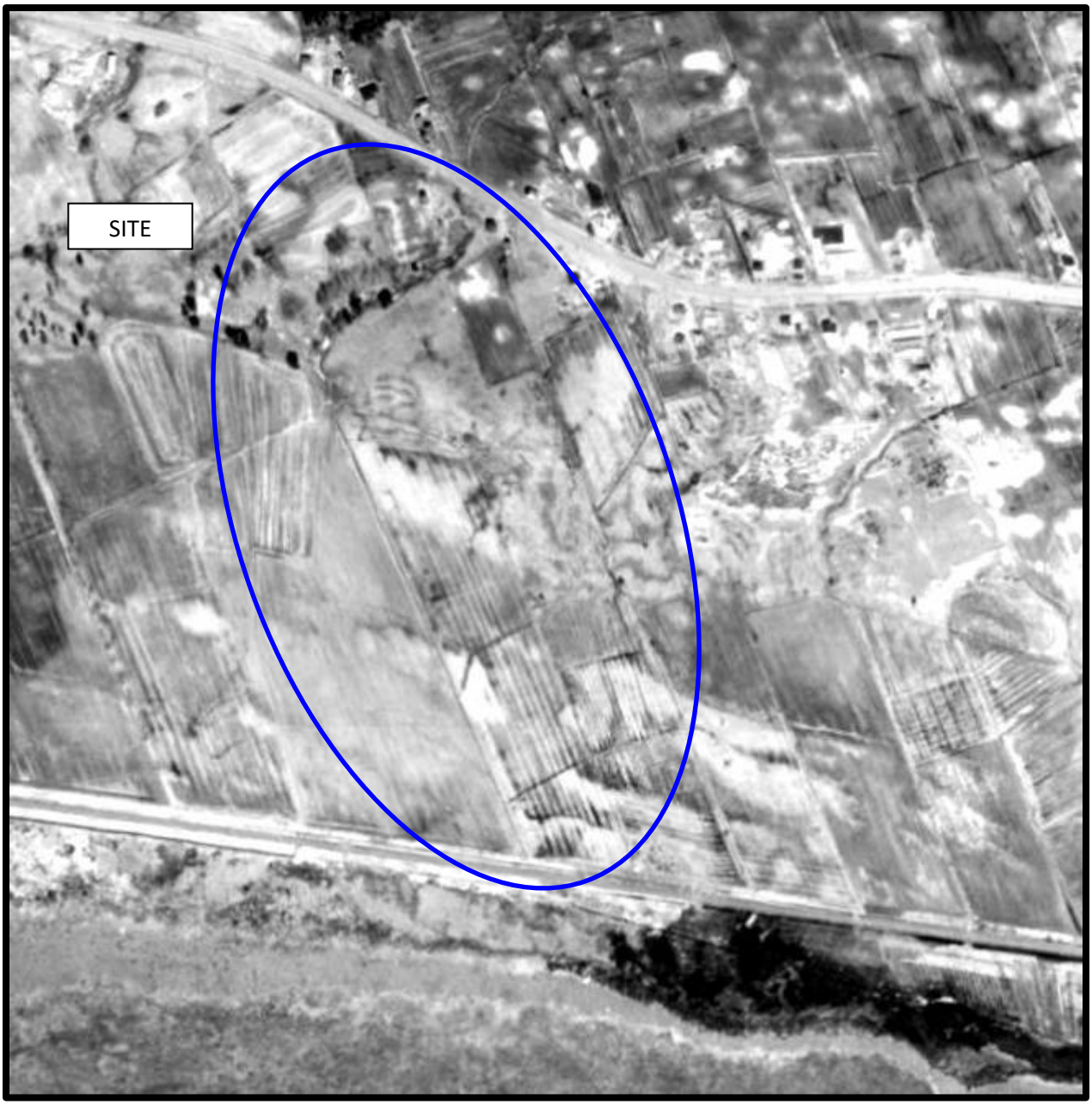
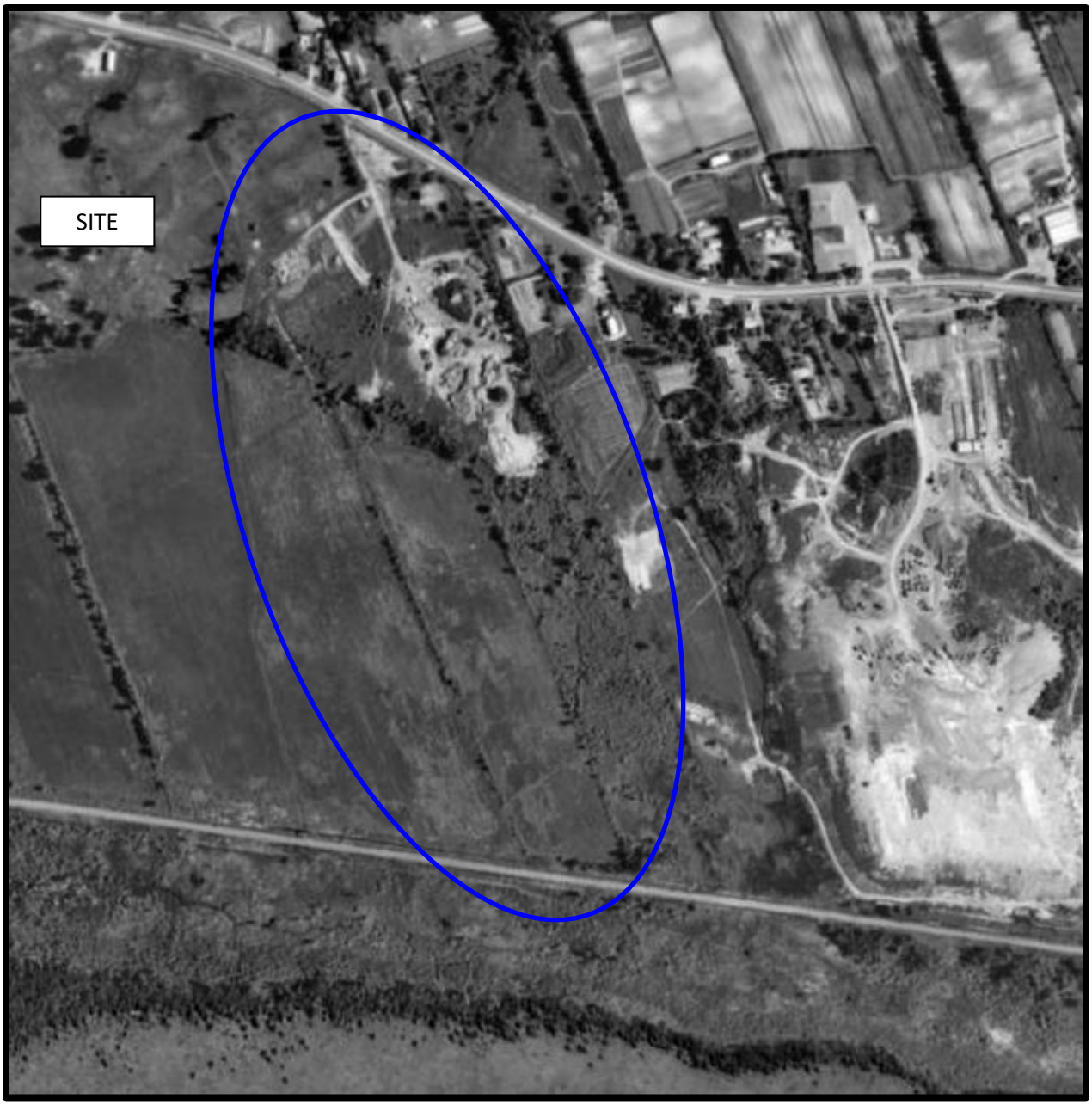


AERIAL PHOTOGRAPH
1965

PATERSON GROUP

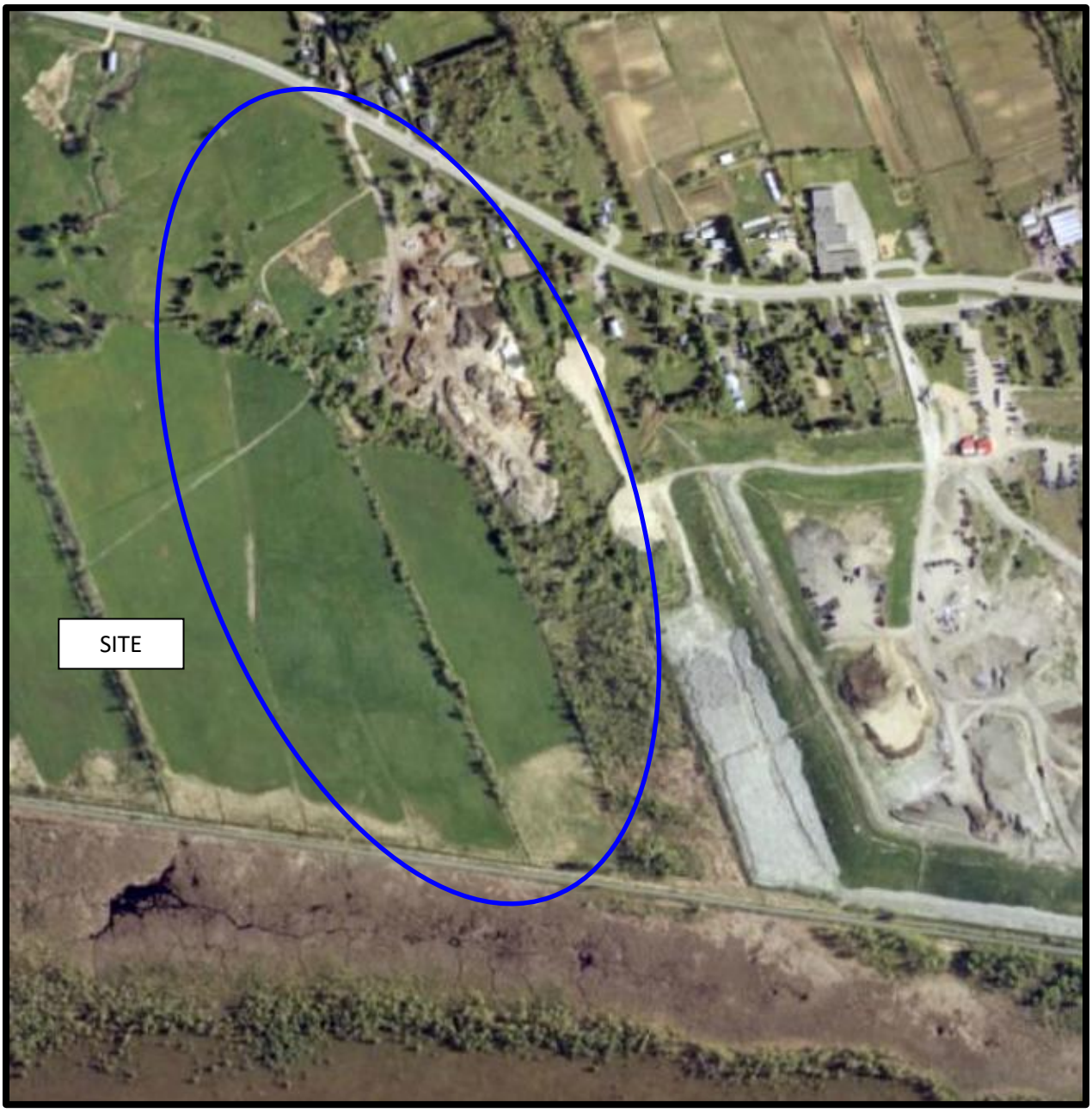
AERIAL PHOTOGRAPH
1976

PATERSON GROUP



AERIAL PHOTOGRAPH
1991

PATERSON GROUP



AERIAL PHOTOGRAPH
2002

PATERSON GROUP

AERIAL PHOTOGRAPH
2011

PATERSON GROUP

AERIAL PHOTOGRAPH
2017

PATERSON GROUP

AERIAL PHOTOGRAPH
2023

PATERSON GROUP

Site Photographs

PE4588 | 3252 Navan Road, Ottawa ON | October 5, 2023

Photograph 1: View of Northern Portion of the Phase I Property Looking North

Photograph 2: View of Western Portion of the Phase I Property Looking West

APPENDIX 2

MECP FREEDOM OF INFORMATION

MECP WELL RECORDS

TSSA RESPONSE

HLUI RESPONSE

ERIS REPORT

Ontario

Ministry of the Environment and Climate Change

Freedom of Information and
Protection of Privacy Office
40 St. Clair Avenue West, 12th Floor
Toronto ON M4V 1M2
Telephone 416 314-4075

Freedom of Information Request

Instructions

Use this form to request records that are in the Ministry's files on environmental concerns related to properties. Our fax number is 416 314-4285.

For Ministry Use Only

FOI Request Number	Date Request Received (yyyy/mm/dd)
Fee Paid	☐ Cheque ☐ VISA/MC ☐ Cash/Money Order

☐ CNR ☐ ER ☐ NOR ☐ SWR ☐ WCR ☐ IEB ☐ EAA ☐ EMR ☐ SCB ☐ SDW

1. Requester Data

Last Name	First Name	Middle Initial
Berube	Samuel	R

Title	Company Name
EIT	Paterson Group Ltd.

Mailing Address

Unit Number	Street Number	Street Name	PO Box
	154	Colonnade Road South	

City/Town	Province	Postal Code
Ottawa	Ontario	

Email Address	Telephone Number	Fax Number
sberube@patersongroup.ca	316 226-7381 ext.	

Project/Reference Number	Signature of Requester
PE4588	

2. Request Parameters

Municipal Address (Municipal address mandatory for cities, towns or regions)

Unit Number	Street Number	Street Name	PO Box
	3252	Navan Road	

Lot Number	Concession	Geographic Township
4	4	Gloucester

City/Town/Village	Province	Postal Code
Ottawa	Ontario	K4B 1H9

Present Property

1. Owner
   Claridge Homes — Date of Ownership (yyyy/mm/dd)
   Tenant (if applicable)

Previous Property

1. Owner — Date of Ownership (yyyy/mm/dd)
   Tenant (if applicable)

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3. Search Parameters

Search Parameters	Specify Year(s) Requested
Environmental concerns (General correspondence, occurrence reports, abatement)	all
Orders	all
Spills	all
Investigations/prosecutions ► Owner and tenant information must be provided	all
Waste Generator number/classes	all

Files older than 2 years may require $60.00 retrieval cost. There is no guarantee that records responsive to your request will be located.

4. Environmental Compliance Approvals/Certificates of Approval

Environmental Compliance Approvals/Certificates of Approval	SD	Specify Year(s) Requested
air - emissions	☐	all
renewable energy	☐	all
water - mains, treatment, ground level, standpipes & elevated storage, pumping stations (local & booster)	☐	all
sewage - sanitary, storm, treatment, stormwater, leachate & leachate treatment & sewage pump stations	☐	all
waste water - industrial discharge	☐	all
waste sites - disposal, landfill sites, transfer stations, processing sites, incinerator sites	☐	all
waste systems - haulers: sewage, non-hazardous & hazardous waste, mobile waste processing units, PCB destruction	☐	all

Proponent information must be provided and Environmental Compliance Approval/Certificate of Approval number(s) (if known). 1985 and prior records are searched manually. Search fees in excess of $300.00 may be incurred, depending on the types and years to be searched. Specify Approval number(s) (if known). If supporting documents are also required, mark SD box and specify type e.g. maps, plans, reports, etc.

ATTACHMENT 1

Report on 2019 Landfill Monitoring

GOLDER

REPORT

2019 Landfill Monitoring

Waste Connections of Canada
Navan Waste Recycling and Disposal Facility
Ottawa, Ontario

Submitted to:

Waste Connections of Canada
Waste Connections of Canada
3354 Navan Road
Ottawa, Ontario
K4B 1H9

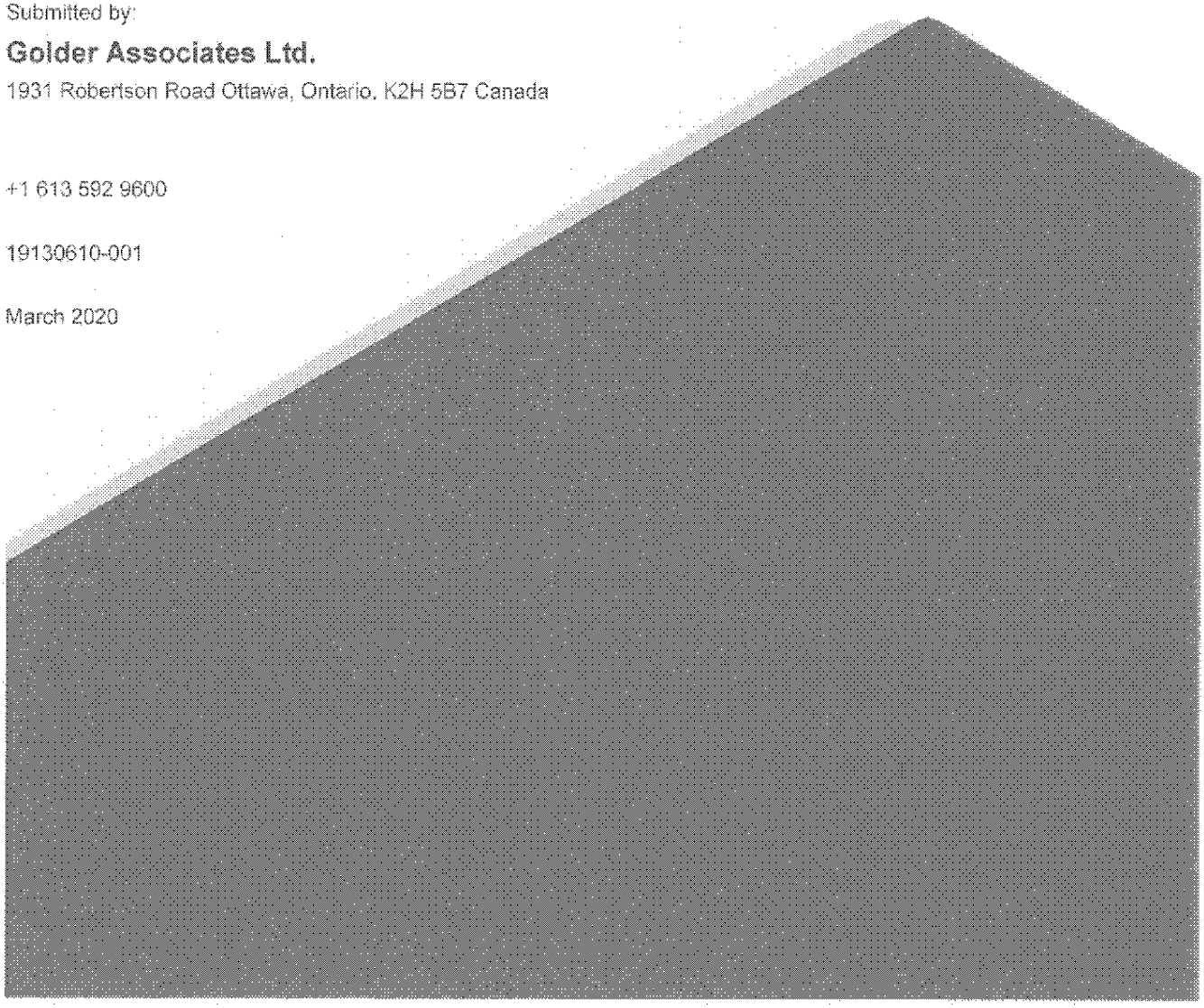
Submitted by:

Golder Associates Ltd.
1931 Robertson Road Ottawa, Ontario, K2H 5B7 Canada

+1 613 592 9600

19130610-001

March 2020



Appendix D-Monitoring and Screening Checklist
General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.
Instructions: A complete checklist consists of:
(a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
(b) completed contact information for the Competent Environmental Practitioner (CEP)
(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:
For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:
(a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..
Definition of Surface water CEP:
A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site (WDS) Name	Navan Waste Recycling and Disposal Facility
Location (e.g. street address, lot, concession)	3354 Navan Road. Parts of Lots 2, 3 and 4, Concession IV
GPS Location (taken within the property boundary at front gate/ front entry)	460569.6m E 5030570.0m N (Zone 18)
Municipality	City of Ottawa (formerly City of Gloucester)
Client and/or Site Owner	Waste Connections of Canada
Monitoring Period (Year)	2019
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval (ECA) Number (formerly "Certificate of Approval" (C of A)) :	No. A460702
Director's Order No.:	N/A
Provincial Officer's Order No.:	N/A

Other:	N/A		
Report Submission Frequency	(•) **Annual** ( ) **Other**	Due March 31	
The site is: **(Operation Status)**	(•) **Open** ( ) **Inactive** ( ) **Closed**		
Is there an active waste transfer station at the site?	( ) **Yes** (•) **No**		
Does this WDS have a Closure Plan?	(•) **Not yet submitted** ( ) **Submitted and under review** ( ) **Submitted and approved**		
Total Approved Capacity	7,600,000 (excl. final cover)	*Units*	Cubic Metres
Maximum Approved Fill Rate	1,500	*Units*	Tonnes per Day
Total Waste Received within Monitoring Period (Year)	222,976	*Units*	Tonnes
Total Waste Received within Monitoring Period (Year) *Describe the methodology used to determine this quantity*	Weighed		
Estimated Remaining Capacity	1,896,722	*Units*	Cubic Metres
Estimated Remaining Capacity *Describe the methodology used to determine this quantity*	Estimation		
Estimated Remaining Capacity *Date Last Determined*	1-Jan-2020		
Non-Hazardous Approved Waste Types	[X] Domestic [X] Industrial, Commercial & Institutional (IC&I) [ ] Source Separated Organics (Green Bin) [ ] Tires	[X] Contaminated Soil [X] Wood Waste [ ] Blue Box Material [ ] Processed Organics [ ] Leaf and Yard Waste	[ ] Food Processing/Preparation Operations Waste [ ] Hauled Sewage Other: Asbestos waste. Petruscible waste are not accepted for landfilling.
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*	None		

Year Site Opened *(enter the Calendar Year only)*	1960	**Current ECA Issue Date**	April 16, 2009, not incl. notices
Is your Site required to submit Financial Assurance?		◉ Yes ○ No	
Describe how your WDS is designed.		○ Natural Attenuation only ◉ Fully engineered Facility ○ Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		○ Yes ◉ No	
If closed, specify ECA, control or authorizing document closure date:		N/A	
Has the nature of the operations at the site changed during this monitoring period?		○ Yes ◉ No	
If yes, provide details:			

Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)	○ Yes ◉ No

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) **The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:**	◉ **Yes** ○ **No**	
2) **All groundwater, leachate and landfill gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by ECA or other relevant authorizing/ control document(s):**	○ **Yes** ◉ **No** ○ **Not Applicable**	If no, list exceptions below or attach information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
94-2 and 94-5	Monitoring wells 94-2 and 94-5 were inadvertently excluded during the June 2019 monitoring session.	
MW09-1A, 1B, 1C, and 1D	Those groundwater monitoring locations were not sampled during the winter of 2020 due to historical conditions of frozen water in the monitoring wells. Instead, they were monitored in November 2019. MW09-1A was frozen at the time and no sample was collected at this location.	

3) a) Some or all groundwater, leachate and landfill gas sampling and monitoring requirements have been established or defined outside of a ministry ECA, authorizing, or control document, *or Ministry concurrence.*	○ Yes ◉ No ○ Not Applicable	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	○ Yes ○ No ◉ Not Applicable	If no, list exceptions below or attach additional information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

4) **All field work for groundwater investigations was done in accordance with Standard Operating Procedures (SOP) as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):**	○ Yes ◉ No	Golder Associates Ltd. standard practices were followed as described in the report.
Sampling and Monitoring Program Results/WDS Conditions and Assessment:		
5) **The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/ or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.**	◉ Yes ○ No	
6) **The site meets compliance and assessment criteria.**	○ Yes ◉ No	In 2019, only one trigger exceedance of the background range was reported: it was for magnesium at MW92-10, in the weathered clay stratigraphic unit. No other continued increase in concentration for other parameters beyond the background range was reported in 2019 in the sand stratigraphic unit or the weathered clay stratigraphic unit.
7) **The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.**	○ Yes ◉ No	Exceedances of background range were reported at many downgradient monitoring wells for several parameters in 2019. Additional data in the intact clay and glacial till/upper bedrock units to be collected in 2020 is needed to evaluate trends in leachate indicator parameters concentrations in these units.

1) Is one or more of the following risk reduction practices in place at the site: *(a)* There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or *(b)* There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or *(c)* The site meets the following two conditions (typically achieved after 15 years or longer of site operation): *i.*The site has developed stable leachate mound(s) and stable leachate plume geometry/ concentrations; and *ii.*Seasonal and annual water levels and water quality fluctuations are well understood.	◉ Yes ○ No	Note which practice(s):	☒ (a) ☒ (b) ☐ (c)
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	◉ Yes ○ No ○ Not Applicable	In 2019, only one trigger exceedance of the background range was reported: it was for magnesium at MW92-10, in the weather clay unit. The MECP was informed of this exceedance. WCC intends to maintain low leachate level in the landfill and be proactive in maintaining the leachate forcemain. A spare leachate pump was acquired in 2019 as a contingency.	

Groundwater CEP Declaration:

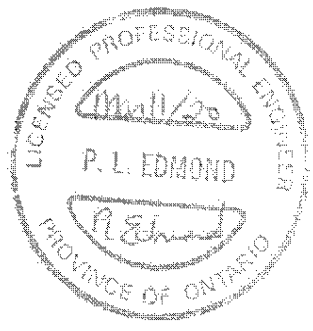
I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

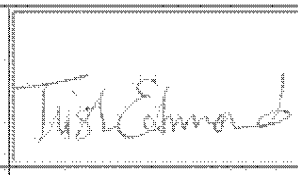
I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

○ **No changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/ are recommended:**	Due to on-going inability to collect water samples in monitoring wells MW09-1A through D located in Mer Bleue because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer). It is also proposed to remove VOCs from the list of parameters of the groundwater monitoring program as well as discontinue sediment monitoring (see rationale in Section 9.0).
◉ **No Changes to site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/are recommended:**	
Name:	Trish Edmond, M.E.Sc., P.Eng.
Seal:	Add Image 

Signature:		**Date:**	11-Mar-2019
CEP Contact Information:			
Company:	Golder Associates Ltd.		
Address:	1931 Robertson Road, Ottawa, Ontario, K2H 5B7		
Telephone No.:	613-592-9600	Fax No. :	613-592-9601
E-mail Address:	Trish_Edmond@golder.com		
Co-signers for additional expertise provided:			
Signature:		**Date:**	Select Date
Signature:		**Date:**	Select Date

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):	
Name (s)	See Attachment A.

Distance(s)	N/A

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) **The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:**	(●) Yes ( ) No	
2) **All surface water sampling for the monitoring period being reported was successfully completed in accordance with the ECA or relevant authorizing/control document(s) (if applicable):**	(●) Yes ( ) No ( ) Not applicable	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

3) a) **Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry ECA or authorizing/control document** *, or Ministry concurrence.*	( ) Yes (●) No ( ) Not Applicable	
b) **If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:**	( ) Yes ( ) No (●) Not Applicable	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

4) All field work for surface water investigations was done in accordance with SOP, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	○ Yes ◉ No	Golder Associates Ltd. standard practices were followed as described in the report.

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):	◉ Yes ○ No

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table on the following page or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. ECA limit, PWQO, background	e.g. X% above PWQO
6) **In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?**	(•) Yes ( ) No	There are no exceedances as there is no surface water-related compliance criteria (see question 7).

7) **All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.**	(●) **Yes** ( ) **No**	The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility. The MECP has agreed that this is the preferred approach for the WCC Navan Facility.
8) **For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g. , PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):**	( ) Yes ( ) No ( ) Not Known (●) Not Applicable	
9) **Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):**	( ) **Yes** ( ) **No** (●) **Not Applicable**	

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

◉ No Changes to the monitoring program are recommended	
○ The following change(s) to the monitoring program is/are recommended:	
◉ No changes to the site design and operation are recommended	
○ The following change(s) to the site design and operation is/ are recommended:	

CEP Signature	
Relevant Discipline	P.Eng. with demonstrated relevant experience.
Date:	11-Mar-2019
CEP Contact Information:	Trish Edmond, M.E.Sc., P.Eng.
Company:	Golder Associates Ltd.
Address:	1931 Robertson Road, Ottawa, ON, K2H 5B7
Telephone No.:	613-592-9600
Fax No. :	613-592-9601
E-mail Address:	Trish_Edmond@golder.com

Save As | Print Form

Attachment A

In the event that leachate-impacted water was to reach either stormwater management ponds or ditches on the site, the source of the impact would be determined and then intercepted, as required. If necessary, the affected pond and/or ditches could then be emptied through a temporary pumping operation and the pumped water could be combined with the leachate and directed for off-site treatment. Therefore, there are no surface water bodies potentially receiving waste disposal site effluent.

Distribution List

10 copies	Waste Connections of Canada
1 copy	National Capital Commission
1 e-copy	Golder Associates Ltd.

Executive Summary

This report serves as the annual environmental monitoring portion of the 2019 site operations and monitoring report and presents the results of groundwater, surface water, leachate and sediment monitoring activities carried out during 2019 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility). This report has been prepared to fulfill the reporting requirements outlined in Conditions 135 and 136 of Environmental Compliance Approval (ECA) No. A460702.

The following executive summary highlights key points only; for complete information and findings it is necessary for the reader to examine the complete report.

Based on the groundwater levels obtained during the 2019 monitoring program, no significant change in groundwater flow patterns has been observed.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (un-weathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present up-gradient, at the down-gradient edge (used to assess compliance) and further down-gradient of the landfill in each of these units.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2018 background range.

Leachate quality monitoring results for 2019 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Trigger concentrations exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

In 2019, only one trigger exceedance of the background range was reported: it was for magnesium at MW92-10, in the weathered clay stratigraphic unit. No other continued increase in concentration for other parameters beyond the background range was reported in 2019 in the sand stratigraphic unit or the weathered clay stratigraphic unit, due to stabilizing or decreasing concentrations following WCC actions.

In a continuing effort to achieve a drained state in the leachate collection system, WCC intends to proactively maintain the forcemain in good working condition and acquired in 2019 a spare leachate pump to reduce down time when a pump requires servicing. Discharge pumps were already upgraded in the fall of 2011 from 20 horsepower to 35 horsepower in an effort to achieve and maintain a discharge of 17 litres per second. Treatment modifications were commissioned in 2012, increasing pumping capability, which resulted in the ability to maintain the leachate collection system in as much a drained state as possible and to better manage the peak discharge periods. A similar course of action is proposed to be followed in 2020.

Results from the upcoming spring 2020 monitoring session will be analyzed to determine if the effect of these actions are detected in groundwater quality with a decrease in concentrations of Leachate Indicator Parameters at trigger locations, including in the intact clay and glacial till/upper bedrock units. At that point, the need for a formal contingency plan will be assessed in collaboration with the MECP.

The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

The proposed 2020 Environmental Monitoring Program is the same as was conducted in 2019, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (see Section 9.0). As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as has been done between 2014 and 2018 (due to dry conditions in the summer of 2019, they were sampled in the fall where possible).

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the November 2018 monitoring session and will be monitored again in the spring of 2020.

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1.0 INTRODUCTION

This report serves as the 2019 annual monitoring report and presents the results of monitoring activities carried out during 2019 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility).

The WCC Navan Facility is a 91.87 hectare (ha) waste management facility that includes a 40 ha landfill, as well as processing (recycling). The site is located on parts of Lots 2, 3 and 4, of Concession IV, Ottawa Front in the City of Ottawa (formerly the city of Gloucester), Ontario (see Key Plan, Figure 1). This site has been in operation since 1960 and operates under Environmental Compliance Approval (ECA) No. A460702. In April 2009, WCC received *Environmental Protection Act* approval for the expansion of the WCC Navan Facility.

The monitoring program undertaken in 2019 by Golder Associates Ltd. (Golder) is outlined in Tables 1a through 1c. Monitoring to date at the WCC Navan Facility consists of water quality analysis of surface water, groundwater and leachate. The 2019 monitoring program was a continuation of the monitoring program carried out in 2018 and followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and Condition 10.1 of the Conditions of Environmental Assessment Approval. As per Condition 109 of ECA No. A460702, the monitoring program includes sampling of the monitoring wells located in BH09-1, in order to assess the groundwater quality in the Mer Bleue Bog. The original monitoring program indicated that the wells would be sampled during the winter, when the Mer Bleue Bog is frozen and the wells are accessible. However, the groundwater in the monitoring wells has frequently been frozen during these events. In the 2013 monitoring report (Golder, 2014), it was proposed to sample them during the summer, rather than winter, and this recommendation has carried forward to present. Due to dry conditions in the vicinity of the Mer Bleue Bog, groundwater samples were instead successfully collected at monitoring well MW09-1B, MW09-C, and MW09-D on November 14, 2019 (no sample was collected from monitoring well MW09-1A in November due to frozen conditions).

In addition, sediment quality monitoring which started in 2000 at the request of the National Capital Commission (NCC) at three locations within the Mer Bleue Bog is also documented in this report. Results of landfill gas, noise and odour monitoring undertaken in 2019 are provided under separate covers in Attachments 2 and 3.

A site inspection was conducted by the MECP at the site on September 12, 2019. No non-compliance issues were identified at the time of the inspection. A copy of the inspection report is provided in Appendix H.

2.0 FIELD PROCEDURES

2.1 Objectives

The objectives of the 2019 water quality monitoring program were:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

2.2 Environmental Monitoring Program

2.2.1 Groundwater Component

The 2019 groundwater monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and satisfies objectives listed above. Water quality monitoring at the WCC Navan Facility was initiated in 1981. Since 1991, semi-annual monitoring programs were undertaken. Observation wells were added in 1992, 1994, 1995, 1998, 2000, 2005, 2007, 2009, 2010 and 2011. Groundwater monitoring sessions were carried out on June 19 and November 20-21, 2019. The groundwater monitors are outlined in Tables 1a, 1b and 1c and illustrated on the Site Plan (Figure 2). Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected in November 2018. The monitoring wells screened in the intact clay deposit and in the glacial till/upper bedrock zone will be sampled again in the spring of 2020.

The approved groundwater monitoring program was followed, except that as discussed in Section 1.0, groundwater monitoring locations BH09-1A, BH09-1B, BH09-1C and BH09-1D were not sampled during the winter of 2020 due to historical conditions of frozen water in the monitoring wells. Due to dry conditions in the summer, monitoring wells BH09-1B, BH09-1C, and BH09-1D were sampled instead during the fall session on November 21, 2019 (monitoring well BH09-1A was frozen and therefore no sample could be collected at the time). In addition, monitoring wells OW-94-2 and OW-94-5 were inadvertently confused with two other wells that were not part of the monitoring program and no samples were collected in the spring at these locations.

Detailed logs of the subsurface conditions encountered in each borehole are provided on the Record of Borehole sheets in Appendix A for most of the groundwater monitors included in the 2019 groundwater monitoring program. The top of pipe and ground surface elevations at each groundwater monitor location were surveyed with reference to geodetic datum following completion of the corresponding borehole drilling and groundwater installation program. The top of pipe for each of the monitoring wells included in the groundwater monitoring program were re-surveyed by WCC during November 2011 to account for any movement of the monitors over time.

The groundwater levels in the monitors included in the sampling sessions were measured on June 13, 2019 and November 14, 2019.

All monitors sampled during 2019 were developed through the removal of at least one standing volume of water using dedicated samplers which have been provided in each groundwater monitor. Sampling of groundwater was generally performed one week after monitor development, because the wells recover slowly.

As part of the Quality Assurance/Quality Control (QA/QC) program, a total of 3 field groundwater samples duplicates were prepared (2 in the spring and 1 in the fall) along with one field blank and one trip blank prepared during the fall sampling session.

The temperature, pH and electrical conductivity of the groundwater samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private certified analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol provided below was followed for the groundwater samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
total dissolved solids (TDS), alkalinity, sulphate, nitrate, nitrite, chloride, bicarbonate, carbonate, hardness (calcium and magnesium), potassium and sodium	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with sodium bisulphate

Notes: * Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.

Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario performed all laboratory chemical and physical analyses on the groundwater samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The reportable detection limits (RDLs) for the specific groundwater analyses were generally commensurate with the standards established in the Ontario Drinking Water Quality Standards, Objectives and Guidelines (referred to as ODWQS, MOE, 2006, revised January 1, 2018).

2.2.2 Leachate Component

The leachate monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702. Leachate quality analysis was undertaken on samples obtained from the pump station (L5) during the June 20, August 28 and November 21 monitoring sessions as outlined in Tables 1a through 1c. The location of the leachate monitor is illustrated on the Site Plan (Figure 2).

As part of the QA/QC program, one field blank and one trip blank for the volatile organic compounds (VOCs) was prepared during the August sampling session.

The temperature, pH, electrical conductivity and dissolved oxygen of the collected leachate samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All leachate samples were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2.

The sample preparation and preservation protocol outlined below was followed for the leachate samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, total suspended solids (TSS), biochemical oxygen demand (BOD), hardness (calcium and magnesium), potassium and sodium	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)**, dissolved organic carbon (DOC)	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with sodium bisulphate

Notes:
* Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.
** Dissolved inorganic carbon (DIC) calculated based on laboratory dissolved organic carbon (DOC) and total dissolved carbon

Paracel performed all laboratory chemical and physical analyses on the leachate samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific leachate analyses were commensurate with the standards established in the ODWQS (MOE, 2006, revised January 1, 2018).

2.2.3 Surface Water

The 2019 surface water monitoring program followed the program outlined in Condition 109 of ECA No. A460702. The 2019 surface water monitoring program is outlined in Tables 1a through 1c and monitoring stations are illustrated on Figure 2. Surface water samples were obtained on June 20, August 28, and November 21, 2019.

The only deviations from the approved surface water monitoring program were due to dry or stagnant conditions. Surface water monitoring stations S5, S8, S9, S10, and S11 were not sampled in August 2019 and station S5 in June and November 2019.

The estimation of surface water flow was obtained concurrently with surface water sampling on June 20, August 28 and November 21, 2019.

One field duplicate was prepared during the June and November sampling sessions as part of the QA/QC program.

The temperature, pH, electrical conductivity and dissolved oxygen of the surface water samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The same preparation and preservation protocol below was followed for each of the surface water samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese and zinc	plastic bottle, unfiltered and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, TSS, BOD, dissolved organic carbon (DOC), hardness (calcium and magnesium), potassium and sodium	plastic bottle, unfiltered and unpreserved
ammonia*, total phosphorus, phenols, COD and TKN	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)	amber glass bottle, unfiltered and unpreserved

Notes: * Unionized ammonia calculated based on laboratory ammonia concentration, field temperature and pH measurements.

Paracel performed all laboratory chemical and physical analyses on the surface water samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific surface water analyses were generally commensurate with the standards established in the Provincial Water Quality Objectives (referred to as PWQO, MOE, 1994, reprinted 1999).

2.3 Sediments

Sediment quality was monitored at three locations within the Mer Bleue Bog. The sampling locations are the same as the surface water sampling stations located within the bog, i.e., SED-W was obtained at SW-W, SED-C at SW-C and SED-E at SW-E (refer to Figure 2). Sediment quality monitoring in the Mer Bleue Bog was added to the monitoring program in 2000 and sediment samples were obtained in 2019 at three locations on June 20 and November 21.

All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol outlined below was followed for the sediment samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium and zinc	glass jar, with a plastic lid

Paracel performed all laboratory chemical and physical analyses on the sediment samples. The Report of Analyses sheets from Paracel are provided in Appendix B.

2.4 Status of Monitoring Well Network

During the spring monitoring session, the condition of each well within the monitoring well network at the site was assessed. A summary of the findings of the 2019 monitoring well network condition survey (properly cased, capped and locked) are provided in Table 3. At the time of the condition survey it was observed that all monitoring wells were in good condition noting that MW05-1D could use some new tubing.

3.0 WATER LEVEL DATA

3.1 Groundwater Levels

Records of monitoring well water elevations obtained in June and November 2019 are provided in Tables C-1 and C-2, Appendix C and are shown graphically on Figures C1 through C10. Water level changes for 2019 are discussed in the following sub-sections. It should be noted that all of the monitoring wells were resurveyed in 2011 which resulted in an increase in water elevations at some locations. This is a reflection of the more accurate survey data and does not necessarily reflect changes in the groundwater elevations.

3.1.1 Up-Gradient Control Wells

The results of water levels measured at the up-gradient wells are shown graphically on Figure C1 through Figure C4 in Appendix C. There are no significant changes indicated in groundwater levels measured at these locations. The results indicate the shallow water table to be typically located approximately 1 to 2 metres (m) below ground surface at up-gradient wells OW-92-12 to OW-92-19 and MW05-1A to MW05-1D. The unusually elevated ground water level recorded in November 2017 at monitoring location OW-92-15, returned to levels similar historical levels during the 2018 monitoring program. There are only small fluctuations in water levels indicated for recent years.

Hydraulic head profiles for monitoring wells OW-92-12 to OW-92-19 for June and November 2019 are shown on Figure 3 illustrating a downward hydraulic gradient. The only variation in the direction of the hydraulic gradient is indicated in the upper 5.6 m to 10.4 m below ground surface in the spring and fall, from a downward gradient to an upward gradient in the weathered clay. This result may be attributed to a perched water table at the interface of the weathered clay and the intact clay. The relatively weak downward gradient from the sand to the weathered clay suggests a hydraulic interconnection between these units. The downward gradient is quite pronounced from the weathered clay down to the lower reaches of the intact clay deposit. It is interpreted that the intact clay deposit at depth beneath the landfill site acts as a barrier to groundwater flow.

3.1.2 Immediate Down-Gradient Wells and Wells in Line with Immediate Down-Gradient Wells

The results of the water levels measured at the large down-gradient nest of observation wells (OW-92-1 to OW-92-8 and MW05-8) are shown graphically on Figure C5 provided in Appendix C. These results indicate the shallow groundwater table lies within the sand deposit close to the original ground surface ranging in elevation from about 68.58 m to 71.46 m. Similar results are indicated at observation wells OW-92-9 to OW-92-11 and MW05-11 as well as OW-94-1 to OW-94-3 and MW05-R3 as shown graphically on Figures C6 and C7, respectively. Seasonal variations of nearly 1 m have previously been indicated. The high water levels generally occur during the wet spring whereas the lower water levels are recorded during the dry summer months and fall. Similar trends were observed in 2019 at most wells, with the higher spring elevations being more pronounced in the spring of 2019 (although not as much as in 2018).

Hydraulic head profiles for the nest of observation wells OW-92-1 to OW-92-8 are presented on Figure 3. Unlike the up-gradient groundwater level profiles, the down-gradient profiles historically have indicated a slight upward vertical gradient and a localized weak downward gradient observed at times between the upper 6.3 m to 7.6 m within the weathered clay. Similarly to 2018, a slight downward gradient is observed from the sand to the weathered clay in 2019. The upper four wells historically have appeared to be hydraulically connected with near vertical or hydrostatic water level profiles. A slight upward gradient from the bedrock to the weathered clay at the down-gradient boundary of the landfill would suggest there is upward vertical flow at this location, which would retard the potential for leachate migration into the deeper groundwater system. In the spring of 2019, there was near vertical or a hydrostatic water level profile between the bedrock and weathered clay.

3.1.3 Mer Bleue/Down-Gradient Control Wells

Water levels obtained at the down-gradient control wells are shown graphically on Figures C8, C9 and C10 in Appendix C. These results indicate artesian conditions at OW-94-4 to OW-94-6, OW-95-5 to OW-95-7 and OW-95-9, while at OW-95-1 to OW-95-3, the shallow groundwater table is close to the ground surface within the upper sand, weathered and intact clay. The water level measured at monitoring well OW-94-4 in November 2019 was lower than recent historical data (by 0.42 m), but similar to water levels typically measured in this monitor prior to 2012.

Hydraulic head profiles for the nest of observation wells OW-95-5 to 95-7 and OW-95-9, as shown on Figure 3, illustrate an upward gradient through most of the profile with a weak downward gradient from the sand to the weathered clay. It is noted that no water level could be recorded at OW-95-9 in November 2019 due to frozen conditions. Historically, there has been an upward gradient through the entire profile. The presence of an upward gradient suggests upward groundwater flow is occurring south of the landfill. These results may also suggest upward leaching of porewater from the Champlain Sea clay, a brackish water deposit, may be occurring at the southern boundary of the landfill. North of the landfill, downward leaching of the clay porewater is indicated.

3.1.4 Horizontal Hydraulic Gradients

The horizontal hydraulic gradient in the shallow sand deposit and weathered clay at this site is consistent with the relief of the property which changes in elevation by approximately 15 m to 18 m between the up-gradient and down-gradient boundaries of the landfill. Since the shallow water table appears to be a reflection of the original surface topography, horizontal hydraulic gradients are expected to vary between 0.007 in the plateau above the escarpment and 0.014 in the valley below. Water levels measured south of the landfill indicate shallow groundwater is flowing in a south to southwest direction with a small hydraulic gradient ranging between 0.005 and 0.025. The horizontal gradients in the bog area are influenced by seasonal fluctuations in the surface water levels. Hydraulic gradients could also be influenced by the leachate collection system (LCS) located along the south toe of the landfill. Keeping the LCS drained could result in a lowering of the water table at the southeast corner of the landfill by more than 3 m below the original grade at the southeast corner of the landfill and by 2 m at the southwest corner. This water table lowering could significantly influence the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient side of the LCS was constructed to alleviate any potential problems related to lowering of the groundwater table south of the landfill.

Water levels measured in the up-gradient and down-gradient deep wells (OW-92-12 and OW-95-9) indicate a typical difference in water levels of about 6 m, which represents a hydraulic gradient of approximately 0.01 (0.007 in spring 2019) across the site within the glacial till/upper bedrock.

Many factors, such as mounding within the waste pile, the installation of the leachate collection system and the construction of waste cells with under drainage will influence the rate of groundwater flow across the site.

3.2 Surface Water Flow Measurements

Estimates of surface water flow measurements for 2019 are summarised below along with the historical minimum and maximum flow rates estimated at each monitoring station.

Monitoring Station	Minimum Flow L/s	Maximum Flow L/s	Expected Dry Weather Flow L/s	Estimated Flow June 20, 2019 L/s	Estimated Flow Aug. 28, 2019 L/s	Estimated Flow Nov. 21, 2019 L/s
S-1	No flow	73	0.5 – 2	0.5	0.9	0.9
S-3	No flow	140	<0.5	0.3	No flow	No flow
S-5	No flow	No flow	No flow	Dry	Dry	Dry
S-8	No flow	5 – 10	0.5 – 2	No flow	Dry	No flow
S-9	No flow	94	2 – 5	3.3	Dry	Flow[b]
S-10 (SW-W)[a]	No flow	No flow	No flow	No flow	Dry	No flow
S-11 (SW-C)[a]	No flow	No flow	No flow	No flow	Dry	No flow
S-12 (SW-E)[a]	No flow	No flow	No flow	No flow	No flow	No flow
S-15	No flow	120	0.3 – 2	2.5	1.4	1.0
S-16	No flow	56	No flow	8.3	No flow	No flow
S-17	No flow	44	0.5 – 2	2.3	0.6	2.0

Notes:
[a] Monitoring stations S-10 (SW-W), S-11 (SW-C) and S-12 (SW-E) are located at the northern edge of the Mer Bleue Bog and consist of stagnant bog water.
[b] Flow was observed to be present at surface water monitoring station S-9 during the fall monitoring session but could not be measured due to the presence of ice.

Input: ETB
Checked: RPM

4.0 GROUNDWATER QUALITY ASSESSMENT

Groundwater has been monitored at observation wells since 1981. However, since 1985, landfilling operations expanded over the original down-gradient observation wells which have since been replaced with the existing wells. Existing observation wells were installed in 1992, 1994, 1995, 1998, 2005, 2007, 2009, 2010 and 2011.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as follows:

- a shallow surface sand layer at depths ranging from 1.5 to 2.5 m below original grade
- the weathered clay zone of a thick clay deposit at depths ranging from 3.5 to 4.5 m below original grade
- the intact clay deposit at depths ranging from 7 to 8 m below original grade
- glacial till/bedrock contact zone at depths ranging from 22.3 to 37.1 m below original grade

The two upper stratigraphic units, the sand and weathered clay units, were sampled for both the June and November monitoring events. The two lower stratigraphic units, the intact clay and near bedrock units, are sampled every 18 months. Groundwater samples from these units were collected in November 2018 and the next sampling session for the monitoring wells screened in these units will be in the spring of 2020. The observation wells monitored in 2019 are listed in Tables 1a, 1b and 1c and illustrated on Figure 2.

As previously discussed, Condition 109 of the ECA requires groundwater monitoring locations MW09-1A, MW09-1B, MW09-1C and MW09-1D to be sampled once per year. Due to expected frozen conditions in the winter, MW09-1A, MW09-1B, MW09-1C and MW09-D have been monitored during the summer sessions starting in 2014. Due to dry conditions in the summer of 2019, these monitoring wells were monitored during the fall session instead. As indicated earlier, due to frozen conditions, no sample could be collected from monitoring well MW09-1A in November 2019. Data from these wells is being collected to assess the groundwater quality in the area of the Mer Bleue as part of the expansion of the landfill.

Current and historical analytical results for groundwater in all units are presented in Appendix D.

4.1 Quality Assurance/Quality Control

The 2019 QA/QC protocol included the following: (i) preparation of one laboratory trip blank and one field blank for the November 2019 monitoring session to be analyzed for VOCs; (ii) the collection and analysis of two blind groundwater sample duplicates for the June 2019 sampling session and (iii) one blind groundwater sample duplicate for the November 2019 sampling session. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the relative percent difference (RPD) between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All QA/QC results for groundwater were within acceptable tolerance limits during the June 2019 monitoring session, except for the potassium concentration in the sample collected from MW-05-1D (identified as 05-1D in the laboratory report) and its duplicate (identified as Dupe-2 in the laboratory report). The sample collected at MW-05-1D in June 2019 and its duplicate had potassium concentrations consistent with historical results.

One blind groundwater sample duplicate was analyzed during the November 2019 session. All QA/QC results for groundwater were within acceptable tolerance limits during the November 2019 monitoring session except for the copper concentration in the sample collected from MW-95-8 (identified as 95-8 in the laboratory report) and its duplicated (identified as Dupe-3 in the laboratory report). The sample collected at MW-95-8 and its duplicate were re-analyzed by the laboratory and deemed the QC to be acceptable for both samples. Copper concentrations are consistent with historical results for both MW-95-8 and its duplicate.

It is believed that the discrepancies noted should not affect the interpretation of the groundwater results.

The results of the VOCs analyses of the field blank and trip blank (identified respectively as Field Blank and Trip Blank in the laboratory report from the November 2019 monitoring session) were within acceptable tolerance limits with all parameters concentrations below their respective RDL.

4.2 Up-Gradient Control Wells

Monitoring of groundwater quality up-gradient from the site was made possible with the use of observation wells installed in 1992 behind the WCC administration office at 3354 Navan Road (OW-92-12 to OW-92-19). In 1995, two additional wells were installed within the shallow sand deposit to the northeast (OW-95-4) and northwest (OW-95-8). Four additional wells were installed in the fall of 1998 at the up-gradient corners of the waste footprint (OW-98-1 to 98-4). In August 2011, a borehole was drilled and a new observation well was installed to replace OW-98-2 in the intact clay deposit, as it was filled with sand. Monitoring wells OW-95-4, OW-98-4 and OW-98-3 were decommissioned in 2012 and replaced by existing monitoring wells MW05-1A to D as per Item 42 listed in Schedule A of ECA No. A460702. All these wells are referred to as the up-gradient control wells. The up-gradient groundwater quality in each stratigraphic unit was compared to the ODWQS for which aesthetic objectives or maximum or interim maximum acceptable concentrations exist.

4.2.1 Sand Layer

The background groundwater quality within the sand layer was monitored during the 2019 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-19, MW05-1D (replacing OW-95-4) and OW-95-8.

The groundwater quality during 2019 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During June 2019 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2019 Monitoring Session
92-19	[None]	Manganese and TDS
05-1D	Chloride, TDS, sodium	Chloride, TDS
95-8	Manganese and TDS	Iron, Manganese and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, manganese, iron, sodium and TDS, which exceed the ODWQS.

4.2.2 Weathered Clay Deposit

The background groundwater quality within the weathered clay deposit was monitored during the 2019 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-18, OW-98-1 and MW05-1C (replacing OW-98-4).

The groundwater quality during 2019 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During June 2019 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2019 Monitoring Session
92-18	Chloride and TDS	Chloride, manganese and TDS
98-1	Chloride, iron, manganese, sodium and TDS	Chloride, iron, manganese, sodium and TDS
05-1C	[None]	Iron and manganese

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS, which exceed the ODWQS.

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4.3 Mer Bleue/Down-Gradient Control Wells

Groundwater further down-gradient from the landfill is monitored with the use of nested observation wells installed in 1994 and 1995 south of the landfill at the northern edge of the Mer Bleue Bog. These observation wells were installed to obtain a better understanding of the hydrogeology of the area and geochemistry of the groundwater south of the landfill. The nested wells are located in line with the eastern limits of the landfill (OW-94-4, OW-94-5 and OW-94-6), east of the landfill centre line (OW-95-5, OW-95-6, OW-95-7 and OW-95-9) and in line with the western limits of the existing landfill (OW-95-1, OW-95-2 and OW-95-3). All these wells are referred to as the down-gradient control wells. The groundwater quality of the down-gradient control wells in each stratigraphic unit was compared to the ODWQS for aesthetic objectives or maximum or interim maximum acceptable concentrations.

4.3.1 Sand Layer

The down-gradient groundwater quality within the sand layer was monitored during the 2019 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-6, OW-95-3, OW-95-7.

The groundwater quality during 2019 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During June 2019 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2019 Monitoring Session
94-6	Chloride, manganese, sodium, temperature and TDS	Chloride, iron, manganese, sodium and TDS
95-3	Manganese, sodium and TDS	Manganese, sodium and TDS
95-7	Chloride, iron, manganese, sodium and TDS	Chloride, iron, manganese, sodium and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, iron, manganese, sodium and TDS which exceed the ODWQS. Similar ODWQS exceedances for these parameters were also observed in the up-gradient groundwater at similar concentrations.

4.3.2 Weathered Clay Deposit

The down-gradient groundwater quality within the weathered clay deposit was monitored during the 2019 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-5, OW-95-2 and OW-95-6.

The groundwater quality during 2019 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During June 2019 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2019 Monitoring Session
94-5	[Not available][1]	Chloride, manganese, sodium and TDS
95-2	Chloride, sodium and TDS	Chloride, manganese, sodium and TDS
95-6	Chloride, manganese, sodium and TDS	Chloride, manganese, sodium and TDS

Note: [1] Sampling was inadvertently excluded during the spring monitoring session at monitoring well 94-5.

Input: ETB
Checked: RPM

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As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, manganese, sodium and TDS which exceed the ODWQS, similarly to groundwater quality within the same deposit upgradient of the landfill. The groundwater quality within the weathered clay deposit also has occasional ODWQS exceedances of iron.

4.4 Results

Piper trilinear diagrams for groundwater in the sand layer during June and November 2019 are shown on Figures 4 and 5, respectively. The diagrams indicate that shallow groundwater at the immediately down-gradient locations is somewhat variable and has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the sand within the Mer Bleue Bog. Similar to past observations, the distribution of up-gradient groundwater quality on the Piper diagrams is reflecting elevated but stable chloride and hardness (calcium and magnesium) concentrations at MW05-1D since 2012.

Figures 6 and 7 indicate that groundwater in the weathered clay at the immediately down-gradient site OW-92-10 has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the weathered clay within the Mer Bleue Bog. Groundwater at other compliance sites is more like groundwater in the weathered clay within the Mer Bleue Bog. These diagrams also indicate that groundwater in the weathered clay deposit up-gradient of the landfill is different from groundwater in the bog. There are no significant changes from the previous year.

A Phase II Environmental Site Assessment was conducted at the landfill by Intera (Intera, 2003). This assessment concluded that groundwater within the sand layer, the upper weathered clay and perhaps the deeper intact clay deposit on down-gradient lands has slightly elevated concentrations of parameters previously thought to be indicative of landfill leachate (e.g., boron, ammonia, TKN). However, there is no obvious spatial correlation of these parameters with proximity to the landfill or groundwater migration pathway. The lack of spatial correlation suggests that groundwater on down-gradient lands is representative of naturally elevated background groundwater quality associated with the Mer Bleue environment.

In addition, the groundwater and surface water trigger mechanism report prepared by Golder (Golder, 2007b) demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are not potential impacts from landfill activities. Naturally elevated parameters measured included boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

5.0 LEACHATE CHARACTERISTICS

Prior to the construction of the leachate collection system (LCS) in 1991-1992, leachate was sampled and analysed in areas where surface breakout was observed. Breakout of leachate, when encountered, usually occurred at the down-gradient toe of the landfill.

The monitoring program for leachate quality has focused on the LCS. For the purpose of the annual monitoring report, leachate generated by the landfill is monitored at the down-gradient end of the south toe collector at L5 at the same time surface water is monitored. A more extensive leachate monitoring program is carried out throughout the year in accordance with a City of Ottawa Leachate Discharge Agreement for the discharge of treated leachate at the Robert O. Pickard Environmental Centre (ROPEC), the municipal wastewater treatment plant.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation. The landfill is underlain by a thick natural clay deposit which has a hydraulic conductivity, K, of less than 10^{-9} metres per second and as such performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater, but rather it is predominantly precipitation that has infiltrated through the waste pile. It should be noted that leachate at the site could also consist of porewater from the underlying clay as a result of upward gradients and/or consolidation, noting that porewater release to the leachate collection system is slowed by the low hydraulic conductivity of the clay.

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. The intrinsic biodegradability of municipal landfill leachate can be measured by a BOD:COD ratio. During the first several years of production, the BOD:COD ratio generally is in the 0.5 range. As the landfill ages, the ratio decreases to levels less than 0.1 suggesting a more or less biologically recalcitrant organic composition (Andreottola et al., 1989). Also, the concentration of ammonia tends to increase with landfill age since ammonia is a by-product of the stabilisation of organic matter (Elefiniotis et al., 1989), although at a dry waste facility such as the WCC Navan Facility, ammonia concentrations can be expected to remain relatively low.

Typical parameter concentrations in leachate are provided in the tables below. Average concentrations indicate that the WCC Navan Facility leachate is distinctly different from most other landfill sites in Ontario, including the City of Ottawa Trail Waste Facility, with most analytes measured in the WCC Navan Facility leachate having much lower concentrations. The concentration of various parameters listed below suggests a comparatively low strength leachate is generated at the WCC Navan Facility. The concentration of the traditional indicators of environmental quality (conventional pollutants) such as BOD_5, suspended solids, ammonia and metals such as iron and zinc are relatively low. The WCC Navan Facility leachate has much lower concentrations because it is not generated from municipal waste.

Parameter	WCC Navan Waste Recycling and Disposal Facility L5 *			Trail Road & Nepean Landfills [1]			Ontario Landfills [2]		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
Boron	0.37	29.3	15.4	3.92	6.22	5.348	0.8	52	10.4
Ammonia	0.01	112	44.2	----	----	----	7.6	1,820	175
BOD_5	1.6	662	105.6	111	1,790	652	1	66,000	4,975
Conductivity	669	5,640	3,857	----	----	----	475	26,100	6,088
TDS	1,690	10,300	2,874	----	----	----	196	9,030	4,327
Sodium	53.9	850	539	----	----	----	13.8	16,000	936
Manganese	0.066	13.2	1.29	0.0879	1.62	0.627	0.03	793	3.54
COD	69.2	1,240	449	380	4,700	1,493	1	47,300	7,855
Iron	0.003	32.7	7.79	0.798	58.3	13.26	0.01	1,300	58
Copper	<0.0005	0.254	0.012	0.0165	0.374	0.1567	0.007	7	0.045
TSS	<2	1,190	108	2	12,400	92.1	3	8,130	445
Chloride	76.5	1,000	475	1,000	1,640	1,308	0.4	12,000	270
Lead	<0.00002	0.1	0.008	<0.05	0.276	----	0.001	2.1	0.070
Zinc	<0.005	0.48	0.05	0.0366	2.21	0.62	----	16	1.42

Notes:
All concentrations are in mg/L except conductivity (µS/cm)
* Calculated using all historical data since 1992 for L5.
< Denotes concentration is lower than the Reportable Detection Limit (RDL).
[1] City of Ottawa Trail Road Annual Operating and Monitoring Report – 2000.
[2] Howard and Livingston, "Contaminant Source Audits and Groundwater Quality", Environmental Geology of Urban Areas, 104-116, Ed. by N. Eyles, Geological Association of Canada, 1997.

Updated by: RPM
Checked by: ETB

Water impacted by leachate will typically have high concentrations of dissolved constituents with chemical concentrations ten to several hundred times higher than those measured at reference monitoring locations. Chemical concentrations have a high temporal variability due to variations in the composition, age and moisture of the waste and meteorological conditions.

Leachate monitored in 2019 to assist with assessment of surface water and groundwater quality was sampled on June 20, August 28 and November 21, 2019. Results of the chemical analysis undertaken by Paracel and the field measured parameters are provided along with historical data in Appendix E. The results indicate that leachate generated at the WCC Navan Facility continues to be a relatively weak wastewater when compared to municipal landfill leachate.

One field blank and one laboratory trip blank were analyzed during the August 2019 monitoring session. The results of the VOCs analyses for these two samples were within acceptable tolerance limits with all parameters concentrations below the RDL.

Leachate quality monitoring results for 2019 indicate that the leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Concentrations of ammonia, boron, chloride, potassium, and TKN show a generally increasing trend over time. The concentrations of DIC, manganese, show a general decreasing trend over time. Previously reported decreasing trend in hardness appears to be stabilizing. The concentrations of certain parameters remain above the surface water and groundwater quality near the site.

Monitoring of treated leachate is also carried out on a frequent basis in compliance with the City of Ottawa discharge requirements at the water pollution control plant (ROPEC).

6.0 GROUNDWATER COMPLIANCE ASSESSMENT

6.1 Compliance Mechanism

The objectives of groundwater trigger mechanisms at the WCC Navan Facility are to utilize the results of the ongoing groundwater monitoring program to assess site compliance and to trigger implementation of the contingency plans, when and if necessary. The purpose of the trigger mechanisms is to prevent leachate-impacted groundwater exceeding a certain negative threshold level from occurring. The trigger mechanism was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the Navan Facility.

Traditional methods of site compliance provide very limited useful and/or reliable parameters for assessment of the WCC Navan Facility; therefore, an alternate method must be used. The difference in hydrogeology across the site coupled with the very saline environment of the clay deposit that underlies the Mer Bleue clay have resulted in the MECP accepting that Guideline B-7 (RUPO) is not applicable at this site. The MECP's position in this regard was documented in a November 2000 memorandum issued by the MECP (MOE, 2000). Therefore, the Leachate Indicator Parameter list and the method to determine if leachate from the site is impacting local groundwater was developed in the Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The Leachate Indicator Parameter list includes alkalinity, ammonia, boron, chloride, hardness, magnesium, manganese and potassium.

After the completion of a monitoring session, the concentration of each Leachate Indicator Parameter for all groundwater locations used to assess compliance should be visually checked. If a parameter concentration appears to be elevated, a comparison to the background concentration range should be completed. The potential for an increase in concentration of a Leachate Indicator Parameter will be investigated by comparing the concentrations for each parameter to the background range for its corresponding stratigraphic unit. The background range will be derived from the maximum and minimum data obtained at the locations used to assess compliance from 1998 to present in each stratigraphic unit. In addition, data from monitoring well MW05-3 located to the east of the site and not impacted by landfill leachate will be used to define the background range. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each location used to assess compliance are presented in time-concentration graphs in Appendix F. The background ranges will be updated annually using the most recent data if it is not deemed impacted by landfill leachate. An exceedance of the background range is considered an exceedance of the trigger mechanism and the implementation of the trigger format outlined in the trigger mechanism report should proceed.

No comments from the MECP have been received on the groundwater aspects of the 2018 annual monitoring report at the time this report was completed.

6.2 Immediately Down-Gradient Wells Used to Assess Compliance

At the down-gradient limit of the landfill, groundwater quality was monitored at three nests of observation wells installed in 1992 and 1994. These wells are located at the southeast corner of the landfill (OW-92-9, OW-92-10 and OW-92-11), east of the landfill centre line at grid line 9 (OW-92-1 to OW-92-8) and at the southwest corner of the landfill (OW-94-1, OW-94-2 and OW-94-3). Two additional wells, MW-C and MW-E, were installed within the upper sand unit and shallow clay in 2000 at the northern boundary of the NCC property (now WCC property) located south of the VIA ROW. These observation wells are referred to as wells used to assess compliance.

MW07-1 is located in line with the wells used to assess compliance, to the southeast of the landfill in an area that has historically not been impacted by landfill leachate. These wells were installed in 2007 and their purpose is to monitor the future performance of the landfill expansion. With the commencement of landfilling operations in the expansion area east of the historical landfill footprint in 2016, these wells will be used along with the wells used in past reports to assess compliance along the southern property line. New trigger concentrations were proposed in the 2017 monitoring report (Golder, 2018). These trigger concentrations are implemented herein.

In 2005, three new sand layer wells used to assess compliance were installed to evaluate some unusual results at OW-94-3, OW-92-8 and OW-92-11. The new monitoring wells are called MW05-R3, MW05-8 and MW05-11 and have replaced OW-94-3, OW-92-8 and OW-92-11 for groundwater quality results, respectively, as of November 2006.

6.2.1 Sand Layer

The down-gradient compliance site groundwater quality within the sand layer was monitored during the 2019 groundwater monitoring program through the inclusion of monitors OW-94-3 and MW05-R3, OW-92-8 and MW058, OW-92-11 and MW05-11, MW-C, MW-E and MW07-1D. Monitor MW07-1D is included now that landfilling has begun in the lateral expansion area. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the sand layer are presented in time-concentration graphs in Appendix F-A.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	June 2019 Monitoring Session	November 2019 Monitoring Session
MW-C	None	Chloride
MW-E	None	None
05-R3	None	None
05-8	Alkalinity, Boron, Manganese	Alkalinity, Boron, Hardness, Manganese, Magnesium
05-11	Alkalinity, Ammonia, Boron, Hardness	Boron
07-1D	None	None

Input: ETB
Checked: RPM

6.2.2 Weathered Clay Deposit

The down-gradient compliance site groundwater quality within the weathered clay deposit was monitored during the 2019 groundwater monitoring program through the inclusion of monitors OW-92-7, OW-92-10, OW-94-2 and MW07-1C. Monitor MW07-1C is included now that landfilling has begun in the lateral expansion area. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the weathered clay deposit are presented in time-concentration graphs in Appendix F-B.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	June 2019Monitoring Session	November 2019 Monitoring Session
92-7	Potassium	None
92-10	Hardness, Magnesium	Hardness, Magnesium
94-2	None	None
07-1C	None	None

Input: ETB
Checked: RPM

6.3 Results

The Leachate Indicator Parameters at all groundwater monitoring locations used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2018 background range.

After the reported 2018 increases in concentrations above the background ranges observed in the sand stratigraphic unit, increasing trends continued in 2019 for concentrations of two parameters: manganese at MW05-8 (with a slight decrease in concentration reported in the fall) and ammonia at MW05-11 (with a significant decrease in concentration reported in the fall). Previously reported increasing concentrations at MW05-8 and/or MW05-11 for alkalinity, ammonia, hardness (magnesium), boron and potassium had a marked decrease in 2019 (some of those concentrations decreased below their corresponding trigger concentrations either in the spring or the fall). An increasing trend in potassium concentration at monitoring well 05-3D since June 2015 continued throughout 2019, with an exceedance of the corresponding trigger concentration reported in November 2019 at this location.

Therefore, there were no continued increases throughout 2019 above the background ranges observed in the sand stratigraphic unit in 2019 at trigger locations.

It is noted that MW05-11 is located immediately down-gradient of the leachate collection system (less than 10 m south of the leachate collection system). Monitoring well MW-E, located farther down-gradient directly south of the VIA ROW, on WCC owned land, did not show any exceedances in 2019.

The maximum historical manganese concentration was reported at MW05-8 in June 2019. Manganese concentrations reported at MW05-8 in June and November 2019 (13.7 and 13.2 mg/L, respectively) are exceeding the maximum background concentration of 8.21 mg/L and are following four exceedances reported at this location since spring 2017. However, it is noted that the increasing trend in manganese concentration reported at this location since the fall of 2017 was followed in the fall of 2019 by a slight decrease, as indicated above. Manganese concentrations at this location have been variable in the past but overall there is a general increasing trend. The manganese concentrations observed in the groundwater at MW05-8 are higher than the

maximum concentration of manganese reported for leachate from L5 (8.56 mg/L). As such, it is not expected that the increasing trend of manganese concentrations is a caused entirely by landfill leachate.

The slight increases beyond their corresponding trigger concentration in the fall of 2019 for alkalinity, boron and hardness (magnesium) at MW05-8, as well as boron at MW05-11, potassium MW05-3D and chloride at MW-C will need to be assessed during the 2020 monitoring sessions to determine if their increasing trends continues.

It is proposed to increase the maximum background concentration for ammonia and chloride in the sand stratigraphic unit to 2.22 mg/L and 322 mg/L, respectively. In both cases, the elevated concentrations were reported, whereas no sign of leachate impact was observed for other parameters during the same sessions.

There were no increases above the background ranges observed in the weathered clay stratigraphic unit in 2019 at trigger locations, with the exception of concentrations for hardness and magnesium at OW-92-10 which exceeded their corresponding background concentrations in June and November 2019 (589 mg/L and 588 mg/L for hardness and 80.7 mg/L and 81.5 mg/L for magnesium, respectively). Although in both cases they stabilized in the fall 2019, the slight increase in magnesium concentration reported at 92-10 in November confirms a trigger exceedance whereas the slight decrease for hardness did not confirm the trigger exceedance. While other leachate indicator parameters at this location were reported to be well within the background range, an increasing trend since 2012 in concentrations of alkalinity and ammonia has been observed. The concentrations of alkalinity, ammonia and chloride in the groundwater from the weathered clay are lower than the concentrations observed in the groundwater from the underlying intact clay. The historic upward gradients between the intact clay and weathered clay and potential release of porewater within the intact clay may, at least in part, be the source of the increased concentrations overtime observed in the weathered clay.

The maximum chloride concentration reported at OW-94-2 in November 2017 does not appear to be related to leachate impacts but rather natural (or influence from a secondary source) variations. Therefore, as proposed in the 2018 Annual Monitoring Report (Golder, 2019), the background maximum chloride concentration in weathered clay was increased from 605 to 629 mg/L.

Groundwater quality in the intact clay and glacial till/upper bedrock unit was not monitored during the 2019 monitoring session. Monitoring of these stratigraphic units occurs every 18 months with the next scheduled session in spring 2020. Concentrations of Leachate Indicator Parameters in groundwater samples collected in 2018 from compliance monitors screened in the intact clay unit were all below the respective trigger concentrations, except for concentrations of potassium, magnesium and hardness at MW07-1B, reported in November 2018, which exceeded their corresponding maximum background concentration. These exceedances will need to be verified during in the spring 2020 monitoring session. If future results do not reflect an upward trend and the data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in this monitoring well is still considered unimpacted by landfill leachate.

Concentrations of Leachate Indicator Parameters in groundwater samples collected from compliance monitors screened in the glacial till/upper bedrock unit in 2018 were all below the respective trigger concentrations, except for the concentration of magnesium from glacial till monitoring well MW07-1A reported in November 2018 (12.9 mg/L) which was above the trigger concentration. This exceedance would have to be confirmed during the spring of 2020. It follows another exceedance reported in the spring of 2017 with a possible short duration increasing trend associated with magnesium concentrations at this location. If future results do not reflect an upward trend and the

data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in this monitoring well is still considered unimpacted by landfill leachate.

Exceedances were also reported in November 2018 for alkalinity at MW05-3A and MW07-1A and hardness at MW07-1A. These exceedances will need to be confirmed during the spring 2020 monitoring session.

6.3.1 Confirmed Exceedances and Proposed Course of Action

As mentioned above, one confirmed exceedance of the trigger concentration was reported in the sand stratigraphic unit in June 2019 for manganese concentrations at MW05-8. However, the concentration reported in November 2019 at this location was lower and therefore did not confirm the continued increase in concentration. In the weathered clay stratigraphic unit, only one confirmed exceedance was reported in 2019 for magnesium at MW92-10.

Following the confirmed exceedances reported in the 2018 annual monitoring report (Golder, 2019), in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. Trigger results of the spring and fall monitoring sessions were reported by Golder, on behalf of WCC, to the MECP Ottawa District Office via email on August 8, 2019 and December 24, 2019, respectively. In accordance with the proposed course of action presented to the MECP in the 2018 annual monitoring report and communications in 2019, WCC acquired a spare leachate pump to reduce down time when a pump requires servicing and WCC intends to proactively maintain the forcemain in good working condition in a continuing effort to achieve a drained state in the leachate collection system.

Leachate pumping and disposal operating issues reported in the fall 2018 had an impact to groundwater quality in the sand and weathered clay units in monitoring wells located immediately downgradient of the leachate collection system (less than 10 m south of the leachate collection system and close to the south toe collector). Concentrations of some Leachate Indicator Parameters in the sand unit spiked in November 2018, but the efforts from WCC in 2019 were successful in limiting the continued increases in concentrations. Concentrations are expected to stabilize or decrease in future monitoring sessions as long as these corrective actions continue to be implemented. Since the hydraulic conductivity of the sand is greater than the weathered clay, it is expected that elevated concentrations will take longer to dissipate in the weathered clay unit. Increasing trends in the weathered clay will be monitored closely in 2020.

Results from the upcoming spring 2020 monitoring session will be analyzed to determine if the effect of these actions are detected in groundwater quality with a decrease in concentrations of Leachate Indicator Parameters at trigger locations. At that point, the need for a formal contingency plan will be assessed in collaboration with the MECP. It is WCC's intention to continue implementing in 2020 the proposed voluntary action plan to address increases in concentrations.

7.0 SURFACE WATER QUALITY ASSESSMENT

7.1 Quality Control/Quality Assurance

One blind sample duplicate was analyzed per surface water monitoring session in 2019 as part of the QA/QC protocol. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the RPD between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All duplicate results for surface water were within acceptable tolerance limits in 2019, with the exception of concentrations reported for manganese at one surface water monitoring station in August 2019 (135 mg/L for the primary sample and 355 mg/L for the duplicate sample, respectively). The concentration in the duplicate sample is uncharacteristic of manganese concentrations at this location. Since the concentration reported in the primary sample is within the range of historical concentrations reported at this location, the 2019 surface water data reported by the laboratory for manganese is considered anomalous but overall the surface water is considered acceptable.

7.2 Surface Water Quality Monitoring

A total of eleven surface water stations continue to be monitored on an on-going basis at this site. The monitoring stations have been located to obtain representative information on water quality up-gradient from the landfill at stations S1, S3, S15, S16 and S17 (background), on water quality at compliance sites down-gradient from the landfill at stations S5, S8 and S9 and on water quality in the Mer Bleue Bog at S10 (SW-W), S11 (SW-C) and S12 (SW-E). Monitoring locations SW-W, SW-C and SW-E are location references used by the NCC.

Stations S1 and S17 are located northeast and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Stations S3, S15 and S16 are located to the west/northwest and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Station S1 is located at the northeast corner of the landfill below a culvert that discharges into a south flowing east perimeter ditch. Station S3 is located at the northwest corner within the site buffer, down-gradient from where a north diversion ditch flows into a west drainage channel. Station S15 is located to the west of the landfill where the north ditch flows into a southward flowing west perimeter ditch. Station S16 is located northwest of the site in a ditch along the south side of Navan Road and up-gradient from station S15. Station S17 is located in an east ditch along the south side of Navan Road and up-gradient from station S1. These stations are considered to be representative of up-gradient background surface water quality.

Stations S5, S8 and S9 are located down-gradient from the landfill. Station S5 is located at a culvert beneath the VIA Rail right-of-way (ROW) just east of the landfill centre line near grid line 10 and is dry throughout most of the year. Station S8 is located in a wide and shallow westward flowing channel having a swamp environment and is down-gradient from the southwest corner of the landfill and north of the VIA ROW, immediately west from where the west drainage channel discharges into the ditch. Station S9 is located near a large concrete box culvert beneath the VIA ROW and down-gradient from the southeast corner of the landfill. Since the fall of 2013, water has been backing up upstream of surface water station S9 as a result of blockage in the box culvert by aggressive beaver activity. Steps were taken by WCC in spring 2017 to reduce the beaver activity in the area and no blockage was observed during the fall monitoring session. No specific beaver activity was noted in 2019.

Surface water sampling stations S10, S11 and S12, also referred to by the NCC in other reports as SW-W, SW-C and SW-E, respectively, are located south of the landfill at the northern edge of the Mer Bleue Bog and consist of stagnant bog water. Stations S10, S11 and S12 were added in 1995 to obtain data considered to be representative of water quality in the receiving water at the perimeter of the bog.

For the purpose of surface water quality assessment, the background surface water quality is assumed to be represented by the data available from stations located in close proximity to the landfill and up-gradient of surface water flow. For the 2019 monitoring program, the PWQO is being applied for the purpose of water quality assessment at the surface water sampling stations.

Surface water monitoring for 2019 was carried out on June 20, August 28, and November 21 at up-gradient control sites S1, S3, S15, S16 and S17, sites S5, S8 and S9 and the down-gradient control sites S10, S11 and S12. Analytical test reports submitted by Paracel for water samples obtained in 2019 are provided in Appendix B. Historical data are also provided in Appendix G.

Station S5, S8, S9, S10, and S11 were found to be dry during the summer monitoring session in 2019. Therefore, samples could not be collected at these stations at the time.

Water quality data was compared to historical data obtained at each station and trends in the concentration of key indicator parameters were examined.

The PWQO criteria for chromium changed in 1999 from chromium to chromium III and chromium VI. The laboratory reports total chromium and the exceedances noted in the tables in the following sections are values of total chromium that are greater than the PWQO for chromium III, i.e. 8.9 µg/L (there is no PWQO for total chromium). Should current data show an increasing trend, attempts will be made to separate the analysis into chromium III and chromium VI.

7.2.1 Up-Gradient Control Stations

The up-gradient surface water quality was monitored during the 2019 monitoring program through the inclusion of up-gradient stations S1, S3, S15, S16 and S17.

The surface water quality during 2019 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Station	Parameter(s) Exceeding or Outside PWQO		
	June 2019 Monitoring Session	August 2019 Monitoring Session	November 2019 Monitoring Session
S1	[None]	Cobalt, copper, iron, phenols, and total phosphorous	[None]
S3	Dissolved oxygen and iron	Dissolved oxygen, iron, phenols, and total phosphorous	Dissolved oxygen and iron
S15	Iron and total phosphorus	Iron, phenols, and total phosphorous	Cobalt, iron and phenols
S16	Cobalt, copper, dissolved oxygen, iron and total phosphorous	Cobalt, dissolved oxygen, iron, phenols, and total phosphorous	Chromium, cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorous, and zinc
S17	Iron and total phosphorous	Cobalt, copper, dissolved oxygen, iron, phenols and total phosphorous	Iron, phenols and total phosphorous

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As apparent from the above table, the up-gradient surface water quality is characterized by concentrations of the following parameters which exceed or are outside the PWQO: chromium, cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorus and zinc. Occasional PWQO exceedances of cadmium and boron have been observed in the past as well.

Surface water quality is generally consistent over time (with seasonal variability). An increasing trend in concentrations of alkalinity can be observed at surface water station S1 over time. Previously observed overall increasing trends for concentrations of chloride, DIC, sodium, TDS, hardness and conductivity at surface water station S1, concentrations of alkalinity, ammonia, DIC and iron at surface water station S3 (previously reported elevated concentrations were reported at this station in August 2018, have returned to typical historical concentrations), and concentrations of manganese, sodium and TDS at surface water station S15 appear to have stabilized, with seasonal variability remaining. Similarly, the previously observed decreasing trend in dissolved oxygen concentrations at surface water stations S3 appears to have stabilized with seasonal variability remaining. A slight increasing trend in iron concentrations is observed at surface water station S15.

The current or historical increases in concentrations of parameters at these locations is not related to leachate impact as these stations are up-gradient of the site.

7.2.2 Down-Gradient Control Stations

The down-gradient surface water quality was monitored during the 2019 monitoring program through the inclusion of down-gradient stations S10, S11 and S12.

The surface water quality during 2019 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Monitor	Parameter(s) Exceeding or Outside PWQO		
	June 2019 Monitoring Session	August 2019 Monitoring Session	November 2019 Monitoring Session
S10	Cobalt, dissolved oxygen, iron and total phosphorous	[No sample collected due to dry conditions]	Boron, cobalt, dissolved oxygen, iron, phenols, and total phosphorus
S11	Dissolved oxygen, iron and total phosphorus	[No sample collected due to dry conditions]	Boron, chromium cobalt, copper, dissolved oxygen, iron, phenols, total phosphorus, and zinc
S12	Cobalt, copper, dissolved oxygen, iron, lead, total phosphorus, and zinc	Chromium, cobalt, iron, lead, phenols, and total phosphorous	Iron, phenols and total phosphorus

Input: ETB
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As apparent from the above table, the down-gradient surface water quality is characterized by dissolved oxygen, iron, and total phosphorus concentrations which exceed or are outside the PWQO. Occasional PWQO exceedances of boron, cadmium, cobalt, copper, chromium, phenols and zinc have been observed.

The concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the June, August and November 2019 monitoring sessions were generally similar to or lower than the surface water quality at the up-gradient station S16 during the same session.

Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed.

7.3 Surface Water Compliance Assessment

As previously mentioned, surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. It becomes increasingly difficult to assess surface water site compliance with scattered data. The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility. Surface water quality monitoring will continue at the site, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the WCC Navan Facility.

8.0 SEDIMENTS

Sediment samples SED-W, SED-C and SED-E were obtained at the surface water sampling stations SW-10, SW-11 and SW-12, respectively, on June 20, August 28 and November 21, 2019. Laboratory reports are presented in Appendix B and the results are summarized in Table 4 and Table 5. Included for comparison in Table 4 and Table 5 are the MECP Table 1 sediment criteria and Table 2 and Table 4 Recreation/Parkland soil criteria (MOE, 2011) and the CCME freshwater sediment and Recreation/Parkland soil criteria (CCME, 1999). The table below summarizes the parameters which exceeded sediment criteria.

Sediment Monitor	Parameter(s) Exceeding MECP Table 1 Sediment		Parameter(s) Exceeding CCME Freshwater Sediment	
	June 2019 Monitoring Session	November 2019 Monitoring Session	June 2019 Monitoring Session	November 2019 Monitoring Session
SED-E	Copper, nickel	[None]	[None]	[None]
SED-C	[None]	[None]	[None]	[None]
SED-W	[None]	Copper	[None]	[None]

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Analytical results on the sediment samples indicate that no parameters exceed the CCME Guidelines for freshwater sediment. Copper and nickel concentrations exceed the MECP Table 1 sediment criteria. The analytical results observed at the sampling locations are consistent with historical results observed at the respective locations.

The following table summarizes the parameters which exceeded the soil criteria in 2019.

Sediment Monitor	Parameter(s) Exceeding MECP Table 2/Table 4 Soil		Parameter(s) Exceeding CCME Soil	
	June 2019 Monitoring Session	November 2019 Monitoring Session	June 2019 Monitoring Session	November 2019 Monitoring Session
SED-E	Boron	Boron	[None]	[None]
SED-C	Boron	Boron	[None]	Selenium
SED-W	Boron	Boron	[None]	Selenium

Input: ETB
Checked: RPM

Analytical results on the sediment samples indicate that boron exceeds MECP Table 2 and Table 4 soil criteria during the spring and fall monitoring sessions at each sampling location. Selenium exceeded the CCME soil criteria during the fall monitoring session at SED-C and SED-W. In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Natural wetland systems have been used to treat a variety of wastewater including agricultural and surface mine runoff, irrigation return flows, leachate, urban storm water discharge and other sources of water pollution (U.S. Environmental Protection Agency, 1987). Today, increasing attention is being given to artificial wetlands for the treatment of wastewater. Approximately 90% of Canada's 127 million hectares of wetlands are classified as peatlands where peaty soils are predominant (NAWCC, 1994). The value of peat as an agent for pollution prevention and control has been recognized during the last three decades. Peat's value is directly related to its unique physical and chemical properties. Compared to other mineral soils, peat has a very high organic content (60% carbon), with lignin and cellulose as its main constituents. Peat has a large specific area and is highly porous, properties similar to natural zeolites and activated carbon, which makes it a good adsorbent material (McLellan and Rock, 1988). These contain some functional organic groups such as carboxyl and amino groups that form complexes with metal ions (Dissanayake and Weerasooriya, 1981). Peat is also reported to exhibit ion exchange capacities (Sharma and Froster, 1993). The combination of the above mentioned properties, i.e., being a good adsorbent, forming complexes with metals and having ion exchange capacity makes peat an excellent metal trapping media. Peat is proven to be effective in removal of lead, cadmium, zinc and chromium from raw wastewater (Zhipie et al., 1984), removal of hexavalent chromium from wastewater, removal of copper, iron, manganese, zinc, lead and potassium from industrial wastewater (Cameron, 1978). Sphagnum peat, such as the peat found in eastern Ontario, is reported to be the most suitable peat to use for wastewater treatment systems, in terms of decay resistance (Warith, 1996).

The peat deposit in the Mer Bleue Bog predates any human activity in this area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink. Water levels in the Mer Bleue Bog fluctuate naturally from time to time and have been aggressively drained (in the early 1930's) to promote agricultural exploitation of the bog. Drainage of the Mer Bleue Bog is now under the management of the NCC. In more recent years, water levels have been allowed to rise and agricultural use of the bog has been significantly reduced. From time to time, given the right water levels and environment, the release of constituents absorbed by the peat can be expected. Therefore, it would appear that metals in excess of sediment criteria are the result of natural peat processes and not impacts from the landfill.

In 2002/2003, an assessment of the WCC site operations was undertaken in support of a WCC-NCC exchange of land parcels located south of the Navan landfill along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

9.0 PROPOSED 2020 MONITORING PROGRAM

The proposed 2020 Environmental Monitoring Program is the same as was conducted in 2019, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program and sediment monitoring which is proposed to be discontinued.

In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in downgradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations or one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in downgradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As explained in Section 7.3, the MECP agreed that an excursion of landfill leachate would be apparent in the underlying stratigraphic units prior to a surface water impact and a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. Therefore, it is proposed to discontinue sediment monitoring and rely on the groundwater and surface water monitoring programs to assess off-site leachate impacts. With MECP concurrence, sediment monitoring could resume temporarily if leachate impacts and trigger exceedances are reported at the site.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during November 2018 monitoring session and will be monitored again in the spring of 2020.

The objectives of the 2020 environmental monitoring program are:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

10.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Waste Connections of Canada. The report, which specifically includes all tables and figures, is based on data and information collected by Golder and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder as described in this report.

Golder has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Groundwater, leachate and/or surface water quality conditions may vary from these sampled locations.

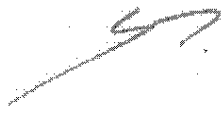
The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

11.0 CLOSURE

We trust this report meets your current needs. If you have any questions regarding this report, please contact the undersigned.

Golder Associates Ltd.



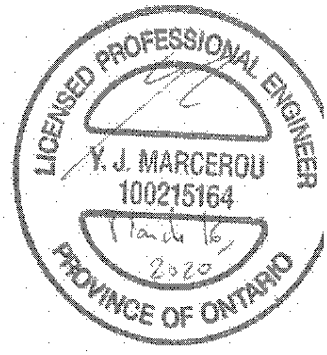


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Table 1a: Summary of Water Sampling Stations for June 2019

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5* S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-4/05-1D 95-8	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2** 05-3C 07-1C	94-5** 95-2 95-6
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Notes:
* Dry conditions or insufficient volume of water did not permit sampling at this station.
** Inadvertently, no sample was collected at this location.

Table 1b: Summary of Water Sampling Stations for August 2019

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5* S8* S9*	S10 (SW-W)* S11 (SW-C)* S12 (SW-E)
Sand Layer			09-1D*
Weathered Clay Deposit			09-1C*
Intact Clay Deposit			09-1B*
Glacial Till/Upper Bedrock			09-1A*
Leachate	L-5		

Notes: * Dry conditions did not permit sampling at this station.

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Checked by: RPM

Table 1c: Summary of Water Sampling Stations for November 2019

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5* S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-8 95-4/05-1D	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7 09-1D
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2 05-3C 07-1C	94-5 95-2 95-6 09-1C
Intact Clay Deposit			09-1B
Glacial Till/Upper Bedrock			09-1A**
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Notes:

* Insufficient volume of water did not permit analyzing for all parameters, including field parameters.

** Monitoring location was frozen during this sampling event. No sample was collected.

Prepared by: ETB
Checked by: RPM

Table 2: List of Parameters Analyzed or Calculated in 2019

Parameter	Surface Water	Leachate	Groundwater	Sediments
Hardness ($CaCO_3$)	X	X	X	
Alkalinity ($CaCO_3$)	X	X	X	
Total Suspended Solids	X	X		
Bicarbonate (HCO_3)			X	
Carbonate (CO_3)			X	
Calcium	X	X	X	
Chloride	X	X	X	
Magnesium	X	X	X	
Total Phosphorous	X	X	X	
Potassium	X	X	X	
Sodium	X	X	X	
Sulphate	X	X	X	
Nitrate nitrogen	X	X	X	
Nitrite nitrogen	X	X	X	
Ammonia nitrogen[1]	X	X	X	
Total Kjeldahl nitrogen	X	X	X	
TDS	X	X	X	
Metals				
Arsenic	X	X	X	X
Boron	X	X	X	X
Cadmium	X	X	X	X
Chromium	X	X	X	X
Cobalt	X	X	X	X
Copper	X	X	X	X
Iron	X	X	X	X
Lead	X	X	X	X
Manganese	X	X	X	X
Mercury				X
Molybdenum				X
Nickel				X
Selenium				X
Zinc	X	X	X	X
Bulk Organics				
Phenols	X	X	X	
BOD_5	X	X		
COD (Chemical Oxygen Demand)	X	X	X	
DIC (Dissolved Inorganic Carbon)	X	X		

Parameter	Surface Water	Leachate	Groundwater	Sediments
DOC (Dissolved Organic Carbon)	X	X		
1,1-Dichloroethane		X	X	
Benzene		X	X	
Ethylbenzene		X	X	
Methylene Chloride		X	X	
Toluene		X	X	
Vinyl Chloride		X	X	
Xylene – m/p		X	X	
Xylene – o		X	X	
Field Measured Parameters				
pH	X	X	X	
Conductivity	X	X	X	
Temperature	X	X	X	
Dissolved Oxygen	X	X		
Flow	X			

Notes: [1] Unionized ammonia calculated for surface water.

Prepared by: ETB
Checked by: RPM

Table 3: 2019 Monitoring Well Network Condition Survey

Well Number	Properly Cased?	Cap?	Lock?	Comments
OW-92-1	√	√	√	
OW-92-2	√	√	√	
OW-92-3	√	√	√	
OW-92-4	√	√	√	
OW-92-5	√	√	√	
OW-92-6	√	√	√	
OW-92-7	√	√	√	
OW-92-8	√	√	√	
OW-92-9	√	√	√	
OW-92-10	√	√	√	
OW-92-11	√	√	√	
OW-92-12	√	√	√	
OW-92-13	√	√	√	
OW-92-14	√	√	√	
OW-92-15	√	√	√	
OW-92-16	√	√	√	
OW-92-17	√	√	√	
OW-92-18	√	√	√	
OW-92-19	√	√	√	
OW-94-1	√	√	√	
OW-94-2	√	√	√	
OW-94-3	√	√	√	
OW-94-4	√	√	√	
OW-94-5	√	√	√	
OW-94-6	√	√	√	
OW-95-1	√	√	√	
OW-95-2	√	√	√	
OW-95-3	√	√	√	
OW-95-4				Abandoned, well removed.
OW-95-5	√	√	√	
OW-95-6	√	√	√	
OW-95-7	√	√	√	
OW-95-8	√	√	√	
OW-95-9	√	√	√	
OW-98-1	√	√	√	
OW-98-3				Abandoned, well removed.
OW-98-4				Abandoned, well removed.
MW05-R3	√	√	√	
MW05-8	√	√	√	
MW05-11	√	√	√	
MW-C	√	√	√	
MW-E	√	√	√	

Well Number	Properly Cased?	Cap?	Lock?	Comments
MW05-1A	√	√	√	
MW05-1B	√	√	√	
MW05-1C	√	√	√	
MW05-1D	√	√	√	Needs new tubing
MW05-2A	√	√	√	
MW05-2B	√	√	√	
MW05-2C	√	√	√	
MW05-2D	√	√	√	
MW05-3A	√	√	√	
MW05-3B	√	√	√	
MW05-3C	√	√	√	
MW05-3D	√	√	√	
MW07-1A	√	√	√	
MW07-1B	√	√	√	
MW07-1C	√	√	√	
MW07-1D	√	√	√	
MW09-1A	√	√	√	
MW09-1B	√	√	√	
MW09-1C	√	√	√	
MW09-1D	√	√	√	
MW11-1	√	√	√	

Entered by: ETB
Checked by: RPM

Table 4: Summary of Analytical Results – Sediments (June 2019)

Parameter	June 20, 2019			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	3.3	1.3	2.4	18	18	12	6	5.9
Boron*	**11.1**	**3.0**	**17.5**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	23.9	16.7	12.6	160	160	64	26	37.3
Cobalt	4.5	2.5	2.7	22	22	50	50	nac
Copper	**16.2**	5	14.2	180	180	63	16	35.7
Iron	13,400	7,320	128,000	nac	nac	nac	nac	nac
Lead	8.3	5.1	6.5	120	120	140	31	35.0
Manganese	230	101	504	nac	nac	nac	nac	nac
Mercury	<0.1	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	1.8	<1	2.6	6.9	6.9	10	nac	nac
Nickel	**17.8**	7.8	10	130	130	45	16	nac
Selenium	<1	<1	<1	2.4	2.4	1	nac	nac
Zinc	65.3	26.7	63.7	340	340	200	120	123

Notes:
All concentrations are reported in µg/g dry.
nac - no applicable criteria for this parameter.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2007 (CCME, 1999).
* Criteria based on a hot water extract for available boron.

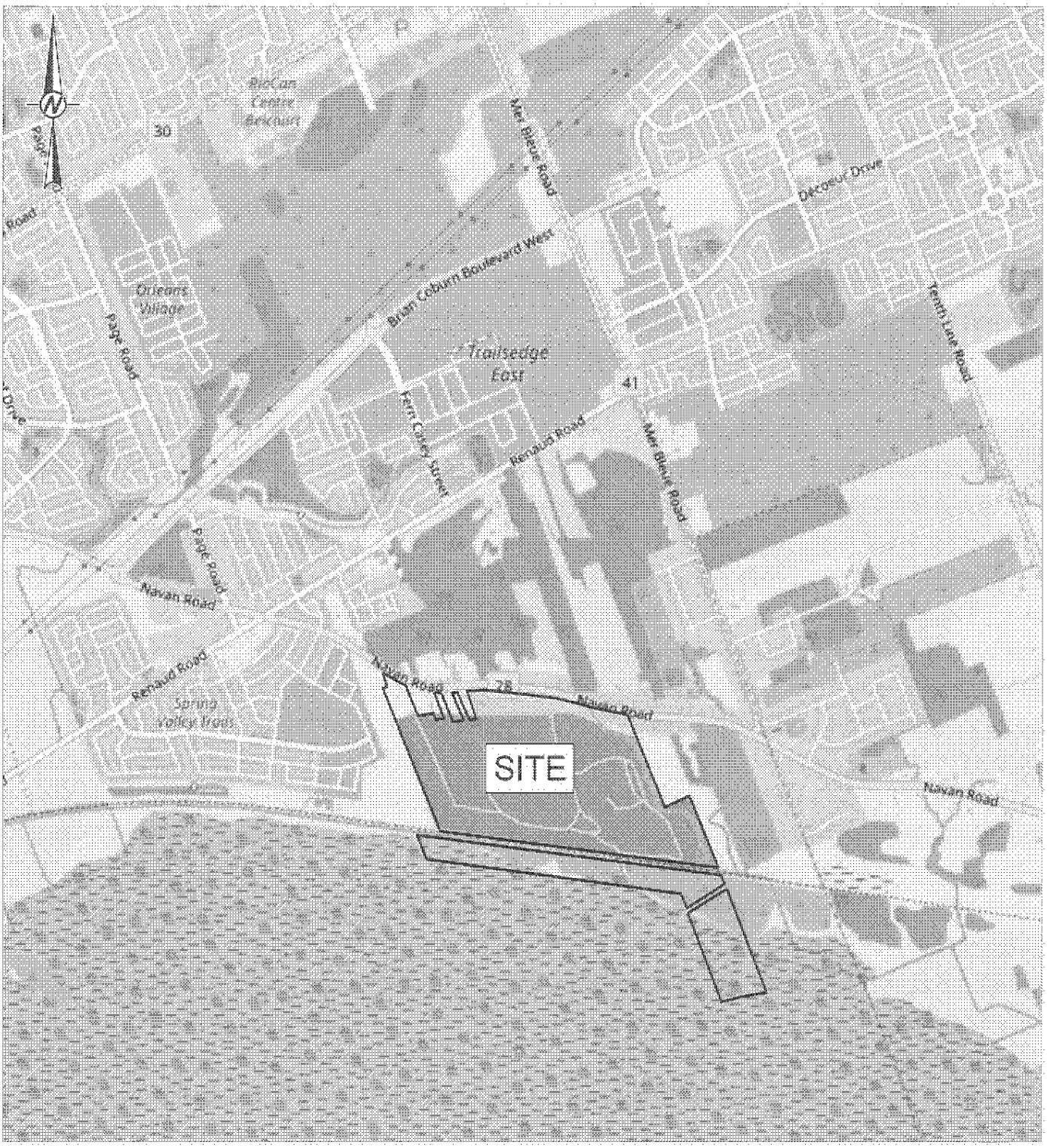
Prepared by: ETB
Checked by: RPM

Table 5: Summary of Analytical Results – Sediments (November 2019)

Parameter	November 21, 2019			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	2.4	1.3	2.4	18	18	12	6	5.9
Boron*	**8.4**	**7.7**	**18.6**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	14.8	17.5	23.9	160	160	64	26	37.3
Cobalt	2.8	3	4.6	22	22	50	50	nac
Copper	9.7	6.8	**18.5**	180	180	63	16	35.7
Iron	13,200	6,910	12,400	nac	nac	nac	nac	nac
Lead	5.4	5.5	7.8	120	120	140	31	35.0
Manganese	311	121	279	nac	nac	nac	nac	nac
Mercury	<0.2	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	<1	<1	3.4	6.9	6.9	10	nac	nac
Nickel	9.3	8.1	14.8	130	130	45	16	nac
Selenium	<1	**1.4**	**1.1**	2.4	2.4	1	nac	nac
Zinc	31.8	27	72.6	340	340	200	120	123

Notes:
All concentrations are reported in µg/g dry.
nac = no applicable criteria for this parameter.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2007 (CCME, 1999).
* Criteria based on a hot water extract for available boron.

Prepared by: ETB
Checked by: RPM



WASTE CONNECTIONS OF CANADA

0 500 1,000
1:25,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

CLIENT
WASTE CONNECTIONS OF CANADA

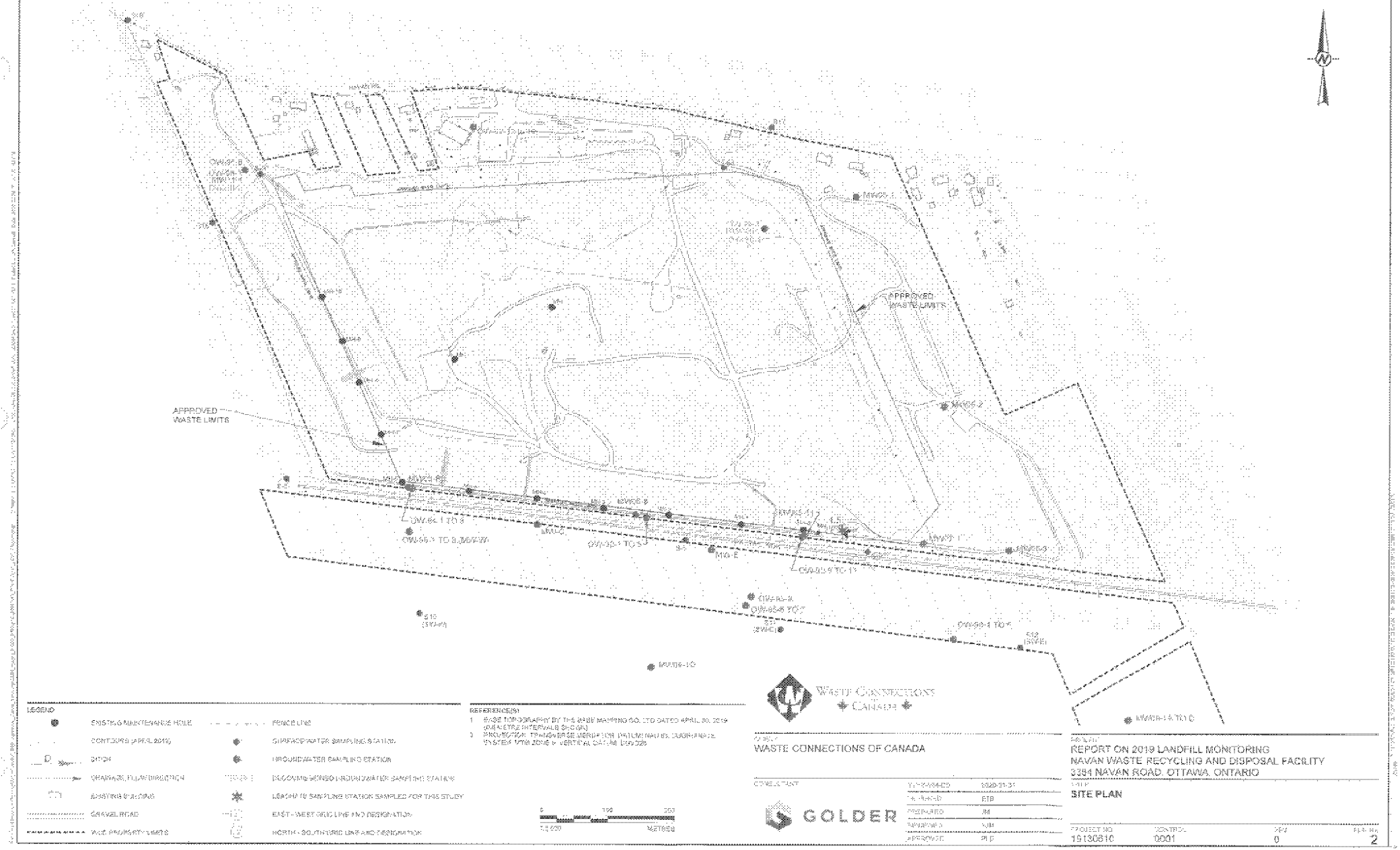
PROJECT
REPORT ON 2019 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-31
DESIGNED	ETB
PREPARED	JM
REVIEWED	YJM
APPROVED	PLE

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
19130610	0001	0	4


APPROVED WASTE LIMITS
APPROVED WASTE LIMITS
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MW19-2
MW19-3
MW19-4
MW19-5
MW19-6
MW19-7
MW19-8
MW19-9
MW19-10
MW19-11
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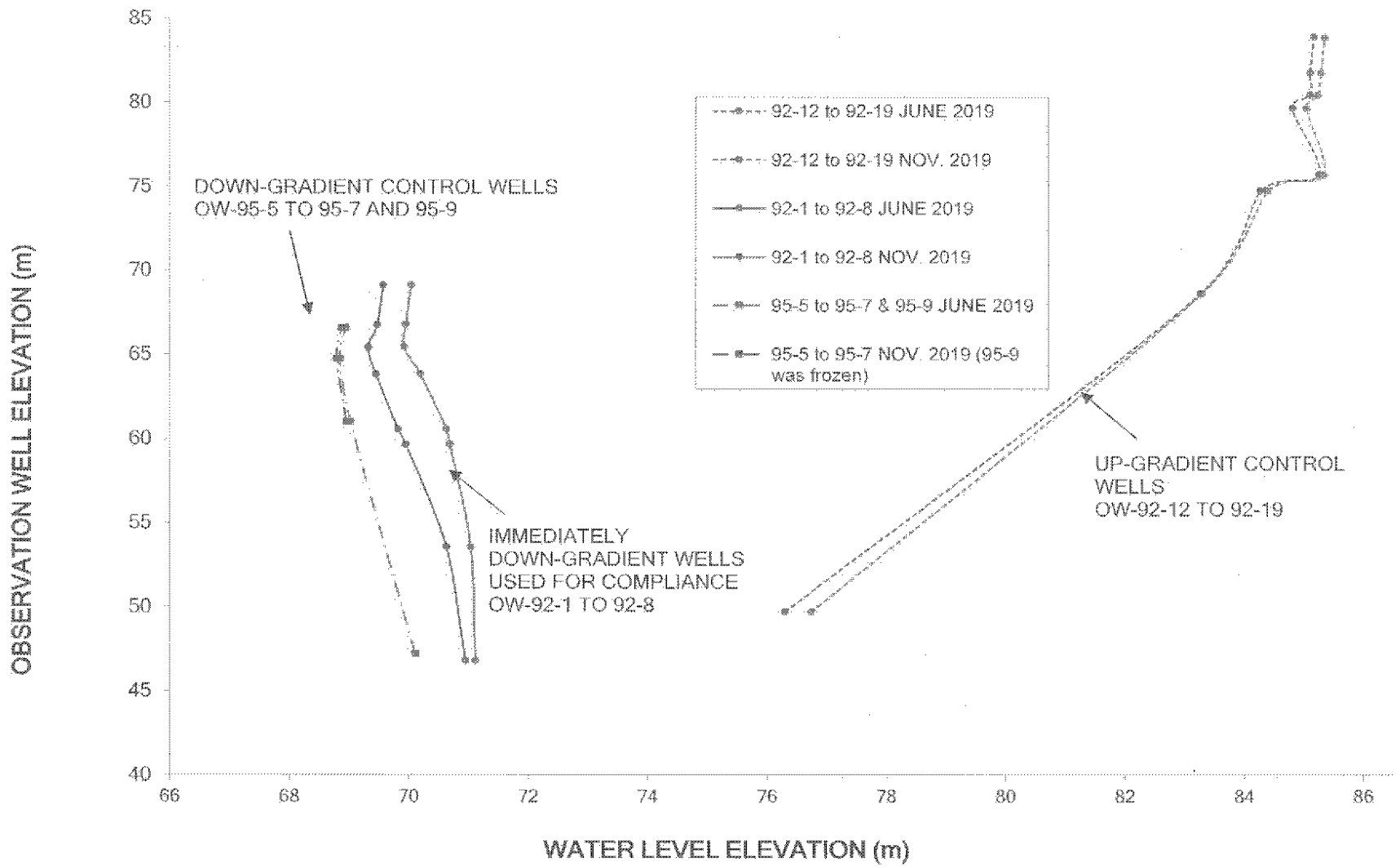


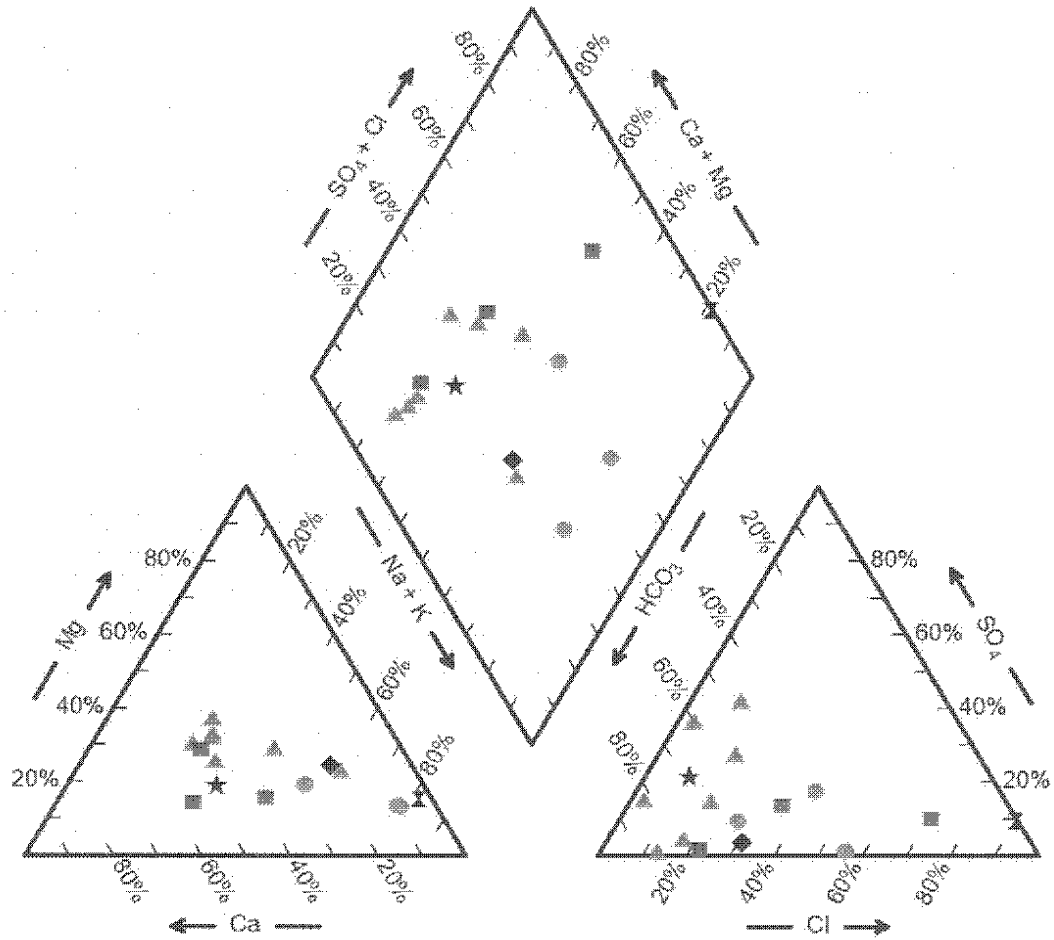
FIGURE 3

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

HYDRAULIC HEAD PROFILES

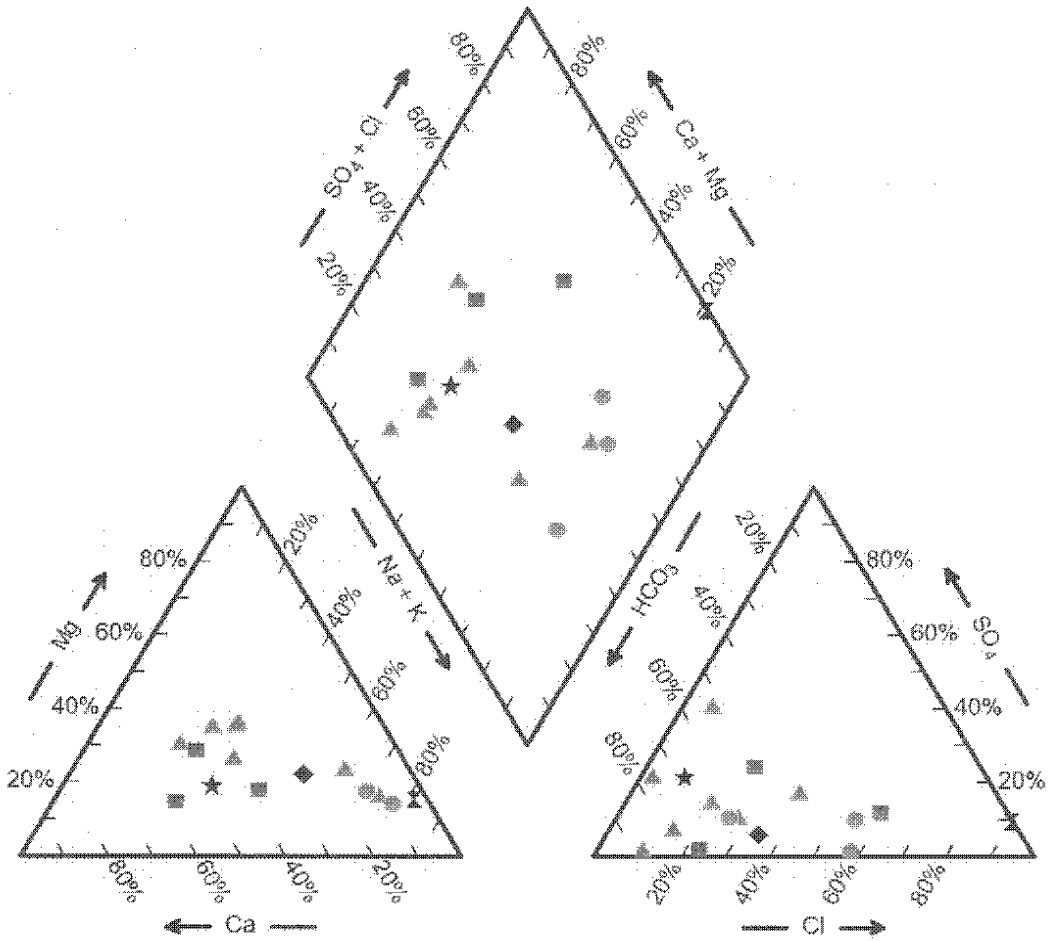
GOLDER



WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Sand Deposit (June 2019)	
	Checked By	RPM		
	Reviewed By	PLE	March 2020	19130610-01	Figure 4

460000

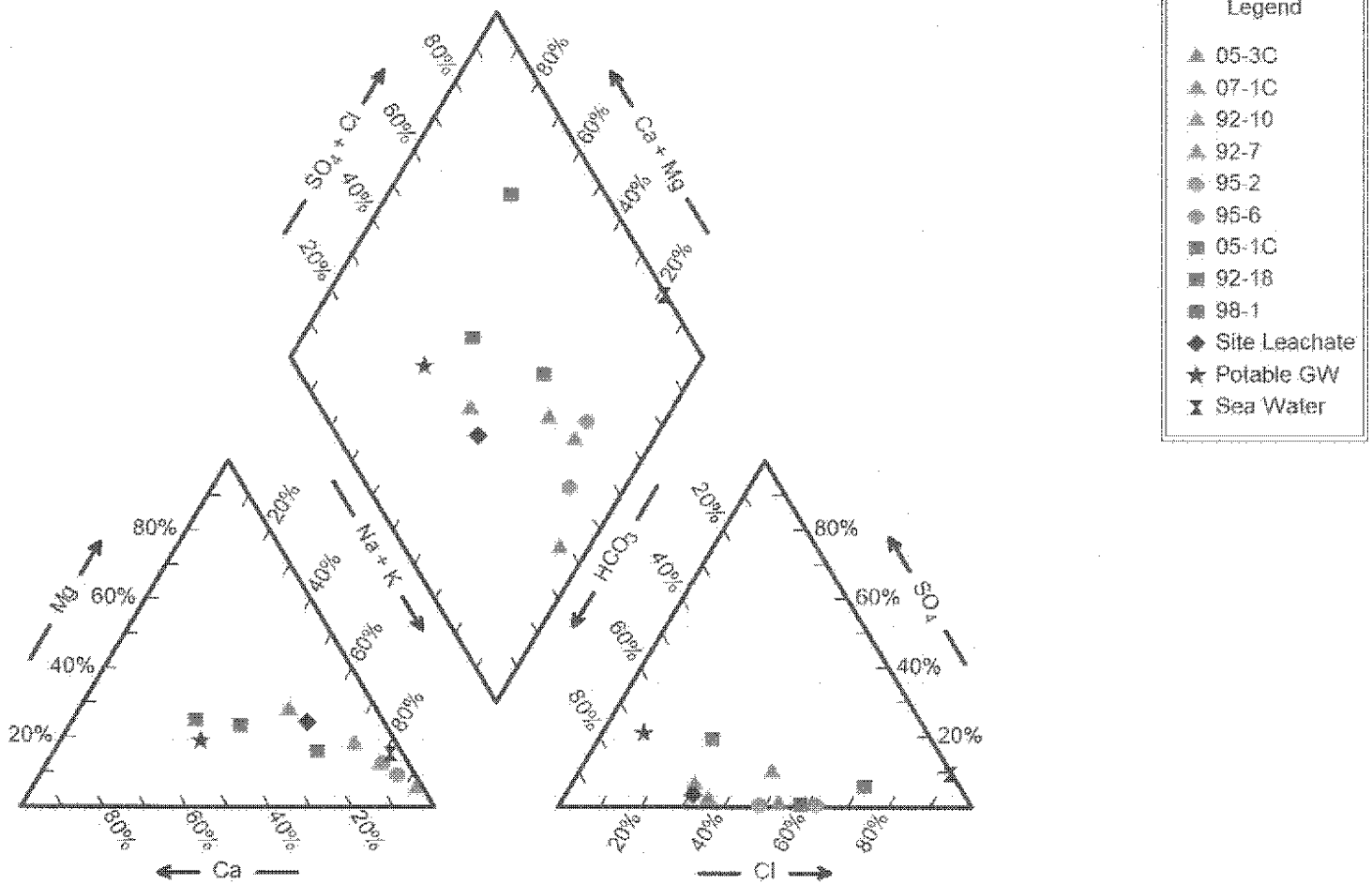


WCC NAVAN FACILITY

GOLDER

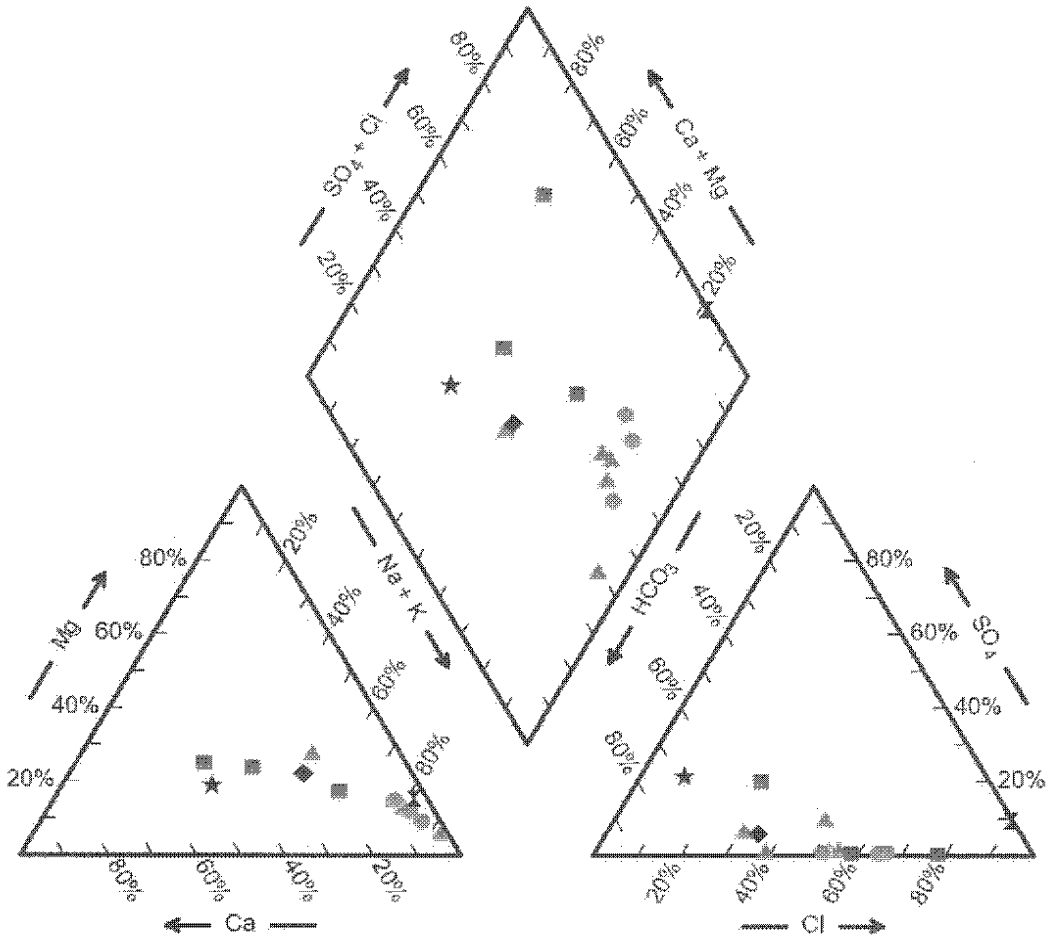
Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Sand Deposit (November 2019)		
Checked By	RPM			
Reviewed By	PLE	March 2020	19130610-01	Figure 5

660000



WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Weathered Clay Deposit (June 2019)		
	Checked By	RPM			
	Reviewed By	PLE	March 2020	19130610-01	Figure 6



WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Weathered Clay Deposit (November 2019)		
	Checked By	RPM			
	Reviewed By	PLE	March 2020	19130610-01	Figure 7

APPENDIX A

Record of Borehole Sheets

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX B

Laboratory Certificates of Analysis

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX C

Groundwater Level Records

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	24-Mar-92 Elevation	25-Mar-92 Elevation	26-Mar-92 Elevation	30-Mar-92 Elevation	31-Mar-92 Elevation	01-Apr-92 Elevation	02-Apr-92 Elevation	03-Apr-92 Elevation	06-Apr-92 Elevation	10-Apr-92 Elevation	22-Apr-92 Elevation	07-May-92 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25	71.10	70.00	70.00	69.95		69.95		69.85		69.75	69.58	69.53
OW-92-2	73.00	73.16	73.50		71.10	18.22	55.53	52.03	53.25	68.88	68.78	67.15		68.15		69.28		69.75	69.66	69.77
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.83	58.13		63.48	64.58	67.28		67.78		68.38		69.01	69.31	69.46
OW-92-4	73.00	73.32	73.67		71.10	g	60.64	59.64		62.54	63.09	65.12		66.73		66.69		68.02	68.90	69.25
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29		65.04	65.54	67.02		67.67		68.29		68.87	69.11	69.19
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88		69.06	69.30	69.76		69.73		69.83		69.56	69.56	69.56
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22		69.32	69.41	69.84		69.87		69.77		69.60	69.51	69.54
OW-92-8	73.00	73.17	73.52		71.10	2.3	69.05	67.55		69.49	69.56	69.35		69.84		69.69		69.45	69.56	69.58
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.82	62.32			64.27	66.87		67.44		68.12		69.00	69.20	69.42
OW-92-10	72.30	72.91	73.27		70.79	4.6	66.85	65.35			69.25	69.76		69.75		69.75		69.66	69.82	69.87
OW-92-11	72.30	72.99	73.38		70.75	2.6	68.9	67.4			69.40	69.78		69.79		69.78		69.69	69.83	69.83
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.68	48.18					74.31	74.25	74.25	74.25	74.25	74.25	74.55	74.64
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.55	67.05							80.61	81.01	81.65	83.05	83.00	82.69
OW-92-14	86.03	86.99	87.24		86.03	12.11	74.67	73.17								79.13	82.95	83.67	83.67	83.72
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17								76.62	79.92	82.51	83.80	83.84
OW-92-16	86.03	86.94	87.19		86.03	7.19	79.59	78.09								81.36	82.73	83.90	84.58	84.56
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9								83.75	84.23	84.79	85.01	84.87
OW-92-18	86.03	87.02	87.28		86.03	5.05	81.73	80.23								84.12	84.92	84.81	85.09	84.98
OW-93-19	86.03	86.96	87.22		86.03	2.93	83.85	82.35								84.35	85.39	85.46	85.58	84.88
OW-81					86.96															
OW-4-5					71.99													70.79		
OW-4-8					72.00													71.03		
OW-94-1	72.00	72.496	72.83		71.33	8.58	63.52	62.02												
OW-94-2	72.00	72.601	72.84		71.33	4.57	67.51	65.01												
OW-94-3	72.00	72.541	72.74		71.33	2.88	68.5	68												
OW-94-4	68.70	69.23	69.61		68.7	8.38	61.07	59.57												
OW-94-5	68.70	69.64	70.2		68.7	3.55	65.9	64.4												
OW-94-6	68.70	69.65	70.13		68.7	1.91	67.54	66.04												
MW-C			70.23																	
MW-E			70.67																	
MW05-1A*	85.48	86.23	86.27																	
MW05-1B*	85.55	86.31	86.33																	
MW05-1C*	85.48	86.32	86.34																	
MW05-1D*	85.62	86.35	86.38																	
MW05-2A*	72.26	69.70	81.38																	
MW05-2B*	72.15	69.74	81.31																	
MW05-2C*	72.05	69.75	81.20																	
MW05-2D*	72.05	70.80	81.25																	
MW06-3A*	69.47	69.70	70.93	74.53																
MW06-3B*	69.52	69.74	70.95	74.47																
MW06-3C*	69.47	69.75	70.90	74.52																
MW06-3D*	69.50	70.80	70.91	74.46																

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D

Prepared by: ETB
Checked by: YJM

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2000 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-May-92 Elevation	01-Jun-92 Elevation	17-Jun-92 Elevation	30-Jun-92 Elevation	21-Jul-92 Elevation	05-Aug-92 Elevation	19-Jul-93 Elevation	02-Nov-93 Elevation	04-Apr-94 Elevation	23-Apr-94 Elevation	08-Jun-94 Elevation	18-Oct-94 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25	69.49	69.30	69.35	69.35	69.65	69.66	69.81	69.82	69.85	69.88	69.84	69.82
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.63	52.03	67.93	69.51	69.58	69.60	69.60	69.58	69.55	69.68	69.50	69.46	69.60	69.57
OW-92-3	73.00	73.29	73.64		71.10	12.22	58.83	58.13	67.66	69.18	69.40	69.43	69.42	69.44	69.63	69.42	69.27	69.29	69.41	69.40
OW-92-4	73.00	73.32	73.67		71.10	g	60.64	59.04	66.99	69.60	69.29	69.37	69.36	69.43	69.62	69.40	69.24	69.24	69.40	69.37
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29	68.54	69.17	69.28	69.25	69.31	69.36	69.38	69.43	69.09	69.45	69.43	69.20
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88	69.44	69.45	69.13	69.14	69.59	69.67	69.10	69.43	69.74	69.71	69.62	69.08
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22	69.29	69.50	69.12	69.17	69.55	68.57	69.11	69.41	69.85	69.75	69.70	69.09
OW-92-8	73.00	73.17	73.52		71.10	2.8	69.05	67.55	69.40	69.48	69.12	69.16	68.54	69.08	69.07	69.37	69.75	69.71	69.65	69.03
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.82	62.32	67.29	69.09	69.14	69.12	69.23	69.23	69.14	69.22	66.95	69.22	69.22	69.10
OW-92-10	72.30	72.91	73.27		70.79	4.8	66.85	65.35	69.29	69.34	69.12	69.16	69.38	69.44	68.94	69.24	69.36	69.55	69.42	68.98
OW-92-11	72.30	72.99	73.33		70.75	2.6	68.5	67.4	69.33	69.38	69.15	69.17	69.40	69.46	68.98	69.27	69.40	69.56	69.44	69.00
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.58	48.18	74.64	74.58	74.57	74.53	74.64	74.65	74.72	74.43			74.94	74.62
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.55	67.06	81.01	82.31	82.44	82.46	82.51	82.50	82.42	82.46	82.47	82.42	82.40	82.47
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17	83.24	83.50	83.58	83.56	83.62	83.63	83.57	83.55	83.41	83.46	83.50	83.48
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17	82.12	83.70	83.78	83.76	83.83	83.82	83.77	83.76	83.57	83.66	83.66	83.66
OW-92-16	86.03	86.94	87.19		86.03	7.19	79.59	78.09	83.32	84.18	84.32	84.29	84.41	84.43	84.32	84.41	84.12	84.40	84.26	84.19
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9	84.19	84.50	84.55	84.49	84.75	84.72	84.51	84.89	84.44	84.75	84.53	84.40
OW-92-18	86.03	87.02	87.28		86.03	5.05	81.73	80.23	84.19	84.58	84.62	84.58	84.66	84.82	84.57	84.75	84.92	84.89	84.61	84.50
OW-92-19	86.03	86.96	87.22		86.03	2.99	83.85	82.35	84.74	84.88	84.66	84.57	85.14	85.29	84.48	84.82	85.24	84.91	84.91	84.48
OW-81					88.96				-	84.61	84.49	86.13	84.99	84.56						
OW-4-5					71.98				68.67	70.37	70.32	70.28	70.56	70.46						
OW-4-8					72.00				68.99	70.41	70.64	70.59	70.62	70.52						
OW-94-1	72.00	72.496	72.83		71.33	8.58	63.52	62.02											68.98	
OW-94-2	72.00	72.601	72.84		71.33	4.67	67.51	65.01											69.04	
OW-94-3	72.00	72.541	72.74		71.33	2.58	69.5	68												
OW-94-4	68.70	69.23	69.61		68.7	8.38	61.07	59.57											67.77	
OW-94-5	68.70	69.64	70.2		68.7	3.55	65.9	64.4											67.82	
OW-94-6	68.70	69.95	70.13		68.7	1.91	67.54	66.04											67.78	
MW-C			70.23																	
MW-E			70.87																	
MW05-1A*	85.48	86.23	86.27																	
MW05-1B*	85.55	86.31	86.33																	
MW05-1C*	85.48	86.32	86.34																	
MW05-1D*	85.62	86.35	86.39																	
MW05-2A*	72.28	69.70	81.38																	
MW05-2B*	72.13	69.74	81.31																	
MW05-2C*	72.08	69.75	81.20																	
MW05-2D*	72.08	70.80	81.25																	
MW05-3A*	69.47	69.70	70.93	74.69																
MW05-3B*	69.52	69.74	70.85	74.47																
MW05-3C*	69.47	69.75	70.80	74.82																
MW05-3D*	69.50	70.80	70.81	74.46																

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

Prepared by: ETB
Checked by: YJM

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	25-Oct-94 Elevation	06-Dec-94 Elevation	28-Mar-95 Elevation	20-Apr-95 Elevation	18-May-95 Elevation	23-Jun-95 Elevation	12 Jul 95 Elevation	26 Jul 95 Elevation	09 Aug 95 Elevation	13 Aug 95 Elevation	15 Aug 95 Elevation	18 Aug 95 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25	69.88	69.83	69.90	69.88	69.92	69.92						69.65
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03	69.56	69.50	69.61	69.77	69.72	69.70						69.59
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.63	58.13	69.39	69.28	69.61	69.65	69.57	69.58						69.44
OW-92-4	73.00	73.32	73.67		71.10	g	60.54	59.04	69.35	69.21	69.54	69.57	69.53	69.56						69.46
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29	69.16	69.27	69.45	69.43	69.40	69.50						69.37
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88	69.01	69.51	69.49	69.48	69.72	69.21						69.2
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22	69.00	69.50	69.48	69.49	69.32	69.23						69.17
OW-92-8	73.00	73.17	73.52		71.10	2.8	69.05	67.55	68.54	69.43	69.05	68.43	69.76	69.20						69.11
OW-92-9	72.30	73.03	73.39		70.67	7.8	63.62	62.32	69.05	69.15	69.17	69.21	69.18	69.16						69.07
OW-92-10	72.30	72.91	73.27		70.70	4.6	66.85	65.35	68.90	69.32	69.25	69.32	69.44	69.06						68.99
OW-92-11	72.30	72.95	73.33		70.75	2.6	68.9	67.4	68.92	69.36	69.29	69.35	69.50	69.11						69.03
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.68	48.18	74.57	74.33	74.56	74.69	74.97	74.88						74.81
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.56	67.06	82.47	82.50	82.52	82.49	82.47	82.44						82.46
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17	83.48	83.49	83.48	83.48	83.50	83.50						83.41
OW-92-16	86.03	87.10	87.35		86.03	11.11	75.67	74.17	83.65	83.68	83.65	83.65	83.66	83.71						83.61
OW-92-18	86.03	86.94	87.16		86.03	7.19	79.59	78.09	84.16	84.26	84.15	84.24	84.20	84.26						84.11
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9	84.40	84.54	84.46	84.52	84.45	84.47						84.4
OW-92-18	86.05	87.02	87.28		86.03	5.05	81.73	80.23	84.52	84.63	84.55	84.62	84.65	84.54						84.49
OW-92-19	86.05	86.98	87.22		86.03	2.93	83.85	82.35	84.48	84.85	84.85	84.73	84.46	84.45						84.46
OW-81					88.96															
OW-4-5					71.99															
OW-4-8					72.00															
OW-94-1	72.00	72.486	72.83		71.33	8.56	53.52	52.02					71.09	71.09						70.79
OW-94-2	72.00	72.601	72.84		71.33	4.57	67.51	66.01					70.52	70.47						70.22
OW-94-3	72.00	72.541	72.74		71.33	2.58	69.5	68					70.39	70.53						70.18
OW-94-4	88.70	89.23	89.61		88.7	6.38	61.07	59.57					88.54	88.54						88.48
OW-94-5	88.70	89.64	78.2		88.7	3.55	66.9	64.4					88.51	88.35						88.42
OW-94-6	88.70	89.66	70.13		88.7	1.91	67.54	66.04					88.42	88.32						88.38
MW-C			70.23																	
MW-E			70.87																	
MW06-1A*	85.48	86.23	86.27																	
MW06-1B*	85.55	86.31	86.33																	
MW06-1C*	85.48	86.32	86.34																	
MW06-1D*	85.62	86.35	86.39																	
MW05-2A*	72.28	69.70	81.38																	
MW05-2B*	72.13	69.74	81.31																	
MW05-2C*	72.06	69.75	81.20																	
MW05-2D*	72.06	70.60	81.25																	
MW05-3A*	69.47	69.70	70.93	74.53																
MW05-3B*	69.52	69.74	70.85	74.47																
MW05-3C*	69.47	69.76	70.80	74.52																
MW05-3D*	69.50	70.60	70.91	74.46																

Notes: * top of riser and surface elevations obtained in November 2005 for MW06-1/2/3(A/B/C/D).

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	21-Aug-95	28-Aug-95	13-Sep-95	18-Sep-95	25-Sep-95	11-Nov-95	06-Jun-96	06-Aug-96	04-Sep-96	09-Jun-97	12-Oct-97	03-Jun-98
	m	m	m	m	m	m	m	m	m	m	m	m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25					69.8	69.97	69.85	69.9	69.89	69.99	69.85	70.05
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03					69.95	69.92	69.7	69.69	69.6	70.06	69.86	70.09
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.63	58.13					69.89	69.9	69.82	69.39	69.45	70.03	69.57	69.89
OW-92-4	73.00	73.32	73.67		71.10	g	60.64	59.04					69.89	69.87	69.82	69.38	69.44	70.04		69.55
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29					69.45	69.77	69.54	69.24	69.34	69.65	70.1	69.34
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88					69.13	69.55	69.35	69.2	69.17	69.21	68.83	69.08
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22					69.13	69.5	69.4	69.17	69.17	69.18	68.78	69.04
OW-92-8	73.00	73.13	73.62		71.10	2.8	69.05	67.55					69.1	69.46	69.35	69.11	69.17	69.2	68.82	69.07
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.82	62.32					68.99	69.36	69.21	69.08	69.15	69.28	68.83	68.98
OW-92-10	72.30	72.91	73.27		70.70	4.8	66.85	65.35					68.92	69.34	69.22	68.97	69	69.06	68.8	68.96
OW-92-11	72.30	72.98	73.33		70.75	2.8	68.9	67.4					68.91	69.36	69.23	68.99	69.03	69.1	68.83	68.98
OW-92-12	86.03	87.14	87.41		86.03	37.1	48.68	48.18					74.87	74.69	74.82	74.62	74.49	74.98	74.5	74.70
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.86	67.06					82.4	82.45	82.62	82.58	82.77	82.61	82.56	82.55
OW-92-14	86.03	86.96	87.24		86.03	13.11	74.67	73.17					83.41	83.55	83.72	83.66	83.51	83.66	83.48	83.58
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17					83.8	83.74	83.9	83.7	83.87	83.93	83.64	83.79
OW-92-16	86.03	86.94	87.19		86.03	7.19	79.58	78.09					84.04	84.37	84.42	84.26	84.24	84.33	84.06	84.20
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9					84.22	84.53	84.58	84.47	84.42	84.5	84.27	84.34
OW-92-18	86.03	87.02	87.29		86.03	5.05	81.73	80.23					84.24	84.56	84.54	84.62	84.47	84.58	84.31	84.43
OW-92-19	86.03	86.96	87.22		86.03	2.93	83.85	82.35					84.24	84.79	84.57	84.47	84.41	84.49	84.34	84.33
OW-81					86.96															
OW-4-6					71.99															
OW-4-8					72.00															
OW-94-1	72.00	72.486	72.83		71.33	8.56	63.62	62.02					69.13	69.29	69.826	69.316	68.81	69.72	68.38	69.32
OW-94-2	72.00	72.601	72.84		71.33	4.67	67.51	66.01					68.65	69.31	68.911	68.951	68.91	69.04	68.44	68.79
OW-94-3	72.00	72.541	72.74		71.33	2.68	69.5	68					68.62	69.62	69.041	68.891	68.85	68.95	69.01	68.74
OW-94-4	68.70	69.23	69.61		68.7	8.38	61.07	59.57					67.7	68.08	68.51	68.25	68.28	68.52	67.94	68.40
OW-94-5	68.70	69.64	70.2		68.7	3.55	65.9	64.4					68.13	68.5	68.38	67.95	67.54	68.08	67.66	68.00
OW-94-6	68.70	69.66	70.13		68.7	1.91	67.54	66.04					68.83	69.02	68.35	68.01	67.51	68.04	68.02	67.96
MW-C			70.23																	
MW-E			70.87																	
MW05-1A*	85.48	86.25	86.67																	
MW05-1B*	85.55	86.31	86.33																	
MW05-1C*	85.48	86.32	86.34																	
MW05-1D*	85.62	86.35	86.39																	
MW05-2A*	72.28	69.70	61.38																	
MW05-2B*	72.13	69.74	61.31																	
MW05-2C*	72.08	69.75	61.20																	
MW05-2D*	72.08	70.80	61.25																	
MW05-3A*	69.47	69.70	70.93	74.53																
MW05-3B*	69.52	69.74	70.85	74.47																
MW05-3C*	69.47	69.75	70.80	74.52																
MW05-3D*	69.50	70.80	70.91	74.46																

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

Prepared by: ETB
Checked by: YJM

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-Aug-98 Elevation	26-Oct-98 Elevation	03-May-99 Elevation	11-Oct-99 Elevation	02-May-00 Elevation	20-Oct-00 Elevation	06-Jun-01 Elevation	03-Oct-01 Elevation	17-May-02 Elevation	30-Oct-02 Elevation	22-May-03 Elevation	01-Oct-03 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25	70.01	70.01	70.2	70.12	70.2	70.28	70.32	70.31	70.37	70.47	70.36	70.41
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03	70.08	70.15	69.81	70.16	69.87	70.18	70.24	70.23	70.4	70.26	70.21	
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.63	58.13	69.82	69.86	69.31	69.67	69.97	69.79	69.91	69.74	70.2	69.70	69.94	
OW-92-4	73.00	73.32	73.67		71.10	g	60.54	59.04				69.67	69.97	69.7	69.84	69.6	70.27	69.94	69.89	
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29	69.35	69.54	68.95	69.17	69.97	69.2	69.51	69.98	69.91	69.13	69.77	69.26
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.39	63.86	69.08	69.36	69.4	69.62	69.84	69.95	69.4	69.67	69.89	68.99	69.70	
OW-92-7	73.00	73.25	73.59		71.10	5.15	66.72	65.22	69.03	69.33	69.4	69.96	69.69	68.85	69.37	68.79	69.95	69.03	69.59	68.90
OW-92-8	73.00	73.12	73.52		71.10	2.6	69.05	67.55	69.07	69.24	69.39	68.96	69.74	68.86	69.41	68.8	69.97	69.02	68.59	68.81
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.82	62.32	69.06	68.2	69.29	68.98	69.33	68.66	69.63	69.02	69.59	69.33	69.60	69.32
OW-92-10	72.30	72.91	73.27		70.75	4.8	66.85	65.35	66.99	69.21	69.21		69.28	68.82	69.3	68.85	69.69	69.17	69.46	68.89
OW-92-11	72.30	72.99	73.33		70.75	2.8	68.9	67.4	69.12	69.23	69.18	68.96	69.25	68.76	69.27	68.66	69.67	69.17	69.46	68.92
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.68	48.18	74.61	74.6	75.13	74.58	74.89	74.89	75.04	74.66	75.16	74.65	74.71	74.71
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.56	67.06	82.65	82.57	82.61	82.61	82.6	82.6	82.62	82.55	82.58	82.55	82.51	82.49
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17	83.82	83.58	83.69	83.61	83.65	83.57	83.59	83.46	83.52	83.45	83.56	83.48
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17	83.7	83.75	84.01	83.76	83.85	83.82	84.23	83.65	84.42	84.01	85.13	84.95
OW-92-16	86.03	86.94	87.19		86.03	7.19	79.59	78.09	84.18	84.32	84.46	84.35	84.53	84.17	84.31	84.04	84.52	84.00	84.42	84.09
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9	84.36	84.32	84.67	84.6	84.78	84.33	84.49	84.21	84.72	84.15	84.63	84.19
OW-92-18	86.03	87.02	87.28		86.03	5.05	81.73	80.23	84.43	84.54	84.77	84.76	84.89	84.45	84.74	84.5	84.72	84.14	84.74	84.29
OW-92-19	86.03	86.96	87.22		86.03	2.93	85.85	82.55	84.34	84.54	84.87	84.59	84.81	84.3	84.48	84.2	85.2	84.35	84.76	84.28
OW-81					86.86															
OW-4-5					71.99															
OW-4-6					72.00															
OW-94-1	72.00	72.496	72.80		71.33	9.55	63.62	62.02	69.2	69.29	69.52	63.9	69.6	69.2	69.41	69.4	69.77	69.35	69.70	69.45
OW-94-2	72.00	72.601	72.84		71.33	4.57	67.51	66.01	68.68	69.01	69.25	68.52	69.51	68.72	69.17	69.28	69.65	68.99	69.45	68.70
OW-94-3	72.00	72.541	72.74		71.33	2.55	69.5	68	68.64	68.98	69.31	68.53	69.46	68.59	69.06	69.22	69.69	69.07	69.44	68.72
OW-94-4	68.70	69.23	69.61		68.7	8.38	61.07	59.57	68.25	68.48	68.66	68.13	68.58	68.52	68.6	68.08	68.65	67.91	68.51	68.21
OW-94-5	68.70	69.64	70.2		68.7	3.55	65.9	64.4	67.66	68.38	68.34	68.27	68.46	68.31	68.4	67.92	68.48	67.92	68.43	67.85
OW-94-6	68.70	68.66	70.13		68.7	1.91	67.54	66.04	67.74	68.44	68.36	68.32	68.48	68.32	68.43	67.93	68.48	67.94	68.45	67.85
MW-C			70.29																	
MW-E			70.87																	
MW05-1A*	85.48	86.23	86.27																	
MW05-1B*	85.55	86.31	86.33																	
MW05-1C*	85.46	86.32	86.34																	
MW05-1D*	85.52	86.35	86.39																	
MW05-2A*	72.28	69.70	81.38																	
MW05-2B*	72.13	69.74	81.31																	
MW05-2C*	72.08	69.75	81.20																	
MW05-2D*	72.08	70.80	81.26																	
MW05-3A*	69.47	69.70	70.93	74.53																
MW05-3B*	69.52	69.74	70.85	74.47																
MW05-3C*	69.47	69.75	70.80	74.52																
MW05-3D*	69.50	70.80	70.91	74.46																

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

Prepared by: ETB
Checked by: YJM

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	05-Nov-03 Elevation	08-May-04 Elevation	05-Nov-04 Elevation	25-May-05 Elevation	16-Nov-05 Elevation	19-May-06 Elevation	14-Nov-06 Elevation	07-May-07 Elevation	19-Nov-07 Elevation	13-May-08 Elevation	03-Nov-08 Elevation	11-May-09 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	45.75	45.25	70.49	70.51	70.53	70.47	70.4	70.48	70.57	70.52	70.47	70.55	70.49	70.54
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03	70.35	70.40	70.20	70.32	70.14	70.27	70.35	70.35	70.44	70.55	70.62	70.50
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.63	58.13	69.87	70.09	69.84	70.07	69.83	70.03	70.07	70.02	69.84	70.39	70.19	70.23
OW-92-4	73.00	73.32	73.67		71.10	g	60.64	59.04	69.77	70.05	69.76	70.02	69.56	69.99	70.015	70.03	69.84	70.39	70.13	70.16
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29	69.48	69.88	69.33	69.85	69.11	69.73	69.859	69.89	69.41	70.37	69.71	69.83
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88	69.52	69.80	69.2	69.81	69.98	70.13	69.818	69.73	69.33	70.32	69.60	69.91
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22	69.57	69.70	69.25	69.44	68.94	70.22	70.18	69.60	69.34	70.18	69.59	69.85
OW-92-8	73.00	73.17	73.52		71.10	2.8	69.05	67.55	69.57	69.70	69.25	69.44	68.83	70.21	70.24	69.60	69.37	70.2	69.51	69.78
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.82	62.32	69.55	69.67	69.32	69.59	69.22	69.61	69.679	69.53	69.33	69.85	69.51	69.58
OW-92-10	72.30	72.91	73.27		70.70	4.8	66.85	65.35	69.63	69.61	69.19	69.34	69.16	70.1	70.185	69.46	69.32	69.77	69.53	69.64
OW-92-11	72.30	72.99	73.33		70.75	2.6	68.9	67.4	69.64	69.59	69.27	69.42	69.15	70.09	70.102	69.46	69.44	69.8	69.52	69.63
OW-92-12	88.03	87.14	87.41		86.03	37.1	49.68	48.18	74.30	75.16	74.66	75.23	74.54	75.35	75.33	75.46	75.36	76.82	75.07	75.65
OW-92-13	88.03	87.07	87.36		86.03	18.22	68.56	67.06	82.57	82.59	82.54	82.58	82.59	82.63	82.675	82.70	82.59	82.85	82.69	82.70
OW-92-14	88.03	88.96	87.24		86.03	12.11	74.67	73.17	83.55	83.54	83.46	83.65	83.52	83.72	83.756	83.71	83.61	83.72	83.64	83.87
OW-92-15	88.03	87.10	87.36		86.03	11.11	75.67	74.17	85.00	85.02	84.89	85	84.87	85.15	85.057	85.19	84.87	85.14	84.94	85.23
OW-92-16	88.03	88.94	87.19		86.03	7.19	79.59	78.09	84.32	84.43	84.20	84.44	84.22	84.6	84.606	84.55	84.17	84.63	84.78	84.68
OW-92-17	88.03	87.09	87.37		86.03	6.38	80.4	78.9	84.59	84.66	84.36	84.63	84.44	84.88	84.841	84.76	84.37	84.84	84.50	84.92
OW-92-18	88.03	87.02	87.28		86.03	5.05	81.73	80.23	84.66	84.76	84.42	83.7	84.5	84.81	84.9	84.85	82.87	84.93	84.54	84.96
OW-92-19	88.03	86.96	87.22		86.03	2.93	83.85	82.35	85.00	84.92	84.63	84.69	84.67	85.42	85.486	84.81	84.52	84.82	84.82	85.19
OW-B1					86.96															
OW-4-S					71.99															
OW-4-8					72.00															
OW-94-1	72.00	72.496	72.85		71.33	8.56	63.52	62.02	69.80	69.76	69.55	69.756	69.506	69.756	70.03	69.91	70.06	70.04	69.64	69.29
OW-94-2	72.00	72.601	72.84		71.33	4.57	67.51	66.01	69.52	69.53	68.99	69.331	69.361	69.671	69.576	69.46	69.22	69.44	69.19	68.97
OW-94-3	72.00	72.541	72.74		71.33	2.58	69.5	68	69.56	69.58	69.08	69.301	69.361	69.841	70.111	69.42	69.21	69.40	69.12	68.44
OW-94-4	68.70	69.23	69.61		68.7	8.38	61.07	59.57	68.48	68.55	68.63	68.67	68.49	68.89	68.755	68.67	68.45	68.61	68.73	68.73
OW-94-5	68.70	69.64	70.2		68.7	3.55	65.9	64.4	68.66	68.51	68.60	68.47	68.44	68.46	68.485	68.37	68.30	68.36	68.44	68.45
OW-94-6	68.70	69.66	70.13		68.7	1.91	67.54	66.04	68.54	68.51	68.51	68.48	68.45	68.56	68.507	68.41	68.35	68.41	68.47	68.50
MW-C			70.03																	
MW-E			70.87																	
MW05-1A*	85.48	86.23	86.27													78.66	78.68	79.08	78.76	75.35
MW05-1B*	85.55	86.31	86.33													84.276	83.975	84.21	84.035	83.95
MW05-1C*	85.48	86.32	86.34													84.915	84.625	84.91	85.075	84.46
MW05-1D*	85.62	86.35	86.39													84.83	84.56	84.85	85.12	84.55
MW05-2A*	72.23	69.70	81.36													66.21	66.11	66.62	66.91	66.38
MW05-2B*	72.13	69.74	81.31													68.195	67.535	67.77	67.745	67.13
MW05-2C*	72.08	69.75	81.20													70.38	67.99	70.17	68.72	69.26
MW05-2D*	72.08	70.80	81.25													71.2	68.02	70.14	69.44	71.11
MW05-3A*	69.47	69.70	70.93	74.55												70.02	70.02	70.03	70	70.04
MW05-3B*	69.52	69.74	70.85	74.47												69.9	69.91	70.08	70.07	70.17
MW05-3C*	69.47	69.75	70.80	74.52												69.48	69.43	69.54	69.69	69.80
MW05-3D*	69.50	70.80	70.91	74.46												69.355	69.405	69.73	69.565	69.74

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

Prepared by: ETB
Checked by: YJM

GOLDER

C:\Users\...\19130610-01_GW_EVT_NAVAN_Rpt_Apr2020_Rev0.docx - Table C-1 WATER LEVELS TABLE

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	16-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	16-May-11 Elevation	22-Nov-11 Elevation	23-May-12 Elevation	20-Nov-12 Elevation	21-May-13 Elevation	20-Nov-13 Elevation	23-May-14 Elevation	12-Nov-14 Elevation	26-May-15 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25	70.49	70.52	70.01	70.38	70.49	70.59	70.53	70.62	70.66	70.73	70.73	70.75
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03	70.35	70.37	70.03	70.20	70.33	70.43	70.24	70.37	70.36	70.39	70.33	70.37
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.53	58.13	69.96	70.21	69.69	70.05	69.86	70.21	69.87	70.17	69.85	70.19	69.90	70.12
OW-92-4	73.00	73.52	73.67		71.10	9	60.54	59.04	69.90	70.28	69.63	70.07	69.75	70.20	69.80	70.15	69.79	70.17	69.82	70.09
OW-92-5	73.00	73.31	73.64		71.10	8.66	63.79	62.29	69.47	69.98	69.60	70.00	69.23	70.03	69.45	69.92	69.48	70.19	69.47	69.84
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88	70.27	69.55	69.72	69.95	69.02	69.94	69.32	69.82	69.46	70.26	69.39	69.73
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22	69.17	69.40	69.89	70.05	68.93	69.77	69.23	69.69	69.83	70.09	69.35	69.62
OW-92-8	73.00	73.17	73.52		71.10	2.8	69.05	67.55	69.10	69.41	69.65	69.44	68.93	69.77	69.26	69.73	69.59	70.15	69.36	69.63
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.82	62.32	69.39	69.76	69.64	69.61	69.73	69.80	69.62	69.65	69.85	69.81	69.69	69.58
OW-92-10	72.30	72.91	73.27		70.70	4.6	66.85	65.35	69.19	69.41	69.66	69.80	69.85	69.73	69.83	69.62	69.88	69.83	69.93	69.74
OW-92-11	72.30	72.99	73.33		70.75	2.8	68.9	67.4	69.18	69.42	69.16	69.80	69.81	69.68	69.59	69.68	69.86	69.79	69.90	69.69
OW-92-12	85.03	87.14	87.41		83.03	37.1	48.68	46.18	75.46	75.36	74.71	75.43	75.00	75.01	75.35	75.81	75.64	75.88	75.86	75.70
OW-92-13	85.03	87.07	87.26		83.03	18.22	66.56	65.06	82.90	82.84	82.94	83.03	83.13	83.24	83.16	83.23	83.24	83.22	83.27	83.24
OW-92-14	85.03	86.96	87.24		83.03	12.11	74.67	73.17	83.94	83.83	83.91	84.05	84.13	84.32	84.30	84.35	84.33	84.33	84.38	84.25
OW-92-15	89.03	87.10	87.36		86.03	11.11	75.67	74.17	84.57	84.55	85.15	85.32	84.70	85.46	85.11	85.32	84.73	85.49	84.94	85.27
OW-92-16	89.03	86.94	87.19		86.03	7.19	79.69	78.09	84.90	84.57	84.70	84.77	84.90	85.01	84.86	84.99	84.78	85.06	84.90	84.89
OW-92-17	89.03	87.09	87.37		86.03	6.38	80.4	78.9	84.82	84.74	84.94	84.98	84.81	85.24	85.06	85.20	85.00	85.34	85.16	85.09
OW-92-18	89.03	87.02	87.28		86.03	5.05	81.73	80.23	84.80	84.81	85.03	85.04	84.73	85.26	85.01	85.22	85.01	85.40	85.13	85.12
OW-92-19	89.03	88.96	87.22		86.03	2.93	83.85	82.35	84.61	84.80	85.01	85.27	84.74	85.35	85.00	85.20	85.15	85.47	85.23	85.36
OW-81					85.96															
OW-4-5					71.99															
OW-4-8					72.00															
OW-94-1	72.00	72.496	72.83		71.33	8.56	63.62	62.02	69.57	69.79	69.53	69.86	69.56	69.90	69.81	70.00	69.65	70.07	69.79	69.94
OW-94-2	72.00	72.601	72.84		71.33	4.57	67.61	66.01	69.05	69.11	69.51	69.53	68.97	69.80	69.31	69.44	69.17	69.70	69.23	69.32
OW-94-3	72.00	72.541	72.74		71.33	2.58	69.5	68	69.04	69.13	69.50	69.67	68.92	69.45	69.28	69.39	69.20	69.66	69.26	69.36
OW-94-4	68.70	69.23	69.61		68.7	8.38	61.02	59.67	67.69	68.72	68.71	69.73	69.07	69.10	69.17	69.08	69.14	69.15	69.23	69.10
OW-94-5	68.70	69.64	70.2		68.7	3.55	65.9	64.4	68.38	68.39	68.41	68.46	68.59	68.98	68.96	68.99	68.96	69.04	69.01	68.97
OW-94-6	68.70	69.66	70.13		68.7	1.91	67.54	66.04	68.40	68.46	68.46	68.55	68.89	68.98	68.97	68.99	68.98	69.05	69.05	68.94
MW-C			70.23										68.31	69.16	69.00	69.16	68.83	69.22	69.11	69.18
MW-E			70.87										68.79	69.74	69.40	69.68	69.05	69.78	69.78	69.78
MW05-1A*	85.48	86.23	86.07						78.43	78.88	78.16	78.70	78.43	78.50	78.17	78.37	78.38	78.87	78.25	78.51
MW05-1B*	85.65	86.31	86.33						83.82	83.71	83.65	83.67	83.60	83.61	83.60	83.71	83.55	83.76	83.68	83.73
MW05-1C*	85.48	86.32	86.34						84.26	84.22	84.45	84.73	84.13	84.34	84.23	84.30	84.34	84.55	84.35	84.24
MW05-1D*	85.62	86.35	86.38						84.27	84.21	85.01	84.81	84.18	84.36	84.28	84.31	84.42	84.48	84.39	84.40
MW05-2A*	72.28	69.70	81.38						66.23	66.27	65.72	66.26	75.94	74.05	74.39	74.66	74.54	74.81	74.73	74.62
MW05-2B*	72.13	69.74	81.31						67.97	68.14	67.75	68.11	76.00	76.29	75.90	76.33	76.42	76.55	76.73	76.66
MW05-2C*	72.08	69.75	81.20						69.50	69.70	69.62	69.93	77.37	78.00	77.92	78.10	78.07	78.49	78.22	78.31
MW05-2D*	72.08	70.80	81.25						70.34	70.04	71.01	71.17	77.80	78.65	78.55	78.59	78.29	78.83	78.83	78.79
MW05-3A*	69.47	69.70	70.93	74.53					69.99	70.05	68.65	69.67	70.18	70.19	70.13	70.23	70.15	70.33	70.31	70.33
MW05-3B*	69.52	69.74	70.85	74.47					70.14	70.17	70.17	70.22	70.44	70.51	70.52	70.72	70.83	70.84	70.83	70.55
MW05-3C*	69.47	69.75	70.80	74.52					69.77	69.56	68.82	69.80	70.07	70.14	70.29	70.47	70.82	70.59	70.78	70.58
MW05-3D*	69.50	70.80	70.91	74.46					69.80	69.60	69.67	69.71	70.04	70.13	70.28	70.43	70.84	70.55	70.80	70.53

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D

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WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	25-Aug-15	19-Nov-15	19-May-16	16-Aug-16	10-Nov-16	17-May-17	26-Aug-17	22-Nov-17	15-May-18	03-Aug-18	22-Nov-18
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25		70.77	70.68		70.81	71.00		70.98	71.06		70.97
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03		70.25	70.33		70.22	70.50		70.78	71.10		70.88
OW-92-3	73.00	73.29	73.64		71.10	13.22	59.63	58.13		69.77	70.37		69.70	70.34		70.31	71.00		70.37
OW-92-4	73.00	73.32	73.67		71.10	g	60.54	59.04		69.87	70.35		69.80	70.33		70.22	70.99		70.27
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29		69.18	70.06		69.16	70.78		70.41	71.18		70.11
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88		69.07	69.92		69.09	71.07		70.51	71.18		70.04
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22		69.07	69.78		69.16	71.03		70.64	71.34		70.26
OW-92-8	73.00	73.17	73.52		71.10	2.8	68.95	67.55		69.06	69.79		69.04	71.07		70.74	71.48		70.36
OW-92-9	72.30	73.03	73.39		70.67	7.9	63.82	62.32		69.57	69.79		69.56	70.11		70.06	70.48		70.18
OW-92-10	72.30	72.91	73.27		70.70	4.8	66.35	65.35		69.75	69.63		69.75	70.22		70.12	70.32		70.11
OW-92-11	72.30	72.99	73.38		70.75	4.9	66.9	67.4		69.72	69.59		69.75	70.23		70.11	70.34		70.11
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.66	48.18		75.90	78.23		75.99	75.73		76.45	76.69		76.27
OW-92-13	86.03	87.07	87.36		86.03	18.22	68.58	67.08		83.23	83.29		83.20	83.30		83.39	83.38		83.28
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17		84.22	84.40		84.21	84.44		84.41	84.41		84.34
OW-92-15	86.03	87.10	87.36		86.03	11.11	75.67	74.17		84.74	85.32		84.62	85.54		86.17	85.34		84.81
OW-92-16	86.03	86.94	87.19		86.03	7.19	79.69	78.09		84.76	85.02		84.79	85.27		85.06	85.08		84.76
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9		84.97	85.21		85.05	85.56		85.39	85.30		85.00
OW-92-18	86.03	87.02	87.28		86.03	5.05	81.73	80.23		84.99	85.23		85.06	85.63		85.37	85.34		84.97
OW-92-19	86.03	86.96	87.22		86.03	2.93	83.85	82.35		85.08	85.23		85.13	85.53		85.47	85.34		85.02
OW-81					85.96														
OW-4-5					71.99														
OW-4-8					72.00														
OW-94-1	72.00	72.486	72.83		71.33	3.66	63.52	62.02		69.59	70.09		69.50	70.26		70.09	70.55		70.00
OW-94-2	72.00	72.601	72.84		71.33	4.97	87.61	66.01		69.02	69.37		68.94	69.80		69.62	69.84		69.47
OW-94-3	72.00	72.541	72.74		71.33	2.58	68.5	65		69.03	69.38		68.94	69.75		69.66	69.80		69.41
OW-94-4	68.70	69.23	69.61		68.7	8.36	61.02	59.87		69.16	69.12		69.02	69.13		69.18	69.15		69.14
OW-94-5	68.70	69.84	70.2		68.7	3.55	65.9	64.4		68.86	68.86		68.88	68.86		68.89	68.85		68.75
OW-94-6	68.70	69.65	70.13		68.7	1.91	67.54	66.04		68.96	68.95		68.95	68.97		68.99	68.94		68.90
MW-C			70.23							68.63	69.15		68.05	69.24		69.24	69.24		68.93
MW-E			70.87							69.24	68.69		69.25	69.80		69.83	69.74		69.27
MW05-1A*	85.48	86.23	86.27							78.44	78.52		78.25	78.83		78.45	79.25		76.57
MW05-1B*	85.55	86.31	86.33							83.56	83.78		83.44	83.78		83.71	83.80		83.63
MW05-1C*	85.48	86.32	86.34							84.33	84.33		84.18	84.68		84.61	84.46		84.26
MW05-1D*	85.62	86.36	86.39							84.37	84.52		84.23	84.59		84.65	84.41		84.32
MW05-2A*	72.28	69.70	81.38							74.74	75.08		74.62	75.55		75.31	75.52		75.14
MW05-2B*	72.13	69.74	81.31							76.55	76.82		76.51	76.88		76.96	77.10		77.40
MW05-2C*	72.08	69.75	81.20							78.07	78.49		77.90	78.71		78.42	78.78		78.41
MW05-2D*	72.08	70.60	81.25							78.81	78.94			79.36		79.21	79.19		78.74
MW05-3A*	69.47	69.70	70.92	74.53						70.33	70.49		70.92	70.59		70.64	70.73		70.65
MW05-3B*	69.52	69.74	70.85	74.47						70.85	70.85		72.18	71.32		71.49	71.46		71.40
MW05-3C*	69.47	69.75	70.80	74.52						70.57	70.65		71.46	70.81		70.60	70.98		70.97
MW05-3D*	69.50	70.80	70.91	74.48						70.54	70.67			70.83		70.67	70.75		70.69

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov. 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	13-Jun-19 Elevation	14-Nov-19 Elevation
	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.90	75.31	73.67		71.10	25.1	46.75	45.25	71.12	70.95
OW-92-2	73.90	75.16	73.59		71.10	18.32	53.53	52.03	71.04	70.63
OW-92-3	73.90	75.29	73.64		71.10	12.22	59.83	58.13	70.69	69.95
OW-92-4	73.90	73.32	73.67		71.10	q	60.54	59.04	70.63	69.82
OW-92-5	73.90	73.31	73.64		71.10	8.08	63.78	62.29	70.19	69.45
OW-92-6	73.90	73.40	73.74		71.10	6.47	65.38	63.88	69.92	69.32
OW-92-7	73.90	73.25	73.59		71.10	5.13	66.72	65.22	69.95	69.47
OW-92-8	73.90	73.17	73.52		71.10	2.8	69.05	67.56	70.04	69.67
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.52	62.32	70.09	69.72
OW-92-10	72.30	72.91	73.27		70.70	4.8	66.65	65.35	69.88	69.67
OW-92-11	72.90	72.99	73.33		70.75	2.8	68.9	67.4	69.84	69.64
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.68	48.18	76.74	76.30
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.56	67.06	83.29	83.26
OW-92-14	86.03	86.95	87.24		86.03	12.11	74.67	73.17	84.39	84.27
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17	85.93	85.25
OW-92-16	86.03	86.94	87.19		86.03	7.19	79.59	78.09	85.04	84.80
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9	85.23	85.10
OW-92-18	86.03	87.02	87.28		86.03	6.05	81.73	80.23	85.28	85.10
OW-92-19	86.03	86.96	87.22		86.03	2.93	83.85	82.35	85.34	85.16
OW-81					86.96					
OW-4-5					71.98					
OW-4-9					72.00					
OW-94-1	72.00	72.496	72.83		71.33	8.56	63.52	62.02	70.21	69.61
OW-94-2	72.00	72.601	72.94		71.33	4.57	67.51	66.01	69.41	69.27
OW-94-3	72.00	72.541	72.74		71.33	2.58	69.5	68	69.37	69.30
OW-94-4	68.70	69.23	69.61		68.7	8.36	61.07	59.57	69.16	68.74
OW-94-5	68.70	68.64	70.2		68.7	3.56	65.9	64.4	68.85	68.74
OW-94-6	68.70	69.66	70.13		68.7	1.91	67.54	66.04	68.97	68.88
MW-C			70.23						69.10	68.66
MW-E			70.87						69.69	69.07
MW05-1A*	85.48	86.23	86.27						78.56	78.36
MW05-1B*	85.55	86.31	86.33						83.79	83.44
MW05-1C*	85.48	86.32	86.34						84.31	84.18
MW05-1D*	85.62	86.35	86.38						84.28	84.26
MW05-2A*	72.28	69.70	81.38						75.54	75.14
MW05-2B*	72.13	69.74	81.31						77.28	77.07
MW05-2C*	72.08	69.75	81.20						78.72	78.55
MW05-2D*	72.08	70.80	81.25						79.04	79.01
MW05-3A*	69.47	69.70	70.93	74.53					70.81	70.64
MW05-3B*	69.52	69.74	70.85	74.47					71.32	71.29
MW05-3C*	69.47	69.75	70.80	74.52					70.90	70.87
MW05-3D*	69.50	70.80	70.91	74.46					70.77	70.77

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2005 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	23-Jun-95 Elevation	12-Jul-95 Elevation	26-Jul-95 Elevation	9-Aug-95 Elevation	13-Sep-95 Elevation	15-Aug-95 Elevation	18-Aug-95 Elevation	21-Aug-95 Elevation	25-Aug-95 Elevation	28-Aug-95 Elevation	13-Sep-95 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	69.232	69.556		69.232	69.232	8.12	61.2	60.45	68.8	68.576	68.688				68.736				
OW-95-2	69.232	69.306		69.68	69.232	4.57	64.7	63.95	68.6	68.206	68.366				68.596				
OW-95-3	69.232	69.266		69.81	69.232	2.33	66.7	66.325	68.52	68.278	68.486				68.536				
OW-95-4	85.312	85.31		85.67	85.312	2.72	83.34	82.59	83.01	82.57	83.46				83.22				
OW-95-5	68.477	69.347		69.73	68.477	8.25	60.98	60.23	65.55	68.367	68.437				68.507				
OW-95-6	68.477	69.272		69.7	68.477	4.52	64.71	63.96	68.46	68.27	68.352				68.432				
OW-95-7	68.477	69.177		69.93	68.477	2.31	66.55	66.18	68.45	68.41	68.377				68.427				
OW-95-8	79.32	80.28	84.46	84.62	79.32	2.72	77.35	76.6	78.38	79.1	78.99				78.66				
OW-95-9	68.73	69.482		70.93	68.73	22.90	47.16	46.43	68.96	69.222	69.282				69.232				
OW-95-1	79.32	80.14	84.3		79.32	4.57	76.5	74.75											
OW-95-2	79.32	80.14	84.79	84.4	79.32	6.19	71.83	71.13											
OW-95-3	85.312	85.44		85.84	85.312	7.09	78.97	78.22											
OW-95-4	85.312	85.48		85.87	85.312	4.51	81.55	80.8											
MW11-1				85.08				73.66											
W1a	abandoned	72.228				3.06				69.886		70.988	70.688	70.918	70.988	70.708	70.926	71.318	71.218
W1b	abandoned	72.336				2.64				70.246		70.946	70.866	70.986	71.016	70.876	71.086	71.326	71.206
W1c	abandoned	72.466				2.05				70.696		70.856	70.936	71.086	71.116	71.096	71.346	71.386	71.216
W1d	abandoned	72.558				1.52				DRY		70.758	71.038	71.108	71.118	71.198	71.488	71.358	71.198
W2a	abandoned	72.245				3.07				69.745		70.925	70.845	70.905	70.985	70.705	70.925	71.045	71.195
W2b	abandoned	72.348				2.5				70.573		70.828	70.868	71.018	71.068	70.918	71.168	71.348	71.198
W2c	abandoned	72.463				2.04				70.783		70.753	70.883	71.033	71.073	71.053	71.353	71.393	71.223
W2d	abandoned	72.569				1.53				DRY		70.399	71.079	71.079	71.109	71.189	71.469	71.349	71.159
W3a	abandoned	72.31				3.04				69.69		70.84	70.81	70.83	70.92	70.62	70.76	71.3	71.26
W3b	abandoned	72.426				2.52				70.328		70.826	70.726	70.846	70.956	70.756	70.876	71.316	71.276
W3c	abandoned	72.511				2.01				70.631		70.351	70.881	71.061	71.061	71.021	71.301	71.361	71.231
W3d	abandoned	72.654				1.52				DRY		69.974	71.414	71.134	71.134	71.204	71.474	71.384	71.222
W4a	abandoned	72.272				3.05				69.752		70.822	70.692	70.792	70.862	70.502	70.662	71.322	71.212
W4b	abandoned	72.362				2.49				70.192		70.562	70.812	70.962	71.012	70.822	70.972	71.312	71.212
W4c	abandoned	72.485				2.01				70.505		70.395	70.905	71.085	71.105	71.025	71.205	71.335	71.215
W4d	abandoned	72.508				1.53				DRY		70.068	71.308	71.108	71.108	71.198	71.418	71.348	71.188
W5a	abandoned	72.342				3.05				69.782		71.042	70.902	70.892	70.912	70.602	71.392	71.392	71.212
W5b	abandoned	72.463				2.59				70.353		70.863	70.943	71.083	71.143	70.993	71.15	71.413	71.243
W5c	abandoned	72.544				2.02				70.654		70.724	71.184	71.144	71.164	71.114	71.414	71.384	71.224
W5d	abandoned	72.64				1.53				DRY		70.66	71.28	71.11	71.12	71.21	71.53	71.39	71.2
OW1		72.231													70.821	70.791	70.681	70.691	70.611
OW2		72.077													70.857	70.837	70.737	70.997	70.727
MW05-R2^	72.36	72.93		73.85			57.86	55.38											
MW05-8^	72.48	73.16		74.11			58.48	55.98											
MW05-11^	72.155	72.905		73.858			58.666	56.166											
MW07-1a	70.83	71.43		71.645		23.9	47.49	46.73											
MW07-1b	70.63	71.25		71.605		8.53	62.86	62.1											
MW07-1c	70.6	71.18		71.635		4.72	65.54	65.65											
MW07-1d	70.6	71.25		71.815		2.44	68.926	68.16											
MW09-1A^^	68.76	69.70		69.87															
MW09-1B	68.73	69.74		69.79															
MW09-1C	68.73	69.75		69.78															
MW09-1D	68.58	70.50																	

Notes:

^ top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser.

The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

Prepared by: ETB
Checked by: YJM

COLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	19-Sep-95	29-Sep-95	16-Oct-95	29-Oct-95	11-Nov-96	5-Jun-96	5-Aug-96	4-Sep-96	5-Jun-97	12-Oct-97	3-Jun-98
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	69.232	69.555			69.232	8.12	61.2	60.46		68.706			68.756	68.756	68.686	68.636		68.976	
OW-95-2	69.232	69.306		69.66	69.232	4.57	64.7	63.95		68.486			68.576	68.506	68.396	68.316	68.426	68.106	68.366
OW-95-3	69.232	69.286		69.81	69.232	2.93	66.7	66.325		68.396			68.536	68.436	68.286	68.096	68.286	67.966	68.256
OW-95-4	85.312	85.31		85.67	85.312	2.72	83.34	82.59		82.78			84.24	82.79	82.56	82.56	82.76	82.59	82.67
OW-95-5	68.477	69.347		69.73	68.477	8.25	60.98	60.23		68.467			68.507	68.447	68.327	68.287		67.957	
OW-95-6	68.477	68.272		69.7	68.477	4.52	64.71	63.96		68.062			68.382	68.312	68.052	67.752	68.232	68.072	68.052
OW-95-7	68.477	69.177		69.63	68.477	2.31	66.55	66.18		68.087			68.427	68.387	68.027	67.727	68.217	67.627	68.047
OW-95-8	79.32	80.25	84.46	84.62	79.32	2.72	77.35	76.6		78.48			77.81	78.79	78.48	78.26	78.4	78.23	79.48
OW-95-9	68.73	69.482		70.93	68.73	22.30	47.18	46.43		69.182			69.292	69.182	69.282	69.282			69.292
OW-98-1	79.32	80.14	84.3		79.32	4.57	75.5	74.75											
OW-98-2	79.32	80.14	84.79	84.4	79.32	8.19	71.88	71.13											
OW-98-3	85.312	86.44		85.84	85.312	7.09	78.97	78.22											
OW-98-4	85.312	85.48		85.87	85.312	4.51	81.55	80.8											
MW11-1				85.08				73.58											
W1a	abandoned	72.238				3.96			71.388	71.488	71.446	71.428							
W1b	abandoned	72.336				2.54			71.376	71.446	71.456	71.356							
W1c	abandoned	72.466				2.05			71.366	71.476	71.426	70.988							
W1d	abandoned	72.558				1.62			71.356	71.468	71.458	70.258							
W2a	abandoned	72.245				3.07			71.425	71.465	71.445	71.345							
W2b	abandoned	72.348				2.5			71.358	71.458	71.428	71.158							
W2c	abandoned	72.453				2.04			71.373	71.463	71.433	70.983							
W2d	abandoned	72.669				1.53			71.318	71.439	71.419	70.089							
W3a	abandoned	72.31				3.04			71.51	71.49	71.46	71.43							
W3b	abandoned	72.428				2.52			71.476	71.496	71.466	71.426							
W3c	abandoned	72.511				2.01			71.361	71.461	71.441	71.021							
W3d	abandoned	72.634				1.52			71.254	71.444	70.434	70.214							
W4a	abandoned	72.272				3.05			71.452	71.482	71.462	71.422							
W4b	abandoned	72.362				2.49			71.342	71.402	71.342	71.212							
W4c	abandoned	72.465				2.01			71.335	71.405	71.405	70.925							
W4d	abandoned	72.608				1.52			71.348	71.448	71.428	70.188							
W5a	abandoned	72.342				3.05			71.502	71.472	71.462								
W5b	abandoned	72.463				2.56			71.403	71.463	71.443	71.153							
W5c	abandoned	72.544				2.02			71.394	71.404	71.474	70.244							
W5d	abandoned	72.64				1.52			71.37	71.36	71.47	2.54							
OW1		72.231							70.631	70.911	71.021	71.061				69.911			
OW2		72.227							70.687	70.967	71.127	71.107				70.147			
MW05-R3*	72.36	72.93		73.85			57.86	56.36											
MW05-R*	72.48	73.19		74.11			58.48	56.98											
MW05-11*	72.155	72.905		73.658			58.655	56.155											
MW07-1a	70.63	71.43		71.645		23.9	47.49	46.79											
MW07-1b	70.63	71.25		71.605		8.53	62.86	62.1											
MW07-1c	70.6	71.19		71.635		4.72	66.64	65.88											
MW07-1d	70.6	71.23		71.615		2.44	68.926	68.16											
MW09-1A**	68.76	69.70		69.67															
MW09-1B	68.73	69.74		69.79															
MW09-1C	68.73	69.75		69.79															
MW09-1D	69.58	70.80																	

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser.

The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

Prepared by: ETB
Checked by: YJM

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2009 Top of Riser	Nov. 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	14-Aug-88 Elevation	3-May-99 Elevation	11-Oct-99 Elevation	2-May-00 Elevation	18-Oct-00 Elevation	8-Jun-01 Elevation	3-Oct-01 Elevation	17-May-02 Elevation	30-Oct-02 Elevation	22-May-03 Elevation	1-Oct-03 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	69.232	69.555			69.232	8.12	61.2	60.45				68.794	68.606	68.75	68.51	68.75	68.386	68.67	68.64
OW-95-2	69.232	69.306		69.65	69.232	4.57	64.7	63.95	68.326	68.585	68.926	68.549	68.566	68.59	68.29	68.56	68.186	68.55	68.29
OW-95-3	69.232	69.286		69.61	69.232	3.33	66.7	66.325		68.516	68.456	68.476	68.46	68.48	68.28	68.51	68.146	68.5	68.24
OW-95-4	85.312	85.31		85.67	85.312	2.72	83.34	82.69	82.6	82.7	82.68	82.83	82.68	82.68	82.43	82.18	81.98	82.53	82.59
OW-95-5	68.477	69.347		69.75	68.477	8.25	60.98	60.23				68.527	68.807	68.49	68.07	68.54	68.047	68.34	67.95
OW-95-6	68.477	69.272		69.7	68.477	4.52	64.71	63.96	67.982	68.422	68.462	68.422	68.402	68.43	67.99	68.51	67.972	68.41	68.05
OW-95-7	68.477	69.177		69.83	68.477	2.31	66.55	66.18	67.917	68.417	68.377	68.337	68.297	68.32	67.92	68.37	67.897	68.16	67.90
OW-95-8	79.32	80.26	84.46	84.62	78.32	2.72	77.35	76.6	76.2	78.77	78.85	79.09	79.71	78.92	78.45	79.13	78.42	79.03	78.61
OW-95-9	68.73	69.482		70.93	68.73	22.30	47.18	46.43	69.282	69.182		69.362	69.432	69.48	69.36	69.48	69.482	69.4	69.50
OW-98-1	79.32	80.14	84.3		79.32	4.57	75.5	74.75		79.09	78.78	79.52	79.91	78.07	78.40	79.09	78.39	79.03	78.59
OW-98-2	79.32	80.14	84.79	84.4	79.32	8.19	71.88	71.13		80.33	78.34	79.41	79.02	77.87	78.02	78.9	77.91	78.82	78.34
OW-98-3	85.312	85.44		85.84	85.312	7.09	78.97	78.22		81.75	81.58	81.44	81.43	81.39	81.24	81.51	81.31	81.44	81.24
OW-98-4	85.312	85.46		85.87	85.312	4.51	81.55	80.8		82.49	82.22	82.1	82.01	82.03	81.94	82.16	81.95	82.09	81.93
MW11-1				85.08				73.58											
W1a	abandoned	72.238				3.06			69.838										
W1b	abandoned	72.338				2.54			70.096										
W1c	abandoned	72.466				2.05			70.516										
W1d	abandoned	72.568				1.62			71.186										
W2a	abandoned	72.245				3.07			69.965										
W2b	abandoned	72.348				2.5			70.438										
W2c	abandoned	72.463				2.04			71.413										
W2d	abandoned	72.559				1.63			71.199										
W3a	abandoned	72.31				3.04			69.72										
W3b	abandoned	72.426				2.52			70.426										
W3c	abandoned	72.511				2.01			71.011										
W3d	abandoned	72.634				1.52			71.224										
W4a	abandoned	72.272				3.05			69.932										
W4b	abandoned	72.362				2.49			70.242										
W4c	abandoned	72.465				2.01			70.745										
W4d	abandoned	72.608				1.53			71.228										
W5a	abandoned	72.342				3.05			69.452										
W5b	abandoned	72.463				2.56			70.173										
W5c	abandoned	72.544				2.02			70.654										
W5d	abandoned	72.64				1.53			71.38										
OW1		72.231							70.841										
OW2		72.277							70.877										
MW05-R3*	72.36	72.93		73.85			57.66	55.36											
MW05-8*	72.48	73.16		74.11			58.46	55.98											
MW05-11*	72.155	72.905		73.858			58.666	56.155											
MW07-1a	70.63	71.43		71.645		23.9	47.49	46.73											
MW07-1b	70.65	71.26		71.605		9.53	62.86	62.1											
MW07-1c	70.6	71.19		71.635		4.72	66.64	65.88											
MW07-1d	70.6	71.23		71.815		2.44	68.926	68.16											
MW09-1A**	68.76	69.70		69.87															
MW09-1B	68.73	69.74		69.79															
MW09-1C	68.73	69.75		69.79															
MW09-1D	68.66	70.80																	

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser.

The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

GOLDER

Prepared by: ETB
Checked by: YJM

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2009 Top of Riser	Nov. 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	5-Nov-03 Elevation	5-May-04 Elevation	5-Nov-04 Elevation	29-May-05 Elevation	16-Nov-05 Elevation	25-May-06 Elevation	14-Nov-06 Elevation	7-May-07 Elevation	19-Nov-07 Elevation	13-May-08 Elevation	3-Nov-08 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	69.232	69.556			69.232	8.12	61.2	60.45	68.71	68.84	68.76	68.776	68.455	68.526	68.596	68.62	68.626	68.78	68.83
OW-95-2	69.232	69.306		69.65	69.232	4.57	64.7	63.95	68.49	68.59	68.52	68.586	68.436	68.556	68.579	68.61	67.416	68.55	68.67
OW-95-3	69.232	69.286		69.61	69.232	2.33	66.7	66.325	68.47	68.48	68.44	68.41	68.32	69.126	68.361	68.31	68.226	68.30	68.39
OW-95-4	85.312	85.91		85.87	85.312	2.72	83.94	82.89	82.80	82.89	82.84	82.51	82.47	83.41	82.885	82.55	82.44	82.65	81.58
OW-95-5	68.477	69.347		69.79	68.477	8.25	60.98	60.23	68.37	68.53	68.46	68.567	68.277	68.567	65.832	68.60	68.337	68.61	68.57
OW-95-6	68.477	69.272		69.7	68.477	4.52	64.71	63.96	68.41	68.44	68.40	68.432	68.412	68.482	68.507	68.44	68.352	68.42	68.49
OW-95-7	68.477	69.177		69.63	68.477	3.31	66.55	65.18	68.41	68.43	68.40	68.43	68.3	68.297	68.38	68.37	68.127	68.34	68.33
OW-95-8	79.32	80.28	84.46	84.62	79.32	2.72	77.36	76.6	79.16	79.12	79.15	79.06	79.04	79.17	79.178	79.12	78.8	79.05	79.19
OW-95-9	68.73	69.482		70.93	68.73	22.30	47.18	46.43	69.96	69.98	70.00	70.527	69.887	68.732	68.769	68.68	68.702	68.72	68.82
OW-98-1	79.32	80.14	84.3		79.32	4.57	75.5	74.75	79.14	79.08	79.12	79.01	79.01	79.09	79.19	79.08	78.78	79.03	79.14
OW-98-2	79.32	80.14	84.79	84.4	79.32	8.19	71.88	71.13	78.93	78.88	78.96	78.84	78.79	78.98	79.005	78.90	78.99	78.96	78.88
OW-98-3	85.312	85.44		85.84	85.312	7.09	78.97	78.22	81.48	81.44	81.46	81.47	81.49	81.68	81.784	81.73	81.67	81.75	81.85
OW-98-4	85.312	85.48		85.87	85.312	4.51	81.55	80.8	81.99	82.07	82.05	82.11	82.09	82.27	82.255	82.19	81.95	82.28	82.12
MW11-1				86.08				73.58											
W1a	abandoned	72.238				3.06													
W1b	abandoned	72.336				2.54													
W1c	abandoned	72.466				2.05													
W1d	abandoned	72.556				1.52													
W2a	abandoned	72.245				3.07													
W2b	abandoned	72.348				2.5													
W2c	abandoned	72.453				2.04													
W2d	abandoned	72.559				1.53													
W3a	abandoned	72.31				3.04													
W3b	abandoned	72.426				2.52													
W3c	abandoned	72.511				2.01													
W3d	abandoned	72.634				1.52													
W4a	abandoned	72.272				3.05													
W4b	abandoned	72.362				2.49													
W4c	abandoned	72.465				2.01													
W4d	abandoned	72.608				1.53													
W5a	abandoned	72.342				3.05													
W5b	abandoned	72.463				2.56													
W5c	abandoned	72.544				2.02													
W5d	abandoned	72.64				1.53													
OW1		72.221																	
OW2		72.277																	
MW05-R3*	72.36	72.93		73.85			57.66	55.35						69.27	69.43	68.82	68.80	68.87	68.50
MW05-81*	72.48	73.16		74.11			68.43	65.98						69.68	69.52	68.99	68.80	69.03	68.98
MW05-11*	72.155	72.905		73.856			68.665	66.155						69.46	69.56	68.87	68.78	69.22	68.94
MW07-1a	70.63	71.43		71.645		23.9	47.49	46.73									69.87	69.94	69.90
MW07-1b	70.63	71.28		71.605		8.53	62.55	62.1									69.33	69.46	69.46
MW07-1c	70.6	71.19		71.635		4.72	66.64	65.85									69.23	69.21	69.58
MW07-1d	70.6	71.23		71.815		2.44	68.925	68.16									69.23	69.21	69.60
MW09-1A**	68.76	69.70		69.87															
MW09-1B	68.73	69.74		69.79															
MW09-1C	68.73	69.75		69.79															
MW09-1D	69.55	70.80																	

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser.

The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

Prepared by: ETB
Checked by: YJM

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	11-May-09 Elevation	10-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	16-May-11 Elevation	22-Nov-11 Elevation	23-May-12 Elevation	20-Nov-12 Elevation	21-May-13 Elevation	20-Nov-13 Elevation	23-May-14 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	69.232	69.556		69.232	69.232	8.12	61.2	60.45	68.83	frozen	68.86	68.85	68.85	68.83	68.81	68.82	68.79	68.85	68.82
OW-95-2	69.232	69.306		69.65	69.232	4.57	64.7	63.95	68.67	68.57	68.57	68.66	68.64	68.61	68.87	68.62	68.85	68.80	68.81
OW-95-3	69.232	69.286		69.81	69.232	2.33	66.7	66.325	68.36	68.32	68.31	68.85	68.43	68.79	68.84	68.81	68.79	68.80	68.80
OW-95-4	85.312	85.91		85.67	85.312	2.72	83.34	82.59	81.53	82.43	82.44	81.53	82.72	82.61					
OW-95-5	68.477	69.347		69.75	68.477	8.25	60.98	60.23	68.57	68.40	68.51	68.62	68.69	68.97	68.99	69.01	68.84	69.05	68.98
OW-95-6	68.477	69.272		69.7	68.477	4.52	64.71	63.99	68.49	68.36	68.43	68.47	68.66	68.64	68.92	68.86	68.86	68.90	68.92
OW-95-7	68.477	69.177		69.63	68.477	2.31	66.55	66.18	68.33	68.31	68.25	68.29	68.44	68.89	68.96	68.93	68.92	68.93	68.95
OW-95-8	79.32	80.26	84.46	84.62	79.32	2.72	77.36	76.6	79.16	79.80	79.74	79.66	79.86	79.72	80.07	79.83	80.32	79.79	80.41
OW-95-9	69.73	69.482		70.53	69.73	22.30	47.18	46.43	68.62	68.67		68.30	68.39		68.81	68.84	68.79		69.93
OW-96-1	79.32	80.14	84.3		79.32	4.57	76.5	74.75	79.14	79.94	79.53	79.54	79.93	79.53	79.98	79.79	80.20	79.71	80.35
OW-96-2	79.32	80.14	84.79	84.4	79.32	8.19	71.68	71.13	78.68	80.02	80.24	80.24	80.44						
OW-96-3	85.312	85.44		85.84	85.312	7.09	78.67	78.22	81.65	81.87	81.65	81.71	81.69	81.90					
OW-96-4	85.312	85.49		85.87	85.312	4.51	81.55	80.8	82.12	81.96	82.08	82.21	82.10	82.26					
MW11-1				85.06				73.58						79.96	80.32	80.10	80.52	79.98	80.58
W1a	abandoned	72.236				3.06													
W1b	abandoned	72.336				2.54													
W1c	abandoned	72.466				2.05													
W1d	abandoned	72.556				1.52													
W2a	abandoned	72.345				3.07													
W2b	abandoned	72.348				2.5													
W2c	abandoned	72.453				2.04													
W2d	abandoned	72.559				1.53													
W3a	abandoned	72.31				3.04													
W3b	abandoned	72.426				2.52													
W3c	abandoned	72.511				2.01													
W3d	abandoned	72.634				1.52													
W4a	abandoned	72.272				3.05													
W4b	abandoned	72.362				2.49													
W4c	abandoned	72.465				2.01													
W4d	abandoned	72.606				1.52													
W5a	abandoned	72.342				3.05													
W5b	abandoned	72.463				2.56													
W5c	abandoned	72.544				2.02													
W5d	abandoned	72.64				1.53													
OW1		72.231																	
OW2		72.277																	
MW05-R3*	72.36	72.93		73.86			57.86	55.36	65.63	68.39	68.51	68.80	69.06	68.59	68.84	69.35	69.48	69.30	69.78
MW05-8*	72.43	73.16		74.11			58.43	55.98	69.17	68.58	68.79	69.08	69.43	68.94	69.72	69.27	69.67	69.61	70.13
MW05-11*	72.155	72.905		73.858			58.655	56.155	68.05	68.80	68.91	69.08	69.19	68.83	69.73	69.63	69.81	69.89	69.91
MW07-1a	70.63	71.43		71.645		23.9	47.49	46.73	69.92	69.35	69.93	69.56	69.80	69.81	69.92	69.85	69.95	69.88	70.02
MW07-1b	70.63	71.25		71.805		8.53	62.86	62.1	69.54	69.50	69.61	69.57	69.48	69.98	69.85	69.69	69.82	69.99	69.94
MW07-1c	70.9	71.19		71.635		4.72	66.64	65.85	69.47	69.41	69.25	69.66	69.53	70.04	69.90	69.85	69.73	69.85	69.80
MW07-1d	70.6	71.23		71.815		2.44	69.925	68.16	69.45	69.35	69.24	69.70	69.52	70.18	69.93	69.98	69.87	69.98	69.93
MW09-1A**	68.78	69.76		69.87							69.51	69.41	69.41		69.43	69.32	69.47	69.52	69.40
MW09-1B	68.73	69.74		69.78							69.65	69.77	69.77		69.65	69.74	69.60	69.75	69.75
MW09-1C	68.73	68.75		69.79							68.56	68.58	68.58		68.61	68.59	68.73	69.43	68.52
MW09-1D	69.56	70.80									69.20	69.25	69.25						

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser.
The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2008 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	27-Aug-14	12-Nov-14	26-May-15	26-Aug-15	19-Nov-15	19-May-16	18-Aug-16	10-Nov-16	17-May-17	28-Aug-17	22-Nov-17
	m	m	m	m	m	m	m	m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m
OW-95-1	69.292	69.556			69.292	6.12	61.2	60.45		68.84	68.81		68.74	68.79		68.41	68.82		68.87
OW-95-2	69.232	69.308		69.65	69.232	4.57	64.7	63.95		68.83	68.73		68.74	68.78		68.71	68.69		68.82
OW-95-3	69.232	69.286		69.31	69.232	2.83	66.7	66.324		68.82	68.80		68.78	68.74		68.73	68.77		68.80
OW-95-4	85.312	85.31		85.67	85.312	2.72	85.54	82.59											
OW-95-5	68.477	69.347		69.73	68.477	8.25	60.98	60.25		69.04	68.99		69.01	69.00		68.95	69.00		68.99
OW-95-6	68.477	69.272		69.7	68.477	4.52	64.71	63.96		68.92	68.89		68.90	68.85		68.86	68.90		68.90
OW-95-7	68.477	69.177		69.83	68.477	2.31	66.86	66.18		69.00	68.94		68.97	68.91		68.90	68.95		68.96
OW-95-8	79.32	80.26	84.46	84.62	79.32	2.72	77.35	78.6		80.04	80.16		79.97	80.48		79.96	80.92		80.29
OW-95-9	68.73	69.482		70.93	68.73	22.30	47.18	46.43		69.89	69.91		69.85	69.96		69.89	69.88		70.03
OW-98-1	79.32	80.14	84.3		79.32	4.57	75.5	74.75		79.92	80.06		79.85	80.34		79.86	80.76		80.14
OW-98-2	79.32	80.14	84.79	84.4	79.32	8.19	71.88	71.13											
OW-98-3	85.312	85.44		85.84	85.312	7.09	78.97	78.22											
OW-98-4	85.312	85.48		85.87	85.312	4.51	81.55	80.8											
MW11-1				85.08				73.58		80.24	80.33		80.09	80.61		80.10	81.00		80.43
W1a	abandoned	72.238				3.06													
W1b	abandoned	72.336				2.64													
W1c	abandoned	72.466				2.05													
W1d	abandoned	72.565				1.52													
W2a	abandoned	72.245				3.07													
W2b	abandoned	72.348				2.5													
W2c	abandoned	72.453				2.04													
W2d	abandoned	72.559				1.53													
W3a	abandoned	72.31				3.04													
W3b	abandoned	72.428				2.52													
W3c	abandoned	72.511				2.01													
W3d	abandoned	72.634				1.52													
W4a	abandoned	72.272				3.05													
W4b	abandoned	72.362				2.49													
W4c	abandoned	72.465				2.01													
W4d	abandoned	72.605				1.53													
W5a	abandoned	72.342				3.05													
W5b	abandoned	72.462				2.56													
W5c	abandoned	72.544				2.02													
W5d	abandoned	72.64				1.53													
OW1		72.231																	
OW2		72.277																	
MW05-R3*	72.36	72.83		73.85			67.88	66.98		69.33	69.38		69.11	69.46		69.03	70.05		69.83
MW05-8*	72.43	73.16		74.11			68.48	66.98		69.38	69.63		69.05	69.78		69.07	71.08		70.58
MW05-11*	72.155	72.806		73.858			58.855	56.155		69.92	69.73		69.74	69.62		69.78	70.24		70.13
MW07-1a	70.83	71.45		71.645		23.9	47.49	46.73		70.02	70.03		70.01	70.19		70.11	70.27		70.33
MW07-1b	70.83	71.26		71.605		8.53	62.85	62.1		70.16	69.86		69.87	69.94		70.44	70.39		70.28
MW07-1c	70.6	71.19		71.635		4.72	65.64	65.88		70.09	69.81		69.85	69.73		69.85	69.83		70.05
MW07-1d	70.6	71.23		71.615		2.44	68.925	68.18		70.22	69.94		69.98	69.87		69.98	69.97		70.20
MW09-1A**	68.76	69.70		69.67					69.46	69.47	69.45	69.43	69.73	69.50	69.63	69.62	69.70	Not found	Frozen
MW09-1B	68.73	69.74		69.79					68.76	68.80	68.81	68.71	68.81	68.64	68.52	68.80	68.65	Not found	70.20
MW09-1C	68.73	69.76		69.79					68.60	68.83	68.62	68.66	68.61	68.61	68.59	68.62	68.62	Not found	70.20
MW09-1D	69.58	70.60							69.25	70.80		69.17			69.13			69.85	70.90

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser

The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

GOLDER

[illegible] sharepoint.com/[illegible]/Navan Remedial Optimization/Report Figures/C - Water Level Figures/C-2 WELL WATER LEVELS TABLE

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	15-May-18 Elevation	3-Aug-18 Elevation	22-Nov-18 Elevation	13-Jun-19 Elevation	14-Nov-19 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	69.232	69.556			69.232	8.12	61.2	60.45	68.87		68.88	68.83	68.73
OW-95-2	69.232	68.506		69.65	69.232	4.97	64.7	63.98	68.79		68.74	68.76	68.76
OW-95-3	69.232	69.288		69.81	69.232	3.33	66.7	66.325	69.71		68.75	68.76	68.72
OW-95-4	85.312	85.31		85.67	85.312	2.72	83.34	82.59					
OW-95-5	68.477	69.347		69.73	68.477	8.25	60.88	60.23	69.65		69.09	68.92	68.98
OW-95-6	68.477	68.272		69.7	68.477	4.52	64.71	63.96	68.86		68.88	68.84	68.79
OW-95-7	68.477	69.177		69.63	68.477	2.31	66.55	66.18	68.94		68.96	68.94	68.87
OW-95-8	79.32	80.26	84.46	84.62	79.32	2.72	77.35	76.6	80.76		79.97	80.76	80.08
OW-95-9	86.73	89.482		70.93	86.73	22.30	47.18	46.43	79.11		frozen	79.11	Frozen
OW-98-1	79.32	80.14	84.3		79.32	4.57	75.5	74.75	80.62		79.83	80.63	79.94
OW-98-2	79.32	80.14	84.76	84.4	79.32	8.18	71.88	71.13					
OW-98-3	85.312	85.44		85.84	85.312	7.09	78.97	78.22					
OW-98-4	85.312	85.46		85.67	85.312	4.51	81.55	80.8					
MW11-1				85.08				73.58	80.87		80.10	80.83	80.18
W1a	abandoned	72.238				3.06							
W1b	abandoned	72.336				2.54							
W1c	abandoned	72.468				2.05							
W1d	abandoned	72.558				1.52							
W2a	abandoned	72.245				3.07							
W2b	abandoned	72.345				2.6							
W2c	abandoned	72.453				2.04							
W2d	abandoned	72.559				1.53							
W3a	abandoned	72.31				3.04							
W3b	abandoned	72.425				2.52							
W3c	abandoned	72.511				2.01							
W3d	abandoned	72.634				1.52							
W4a	abandoned	72.272				3.05							
W4b	abandoned	72.362				2.49							
W4c	abandoned	72.465				2.01							
W4d	abandoned	72.609				1.53							
W5a	abandoned	72.342				3.05							
W5b	abandoned	72.483				2.56							
W5c	abandoned	72.544				2.02							
W5d	abandoned	72.64				1.53							
OW1		72.231											
OW2		72.277											
MW05-RS1	72.36	72.93		73.85			57.86	55.36	70.36		69.67	69.53	69.45
MW05-6*	72.48	73.16		74.11			58.48	56.98	71.32		70.21	69.88	69.43
MW05-11*	72.155	72.805		73.858			58.655	58.155	70.35		70.13	69.85	69.86
MW07-1a	70.63	71.43		71.645		23.9	47.49	46.73	70.38		70.30	70.46	70.29
MW07-1b	70.63	71.26		71.505		8.53	62.86	62.1	70.23		70.12	70.16	70.09
MW07-1c	70.6	71.18		71.635		4.72	66.64	65.88	69.83		69.81	69.91	69.90
MW07-1d	70.6	71.23		71.515		2.44	68.925	68.16	69.96		69.94	70.04	70.03
MW09-1A**	68.76	69.70		69.87					69.70	69.69	frozen	artesian	frozen
MW09-1B	68.73	69.74		69.79					68.90	68.76	70.20	68.88	68.74
MW09-1C	68.73	69.75		69.79					68.63	68.47	70.20	68.62	68.58
MW09-1D	69.93	70.80							69.28	69.18	70.20	Not monitored	69.22

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser.

The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

GOLDER

000143

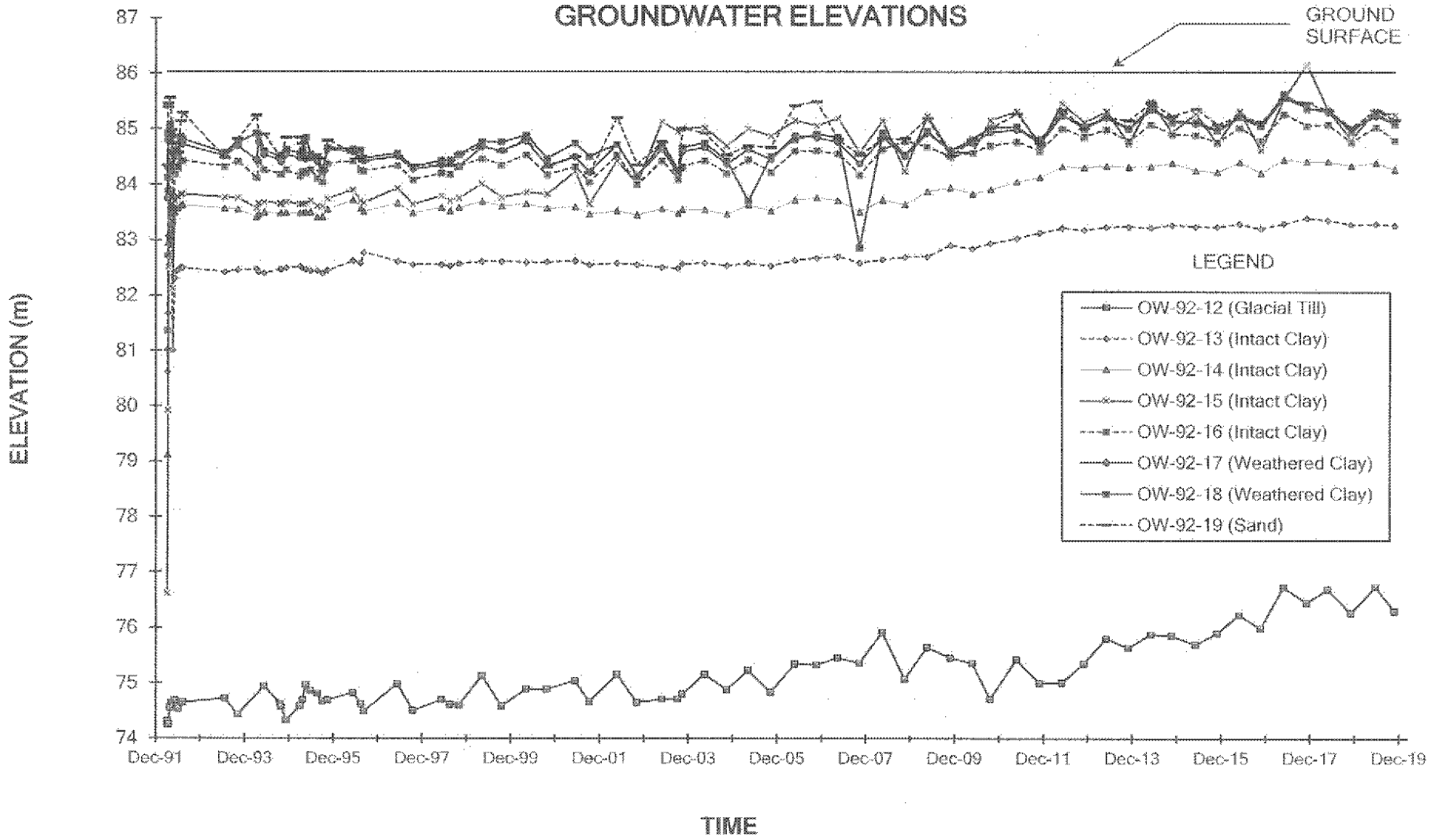

FIGURE C1

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-12 TO OW-92-19

GOLDER

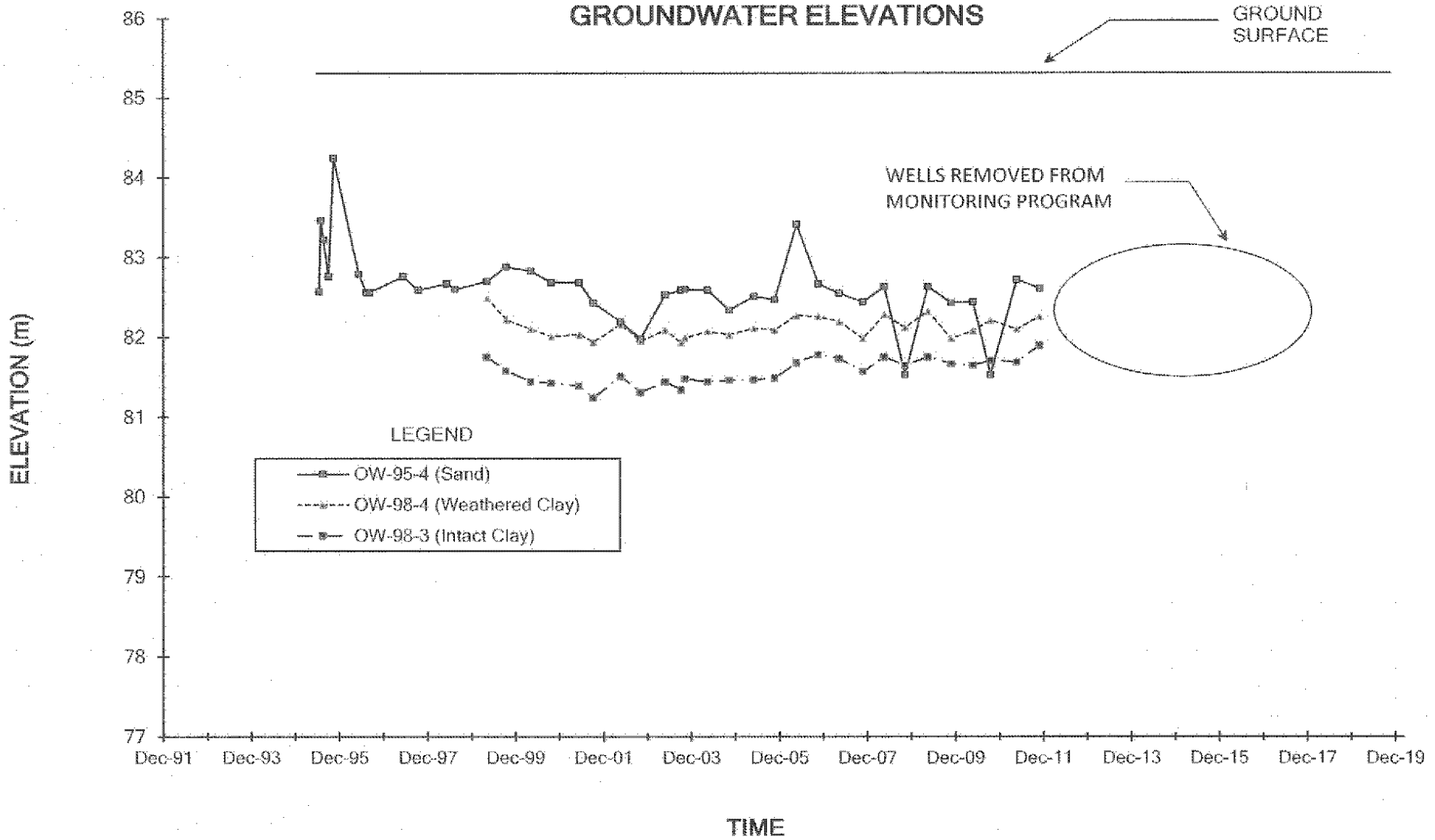

FIGURE C2

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-4 & OW-98-3 & 4

GOLDER

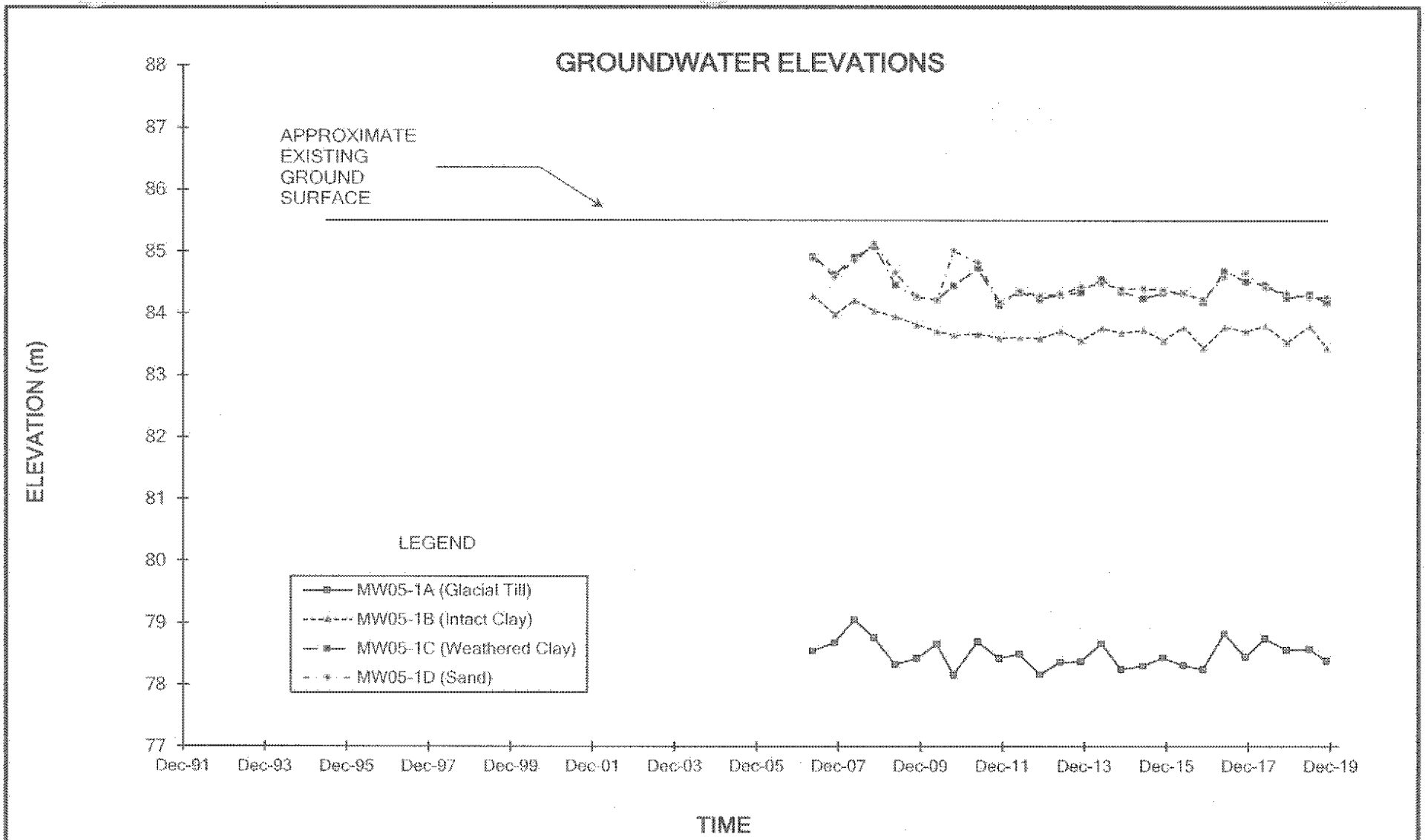

FIGURE C3

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS MW05-1A to MW05-1D

GOLDER

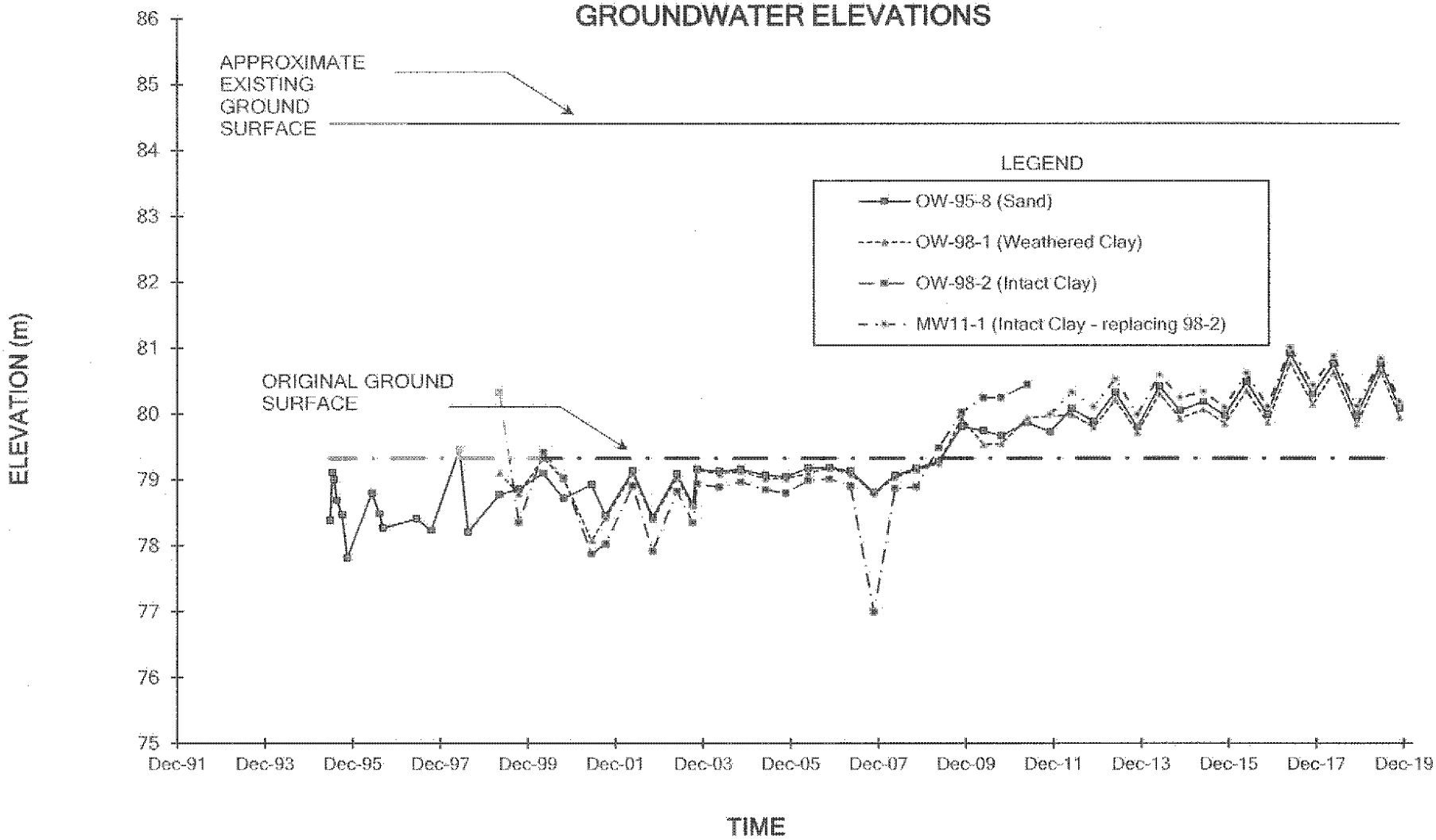

FIGURE C4

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-8, OW-98-1-2 & MW11-1

GOLDER

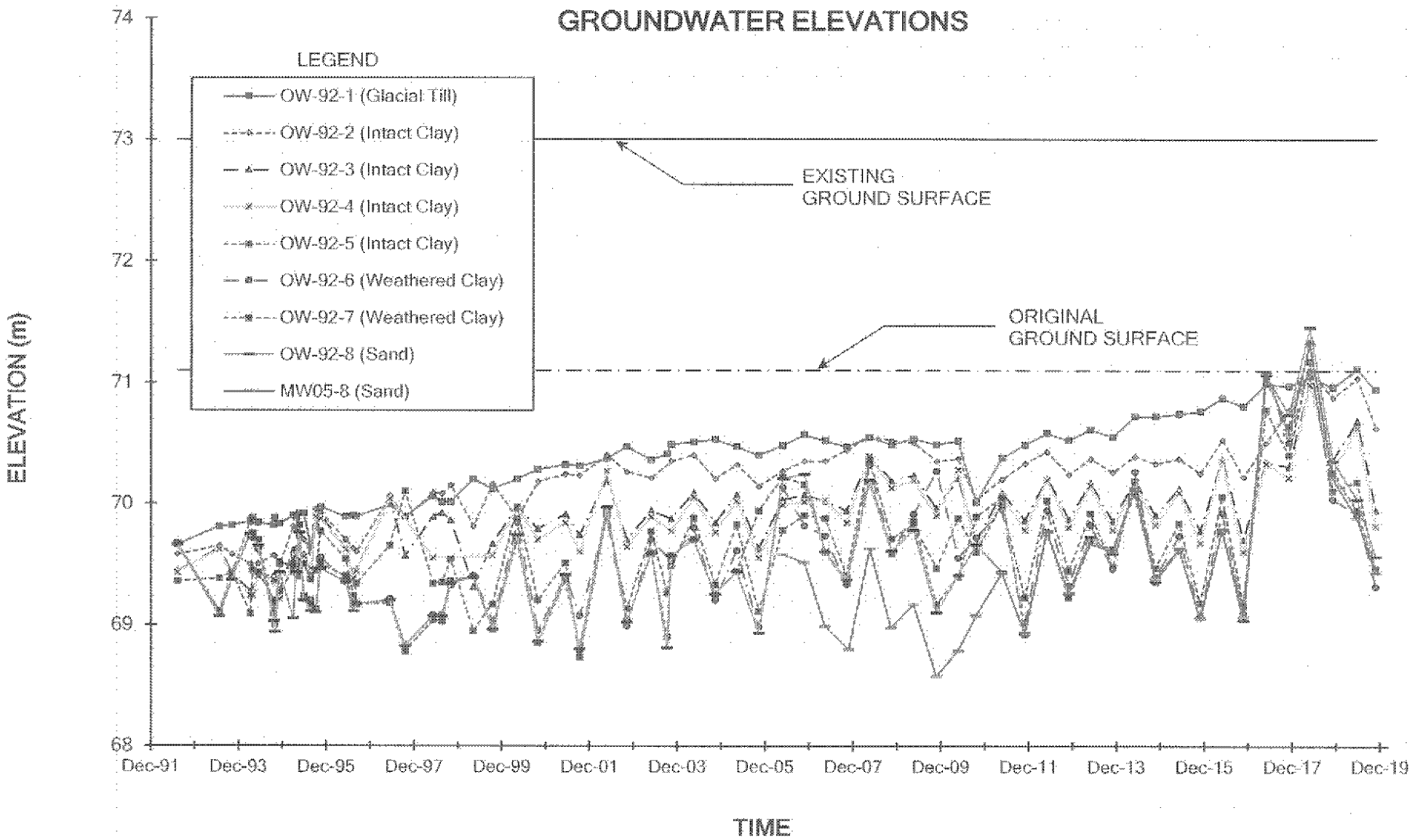

FIGURE C5

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-1 TO 92-8 & MW05-8

GOLDER

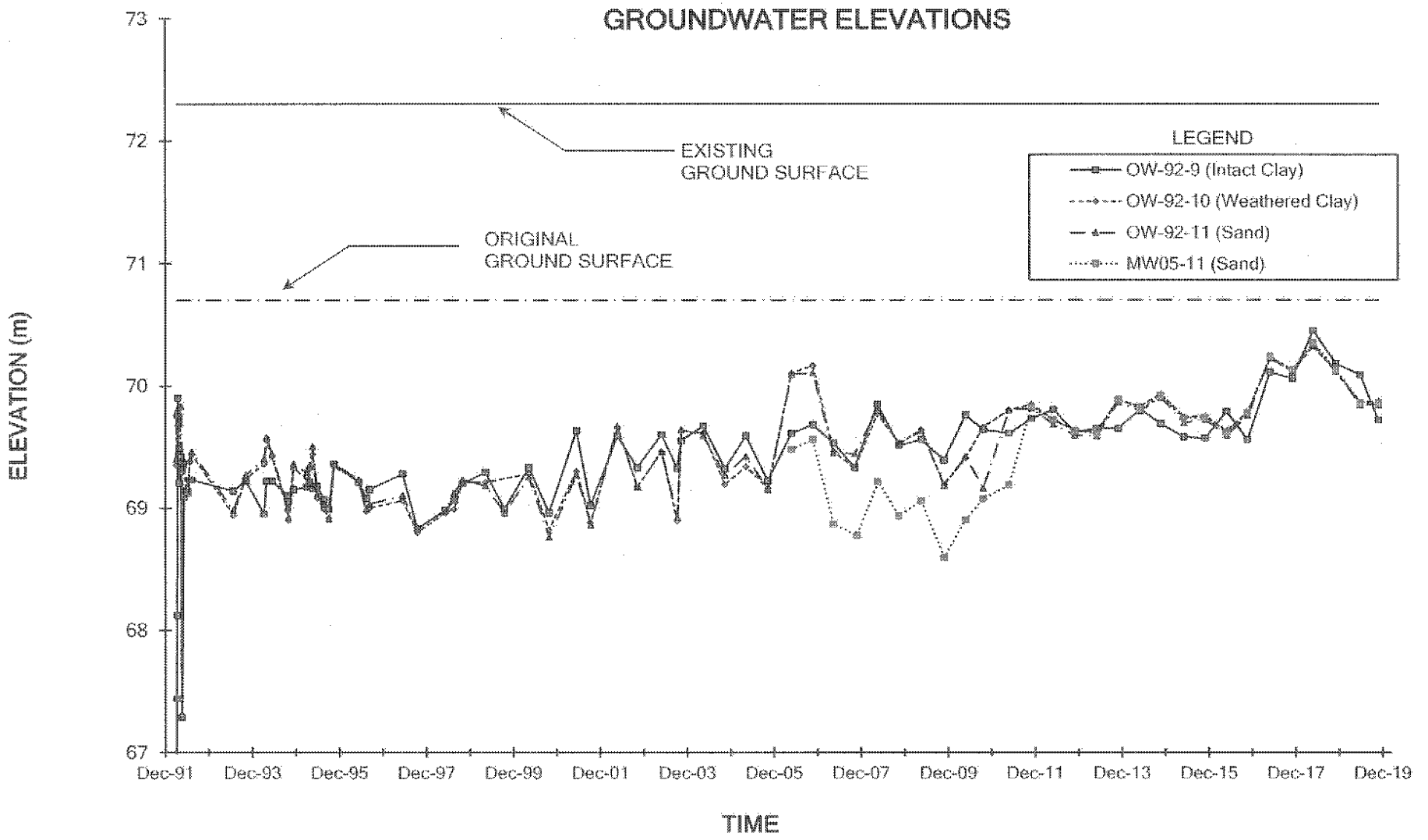

FIGURE C6

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-9 TO 92-11 & MW05-11

GOLDER

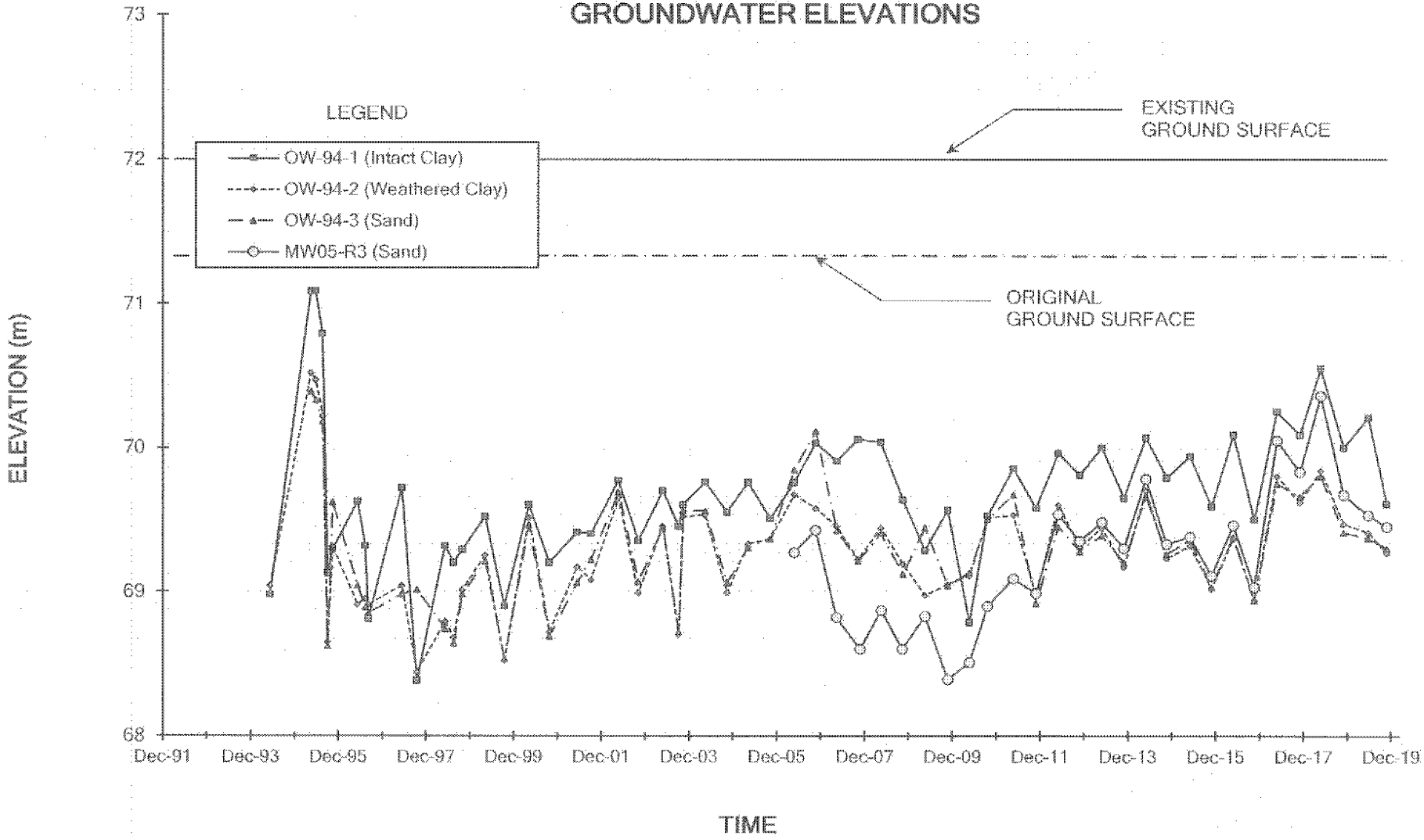

FIGURE C7

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-1 TO 94-3 & MW05-R3

GOLDER

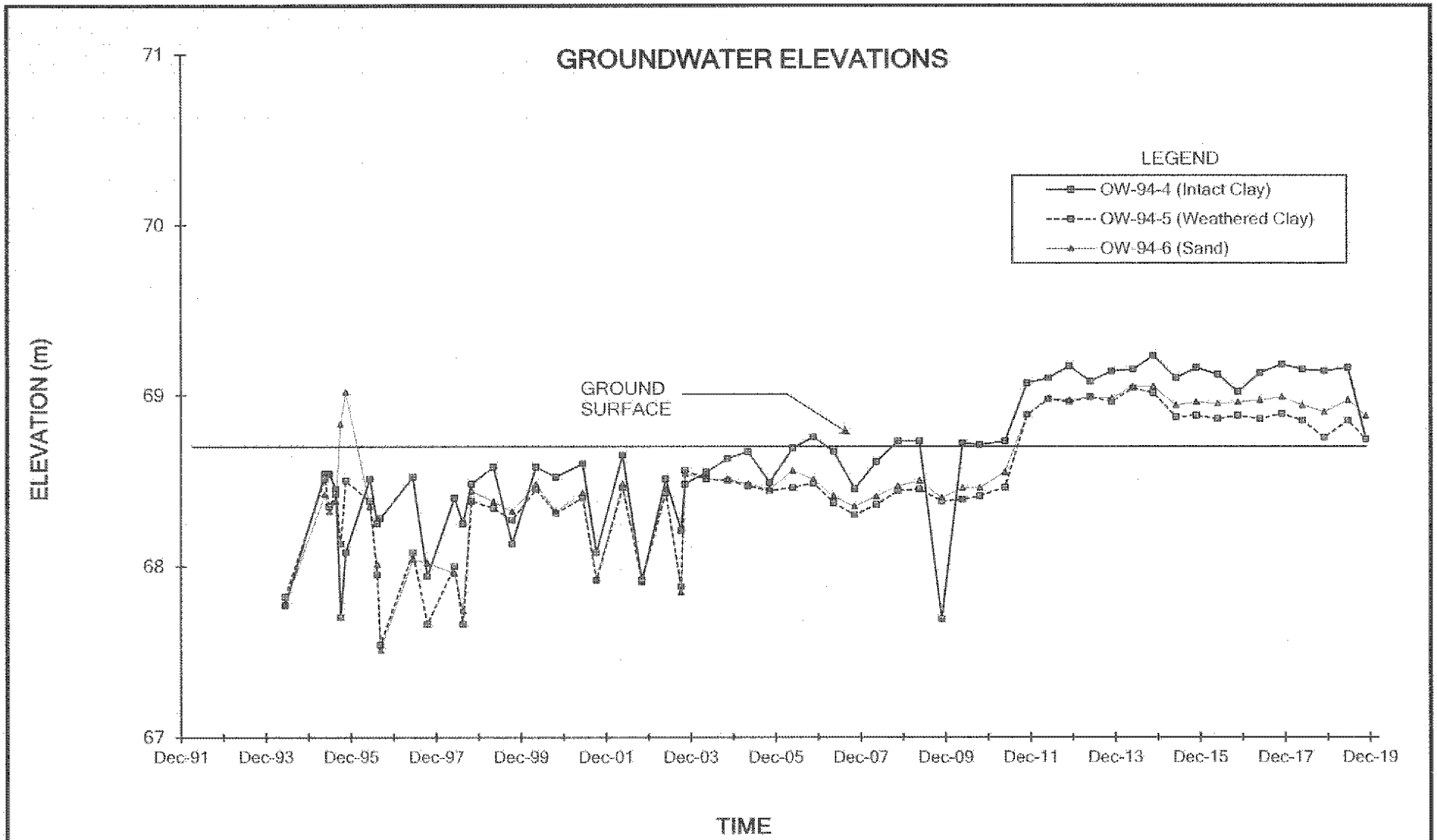

FIGURE C8

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-4 TO 94-6

GOLDER

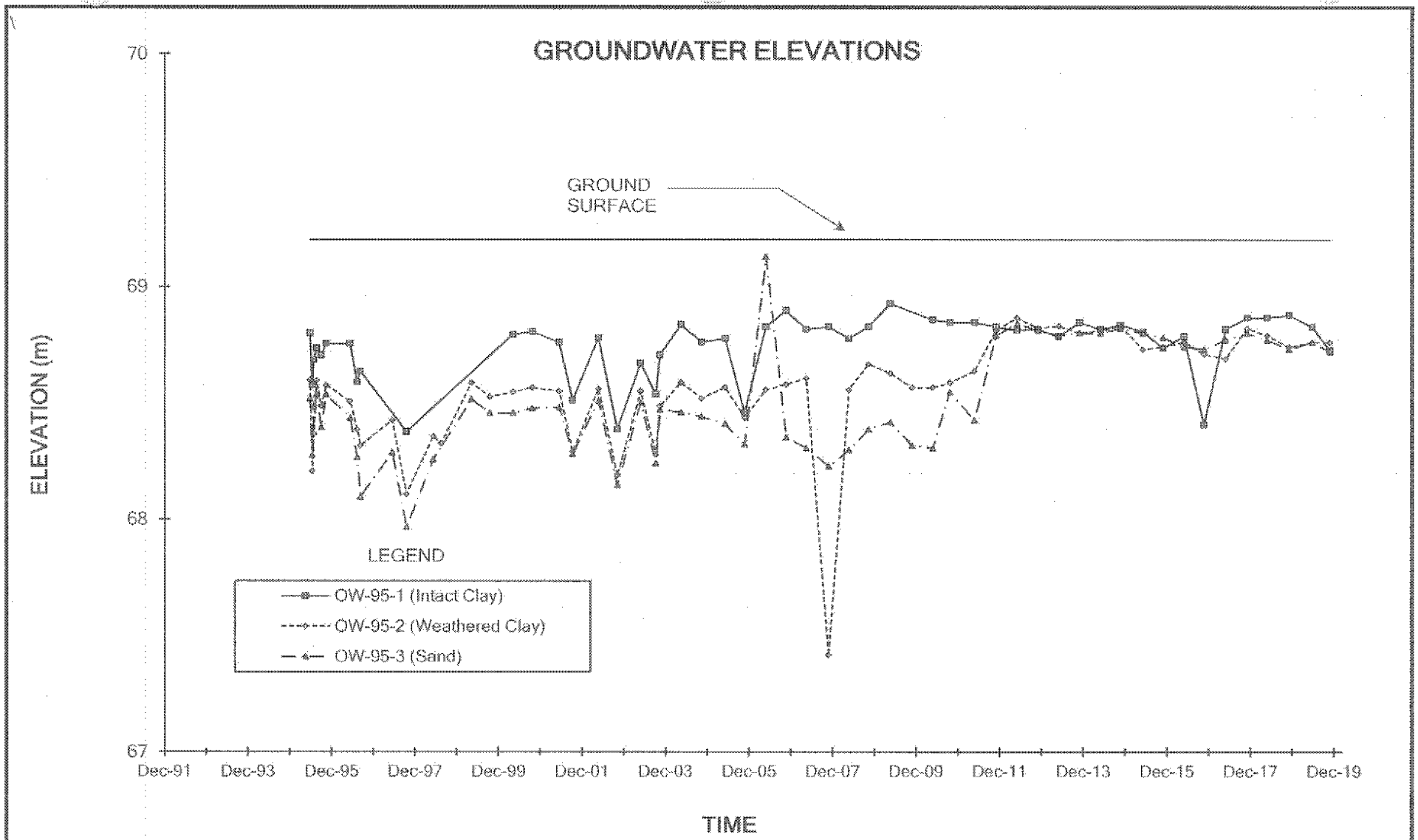

FIGURE C9

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-1 TO 95-3

GOLDER

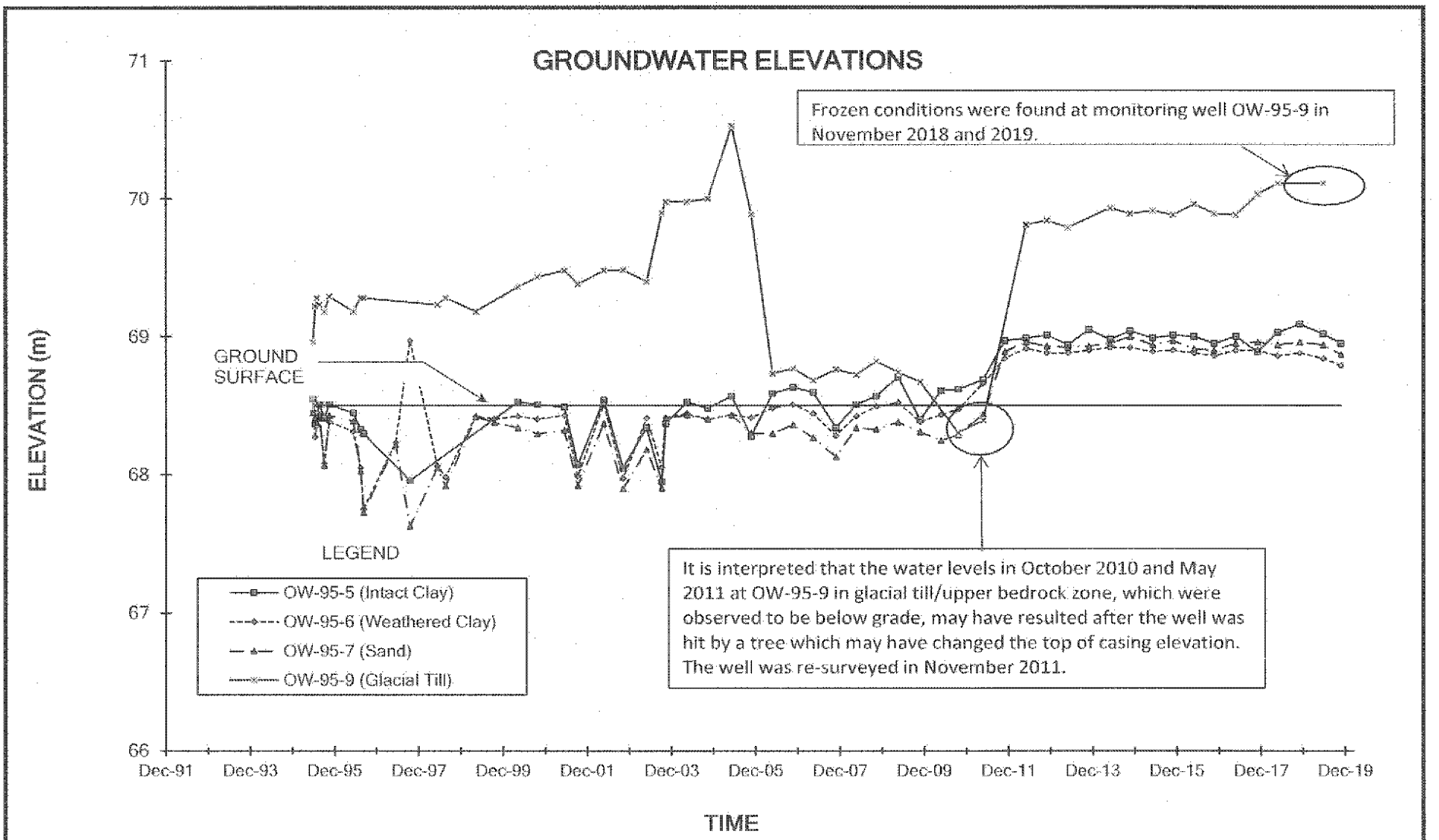

FIGURE C10

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-5 TO 95-7 & 95-9

GOLDER

APPENDIX D

Groundwater Results of Field and Laboratory Chemical and Physical Analyses

Appendix D-1 – Up-Gradient Wells

Appendix D-2 – Immediately Down-Gradient Wells

Appendix D-3 – Down-Gradient/Mer Bleue Wells

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX E

Leachate Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX F

Groundwater Leachate Indicator Parameter Concentrations

Appendix F-A – Sand Layer

Appendix F-B – Weathered Clay Deposit

APPENDIX F-A

Sand Layer

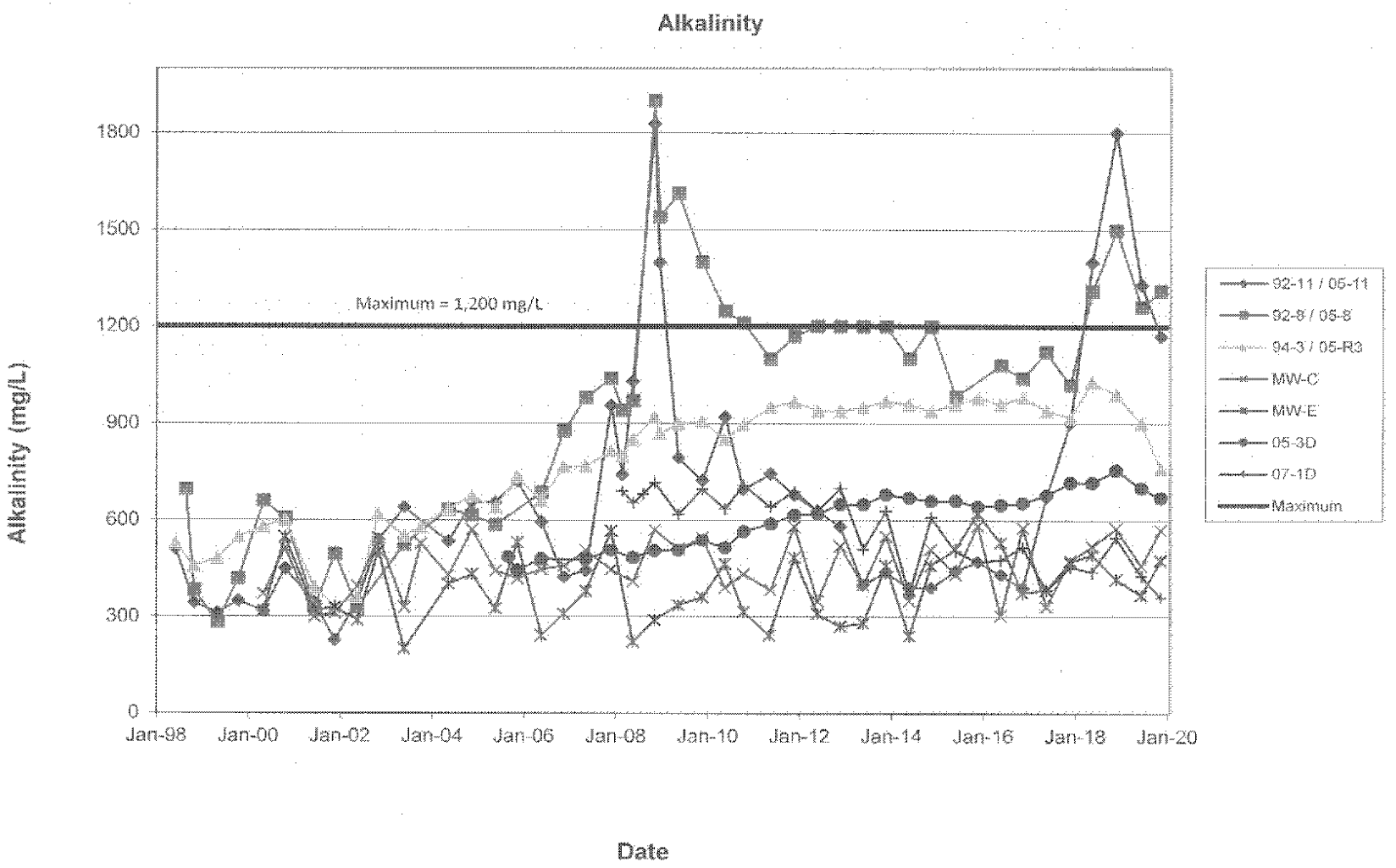

FIGURE FA1

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

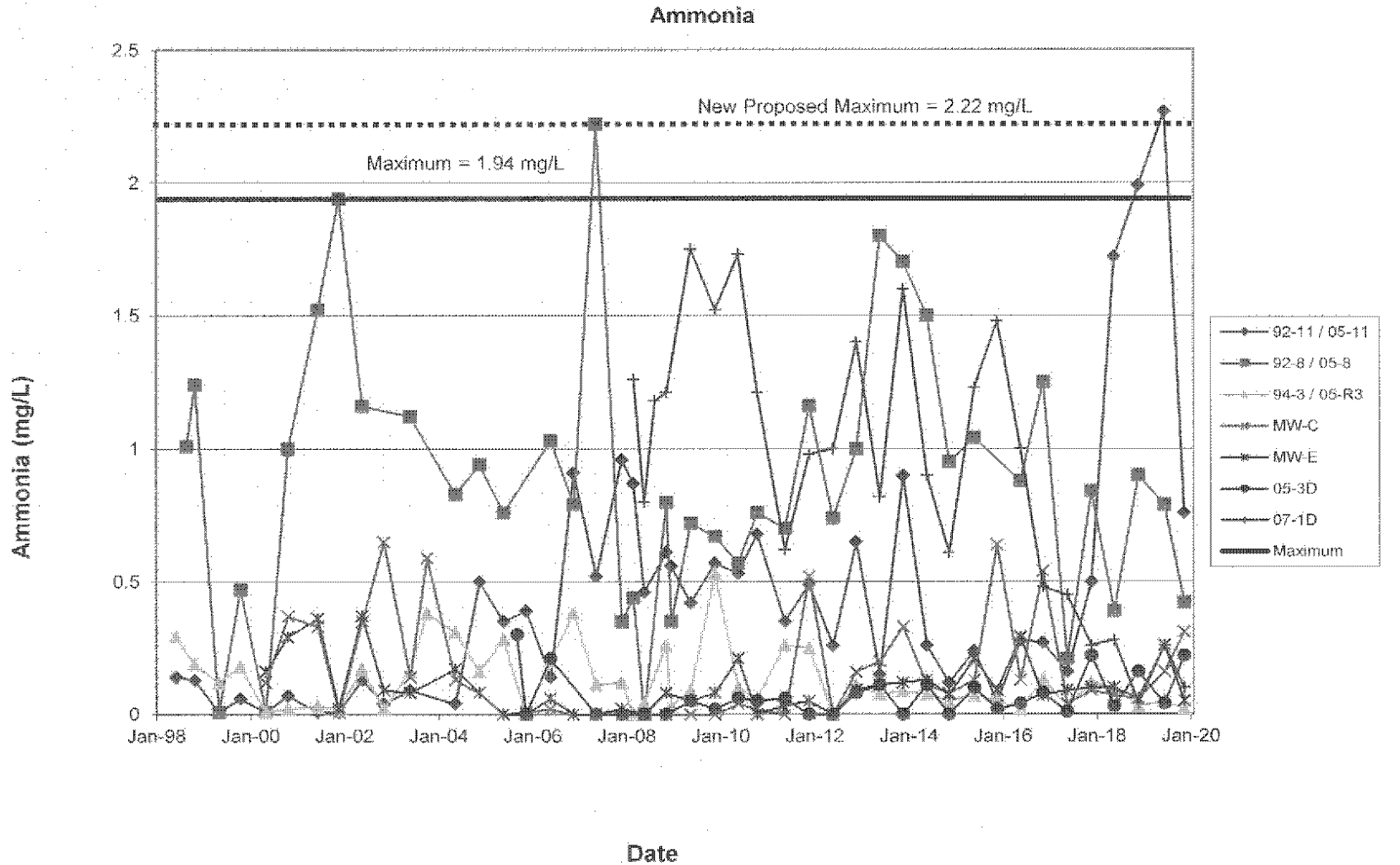

FIGURE FA2

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

000168

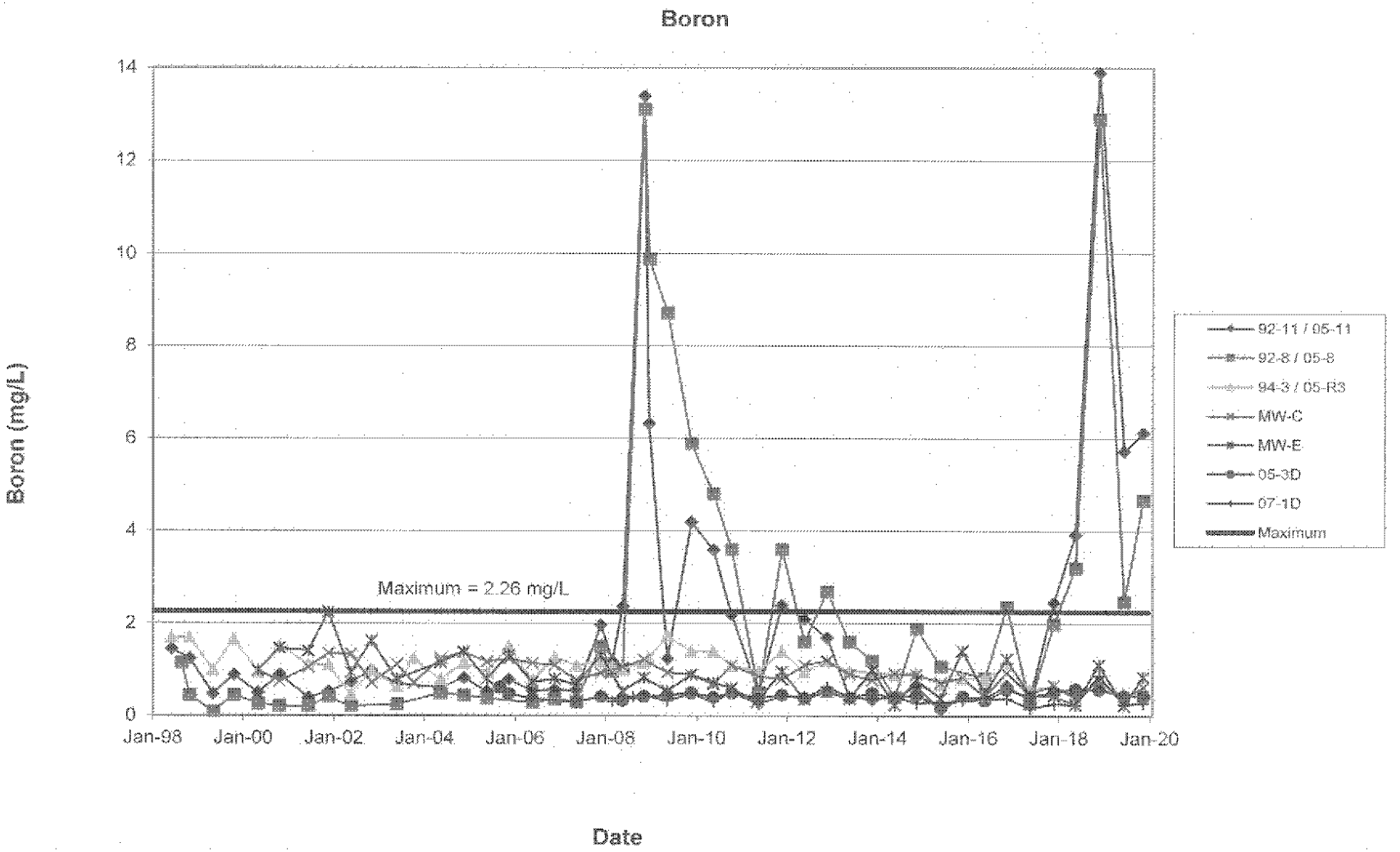

FIGURE FA3

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

000169

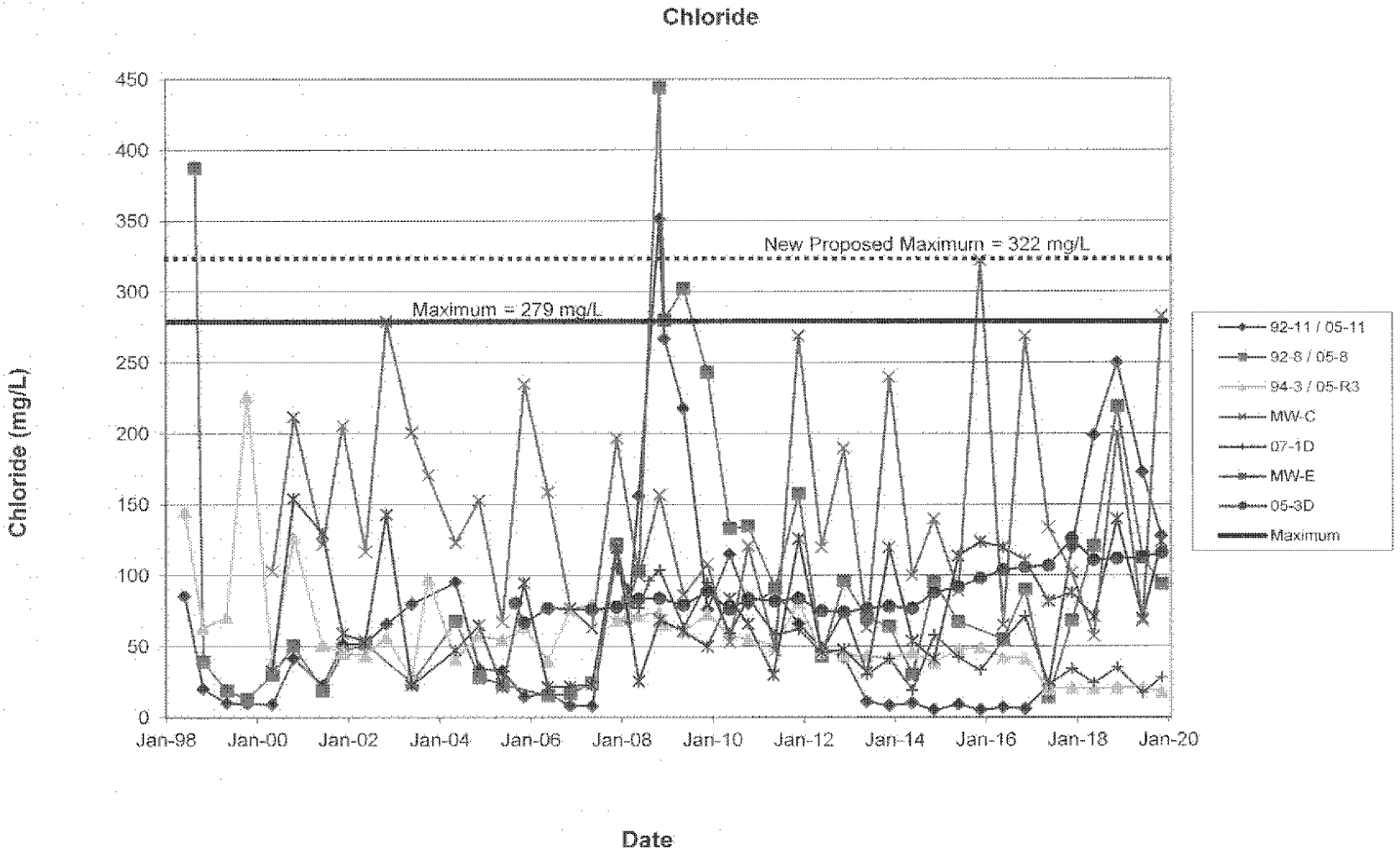

FIGURE FA4

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

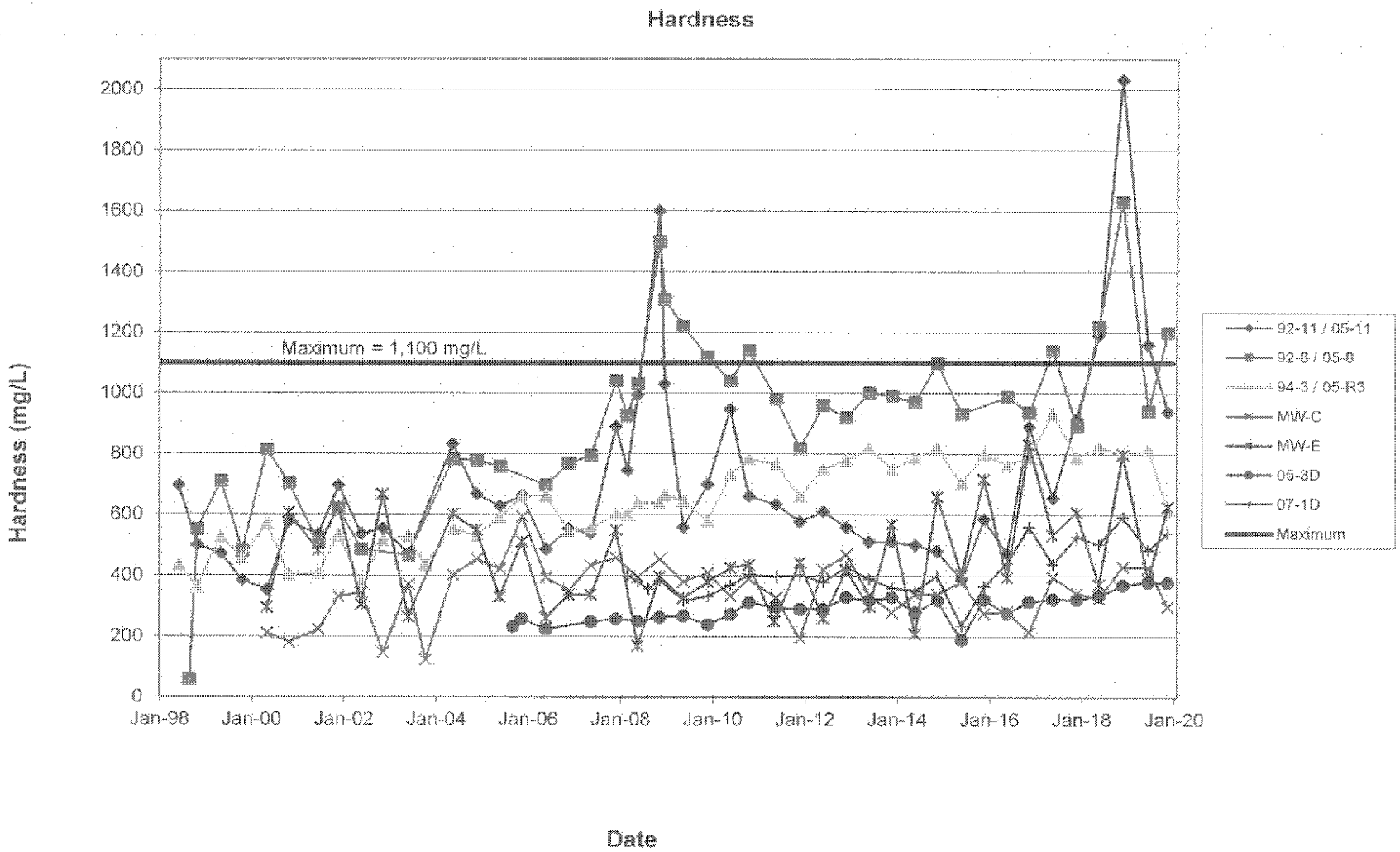

FIGURE FA5

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

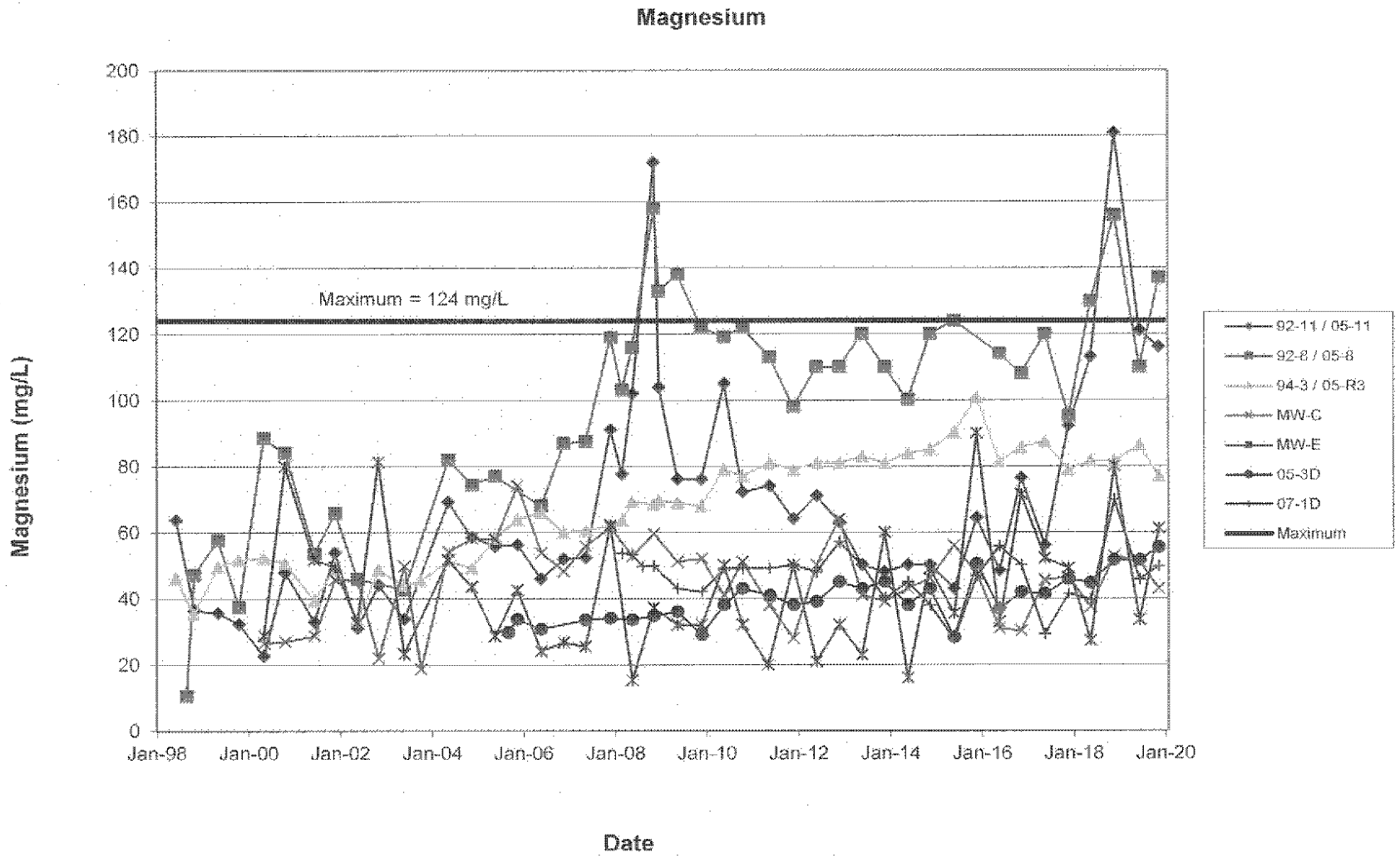

FIGURE FA6

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

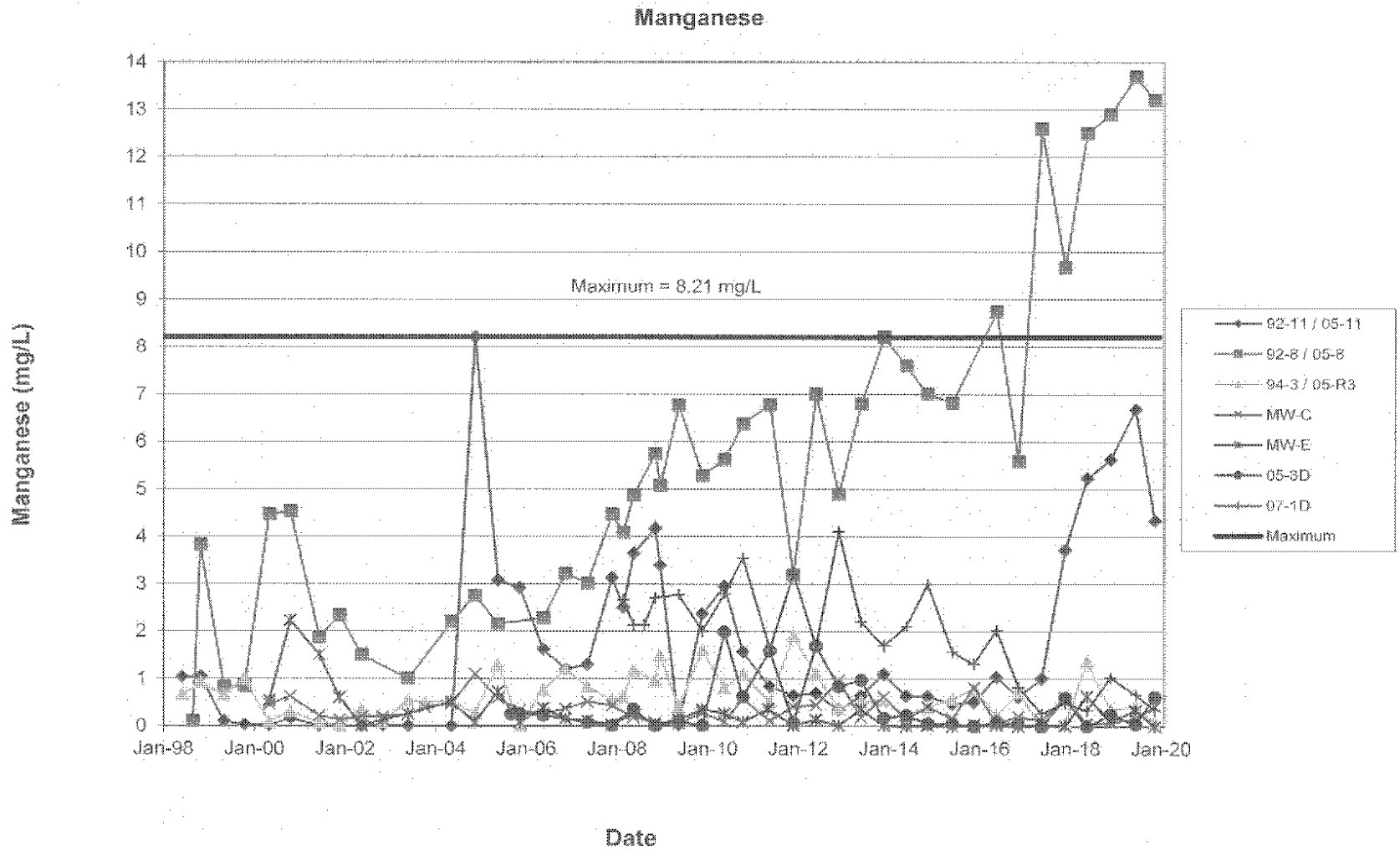

FIGURE FA7

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

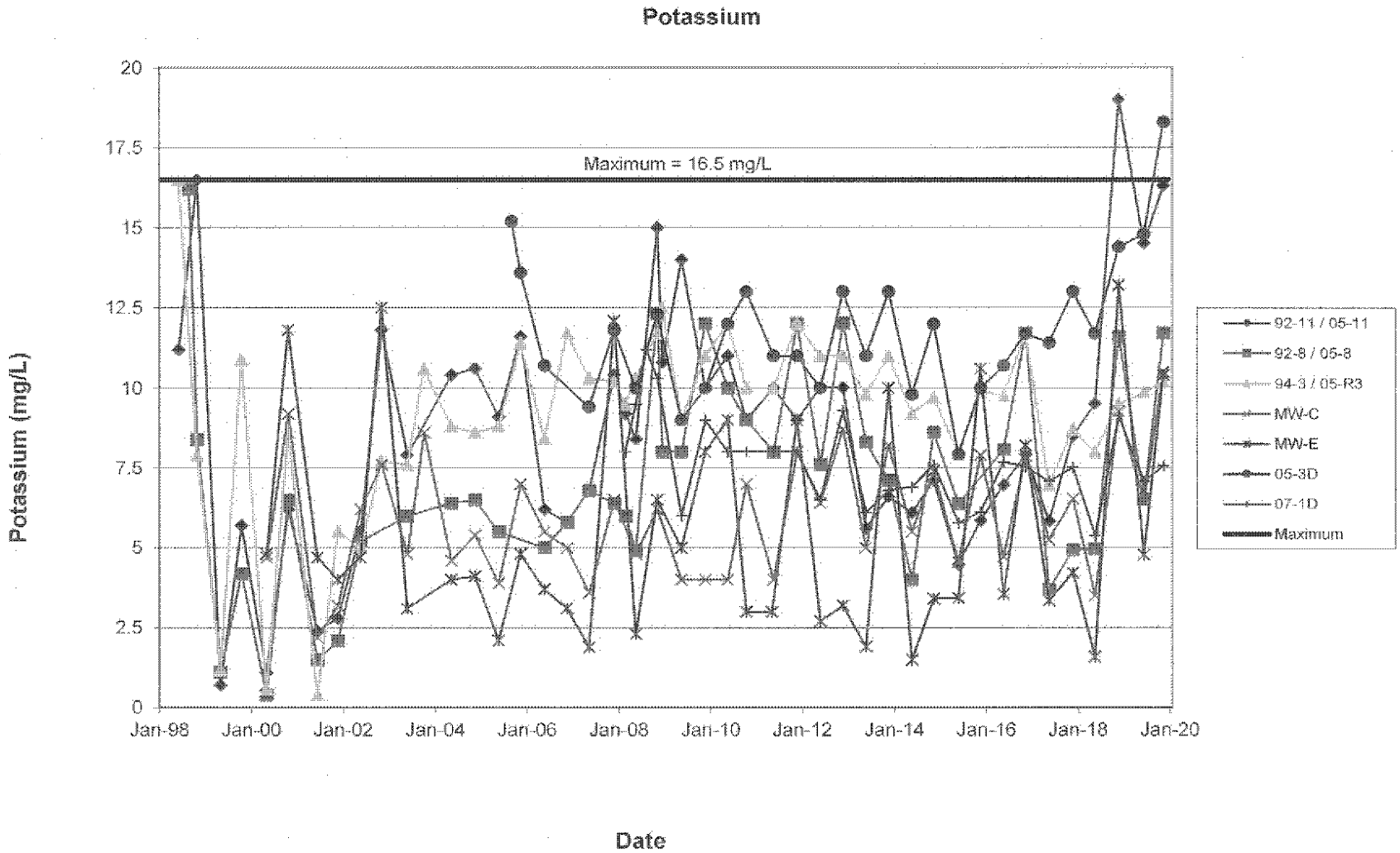

FIGURE FA8

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

APPENDIX F-B

Weathered Clay Deposit

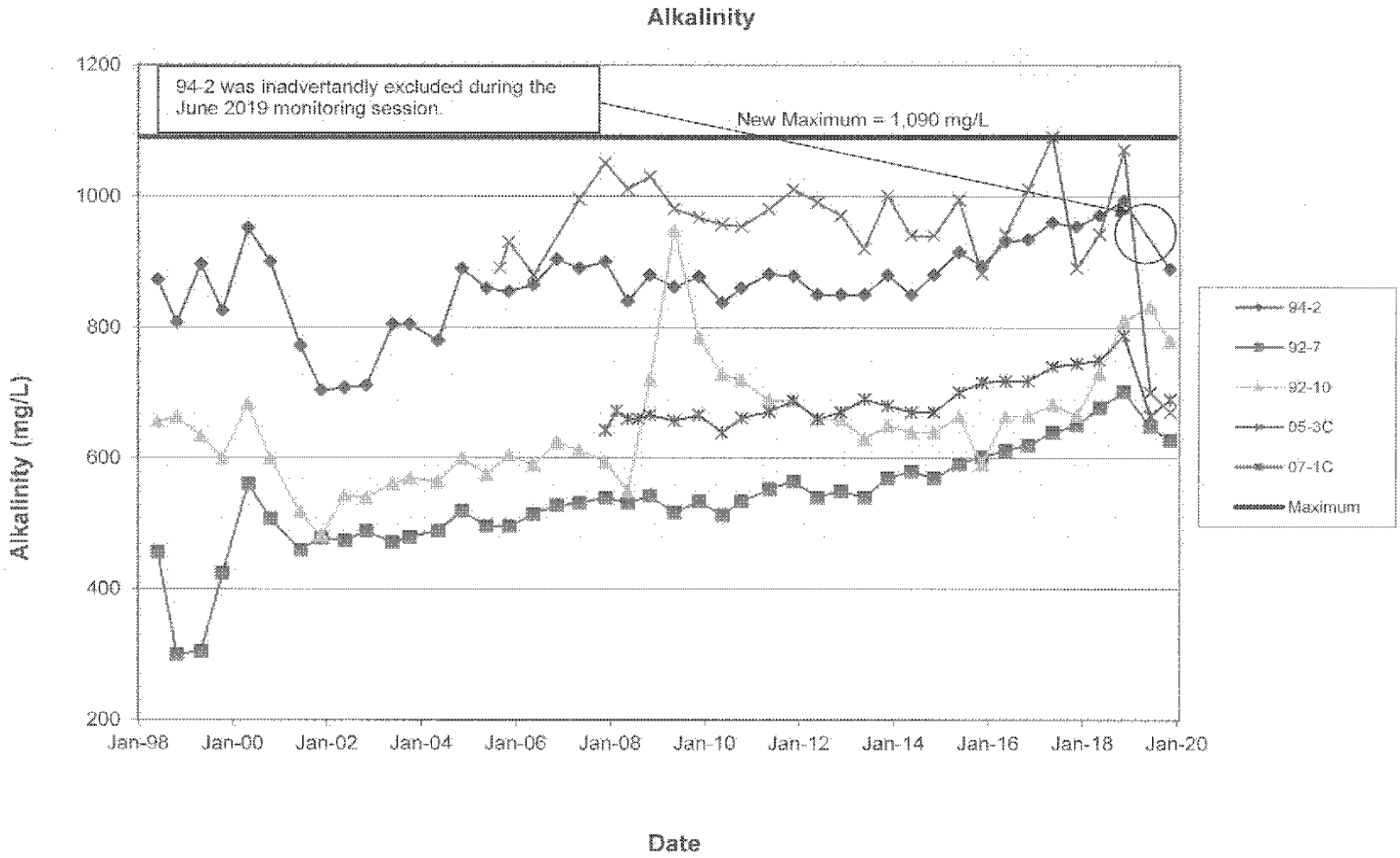

FIGURE FB1

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

WEATHERED CLAY

GOLDER

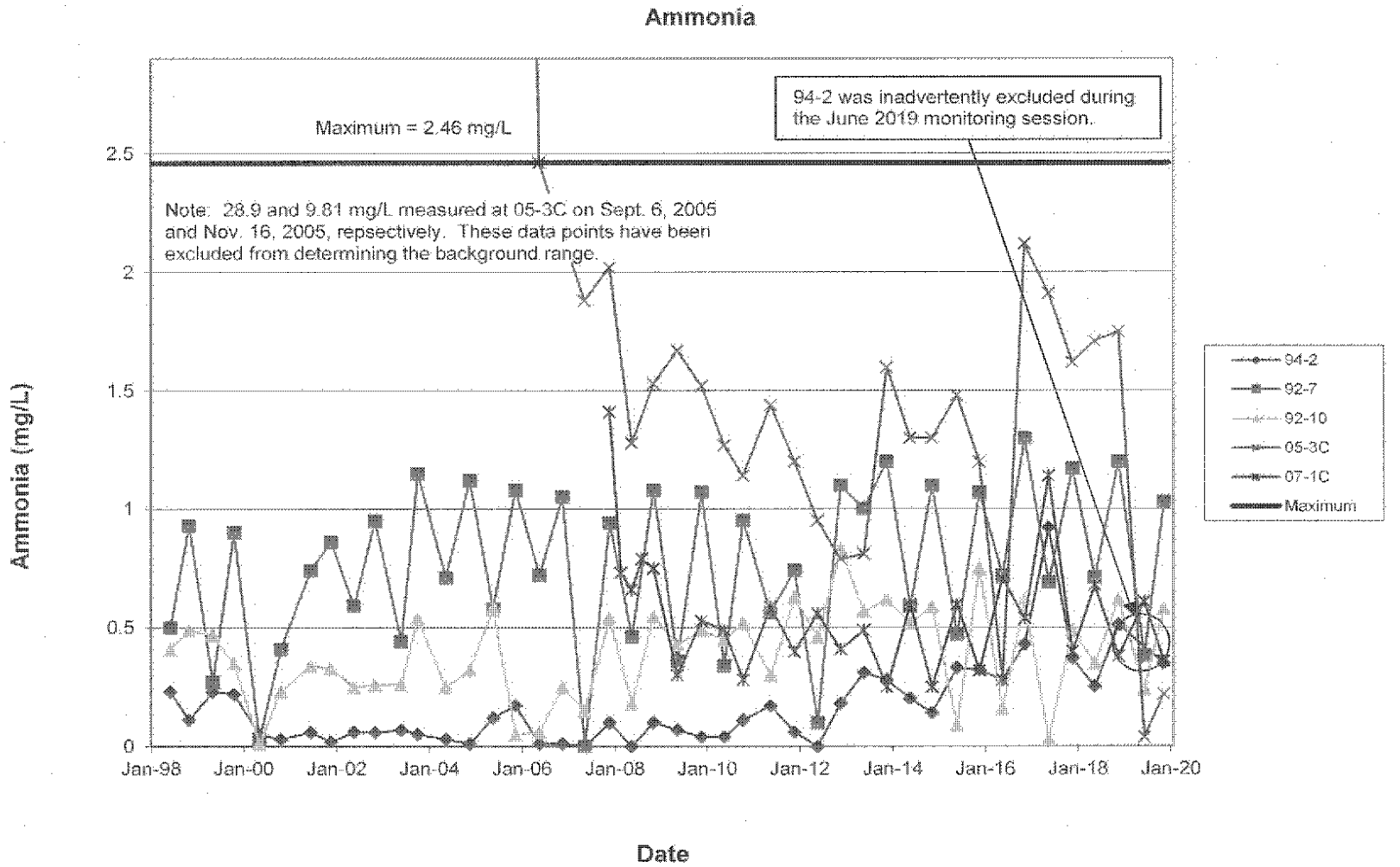

FIGURE FB2

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY
GROUNDWATER
WEATHERED CLAY

GOLDER

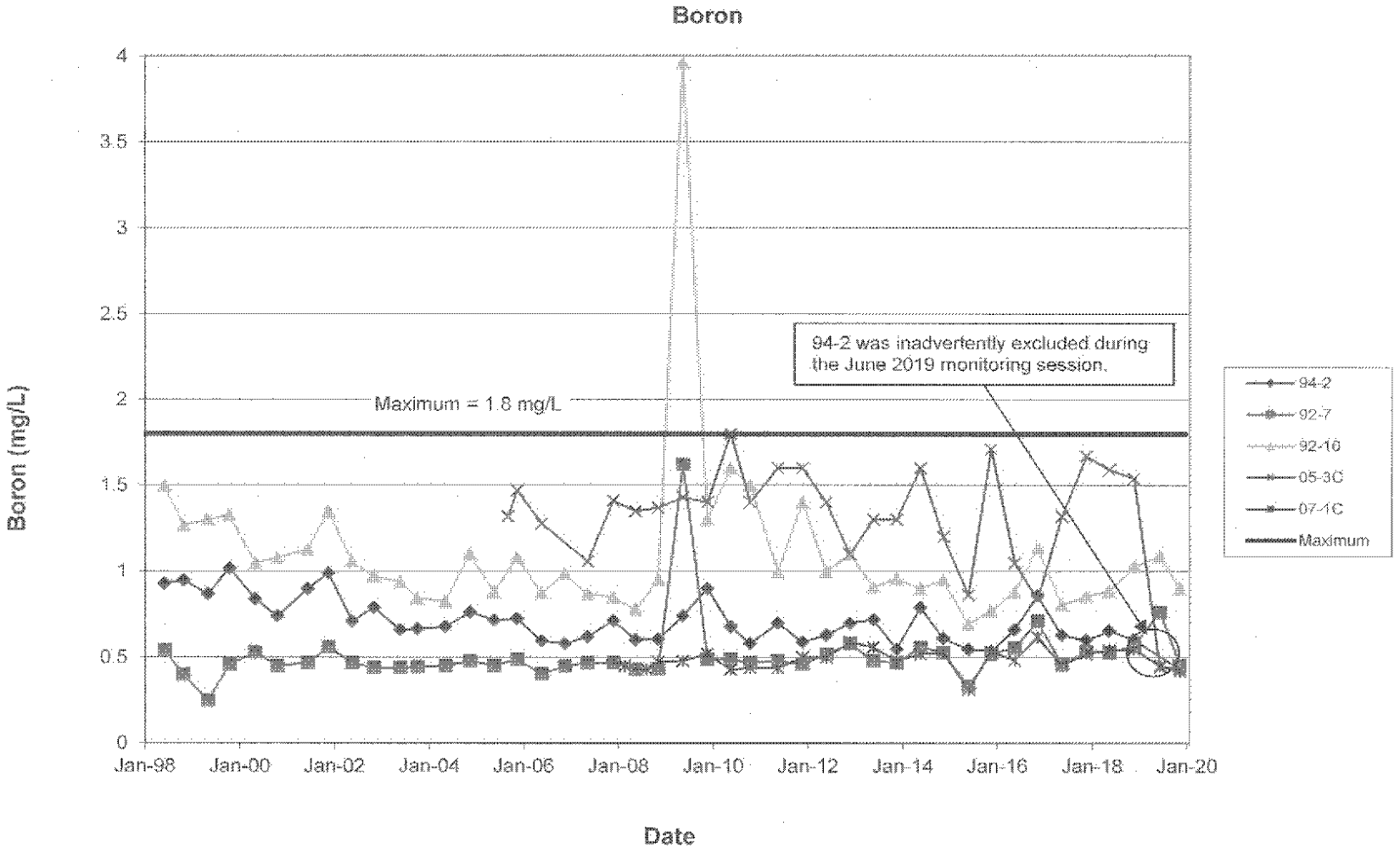

FIGURE FB3

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

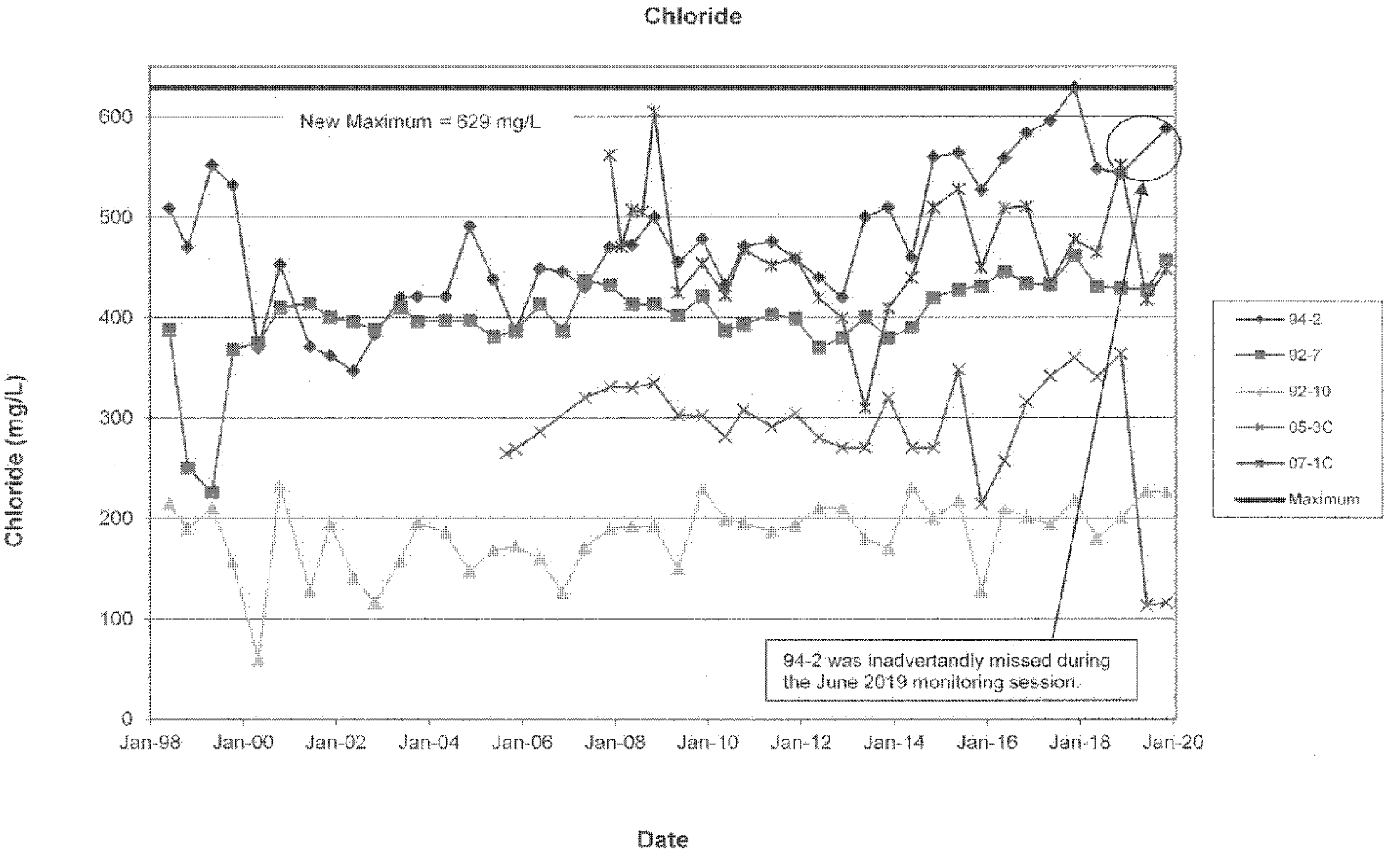

FIGURE FB4

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

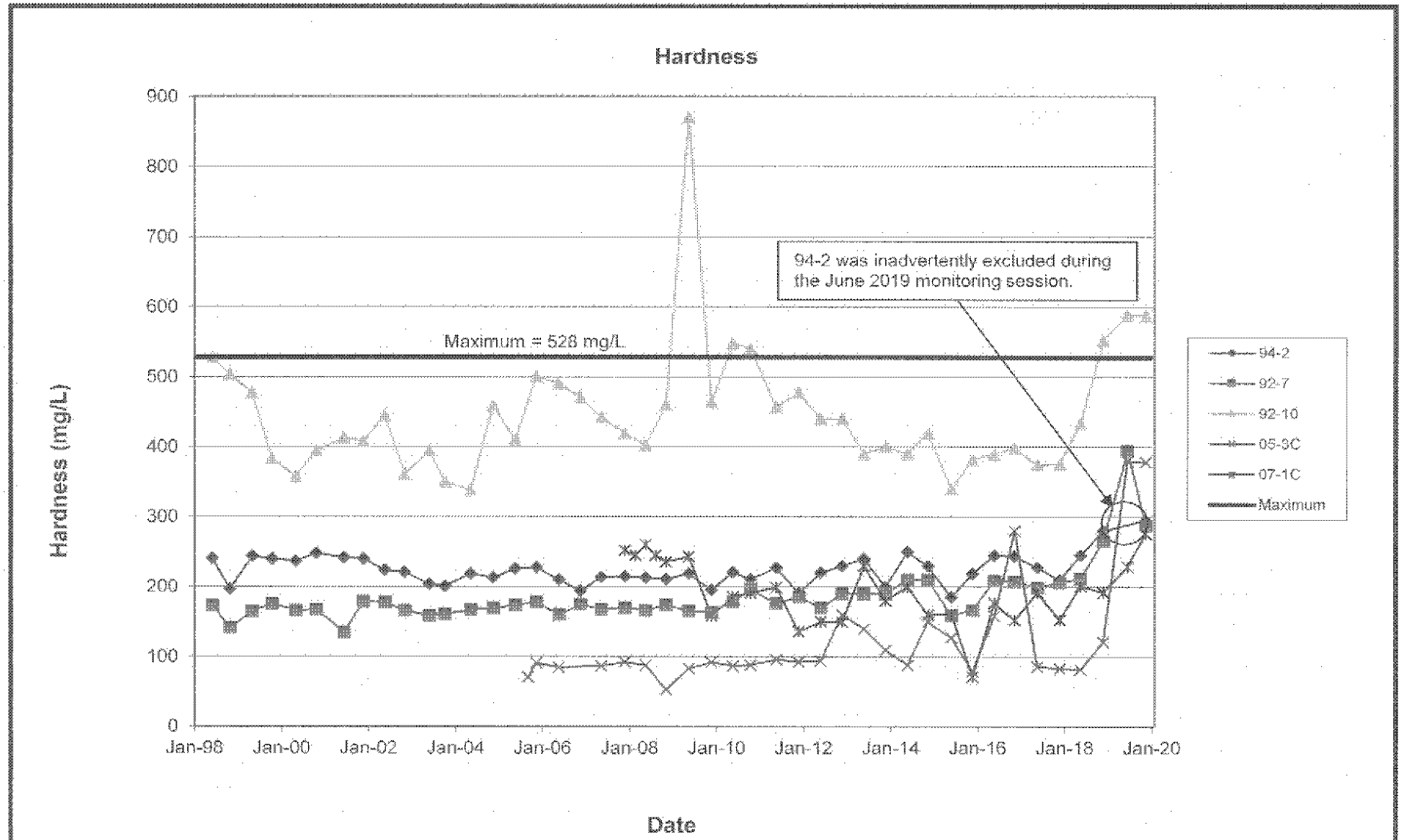

FIGURE FB5

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY
GROUNDWATER
WEATHERED CLAY

GOLDER

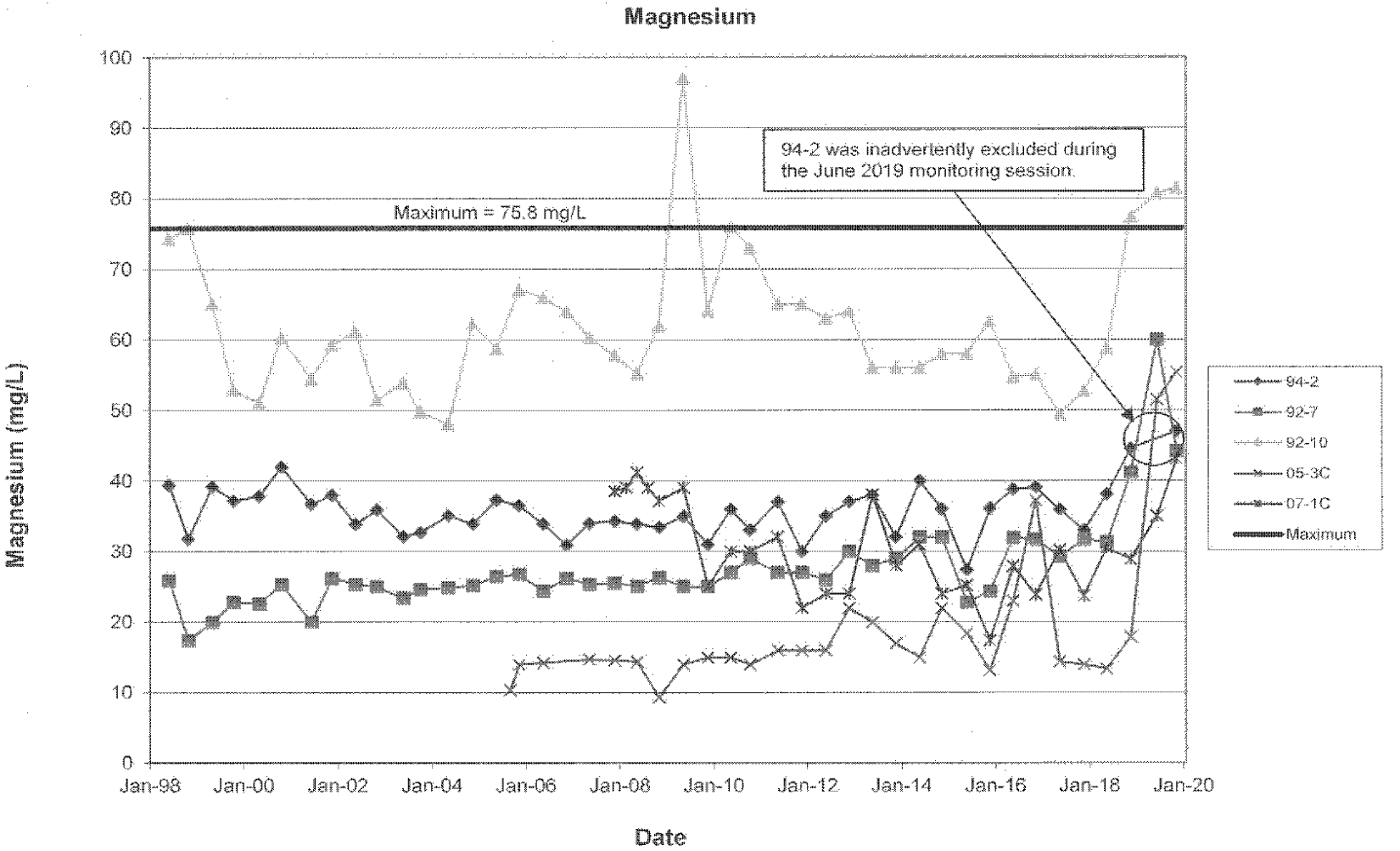

FIGURE FB6

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

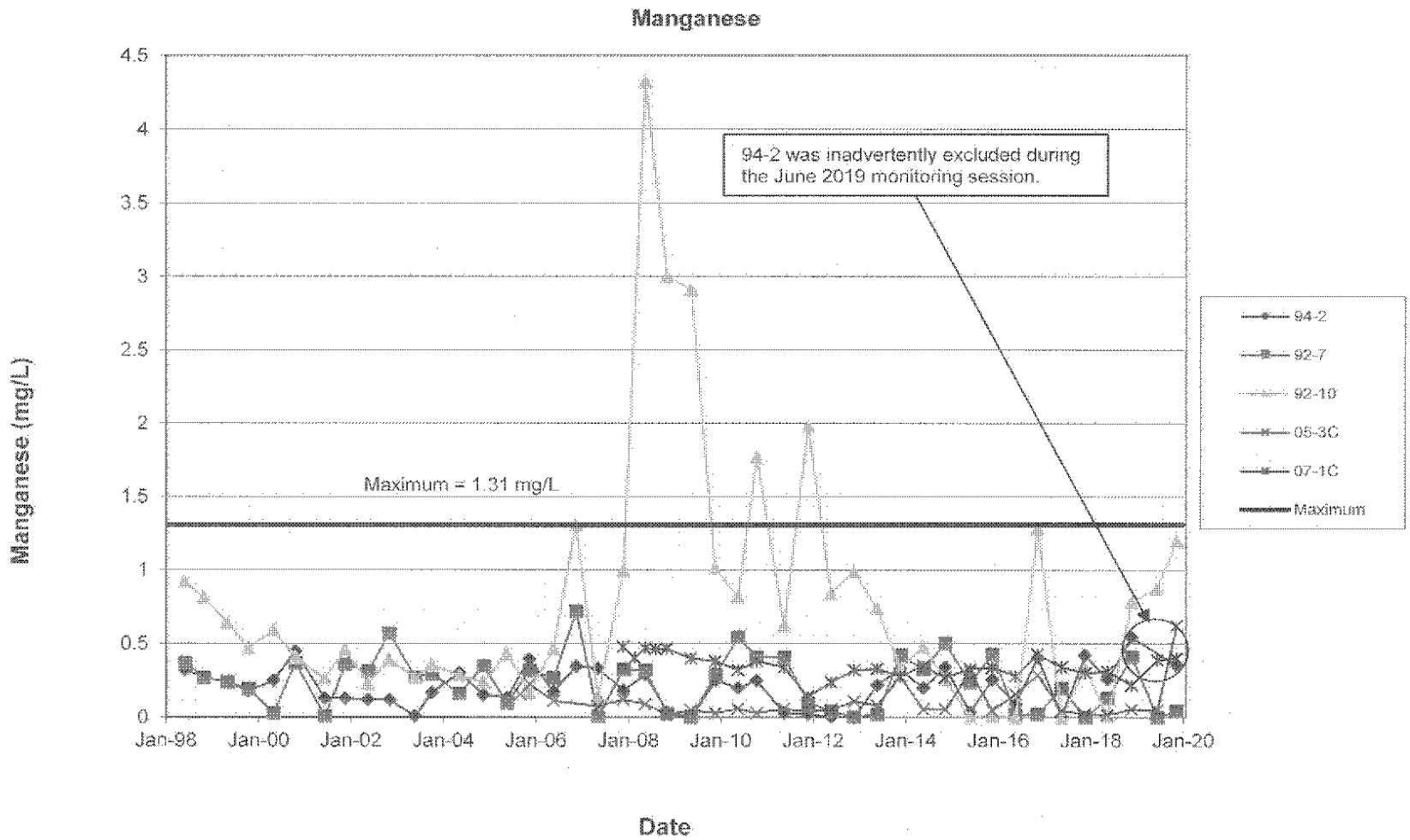

FIGURE FB7

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

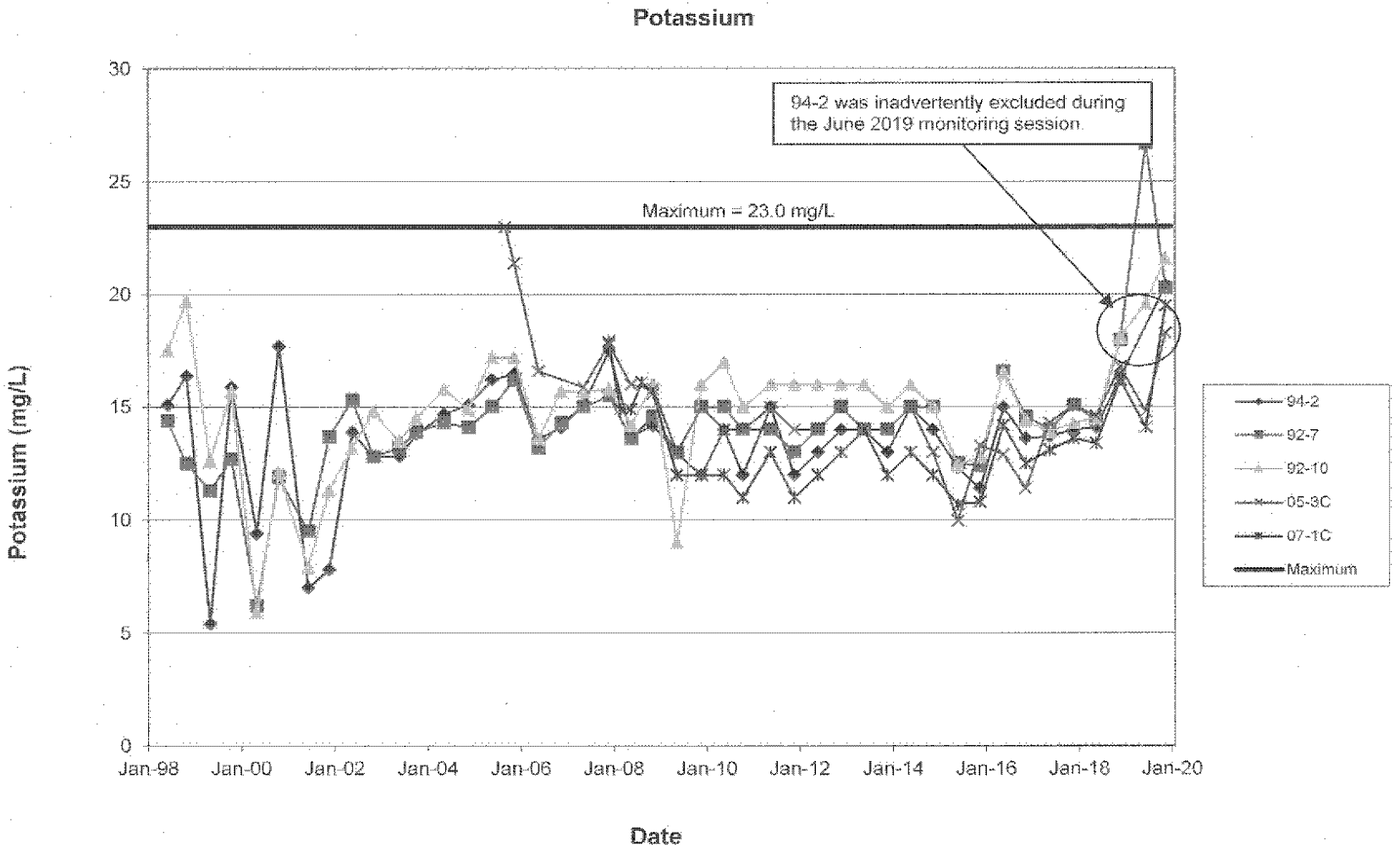

FIGURE FB8

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

APPENDIX G

Surface Water Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX H

MECP Inspection Report and Correspondence

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	Waste Connections of Canada Inc. Mailing Address: Floor 2 - 610 Applewood Cres, Vaughan, Ontario, Canada, L4K 0E3 Physical Address: Floor 2 - 610 Applewood Cres, Vaughan, City, Regional Municipality of York, Ontario, Canada, L4K 0E3 Telephone: (905)532-7510, Extension: 7415, email: chris.visser@wasteconnections.com Client #: 2344-AM3NKK, Client Type: Corporation, NAICS: 562110		
Inspection Site Address:	Navan Landfill Address: 3354 Navan Rd, Ottawa, City, K4B 1H9 District Office: Ottawa GeoReference: Map Datum: NAD83, Zone: 18, Accuracy Estimate: 10-30 metres eg. Medium Quality GPS, UTM Easting: 460890, UTM Northing: 5030224, Site #: 9411-7BDU2B		
Contact Name:	Henri Huneault	**Title:**	Site Manager
Contact Telephone:	(613)824-7289 ext	**Contact Fax:**	
Last Inspection Date:	2018/10/18		
Inspection Start Date:	2019/09/12	**Inspection Finish Date:**	2019/09/12
Region:	Eastern		

1.0 INTRODUCTION

On September 12, 2019 Senior Environmental Officer A. Cappello of the Ministry of the Environment, Conservation and Parks (Ministry), Ottawa District Office conducted an inspection of Waste Connections Canada (WCC), formerly Progressive Waste Solutions Canada Inc. Navan Waste Recycling and Disposal Facility located at 3354 Navan Road in Ottawa, Ontario (the Site). The purpose of this inspection was to assess WCC's compliance with the requirements of the Environmental Protection Act, R.S.O. 1990, c. E. 19, as amended (EPA), Ontario Regulation 347 (O.Reg 347) and Provisional Certificate of Approval Waste Disposal Site Approval A460702.

Prior to conducting the inspection, available data and information, including the ECA and notices, previous inspection reports and the 2018 Operations and Monitoring Report report were reviewed. The 92.85 hectare waste management facility that includes a 40 hectare landfill and processing operations is located on the west side of Navan Road, south of Renaud Road. The adjacent properties include residential homes, the Mer Bleue Bog and commercial properties. The Site is secured with fencing, marsh areas, berms, ditches and a locked gate. WCC employs approximately 26 people and operates Monday to Saturday from 7:00 until 6:00 p.m. with Site preparations occasionally taking place on the weekend. The inspection included an interview and Site tour which were provided by Mr. Henri Huneault, Site Manager.

The Site is permitted to receive waste generated within the Province of Ontario while the processing site may accept waste generated within Outaouais and the Province of Ontario. No waste from the City of Toronto shall be accepted for disposal or for processing at the Site. The Site is permitted to accept only solid non-hazardous municipal waste, asbestos waste, commercial and institutional (IC&C) waste including construction and demolition waste, dry non-putrescible domestic waste and impacted soil. Similarly at the processing site only solid non-hazardous municipal waste excluding putrescible waste shall be accepted.

In June 2015 WCC received approval to operate a Soil Treatment Pad at the landfill and processing facility. Notice 8 under ECA A460702 provides the governing operational requirements for the soil remediation pad, including, training

of personnel, sampling and analysis, uses of soil post soil remediation.

Active landfilling was undertaken in the Phase 1 of the landfill between January and October of 2018 followed by Phase 4 area in October through to the end of December 2018. Other activities undertaken at the Site include the excavation of the east cell identified as Phase 6, continued recycling operations at the facility with treatment of hydrocarbon impacted oils, screening of oversized materials and the pre-treatment and disposal of collected leachate to ROPEC for off-site treatment.

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):
Provisional Certificate of Approval No. A460702, dated April 16, 2009, was issued to Waste Services (CA) Inc., now WCC. The approval officially revoked and replaced the previous approval that was dated May 12, 2006 due to the Site's expansion. The following summarizes the notices that have amended ECA No. 460702:

Notice No. 1 dated October 9, 2009: Permitted construction of base liner and leachate collection system for Phase 1
Notice No. 2 dated August 4, 2010: Widening of Navan Road
Notice No. 3 dated November 1, 2010: Landfill gas odour control system
Notice No. 4 dated April 29, 2011: Financial assurance update (processing Site)
Notice No. 5 June 13, 2012, Notice No. 5: Financial assurance update (processing Site)
Notice No. 6 dated: Financial assurance update (processing Site)
Notice No. 7 dated February 25, 2014: Financial assurance update (landfill)
Notice No 8 dated June 8, 2015: Soil Treatment Pad
Notice No. 9 dated February 1, 2016: Financial assurance update (landfill)
Notice No. 10 dated March 14, 2017: Financial assurance update (combine landfill and processing site FA)

Amended Environmental Compliance Approval (Air) No. 3536-8APNZD was issued to on November 24, 2010 for the approval of one flare, one candlestick flare, one lot of natural gas heating, ventilation and air conditioning equipment and one leachate pumping facility. The conditions of the Air ECA were not included in this inspection.

2.1 FINANCIAL ASSURANCE:

Specifics:
Condition 15 (a) through (e) updated in Notice No. 10 dated March 14, 2017 outlines the financial assurance (FA) requirement for the landfilling and processing operations. The most recent notice combined the FA requirements for the landfill and processing site.

WCC is required to provide FA in a form acceptable to the Director in the amount of $13,914,411 (cumulative payment) no later than January 31, 2018. Condition 15 (d) states that the financial assurance will be reviewed every three years starting on January 18, 2018. WCC is currently in compliance with their financial assurance requirements.

2.2 APPROVED AREA OF THE SITE:

Specifics:
The Site is approved for the use and operation of a 40 hectare footprint within a total waste disposal site of 92.85 hectares. Litter fences to control windblown litter were observed at the top of the landfill mound on the active face.

2.3 APPROVED CAPACITY:

Specifics:
The capacity of the Site is 7,600,000 cubic meters. The Site is permitted to receive up to a maximum daily rate averaged over a year, including daily and interim cover, of 1,500 tonnes per day. The maximum annual amount at which the Site can receive waste for disposal is 234,750 tonnes. The 2018 Operations and Monitoring Report (2018 AMR) stated a total of 408,041 tonnes of materials entered the Site. Of this total, 233,994 tonnes (57.35%) were received as landfill materials, 14,712 tonnes (3.61%) were recycled and removed from the Site and an estimated 50.7 tonnes (0.01%) were waste materials rejected and removed from the Site by WCC for alternative disposal at another licensed facility. Other materials received for re-use on Site included 11,935 tonnes (2.92%) of rock, brick, concrete and rubble re-used as aggregate for road construction, 5,623 tonnes (1.38%) of clean fill, topsoil, and asphalt re-used on Site for final grading, road/pad construction and engineered fill, 31,726 tonnes (7.78%) of treated soils re-used for final cover and structural fill in the east buffer area; and 110,000 tonnes (26.96%) of special materials such as storm sewer screenings and impacted non-hazardous soils that were received at the Site for re-use as cover material.

The life expectancy remaining for the Site as of January 1, 2019 is estimated to be approximately 7.71 years to 11.4 years although the actual life of the landfill will vary based on annual fill rates, in-place waste density, waste diversion and recycling initiatives.

2.4 ACCESS CONTROL:

Specifics:
The Site was inspected on September 12, 2019 at a time when facility was open to the public. During the Site inspection, the scale house with both an incoming and outgoing scale was observed. Mr. Huneault confirmed the scale house attendants are trained to assess incoming loads of waste to ensure only solid non-hazardous waste that is not putrescible is contained in the vehicles. The scale house attendant also confirms compliance with Condition 34 which states only waste from the Province of Ontario, is accepted at the Site. In addition, the scale house attendant confirms compliance with Condition 35 which states only waste generated within the Outaouais and Province of Ontario, may be received at the Processing Site. Waste from the City of Toronto shall not be accepted at the landfill or at the processing site. WCC also employs a screener who is positioned near the active face and uses a CB to communicate with other employees. It is the screener's responsible to identify truck containing unacceptable waste and to scare away the birds.

On occasion, unwanted or inappropriate wastes may be found at the landfill Site such as putrescible wastes or liquid industrial wastes. WCC has a standard operating procedure to identify and remove the waste appropriate for disposal at another licensed facility. WCC completes a Rejected Waste Form and submits the notification to the Ottawa District Office as required in Condition 133. In 2018 the ODO received fifteen Rejected Waste Form notifications via email.

2.5 COVER MATERIAL:

Specifics:
Cover material requirements are outlined in Conditions 55, 56 (a) though (c) and 57 through 60. Acceptable materials used for daily cover include clean aggregate, foundry sand, wood chips and contaminated soil. Condition 56(a) requires daily cover in the amount of 150 mm be applied at the end of each working day. Since the Site was operational during the Site inspection this daily cover had not yet been applied. The active face was confined to one area and the use of screen fencing was being utilized to control litter. Contaminated soil deposited at the Site is a big component of the daily cover used. Hydrocarbon impacted soils are brought to the pad for processing. One WCC employee is responsible for assessing compliance with Condition 139.1 and associated analytical results confirming the soil is solid non-hazardous waste.

A Special Waste Profile is completed for any foundry sands, contaminated soils and asbestos waste.

Condition 56(b) requires intermediate cover in the amount of 300 mm be applied in areas where landfilling has been temporarily discontinued for six months or more. Intermediate areas were well covered and no windblown litter present. Numerous trees have been planted to add to the existing screening at the Site to restrict the view of the recycling storage area.

Condition 56(c) requires final cover in the amount of 900 mm of clay and 150 mm of top soil shall be applied on waste areas that have reached final contours. Outer bermed areas of the Site have received grading and tree planting activities to promote a visually appealing look of the Site.

Condition 57 requires existing intermediate cover material that has eroded such that waste is exposed, the cover material shall be promptly replaced. It was reported that erosion issues are part of the weekly inspections at the Site that generally erosion has not been an issue.

2.6 WASTE BURNING:

Specifics:
Condition 54 prohibits the burning of waste, including wood waste and brush at the Site. No evidence of burning was observed during the Site inspection.

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Specifics:
The monitoring at the Site consists of water quality analysis of surface water, groundwater and leachate. The monitoring program is outlined in Conditions 109 and 112 of ECA A460702. Condition 109 requires WCC to carry out groundwater and surface water monitoring and Condition 112 requires a Professional Geoscientist or Engineer

possessing the appropriate hydrogeological training and experience to execute or directly supervise the execution of the groundwater monitoring and reporting program. Currently Golder Associates Ltd (GAL) completes the sampling programs which meets the requirements of Condition 112. Results of the monitoring program are detailed in the 2018 Operations and Monitoring Report (herein after referred to as the 2018 Annual Monitoring Report/AMR).

The 2018 AMR states the following: "Groundwater at the Navan Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weather clay zone, an intact (unweathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present up-gradient, at the down-gradient edge (used to asses compliance) and further down-gradient of the landfill in each of these units". Water quality monitoring programs are carried out twice annually for groundwater and three times annually for surface water and leachate. Surface water quality monitoring was completed on May 23rd, August 30th and November 28th of 2018. Leachate was sampled at the pump station on May 23rd, August 30th and December 19th. Groundwater quality monitoring was completed on May 15th, August 30th and November 22, 2018. Groundwater monitoring wells further in the Mer Bleue Bog were sampled on August 30th, 2018.

The Ministry has stated that the Reasonable Use Guideline is not applicable at this Site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanisms (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately downgradient from the landfill, which are used to assess compliance, were graphed and visually checked for exceedances of the 1998 to 2017 background range.

The following comments were made in the AMR:

In 2018, one confirmed exceedance of trigger concentration was reported in November for manganese concentrations reported at MW05-8 (with three successive exceedances with an increasing trend) and one confirmed exceedance of the trigger concentration was reported in November for boron at MW05-11 (three successive exceedances with a spike or short duration increase trend). WCC notified the ODO (the undersigned provincial officer) by telephone on March 6, 2019.

The AMR also states that although the manganese concentrations reported at MW05-8 are not believed to be caused by landfill leachate, the boron exceedances combined with increasing trends in concentrations for other Leachate Indicator Parameters indicated that the operating issues experienced in the fall with leachate pumping and disposal activities having to be stopped for long periods of time have had an impact to groundwater collection system (less than 10 metres south of the leachate collection system and close to the south toe collector). High groundwater table elevations reported at downgradient locations in the spring of 2017 and 2018 may have also contributed to the exceedances reported prior to November 2018. The results from the 2019 sampling program will be analysed to determine the need for a formal contingency plan.

In addition, the groundwater and surface water trigger mechanism report prepared by GAL demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are no potential impacts from landfill activities. Naturally elevated parameters measured include boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

The approved groundwater monitoring program was followed, except that as discussed in Section 1.0, groundwater monitoring locations BH09-1A, BH09-1B, BH09-1C and BH09-1D were not sampled during the winter of 2017 due to historical conditions of frozen water in the monitoring wells; these wells were sampled instead during the summer session on August 28, 2017 for BH09-1D and fall sessions on November 29, 2017 for BH09-1B and BH09-1C (frozen conditions were observed at BH09-1A during the fall session).

The 2019 AMR will be reviewed by the Ministry's hydrogeologist upon receipt in the new year.

Surface Water

Surface water and leachate sampling was completed on May 23, August 30, and November 28, 2018. The only deviations from the approved surface water monitoring program were that due to dry or stagnant conditions, surface water monitoring station S5, S8, S9, S12 and S20 were not sampled in August monitoring session.

A total of eleven surface water stations are monitored to obtain representative information on water quality up-gradient from the landfill and to assess compliance at down-gradient stations. Analytical results for up-gradient surface water stations show the surface water quality of characterized by concentrations of the following parametres which exceed or are outside the PWQO: cadmium, chromium, cobalt, dissolved oxygen, iron, lead, phenols, total phosphorus and zinc. Surface water quality is generally consistent over time with seasonal variability. GAL concluded that increases in concentrations of parameters at these locations is not related to leachate impact as these stations are up-gradient of

the site.

Analytical results for the down-gradient surface water stations are summarized in the table under section 7.2.2. Landfill Monitoring Report. Exceedances of the PWQO are various parameters, including the following; dissolved oxygen, iron, total phosphorus, boron, cobalt, phenols, cadmium and lead. These exceedances were observed in monitoring stations S10, S11 and S12. GAL's report states that the concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the August and November 2018 monitoring sessions were generally similar or lower than the surface water quality at the up-gradient station S16 during the same session. Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed.

Leachate

The leachate monitoring program following the program outlined in Conditions 109 and 112 of the ECA A460702. Leachate quality analysis was undertaken on samples obtained from the pump station (L5) during the May 23rd, August 30th and December 19th monitoring sessions. Due to the leachate pump being out-of-service during the November sessions, no sample could be collected at the time, therefore a sample was collected in December.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation because the landfill is underlain by a thick natural clay deposit that performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater but is predominantly precipitation that has infiltrated through the waste pile.

As reported in the 2018 AMR, average concentrations indicated that landfill leachate is distinctly different from most other landfill sites in Ontario as most analytes measured have a much lower concentrations. Leachate quality monitoring results for 2018 indicates that leachate generated at the Site is not significantly different from previous monitoring events. The results indicated that leachate generated at the Site continues to be a relatively weak wastewater when compared to municipal landfill leachate.

2.8 LEACHATE CONTROL SYSTEM:

Specifics:
Condition 86 of the ECA requires that the leachate management system be managed and operated as described in Item 41 in Schedule A attached to the ECA. Item 41 is the Design and Operations Manual approved for the landfill in January 2008. An elaborate perimeter leachate collection system (LCS) and surface water diversion works are installed, maintained and monitoring at the Site. Surface water is diverted around the landfill footprint by a series of perimeter ditches that divert water around and away from the landfilling area. WCC uses a clay cover system when waste has reached the approved fill heights in addition to the installation/planting of vegetation cover while berms and swales divert surface water to perimeter ditches. Surface water is also managed through re-vegetation, installation of silt fencing, applying topsoil over and seeding of the finished surfaces. Storm water retention ponds have been constructed on the east and west sides of the waste mound as part of the surface water management.

The existing leachate management system includes an underlain system in the northwest corner of the existing waste footprint. This area is connected via perforated HDPE pipe to a perimeter leachate collection trench. It consists of a granular-filled trench and perforated drainage pipe which runs along the west and south edges of the waste mound and also extends approximately 150 metres north from the location of the pump station. An underlain leachate collection system also exists in Phase 4, 5 and 1.

As reported in the 2018 AMR, leachate quality monitoring results for 2018 indicates leachate generated at the Site is not significantly different from previous monitoring events. All leachate was pre-treated and pumped via forcemain to the City of Ottawa's sewer system for final treatment at the City's wastewater treatment plan, Robert O Pickard Environmental Centre. The AMR indicated that one Notice of Violation was issued by the City of Ottawa for a leachate overflow that occurred at the sampling manhole located on Renaud Road on September 18, 2018.

Condition 93 requires the leachate collection system piping for each stage of the landfill be inspected annually for the first five years after waste placement and then as often as future inspections indicated to be necessary. The forcemain carrying the leachate to the sewer system was flushed and cleaned three times in 2018.

A leachate spill occurred on September 18, 2018 at WCC's sampling manhole located in the east shoulder of Renaud Road, at the intersection of Page Road. The spill of leachate was caused by blockage in the discharge pipe which connects to the City's system. The City of Ottawa's on contract spill response company NCM responded dislodging the blockage using a vacuum truck. WCC also shut down their system at approximately 9:20 p.m. WCC estimated that approximately 65 m3 of leachate spilled to the road surface and to a grassed area immediately adjacent to the manhole. Leachate also entered catchbasins along Renaud Road which discharge to a stormwater retention pond.

The cause of the blockage was likely related to the forcemain cleanout performed by RSR Environment Inc. that had taken place earlier in the day on September 18th. RSR Environment completed a pump sequence to verify the systen was operating and flowing without obstruction. During the 2018 inspection, it was reported that WCC updated their Forcemain Cleanout SOP to include monitoring at the manhole after the clean-out procedure to ensure this type of incident does not occur again. Mr. Huneault reported that WCC is now monitoring the manhole on a weekly basis. The biannual clean-up procedure has not been yet been updated to include the contingency plan of testing for two days to ensure the leachate forcemain is flowing as expected. Please refer to Section 6.0 Other Inspection Findings.

2.9 METHANE GAS CONTROL SYSTEM:

Specifics:
Condition 84 requires that any buildings or structures at the Site contain adequate ventilation systems to relieve any possible landfill gas accumulation. Routine monitoring for explosive methane gas levels shall be conducted in all buildings or structures at the Site, especially enclosed structures which at times are occupied by people. WCC shall ensure landfill gas alarms are installed and working properly in all existing and proposed Site buildings. It was reported that monitoring is completed monthly and all associated equipment is calibrated by the contractor Armstrong on an annual basis. The 2018 AMR (Report of Landfill Gas Monitoring, section 4.3) states that gas monitors are installed in three on-Site buildings, including the scale house and have not been triggered to date.

As part of the 2009 Landfill Site Expansion, a gas collection and flaring system was approved under ECA No. 6733-7BYS9A as an interim odour control system and is not intended for a landfill gas collection system. The construction of the system was initiated in November 2010 and the flare is now operational using three landfill gas wells to supply the gas to combust. Since the landfill gas has a methane content that will burn no supplemental natural gas supply is needed. The landfill gas odour control system was extended in the fall of 2016. An additional 7 landfill gas collection wells were installed on the east and west sides of the landfill in December 2017. WCC stated that the expansion of the landfill gas collection system was delayed as the elevation required for installation was not reached when anticipated due to wet conditions over 2017 and the reduced amount of waste received. Mr. Huneault reported that four additional landfill gas collection wells were recently installed.

Condition 110 requires annual sampling of the landfill gas according to Item 41 on Schedule A and include on sampling session during the winter when the ground is frozen. The 2017 AMR states that landfill gas monitoring was undertaken in May, August and December 2018 by GAL - methane gas was less than 5% of the Lower Explosive Limi (LEL) was found at most locations. Non-methane organic compounds do no present an emission problem at the Site.

Local residents can file complaints related to the Site through The Friends of Mer Bleue (FOMB) website. Each complaint is forwarded to executives of the FOMB, WCC, MECP and City Councillor's office. The Ministry received odour complaints through the FOMB website November 1, 2018, October 12, 2018, January 13, 2019, May 15, 2019, June 18, 2019 and July 19, 2019. WCCs documents all complaints in the AMR.

2.10 OTHER WASTES:

Specifics:
The Site utilizes last harvest at the active face for additional recyclable capabilities; an excavator with a grappler and magnet allows for easy removal of metals, wood and bulky items. The wood and metals are recovered and moved to a recycling area.

Condition 37 allows House Hazardous Waste (HHW) events. The residential sources (generators) must bring their own wastes to the Site. The wastes are to be received by a hazardous waste carrier permitted through a valid approval to receive, temporarily store and transport HHW to an approved waste disposal Site. All HHW collected by the hazardous waste carrier must be removed from the Site within 24 hours of the completion of the household hazardous waste collection event. WCC hosted a HHW event on Sunday June 3, 2018 when the landfill was not open. The HHW event is always held on a Sunday to ensure there is no confusion between the HHW event and the landfill operations.

Condition 39 requires WCC provide a segregated area for the storage of white goods at the processing site to ensure refrigerant appliances accepted at the Site which have not been tagged by a licensed technician shall be store in a segregated clearly marked area, in an upright position. In addition, Condition 39 requires the white goods to be stored in a manner which allows for the safe handling and to allow the removal of refrigerants. Mr. Huneault confirmed two WCC employees are licensed to remove refrigerant from appliances; Vince Giamberardino (OPD expiry date in January 2024) and Simon Ricard (ODP expiry date June 2023). The binder that contains all tags was reviewed at the time of the Site inspection which showed ODPs are removed approximately 1-2 times per month. At the time of the inspection, white goods were observed to be stored mostly in an upright position, segregated with those that had been tagged. Mr. Huneault also reported that gas recovery company that picks up the freon is Wieners Wholesale Group Inc.

Condition 52 requires that WCC ensure that no more than two hundred twenty-five (225) tonnes of unprocessed and residual waste materials from processing operations shall be stored on Site at any time. Due to space restriction, the amount of unprocessed material is minimal and has never reached close to 225 tonnes.

Condition 65 requires that no waste is received, landfilled or removed from the Site unless a Site supervisor or attendant is present and supervises the operation. At the time of the Site inspection a site attendant was observed present at the active face.

Condition 66 requires that the Site is operated and maintained in a secure manner. The entrance to the Site off Navan Road has a locked gate and portions of the property are fenced. The east side of the property has an extensive ditch system where it is difficult to walk or have vehicles gain access. The south side is fenced to prevent access with snow machines while the west side has marsh land and a ditch. Along the north side of the Site there is a ditch and berm. WCC also has a security camera system and a security guard present for off hours.

Condition 67 requires a sign be installed and maintained at the entrance including the name of Site, owner, ECA number, hours of operation, allowable wastes, telephone number for complaints, 24 hour emergency number, warning against dumping outside the Site and a warning against unauthorized access. A sign meeting all the requirements was observed during the Site inspection.

Condition 70 requires the Site be operated and maintained so that dust, litter, odour, noise, vermin, vectors and traffic do no create an off-Site adverse effect. Mr. Huneault reported that vermin and vectors are not a problem at the Site but these is a pest control program at the Site. Litter is controlled with fencing that is repositioned based on the wind direction. Off-site odours are addressed in Section 2.9 of this report.

Condition 72 addresses dust control at the Site. Dust is controlled on Site by subcontracting CTM Sweeping to clean the yard and Navan Road on an as needed basis, the use a wheel wash to minimize the amount of dirt tracked to the road as well as the use WCC's own sweeper.

Conditions 76 through 83 outline the requirements to accept, handle and dispose of asbestos-containing waste at the Site. Currently WCC accepts asbestos waste from 8:00 a.m until 10:00 a.m with 24 hour notice although WCC will accept asbestos waste without the notice if it conducive to what is happening at the landfill that day. WCC ceases normal landfilling activities when asbestos is to be disposed at the active face. Asbestos waste is deposited in a pit which is then covered by either cover or waste materials to shield the workers from exposure. WCC employees wear protective equipment including masks and tyvek suits and all are provided with training to safely handle asbestos waste.

Condition 88 requires all employees that operate any aspect of the Site shall have the appropriate training. Mr Huneault reported that training is completed on a monthly basis. A summary of the training history of each employee is documented in their employee file. Training includes, but is not limited the following topics; Fire Prevention Plan and Flammable and Combustible Liquids, Asbestos, Lockout/Tagout, Confined Space, Heat Street, Cold Stress, Electrical Safety, Trench Protection, Respirator, Hearing Conservation, Material Sorting and Bailing, Material Handling, Coolant Policy, Maintenance Policy: Coolant, Fuelling, Preventative Maintenance Schedule, Heavy Equipment, Support Equipment, Battery Switch Policy, Daily Inspection Policy, Fuelling Policy as well as monthly safety meetings. All employees are also trained in the new employee handbook.

Condition 89 requires a daily inspection that includes assessing the adequacy of the daily cover material, evidence of unacceptable waste or illegal dumping, the need for dust control on working areas or access roads, unacceptable levels of odours and evidence of leachate discharge to the surface in the immediate vicinity of the working face. WCC currently conducts daily inspections for these items which are addressed immediately. Daily inspection are not currently documented as it part of the on-going operation of the Site where as weekly inspections are written reports.

Conditions 90 and 91 require a variety of items to be inspected on a weekly basis and are documented by WCC staff. Currently Mr. Huneault reviews and signs off all weekly inspections and ensures issues are rectified by not seeing the same item on the following week's report. Condition 132 requires the weekly inspection be documented and include the date and time of inspection, name, title and signature of trained personnel conducting the inspection, a listing of all the areas inspected and any deficiencies observed and recommendation for remedial action and the completion date of such action. Mr. Huneault provided an updated weekly inspection form that includes a column for corrective actions required/comments.

Condition 125 requires WCC to respond and document all complaints received at the Site. As discussed in Section 2.9 of this report, the number of complaints reduced significantly once the landfill gas collection system was expanded and operational. Section 4 of the 2018 AMR documented all of the odour complaints received.

Condition 133 requires that a record be kept of all waste refusals including the reason for the refusal and origin of the waste, if known. WCC provided the undersigned officer of fifteen occurrences of waste refusals in 2018.

Conditions 135 and 136 outline the submission and information requirements for the annual report. The 2018 AMR was received at the ODO within the specified timeline and contains the required documentation.

Condition 139.1 (1) was added to ECA A460702 in Notice No. 8 issued June 8, 2015 which states no contaminated soil other than soil impacted with petroleum hydrocarbons (PHCs), volatile petroleum compounds (VOCs, including benzene, toluene, ethylbenzene, xylenes), low molecular weigh polyaromatic hydrocarbons (PAHs, including naphthalene) may be accepted for processing at the Soil Treatment Pad. Condition 139.2(1) requires documentation from the generator showing the origin of the contaminated soils, verifying that is a solid non-hazardous waste and characterizing its contaminating constituents. WCC current practise is to analyze the contaminated soil accepted at the Site on a job by job basis. A Special Waste Profile is completed for each job, which also includes the required analytical results and is assigned a job number. Each job is segregated on the Soil Treatment Pad and labelled with the job number. The windrows with the associated job numbers were observed during the Site inspection. WCC has not accepted any contaminated soils from emergency spills response. Sampling requirements outlined in 139.3 (1) are completed and submitted to AGAT Laboratories. All treated soil is used as daily over on the Site - therefore reporting outlined in 139.6(1) has not been required (no off-Site disposal).

Ontario Regulation 347 requires landfill sites larger than 1.5 million cubic meters to report annually on the greenhouse gas reductions being achieved at the Site. The Navan Landfill meets the regulation requirements and submitted the required Landfill Data Collection Form electronically to the Ministry.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

The 2017 inspection did not identify any non-compliance issues.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate?
No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?
No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ?
No

Specifics:

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?
No

Specifics:

Was there any indication of minor administrative non-compliance?
No

Specifics:

5.0 ACTION(S) REQUIRED

Pages 199 to / à 203

are not relevant

sont non pertinentes

ATTACHMENT 2

Report on 2019 Landfill Gas Monitoring

GOLDER

REPORT

2019 Landfill Gas Monitoring Report

Waste Connections of Canada
Navan Waste Recycling and Disposal Facility
Ottawa, Ontario

Submitted to:

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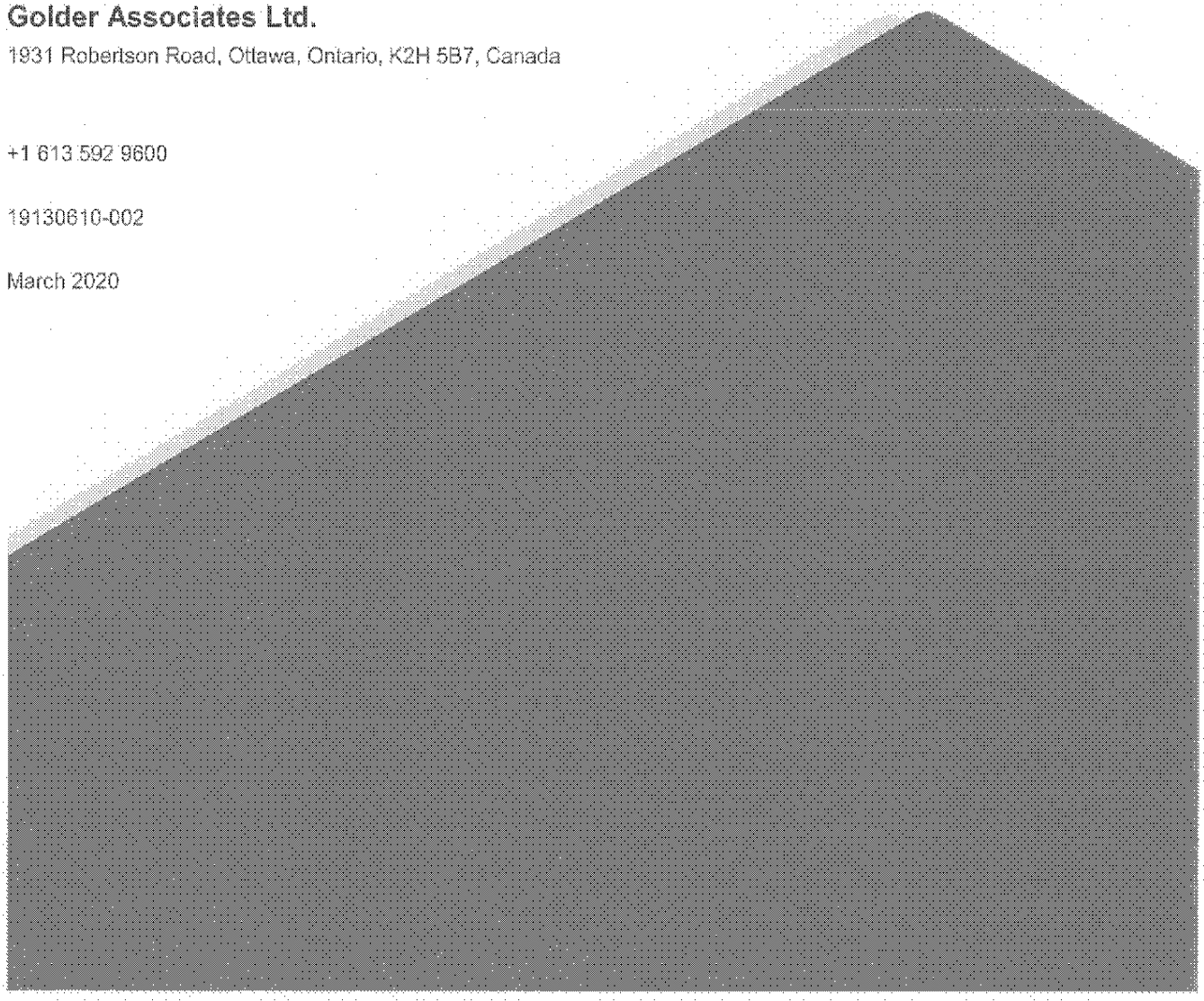
March 2020



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Executive Summary

This report serves as the landfill gas (LFG) monitoring portion of the 2019 site operations and monitoring report and presents the results of LFG monitoring activities carried out during 2019 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility). This report has been prepared to fulfill the reporting requirements outlined in Condition 110 of Environmental Compliance Approval No. A460702 dated April 16, 2009.

The following executive summary highlights key points only; for complete information and findings it is necessary for the reader to examine the complete report.

LFG monitoring was undertaken in June, August and December 2019. At most locations monitored, methane gas was less than 5 percent (%) of the Lower Explosive Limit (LEL). Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 25% LEL (or 1.25% by volume for the spring session) at the following locations:

- Monitoring well OW92-8 (G15) in December 2019
- MH-10 (G-2a) in August and December 2019
- MH-9 (G3-a), MH-7 (G5-a), MH-6 (G6-a), MH-4 (G-12a), MH-3 (G13-a) and the tank truck loading station MH (G-84a) in December 2019

It is noted that no location during the spring 2019 monitoring session reported a methane concentration in excess of 25% LEL nor in excess of 1.25% by volume.

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the WCC Navan Facility based on the 2019 monitoring results. Although no monitoring locations are available below surface at the property boundary, it is anticipated that the WCC Navan Facility met the property boundary requirements in 2019.

Hydrogen sulfide was not detected at any location during the 2019 monitoring events, with the exception of the following locations, which reported relatively low detections:

- Monitoring Wells OW-94-2 (G-8), 05-R3 (G-9) and MH-4 (G-12a) in June 2019
- Collector MH (G-26i) in August 2019

It is noted that an interim LFG odour control system (refer to Section 3.4) was installed in 2011 and commissioned in April 2012. Extensions to the LFG odour control system were installed in 2016, 2017 and the fall 2019. The additional vertical wells installed in 2017 and 2019 are intended to be part of the future permanent LFG collection system. The purpose of this system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells.

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APPENDIX A
2009 Landfill Gas Characterization

1.0 INTRODUCTION

This report serves as the landfill gas (LFG) monitoring portion of the 2019 site operations and monitoring report and presents the results of LFG monitoring activities carried out by Golder Associates Ltd. (Golder) during 2019 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility).

The WCC Navan Facility is located at 3354 Navan Road on part of Lots 2, 3, and 4, Concession IV, Ottawa Front, in the City of Ottawa as shown in Figure 1. This site is operated under Environmental Compliance Approval (ECA) No. A460702 and Certificates of Approval (air) No. 6141-59XKF9 and No. 3536-8APNZD.

This report has been prepared to fulfill the reporting requirements outlined in Condition 110 of ECA No. A460702 dated April 16, 2009.

2.0 CHARACTERISTICS OF LANDFILL GAS AT THE WCC NAVAN FACILITY

The presence of typical LFG is indicated by a reduction in nitrogen (N_2) and oxygen (O_2) and elevated concentrations of carbon dioxide (CO_2), methane (CH_4) and hydrogen sulfide (H_2S) when compared to atmospheric air as described in the table below. The main constituents of typical LFG are CO_2, CH_4 and H_2S. Other parameters such as mercaptans and volatile organic compounds can be present in LFG but at lower concentrations. LFG at the WCC Navan Facility was characterized in 1994, in 2002 and in 2009. The average composition of WCC LFG at the monitored locations is provided in the table below. It is noted that the LFG composition presented herein is not representative of the composition in the LFG collection and flaring system. The raw data from the 1994 and 2002 characterizations is provided in Table 1 and the data from the 2009 characterization is provided in Appendix A.

Select Gases	Sea-Level Composition of Air[1] (15°C and 101 kPa) (% by Volume)	Average WCC LFG Composition November 1994 (% by Volume)	Average WCC LFG Composition June 2002 (% by Volume)	Average WCC LFG Composition 2009* (% by Volume)
Nitrogen, N_2	78.1	77.5	78.4	NM
Oxygen, O_2	20.9	19	20.6	14.6
Carbon Dioxide, CO_2	0.03	2.7	0.5	12.6
Methane, CH_4	0.0002	1.3	0.2	14.1
Trace Elements	<0.01	NM	NM	NM

Notes:

[1] Source: CRC Handbook of Chemistry and Physics by David R. Lide, Editor-in-Chief, 1997 Edition.

* The averages were calculated using data from all Maintenance Holes and cleanouts (both measured with tubing) over the six monitoring sessions.

NM – not monitored

3.0 ENGINEERING SYSTEMS

From a hydrogeological perspective, the WCC Navan Facility is favourably situated on a thick deposit of low permeability, Champlain Sea clay (Leda Clay). The site is characterized by a shallow groundwater table. This is overlain by a thin sand cover, through which gas migration can occur. The west and south perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends to the water table. This drainage system, combined with the natural subsoil conditions, a perimeter buffer area and constructed low permeability barrier systems are considered to have significantly reduced the potential for off-site migration of LFG. The engineering systems in place at the WCC Navan Facility to safeguard against off-site migration of methane gas are discussed below.

3.1 Buffer Area and Natural Barrier System

The WCC Navan Facility is designed with a buffer area and natural barriers. The site has a favourable hydrogeological setting whereby the site is underlain and surrounded by a thick clay deposit of low permeability. The depth below grade to the water table at the perimeter of the site is shallow. The depth of the landfill between the ground surface and the water table is less than 2.5 metres. The Ministry of the Environment, Conservation and Parks (MECP) *Guideline for Assessing Methane Hazards from Landfill Sites* (Ministry of Environment, 1987) considers that methane gas migration of any significance may extend for a distance of ten times the depth of the landfill between the ground surface and the water table. Based on site conditions, this 10:1 general rule would suggest that methane migration could extend for a distance of 25 metres. The north, west, south and east sides of the landfill footprint are surrounded by buffer zones of 30 to 70 metres, 100 metres, 10 metres and 140 metres, respectively. Note that on the south side of the landfill a 10-metre buffer zone exists between the south limits of the waste mound and the VIA Rail right-of-way (ROW) and an additional buffer strip with a width of 100 metres exists to the south of the VIA Rail ROW. These buffers would therefore provide adequate natural venting. The natural barriers and the provision of adequate buffer area present at the WCC Navan Facility are the preferred method of dealing with potential LFG migration.

3.2 Constructed Barrier System

In addition to natural barriers and buffer area, WCC has constructed low permeability clay cut-off walls, clay berms and intervening drainage trenches at the perimeter of the waste footprint. At the edge of the fill area, native sand and other pervious materials have been removed and replaced with less permeable compacted clay. These clay barriers, designed to minimize and contain the flow of leachate, also act as a barrier against the lateral migration of LFG. Presently, the constructed clay barriers exist along the northwest, west, southwest and southeast perimeters of the fill area. As development of the landfill progresses, clay barriers will be constructed along the east and northeast perimeters. In 2019, WCC continued to construct the east buffer adjacent to the waste limit of the east cell in Phase 1. An intervening trench or excavated drainage ditch with its base at an elevation lower than the base of the waste pile and/or water table is also present at the perimeter of the waste footprint and will intercept and force any methane to the atmosphere.

3.3 Passive Ventilation System

The leachate collection system, constructed along the west, south and east limits of the existing waste area, also serves as a passive ventilation system. A passive ventilation system is a system that prevents the subsurface migration of LFGs beyond the landfill property by altering the path of flow without the use of mechanical components.

It can be used as a general barrier to gas movement or as a protective measure for structures and/or vegetation. Maintenance Holes (MHs), installed at intervals of approximately 100 metres are effective in venting LFG as indicated by the results of the field monitoring (as discussed in Sections 4.4 and 5.0).

3.4 Interim Landfill Gas Odour Control System

As part of their commitment to control potential odorous emissions from the site, WCC has installed an interim LFG odour control system which will operate until the full-scale LFG collection system is installed at the site in the near future.

The interim LFG odour control system, which has been constructed within the existing landfill footprint, includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells, as well as the installation of lateral and header piping, condensate management facilities, an outdoor skid-mounted abstraction plant, and a candlestick flare. During construction, some 15 leachate collection system cleanouts were excavated and the perforated pipe replaced with solid pipe and air tight connections. Tees were installed in the header pipe to allow for expansion of the interim odour control system, if required.

The interim LFG odour control system was installed in 2011 and has been operating since April 2012. Extensions to the LFG odour control system were installed in 2016, 2017 and the fall of 2019. The additional vertical wells installed in 2017 and 2019 are intended to be part of the future permanent LFG collection system.

To date, these systems have performed satisfactorily and have assisted in minimizing potential LFG problems related to the landfill operations. A permanent LFG collection system will be installed as part of the expansion of the WCC Navan Facility as the landfill cells are completed to their final elevation.

4.0 LANDFILL GAS ASSESSMENTS

4.1 Olfactive Assessment

The WCC Navan Facility is a dry waste facility and wet organic waste is not permitted for processing or disposal. Consequently, few odours are emitted from the waste pile at this site. Odours from the waste pile, when detected, are in isolated locations occurring generally from fugitive emissions at ground surface in areas of recent landfilling activity, i.e. three to ten months following waste placement. Clay cover material has been placed over the past years on areas where the final fill heights have been reached. The waste and daily/interim cover materials in areas where no clay cover has been placed are sufficiently pervious to provide good ventilation at the surface thereby preventing the accumulation of LFG. The leachate collection system constructed at the south and west perimeters of the waste footprint behave as a passive gas ventilation system. Odours resulting from LFG are, on occasion, noticeable at some of the MH openings located along the leachate collection system. These odours dissipate rapidly and are barely noticeable only a short distance from the source of the odours.

It is important to note that in compliance with the amended ECA dated April 16, 2009, the WCC Navan Facility is no longer receiving materials for composting.

Evaluation of odour is based on the subjective interpretations of WCC's on-site personnel and observations by Golder and WCC staff during site visits as well as documentation of odour complaints received from the public nearby. The site practice, when odour complaints are received at the time of the occurrence, is to carry out an investigation of the source of odour regardless of the source of origin and to follow up with the caller with the corrective measures taken or to notify them of the potential source of odour if it is deemed to be originating from an off-site source.

4.2 Visual Assessment

There are no discernible impacts on vegetation at the surface of the landfill resulting from LFG. WCC has undertaken a landscaping program at the site including seeding berms and planting trees and significant efforts have been made at the site to preserve and relocate existing vegetation. The top surface of the waste pile has not been seeded.

In the past, venting of LFG could be observed at ground surface along the west side of the landfill between MHs. The LFG venting was only noticeable once the ground surface was covered with snow. In 2019, venting of LFG at ground surface was not noticeable.

4.3 Ongoing Gas Monitoring in On-Site Buildings

Gas monitors have been installed in three on-site buildings. The monitors, that are calibrated annually, measure carbon monoxide (CO), nitrogen dioxide (NO_2) and CH_4 in the main site building, H_2S and CH_4 in the scale house, and H_2S and CH_4 in the pump station building. To date, the monitors have not detected any of these gases in the buildings.

4.4 Field Monitoring

Field monitoring with the use of portable field instruments was carried out on June 12, 2019, on August 29, 2019 and on December 17, 2019. The locations where monitoring of LFG and air quality was conducted during the last monitoring session are indicated on Figure 2. Shallow monitoring wells located along the south and north boundaries of the site were included in the monitoring program. Monitoring was also carried out at site facilities such as the leachate pump station, the maintenance garage, the weigh scale station and the leachate collection system. Other on-site locations were selected based on an olfactive and visual inspection of the site, and active landfilling operations. Some locations were selected at random. MHs that are part of the leachate collection system were included.

Monitoring for LFG was also carried out in buildings within close proximity to the landfill. These buildings are the following:

- The on-site maintenance garage
- The on-site pump station
- The on-site scale house
- WCC office at 3354 Navan Road

The ambient air at six addresses along Navan Road and two other off-site locations near the new subdivision adjacent to the site was also included in the LFG monitoring program.

Weather data was obtained from the Ottawa Airport (OTTAWA INTL A, climate ID 6106001) in Ottawa, Ontario located 17 kilometres southwest of the WCC Navan Facility for the monitoring periods of June 12, 2019; August 29, 2019 and December 17, 2019. This weather data is summarized in the table below:

Date	Temperature (°C)			Relative Humidity (%)		Precipitation (mm)			Station Pressure (kPa)			Wind During Working Hours	
	Max.	Min.	Mean	Max.	Min.	Rain	Snow	Total Precip.	Max.	Min.	Variability During Working Hours	Max Speed (km/h)	Prevail. Direct.
June 12, 2019	23.7	6.2	15.0	95	29	0.0	0.0	0.0	100.69	100.14	↓	23	S
Aug. 29, 2019	24.1	12.8	18.5	98	51	0.9	0.0	0.9	99.77	99.57	↓	21	SW
Dec.17, 2019	-2.6	-5.5	-4.1	96	83	0.0	1.8	1.1	100.58	99.46	↓	8	NE

Entered by: RPM
Checked by: YJM

The instruments used to detect and measure LFG concentrations during the various sampling events were a LANDTEC GEM-2000 Plus (during part of the spring and the full fall and winter sessions) and a LANDTEC GEM-5000 (during the other part of the spring session because the GEM-2000 Plus model was not performing optimally) Infrared Gas Analyzers.

The LANDTEC GEM-2000 Plus and the LANDTEC GEM-5000 are designed for analyzing LFG composition and calculating flow. They are handheld devices which can measure percentages of CH_4, CO_2, CO, H_2S and O_2, relative and atmospheric pressure and, in the case of the LANDTEC GEM-2000 Plus, combustible methane Lower Explosive Limit (LEL, equivalent to 5 percent (%) by volume in air for methane gas). Methane and carbon dioxide concentrations are measured by infrared gas analyzer and oxygen is measured by the galvanic cell principle. Since the LANDTEC GEM-2000 Plus was not available for the entirety of the spring session, the LEL for all locations were not reported during this session (see Table 2). Only a partial interpretation related to LEL is therefore possible for the spring session. Concentrations of CH_4 greater than 1.25% by volume are instead discussed in the next Section.

5.0 LANDFILL GAS FIELD MONITORING RESULTS

Results of the monitoring program undertaken in 2019 are presented in Table 2 for June, Table 3 for August and Table 4 for December. At most locations monitored, methane gas was less than 5% LEL. Non-Methane Organic Compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 25% LEL (or 1.25% for the spring session as indicated above) at the following locations:

- Monitoring well OW-92-8 (G15) in December 2019
- MH-10 (G-2a) in August and December 2019
- MH-9 (G3-a), MH-7 (G5-a), MH-6 (G6-a), MH-4 (G-12a), MH-3 (G13-a), and the tank truck loading station MH (G-84a) in December 2019

It is noted that no location during the spring 2019 monitoring session reported a methane concentration in excess of 25% LEL nor in excess of 1.25% by volume.

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met at the WCC Navan Facility based on the 2019 monitoring results. Although no monitoring locations are available below surface at the property boundary, based on the discussion in Section 3.1 of this report it is anticipated that the WCC Navan Facility met the property boundary requirements in 2019.

Hydrogen sulfide was not detected at any location during the 2019 monitoring events, with the exception of the following locations, which reported relatively low concentrations:

- Monitoring Wells OW-94-2 (G-8), 05-R3 (G-9) and MH-4 (G-12a) in June 2019
- Collector MH (G-26i) in August 2019

During the 2019 monitoring events, no odours were detected by Golder technician at the WCC Navan Facility during the spring and summer monitoring sessions. During the 2019 winter monitoring session, moderate, but not offensive odours were noted at the site. Strong odours were specifically noted at gas extraction well GW-1. Historically, odours have been detected in some areas (near the active face); however, they were transient and dissipated at a short distance from the source. As previously mentioned, gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2019, WCC personnel responded to twenty-one odour related complaints. The Public Advisory Committee subsequently mailed out four thousand notices to inform stakeholders of a public meeting organized by the Committee. A total of twelve people attended the public meeting and none of the people in attendance had submitted a complaint. Four vertical wells were installed on site in 2019 as part of the permanent LFG collection system which will help mitigate some of the odour present once connected to the current system.

6.0 ODOUR CONTROL

To ensure the WCC Navan Facility is operated in a manner that minimizes the impact from odour on the public and the natural environment, the following program is in place at the WCC Navan Facility to deal with odour issues.

6.1 Odour Monitoring

WCC has a comprehensive program for monitoring odours and for taking remedial action in the event that odours become at all problematic in the operation of the WCC Navan Facility. Any unusual odour events and any measures taken to deal with odour at the site are recorded and filed on-site.

There are no Ontario Government standards for odour. There are no agreed-upon, empirical measurement protocols or odour thresholds that may be used in the operation of a landfill or processing facility. Consequently,

the ultimate test of an effective odour-control strategy for any facility can only be that it produces no odour complaints from the surrounding community over an extended period of operation. The operators of the facility need to take preventative and other control measures to ensure that odours never reach a threshold where they can generate complaints. The best odour monitoring program available is to give responsibility to all staff working at the site to use their own senses to constantly monitor for excessive levels of odour on-site. While some level of on-site odour is normal and acceptable, it can become a problem when these same odours register off the property. As well, the character of the odour is significant. Many 'aerobic' odours may be very inoffensive, even at a significant concentration, while even very low levels of the types of odour associated with anaerobic activity may be deeply offensive.

It is normal practice at the site to monitor odours in the following way. Every morning, when staff first arrives on the site, a general inspection is undertaken of the facility. While the site manager is looking for anything untoward, the presence of any odours likely to extend beyond the perimeter of the site will be of special concern. In addition, whenever any material at the site is being disturbed by the equipment used at the facility, staff on-site periodically stand downwind of the work that is being done, and assure themselves that any odours being created are mild, indicative of fully aerobic activity, and are not likely to be carried off the property.

In the event that staff on-site believe any odours may have some potential for off-site impact, they will drive to a location off-site and downwind from the work at the facility to determine at that moment if any off-site impact can be detected. If there is a detectable off-site impact, work on the site will be stopped immediately and remedial measures will be taken (see below). If no off-site impacts are detectable, work at the site will proceed with caution, with further periodic inspections off-site. Remedial measures will again be taken as appropriate.

The key to this approach is that all staff are constantly vigilant for even mild odours produced on-site and will take actions to deal with those odours well before they become evident off-site.

A windsock and flag is installed on the site. This provides a strong visual reminder to site staff of existing wind conditions, such that they can make judgments as to the potential for off-site odours, given that day's planned activities.

No odour monitoring program is of much value unless there is a companion program to control those same odours, once they are detected. What follows is a stepped program, capable of dealing effectively with everything from the mildest odours to the most offensive. It should be noted that all of the measures described below can and are just as likely to be applied to only sections of a site, rather than to the entire site. The source of odour problems can commonly be quite localized.

6.2 Prevention

The best odour control strategy is odour prevention. If experienced staff early in the process makes the correct, preventative decisions, odour will not be an issue. Although mild odours are experienced on-site from time to time, they are mild in nature and should not be noticeable off-site.

A perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends below the water table. This drainage system has significantly reduced, if not eliminated, the potential for off-site migration of LFG.

Monitoring of methane gas at the landfill site is performed on three occasions per year generally during the spring, summer and late fall or winter. Results of the monitoring programs and interpretation of the data are presented in the annual Operations & Monitoring report.

A leachate pumping station has been constructed in the southeast corner of the landfill site and a forcemain connection to the municipal sewage treatment plant commenced in 2007. Presently, the disposal method of choice for leachate generated by the WCC Navan Facility is treatment at the Robert O. Pickard Environmental Centre, a waste water treatment plant. The use of leachate retention ponds has been discontinued. This eliminates the possibility of odours emanating from on-site treatment and leachate retention ponds.

As discussed in Section 3.4, an interim LFG odour control system was installed in 2011 and commissioned in April 2012. The purpose of the interim LFG odour control system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells. The system was extended in 2016, 2017 and the fall of 2019.

6.3 Masking the Odour

Principally, these additional measures will consist of using physical, biological and/or chemical methods to mask the odours on the surface of the odour source, so that none of the odours contained within are released to the environment. A number of proven masking techniques are available and can be used at the discretion of the site manager:

- Physically covering the surface of the odour source with a 15 centimetre layer of bulking material is often enough to block the release of most odours for a period of a day or more while remedial work is done;
- A number of biological inoculants are available commercially. These substances, when applied to the surface in a water solution, are felt to effectively reinforce aggressive aerobic activity on the surface by out-competing any anaerobic colonies that may be present in the near surface area. In effect, this creates a bio-filter, and biologically processes anaerobic gases as they are released; and/or,
- A number of chemical/nutrient mixtures are also available commercially. These substances, when applied to the odour source in much the same manner used with the biological inoculants, can have a very similar or even stronger effect. Manufacturers of these products claim that their compounds rapidly stimulate the growth of one desirable family of microorganisms or another, again to create a bio-filter effect.

Whatever the actual mechanism, these products have been proven effective in the field. In all cases, odour control strategies used at this level can be applied within minutes of the decision to use them, and the effects will be largely felt within 10-15 minutes of that application, if not sooner.

6.4 Isolating an Odour Source

The last strategy will consist of using additional measures to isolate and neutralize the offending odour source material. The offensive material may be removed from the problem area, landfilled and covered immediately. This isolation strategy will be used at the discretion of the site manager.

6.5 Complaints Response

In the event that an odour complaint is received, either by the City of Ottawa or the MECP, it is expected that those parties will immediately contact WCC site staff and notify them of the problem. WCC staff will take immediate steps to determine the extent of the problem and whether or not it is caused by the facility. If the source of the odour is deemed to be originating from the WCC Navan Facility, appropriate measures as described above will be taken to mitigate the odour problem and to stop the detection of odours off-site. Again, all such

measures taken will be documented and a record kept on-site. If the identity of the complainant is made known to WCC staff, staff will contact the complainant that day, listen to their description of the problem, advise them in detail of the measures taken to rectify the problem, and invite them to visit the facility at some point to see for themselves how the site is operated. WCC will also call them back in a week's time to determine whether or not they have been aware of any other odours at their location.

WCC staff has found in the past that this kind of immediate and personal attention goes a long way to building community support for a facility and builds community confidence in the management of the site.

7.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Waste Connections of Canada. The report, which specifically includes all tables and figures, is based on data and information collected by Golder Associates Ltd. and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder Associates Ltd. as described in this report.

Golder Associates Ltd. has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Air quality conditions may vary from these sampled locations.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

8.0 CLOSURE

We trust this report satisfies your current requirements. If you have any further questions regarding this report, please contact the undersigned.

Golder Associates Ltd.

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Principal, Geoenvironmental Engineer

RPM/YJM/PLE/sg
https://golderassociates.sharepoint.com/sites/115684/project files/6 deliverables/rpt 02 - lfg monitoring/19130610-002-r-rev 0 - wcc landfill gas 2019_11mar2020.docx

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Table 1: Composition of Landfill Gas at WCC Navan Facility

PARAMETER	November 29, 1994					June 13, 2002				
	MDL	MH-12	G.L. Q-7	MH-7	MH-0	MDL	Ambient (Parking)	Passive Vent F-4	MH-9	Pump Station
		SMP1	SMP2	SMP3	SMP4		SMP1	SMP2	SMP3	SMP4
Nitrogen, N_2 (%)	0.1	77	75	79	79	0.1	77.6	80.1	77.7	78.2
Oxygen, O_2 (%)	0.1	20	15	20	21	0.1	21.6	17.6	21.4	21.7
Carbon Dioxide,CO_2 (%)	0.1	1.8	7.8	1	ND	0.1	ND	1.5	0.3	ND
Methane, CH_4 (%)	0.1	0.7	3.8	0.6	ND	0.1	ND	ND	0.5	ND
Carbon Monoxide, CO (%)	0.1	ND	ND	ND	ND	0.1	ND	ND	ND	ND
Carbon Disulfide (PPM)	0.02	*	ND	-	-	0.04	ND	ND	ND	ND
Dimethyl Disulfide (PPM)	0.03	ND	ND	-	-	0.05	ND	ND	ND	ND
Ethyl Mercaptan / Dimethyl Sulfide (PPM)	0.03	0.4	ND	-	-	0.1	ND	ND	ND	ND
Hydrogen Sulfide / Carbonyl Sulfide (PPM)	0.02	120	0.4	-	-	0.05	ND	ND	ND	-
						2.1	-	-	-	2.2*
Methyl Mercaptan (PPM)	0.03	1	ND	-	-	0.05	ND	ND	ND	ND
Propyl Mercaptan / Ethyl Methyl Sulfide (PPM)	0.03	ND	ND	-	-	0.1	ND	ND	ND	ND
Sulfur Dioxide (PPM)	0.1	ND	ND	-	-	0.4	ND	ND	ND	ND
1,1,1-Trichloroethane (ppb)	0.2	0.1	ND	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene (ppb)	-	-	-	-	-	1	8	ND	9	ND
1,4-Dichlorobenzene	-	-	-	-	-	1	ND	5	6	<1
Benzene (ppb)	0.1	0.1	ND	-	-	1	ND	ND	ND	7
Cyclohexane (ppb)	0.1	0.1	0.1	-	-	-	-	-	-	-
Ethylbenzene (ppb)	-	-	-	-	-	1	ND	3	2	15
Hexane (ppb)	0.1	ND	0.2	-	-	-	-	-	-	-
m,p-Xylene (ppb)	-	-	-	-	-	2	ND	9	2	35
Naphthalene (ppb)	-	-	-	-	-	10	40	ND	48	ND
Other VOC parameters analysed (refer to lab report)	-	-	-	-	-		ND	ND	ND	ND
o-Xylene (ppb)	-	-	-	-	-	1	<1	4	3	11
Styrene (ppb)	-	-	-	-	-	1	11	5	3	6
Toluene (ppb)	0.1	0.7	0.1	-	-	1	15	29	19	170
Total VOCs - EPA 624 (ppb)		4.1	0.4	-	-	-	-	-	-	-
Total Volatile Organics (ppb)	-	-	-	-	-	0.1	0.43	0.24	0.46	0.51
Trichloroethene (ppb)	-	-	-	-	-	1	ND	ND	ND	7
Trichlorofluoromethane (ppb)	0.5	3.1	ND	-	-	-	-	-	-	-

MDL - Method Detection Limit
ND - Not Detected

Created by: BLB
Checked by: PLE

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Table 2: Field Monitoring Results - June 2019
WCC - Navan Waste Recycling and Disposal Facility
2019 Landfill Gas Monitoring - Spring Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Combustible Gas, COMB % LEL	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.0	0.0	20.4	0	0	0	1009
		b	OW-95-8 Ambient Air	0.0	0.0	20.4	0	0	0	1009
	G2	a	MH-10	0.1	0.1	20.3	0	0	3	1009
		b	MH-10 Ambient Air	0.0	0.0	20.4	0	0	0	1009
	G3	a	MH-9	0.0	0.0	20.4	0	0	1	1009
		b	MH-9 Ambient Air	0.0	0.0	20.3	0	0	0	1009
	G4	a	MH-8	0.0	0.0	20.5	0	0	0	1009
		b	MH-8 Ambient Air	0.0	0.0	20.5	0	0	0	1009
	G5	a	MH-7	0.0	0.0	20.6	0	0	0	1009
		b	MH-7 Ambient Air	0.0	0.0	20.4	0	0	0	1009
	G6	a	MH-6	0.1	1.0	19.4	1	0	-	1006
		b	MH-6 Ambient Air	0.0	0.0	19.7	1	0	-	1006
	G7		OW-94-1	0.1	0.0	19.7	0	0	-	1006
	G8		OW-94-2	0.1	0.1	19.7	8	1	-	1006
	G9		05-R3	0.1	0.7	19.8	1	1	-	1006
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.0	20.3	0	0	0	1011
	G11	a	MH-5	0.0	0.1	20.1	0	0	-	1006
		b	MH-5 Ambient Air	0.0	0.0	20.4	0	0	-	1006
	G12	a	MH-4	0.0	0.0	19.9	0	1	0	1011
		b	MH-4 Ambient Air	0.0	0.0	20.1	0	0	0	1011
	G13	a	MH-3	0.0	0.1	20.6	0	0	0	1011
		b	MH-3 Ambient Air	0.0	0.0	20.2	0	0	0	1011
	G14		OW-92-7	0.0	0.0	20.2	0	0	0	1011
	G15		OW-92-8	0.0	0.1	20.0	0	0	0	1011
	G16		05-8	0.0	0.1	20.1	0	0	0	1011
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.0	20.1	0	0	0	1011
	G18	a	MH-2	0.3	0.6	19.6	0	0	0	1011
		b	MH-2 Ambient Air	0.0	0.0	20.2	0	0	0	1011
	G19	a	MH-1	Sealed						
		b	MH-1 Ambient Air	0.0	0.0	20.2	0	0	0	1011
	G20		05-11	0.0	0.0	20.1	0	0	0	1011
	G21		OW-92-9	0.0	0.0	20.1	0	0	0	1011
	G22		OW-92-10	0.0	0.1	20.1	0	0	0	1011
	G23		OW-92-11	0.0	1.3	18.2	0	0	0	1011
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.0	20.3	0	0	0	1011
	G25	a	Pump House Ambient	0.0	0.0	20.3	0	0	0	1011
		b	Air Vent Along Pump House	0.0	0.0	20.3	0	0	0	1011
		c	pump House (inside)	0.0	0.0	20.4	0	0	0	1011
	G26	a	Wet Well MH	0.0	0.0	20.4	0	0	0	1011
		c	Blower Shed	0.0	0.0	20.4	0	0	0	1011
		c	Sea can (blue trailer - inside)	0.0	0.0	20.4	0	0	0	1011
		d	Primary Tank #1	0.0	0.2	20.1	4	0	0	1011
		e	Primary Tank #2	0.0	0.2	20.1	3	0	0	1011
		f	Secondary Tank #1	0.0	0.0	20.1	0	0	0	1011
		g	Secondary Tank #2	0.0	0.0	20.2	0	0	0	1011
			Collector MH	0.0	0.0	20.4	0	0	0	1011
	G27		Grid Line (R-19)	0.0	0.0	20.2	0	0	0	1011
	G81	a	New Pipeline Ambient Air	0.0	0.0	20.4	0	0	0	1009
		b	New Pipeline Clean Out	0.0	0.0	20.5	0	0	0	1009
	G82	a	New Pipeline Clean Out	0.0	0.0	20.5	0	0	0	1009
		b	New Pipeline Ambient Air	0.0	0.0	20.6	0	0	0	1009
	G83	a	New Pipeline Ambient Air	0.0	0.0	20.6	0	0	0	1009
		b	New Pipeline Clean Out MH	Sealed						
	G84	a	Tank Truck loading station MH	0.0	0.0	20.6	0	0	0	1009
		b	Ambient Air Tank Truck loading station MH	0.0	0.0	20.6	0	0	0	1009
	G96	a	MH-0	0.0	0.0	20.5	0	0	0	1009
		b	MH-0 - Ambient Air	0.0	0.0	20.6	0	0	0	1009
OFFICE/BUILDING AREA	G29	a	Garage	0.0	0.0	20.8	0	0	0	1009
		c	Garage (outdoors)	0.0	0.0	20.6	0	0	0	1009
	G28		Lunch Room	0.0	0.0	20.8	0	0	0	1009
	G31	a	Gate Clerk	Removed						
		b	New Scale (outside)	0.0	0.0	20.6	0	0	0	1009
		c	New Gate Clerk (Inside)	0.0	0.0	20.7	0	0	0	1009
	G32		Henri's Office	0.0	0.0	20.6	0	0	0	1009
	G34		OW-92-18	0.0	0.0	20.7	0	0	0	1009
	G35		OW-92-19	0.0	0.0	20.7	0	0	0	1009
	G36		Ambient Air (OW92-18, 92-19)	0.0	0.0	20.7	0	0	0	1009
	G100		Small Vehicle Drop-Off Area	0.0	0.0	20.7	0	0	0	1009

Table 2: Field Monitoring Results - June 2019
WCC - Navan Waste Recycling and Disposal Facility
2019 Landfill Gas Monitoring - Spring Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Combustible Gas COMB % LEL	Atm. Pressure mBars
AIR VENTS	G59	a	Passive Air Vent	0.0	0.0	20.5	0	0	0	1009
		b	Ambient Air	0.0	0.0	20.5	0	0	0	1009
	G60	a	New Passive Air Vent	0.0	0.0	20.7	0	0	0	1009
		b	Ambient Air	0.0	0.0	20.6	0	0	0	1009
	G101	a	Ambient Air - Sealed Pipeline Cleancut	0.0	0.0	20.7	0	0	0	1009
		b	Manhole	Sealed						
FORMER COMPOST AREA	G52		Compost Area East Side	0.0	0.0	20.7	0	0	0	1009
	G53		Compost Area North Side	0.0	0.0	20.6	0	0	0	1009
	G54		Compost Area South Side	0.0	0.0	20.6	0	0	0	1009
	G55		Compost Area West Side	0.0	0.0	20.5	0	0	0	1009
AMBIENT AIR COLLECTOR PIPES	G59	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.0	0.0	19.9	0	0	-	1006
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.0	0.0	20.1	0	0	-	1006
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	0.0	0.0	20.2	0	0	-	1006
	G62	a	Pipe E-10	Sealed						
		b	Ambient Air Collector Pipe E-10	0.0	0.0	20.2	0	0	-	1006
	G63	a	Pipe E-11	Sealed						
		b	Ambient Air Collector Pipe E-11	0.0	0.0	20.3	0	0	-	1006
EAST AND NORTH FACES	G85	a	E-12 Ambient Air	0.0	0.0	20.3	0	0	-	1006
		b	E-12 Passive Air Vent	Sealed						
	G86	a	E-13 Ambient Air	0.0	0.0	20.4	0	0	-	1006
		b	E-13 Passive Air Vent	Sealed						
	G91	a	G-17 Ambient Air	0.0	0	20.4	0	0	-	1006
		b	G-17 Passive Air Vent	Part of new landfill cell						
	G200	a	D/E-14 Ambient Air	0.0	0.0	20.4	0	0	-	1006
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.0	20.5	0	0	-	1006
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	0.0	0.0	20.5	0	0	0	1007
		b	D-15/16 Passive Air Vent	Sealed						
	G203		Pipe Cleanout	0.0	0.0	20.6	0	0	0	1009
	G204		Pipe Cleanout	0.0	0.0	20.6	0	0	0	1009
	G205		Pipe Cleanout	0.0	0.0	20.6	0	0	0	1009
	G206		Pipe Cleanout	0.0	0.0	20.7	0	0	0	1009
	G207		Pipe Cleanout	0.0	0.0	20.7	0	0	0	1009
	G208		Pipe Cleanout	0.0	0.0	20.7	0	0	0	1009
CENTRE AREA - MISCELLANEOUS	G64		New Recycling Area	0.0	0.0	20.4	0	0	0	1009
	G65		Cont. Soil @ L-16	0.0	0.0	20.6	0	0	0	1009
	G66		Cont. Soil @ M-6	0.0	0.0	20.7	0	0	0	1009
	G67	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.0	20.6	0	0	0	1009
	G68		Active Face (location=H7)	0.0	0.0	20.7	0	0	0	1009
	G69		Recycling Area (old)	0.0	0.0	20.6	0	0	0	1009
	G70		Grid Line Location G-2	0.0	0.0	20.4	0	0	0	1009
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.0	20.9	0	0	-	1008
	G74		NEAR MONTE BLUE	0.0	0.0	20.9	0	0	-	1008
NAVAN ROAD	G75		3515 Navan Road	0.0	0.0	20.7	0	0	-	1007
	G76		3546 Navan Road	0.0	0.0	20.8	0	0	-	1007
	G77		3586 Navan Road	0.0	0.0	20.8	0	0	-	1007
	G78		3602 Navan Road	0.0	0.0	20.8	0	0	-	1007
	G79		3626 Navan Road	0.0	0.0	20.6	0	0	-	1006
	G80		3650 Navan Road	0.0	0.0	20.4	0	0	-	1007
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.0	20.6	0	0	0	1009
	GW-2		Gas Extraction Well - Ambient Air	0.0	0.0	20.6	0	0	0	1009
	GW-3		Gas Extraction Well - Ambient Air	0.0	0.0	20.6	0	0	0	1009
	GW-4		Gas Extraction Well - Ambient Air	No longer exists						

Notes:	The day was:	overcast; ✔sunny; cloudy; ___wet; during the ✔ morning; ✔ afternoon
	Temperatures ranged from:	14-23 degrees Celsius.
	Winds were from:	____North; ___ East; ✔ West; ✔ South and: Mild: ✔Moderate; Strong
	Odours were:	✔ not noticeable; __ faint but noticeable; __ moderate but not offensive; _ strong
	Additional Notes:	
	Date: June 12, 2019	Prepared by: ETB Checked by: RPM

Table 3: Field Monitoring Results - August 2019
WCC - Navan Waste Recycling and Disposal Facility
2019 Landfill Gas Monitoring - Summer Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Combustible Gas COMB % LEL	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.0	0.2	20.3	0	0	1	994
		b	OW-95-8 Ambient Air	0.0	0.0	20.3	0	0	0	994
	G2	a	MH-10	2.7	2.7	18.3	0	0	54	994
		b	MH-10 Ambient Air	0.0	0.0	20.4	0	0	0	994
	G3	a	MH-9	0.3	0.5	19.9	0	0	6	994
		b	MH-9 Ambient Air	0.0	0.0	20.4	0	0	0	994
	G4	a	MH-8	0.2	0.1	20.2	0	0	4	994
		b	MH-8 Ambient Air	0.0	0.0	20.4	0	0	0	994
	G5	a	MH-7	0.0	0.1	20.2	0	0	1	994
		b	MH-7 Ambient Air	0.0	0.0	20.3	0	0	0	994
	G6	a	MH-6	0.0	0.3	19.9	0	0	0	1000
		b	MH-6 Ambient Air	0.0	0.0	20.3	0	0	0	1000
	G7		OW-94-1	0.0	0.0	20.1	0	0	0	1000
	G8		OW-94-2	0.0	0.1	19.9	0	0	0	1000
	G9		05-R3	0.0	0.8	19.9	0	0	0	1000
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.0	20.2	0	0	0	1000
	G11	a	MH-5	0.0	0.1	20.1	0	0	0	1000
		b	MH-5 Ambient Air	0.0	0.0	20.3	0	0	0	1000
	G12	a	MH-4	0.0	0.4	19.8	0	0	0	1000
		b	MH-4 Ambient Air	0.0	0.0	20.2	0	0	0	1000
	G13	a	MH-3	0.4	1.2	19.3	0	0	8	1000
		b	MH-3 Ambient Air	0.0	0.0	20.2	0	0	0	1000
	G14		OW-92-7	0.0	0.0	20.2	0	0	0	1000
	G15		OW-92-8	0.0	0.2	20.1	0	0	0	1000
	G16		05-6	0.0	0.1	20.1	0	0	0	1000
	G17		Ambient Air (OW92-7, 92-8 & 05-6)	0.0	0.0	20.2	0	0	0	1000
	G18	a	MH-2	1.0	2.6	18.4	0	0	0	1000
		b	MH-2 Ambient Air	0.0	0.0	20.3	0	0	0	1000
	G19	a	MH-1 (sealed)	Sealed						
		b	MH-1 Ambient Air	0.0	0.0	20.2	0	0	0	1000
	G20		05-11	0.0	0.6	19.4	0	0	0	1000
	G21		OW-92-9	0.0	0.1	20.1	0	0	0	1000
	G22		OW-92-10	0.0	0.2	20.1	0	0	0	1000
	G23		OW-92-11	0.0	3.5	16.7	0	0	0	1000
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.0	20.5	0	0	0	1000
	G25	a	Pump House Ambient	0.0	0.0	20.4	0	0	0	1000
		b	Air Vent Along Pump House	0.0	0.0	20.4	0	0	0	1000
		c	pump House (inside)	0.0	0.0	20.4	0	0	0	1000
	G26	a	Wet Well MH	0.0	3.2	19.7	0	0	1	1000
		b	Blower Shed	0.0	0.0	20.5	0	0	0	1000
		c	Sea can (blue trailer - inside)	0.0	0.2	20.4	0	0	0	1000
		d	Primary Tank #1	0.3	4.1	19.5	0	0	6	1000
		e	Primary Tank #2	0.9	3.9	19.6	0	0	2	1000
		f	Secondary Tank #1	0.0	0.0	20.6	0	0	0	1000
		g	Secondary Tank #2	0.3	0.2	20.5	0	0	0	1000
		i	Collector MH	0.5	1.5	20.0	0	4.5	11	1000
	G27		Grid Line (R-18)	0.0	0.0	20.3	0	0	0	1000
	G81	a	New Pipeline Ambient Air	0.0	0.0	20.4	0	0	0	994
		b	New Pipeline Clean Out	0.0	0.0	20.4	0	0	0	994
	G82	a	New Pipeline Clean Out	0.0	0.0	20.4	0	0	0	994
		b	New Pipeline Ambient Air	0.0	0.0	20.3	0	0	0	994
	G83	a	New Pipeline Ambient Air	0.0	0.0	20.3	0	0	0	994
		b	New Pipeline Clean Out MH	Sealed						
	G84	a	Tank Truck loading station MH	0.0	0.0	20.3	0	0	0	994
		b	Ambient Air Tank Truck loading station MH	0.0	0.0	20.2	0	0	0	994
	G88	a	MH-0	0.0	0.0	20.2	0	0	0	994
		b	MH-0 Ambient Air	0.0	0.0	20.2	0	0	0	994
OFFICE/BUILDING AREA	G29	a	Garage	0.0	0.0	20.6	0	0	0	994
		b	Garage (outdoors)	0.0	0.0	20.6	0	0	0	994
	G28		Lunch Room	0.0	0.0	20.6	0	0	0	994
	G31	a	Gate Clerk	Removed						
		b	New Scale (outside)	0.0	0.0	20.5	0	0	0	994
		c	New Gate Clerk (Inside)	0.0	0.0	20.5	0	0	0	994
	G32		Henri's Office	0.0	0.0	20.6	0	0	0	994
	G34		OW-92-18	0.0	0.1	20.6	0	0	0	994
	G35		OW-92-19	0.0	0.3	20.5	0	0	0	994
	G36		Ambient Air (OW92-18, 92-19)	0.0	0.0	20.7	0	0	0	994
	G100		Small Vehicle Drop-Off Area	0.0	0.0	20.5	0	0	0	994

Table 3: Field Monitoring Results - August 2019
WCC - Navan Waste Recycling and Disposal Facility
2019 Landfill Gas Monitoring - Summer Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Combustible Gas COMB % LEL	Atm. Pressure (mBars)
AIR VENTS	G99	a	Passive Air Vent	0.6	0.5	20.1	0	0	7	994
		b	Ambient Air	0.0	0.0	20.4	0	0	0	994
	G50	a	New Passive Air Vent	0.0	0.0	20.3	0	0	0	994
		b	Ambient Air	0.0	0.0	20.2	0	0	0	994
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.0	20.3	0	0	0	994
		b	Manhole	Sealed						
FORMER COMPOST AREA	G52		Compost Area East Side	0.0	0.0	20.3	0	0	0	994
	G53		Compost Area North Side	0.0	0.0	20.3	0	0	0	994
	G54		Compost Area South Side	0.0	0.0	20.2	0	0	0	994
	G55		Compost Area West Side	0.0	0.0	20.3	0	0	0	994
AMBIENT AIR COLLECTOR PIPES	G59	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.0	0.0	20.1	0	0	0	1000
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.0	0.0	20.1	0	0	0	1000
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	0.0	0.0	20.2	0	0	0	1000
	G62	a	Pipe E-10	Sealed						
		b	Ambient Air Collector Pipe E-10	0.0	0.0	20.2	0	0	0	1000
	G63	a	Pipe E-11	Sealed						
		b	Ambient Air Collector Pipe E-11	0.0	0.0	20.2	0	0	0	1000
EAST AND NORTH FACES	G65	a	E-12 Ambient Air	0.0	0.0	20.3	0	0	0	1000
		b	E-12 Passive Air Vent	Sealed						
	G66	a	E-13 Ambient Air	0.0	0.0	20.3	0	0	0	1000
		b	E-13 Passive Air Vent	Sealed						
	G91	a	G-17 Ambient Air	Could not find due to dense vegetation						
		b	G-17 Passive Air Vent	Part of new landfill cell						
	G200	a	D/E-14 Ambient Air	0.0	0.0	20.3	0	0	0	1000
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.0	20.3	0	0	0	1000
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	0.0	0.0	20.3	0	0	0	1000
		b	D-15/16 Passive Air Vent	Sealed						
	G203		Pipe Cleanout	0.0	0.0	20.4	0	0	0	1000
	G204		Pipe Cleanout	0.0	0.0	20.4	0	0	0	1000
	G205		Pipe Cleanout	0.0	0.0	20.4	0	0	0	1000
	G206		Pipe Cleanout	0.0	0.0	20.4	0	0	0	1000
	G207		Pipe Cleanout	0.0	0.0	20.4	0	0	0	1000
	G208		Pipe Cleanout	0.0	0.0	20.4	0	0	0	1000
CENTRE AREA - MISCELLANEOUS	GP4		New Recycling Area	0.0	0.0	20.3	0	0	0	994
	GP5		Cont. Soil @ L-16	0.0	0.0	20.3	0	0	0	994
	GP6		Cont. Soil @ M-6	0.0	0.0	20.3	0	0	0	994
	G67	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.0	20.4	0	0	0	994
	G68		Active Face (location=K6/19)	0.0	0.0	20.4	0	0	0	994
	GP8		Recycling Area (old)	0.0	0.0	20.4	0	0	0	994
	G70		Grid Line Location G-2	0.0	0.0	20.4	0	0	0	994
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.0	20.5	0	0	0	1000
	G74		NEAR MONTE BLUE	0.0	0.0	20.6	0	0	0	1000
NAVAN ROAD	G75		3516 Navan Road	0.0	0.0	20.6	0	0	0	1000
	G76		3546 Navan Road	0.0	0.0	20.6	0	0	0	1000
	G77		Between 3550 and 3588 Navan Road	0.0	0.0	20.6	0	0	0	1000
	G78		3602 Navan Road	0.0	0.0	20.6	0	0	0	1000
	G79		3626 Navan Road	0.0	0.0	20.6	0	0	0	1000
	G80		3650 Navan Road	0.0	0.0	20.6	0	0	0	1000
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.0	20.3	0	0	0	994
	GW-2		Gas Extraction Well - Ambient Air	0.0	0.0	20.3	0	0	0	994
	GW-3		Gas Extraction Well	0.0	0.0	20.3	0	0	0	994
	GW-4		Ambient Air	0.0	0.0	20.4	0	0	0	994

Notes:	The day was:	✓ overcast; ✓ sunny; ___ cloudy; ___ wet; during the ✓ morning; ✓ afternoon
	Temperatures ranged from:	21 to 22 degrees Celsius
	Winds were from the:	___North; ___ East; ✓ West; ✓ South and: __ Mild; ✓ Moderate; __ Strong
	Odours were:	✓ not noticeable; __ faint but noticeable; __ moderate but not offensive; _ strong
	Additional Notes:	
	Date: August 29, 2019	Prepared by: ETB Checked by: RPM

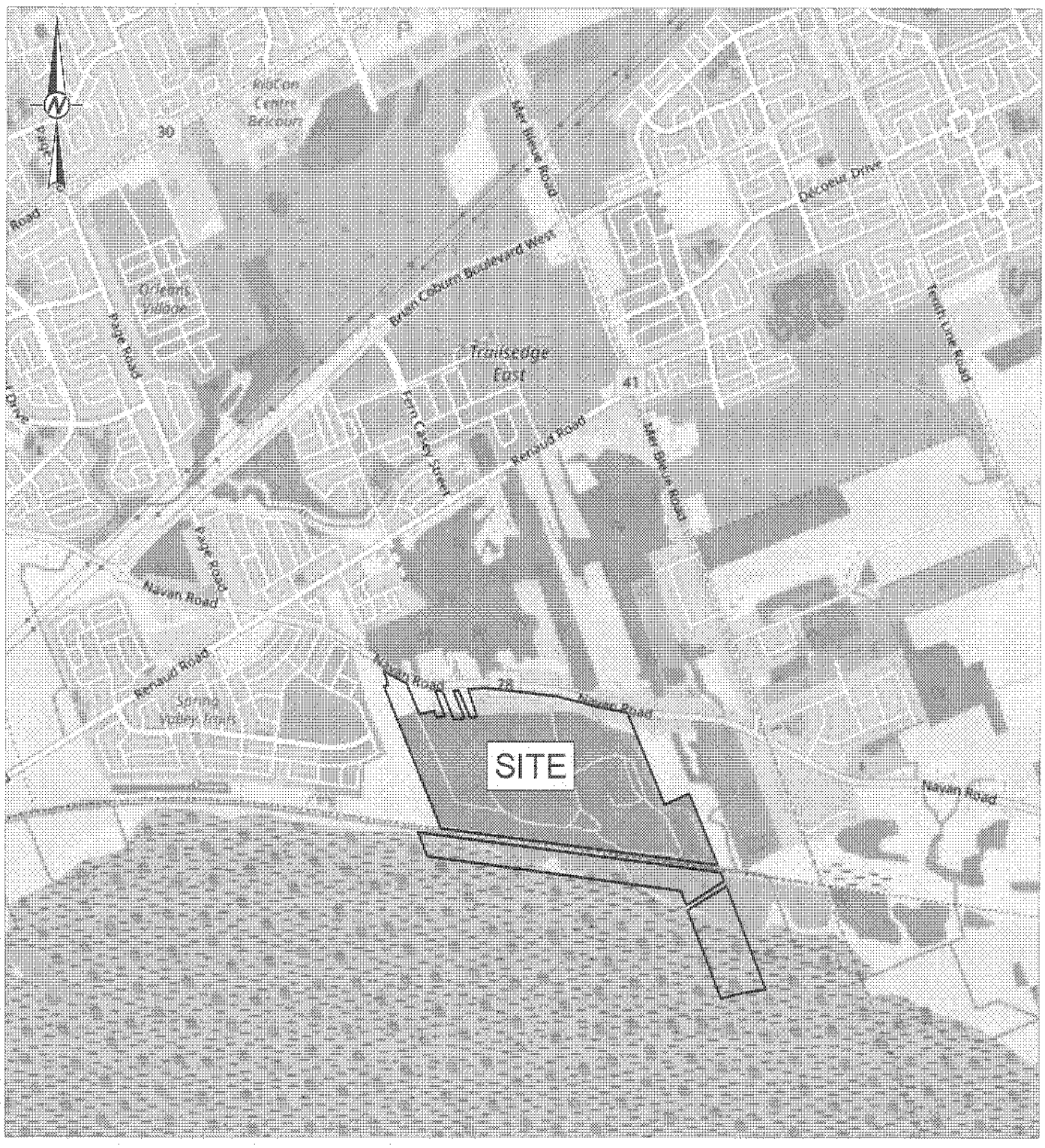
Table 4: Field Monitoring Results - December 2019
WCC - Navan Waste Recycling and Disposal Facility
2019 Landfill Gas Monitoring - Winter Session

	Monitoring Location		Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Combustible Gas COMB % LEL*	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-5	0.0	0.3	21.0	0	0	0	992
		b	OW-95-5 Ambient Air	0.0	0.0	21.0	0	0	0	992
	G2	a	MH-10	2.3	2.1	20.6	0	0	48	992
		b	MH-10 Ambient Air	0.0	0.0	21.0	0	0	0	992
	G3	a	MH-9	3.6	2.6	20.6	0	0	74	992
		b	MH-9 Ambient Air	0.0	0.0	21.2	0	0	0	992
	G4	a	MH-8	0.0	0.1	21.3	0	0	0	992
		b	MH-8 Ambient Air	0.0	0.0	21.2	0	0	0	992
	G5	a	MH-7	1.3	1.5	21.0	0	0	27	992
		b	MH-7 Ambient Air	0.0	0.0	21.4	0	0	0	992
	G6	a	MH-6	2.1	12.9	16.2	0	0	44	994
		b	MH-6 Ambient Air	0.0	0.0	21.7	0	0	0	994
	G7		OW-94-1	0.0	0.3	21.5	0	0	0	994
	G8		OW-94-2	0.0	0.6	21.5	0	0	0	994
	G9		05-R3	0.0	1.2	21.7	0	0	0	994
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.0	21.5	0	0	0	994
	G11	a	MH-5	0.9	13.9	17.6	0	0	15	994
		b	MH-5 Ambient Air	0.0	0.0	21.7	0	0	0	994
	G12	a	MH-4	9.6	9.8	18.4	0	0	>100	994
		b	MH-4 Ambient Air	0.0	0.0	21.7	0	0	0	994
	G13	a	MH-3	15.6	13.4	16.0	0	0	>100	992
		b	MH-3 Ambient Air	0.0	0.0	21.7	0	0	0	994
	G14		OW-92-7	0.0	0.2	21.7	0	0	0	994
	G15		OW-92-5	7.7	8.7	17.6	0	0	52	994
	G16		05-8	0.0	1.9	21.4	0	0	0	994
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.0	21.6	0	0	0	994
	G18	a	MH-2	1.0	6.3	20.5	0	0	20	994
		b	MH-2 Ambient Air	0.0	0.0	21.6	0	0	0	994
	G19	a	MH-1 (sealed)	Sealed						
		b	MH-1 Ambient Air	0.0	0.0	21.5	0	0	0	994
	G20		05-11	0.0	0.5	21.4	0	0	0	994
	G21		OW-92-9	0.0	0.2	21.4	0	0	0	994
	G22		OW-92-10	0.0	1.0	21.3	0	0	0	994
	G23		OW-92-11	0.4	8.7	16.3	0	0	8	994
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.0	21.4	0	0	0	994
	G25	a	Pump House Ambient	0.0	0.0	21.2	0	0	0	995
		b	Air Vent Along Pump House	0.0	0.0	21.3	0	0	0	995
		c	pump House (inside)	0.0	0.0	21.3	0	0	0	995
	G26	a	Wet Well MH	0.0	0.2	21.3	0	0	0	995
		b	Blower Shed	0.0	0.0	21.3	0	0	0	995
		c	Sea can (blue trailer - inside)	0.0	0.2	21.4	0	0	0	995
		d	Primary Tank #1	0.0	0.7	21.4	0	0	0	995
		e	Primary Tank #2	0.0	0.9	21.3	0	0	0	995
		f	Secondary Tank #1	0.0	0.9	21.3	0	0	0	995
		g	Secondary Tank #2	0.0	0.5	21.4	0	0	0	995
		h	Collector MH	0.0	0.0	21.3	0	0	0	995
	G27		Grid Line (R-19)	0.0	0.0	21.3	0	0	0	995
	G81	a	New Pipeline Ambient Air	0.0	0.0	21.0	0	0	0	992
		b	New Pipeline Clean Out	0.0	0.0	21.2	0	0	0	992
	G82	a	New Pipeline Clean Out	1.0	0.9	19.8	0	0	20	992
		b	New Pipeline Ambient Air	0.0	0	21.2	0	0	0	992
	G83	a	New Pipeline Ambient Air	0.0	0.0	21.4	0	0	0	992
		b	New Pipeline Clean Out MH	Sealed						
	G84	a	Tank Truck loading station MH	7.5	7.3	17.3	0	0	>100	992
		b	Ambient Air Tank Truck loading station MH	0.0	0.0	21.4	0	0	0	992
	G98	a	MH-0	0.0	0.0	21.4	0	0	0	992
		b	MH-0 Ambient Air	0.0	0.0	21.1	0	0	0	992
OFFICE/BUILDING AREA	G29	a	Garage	0.0	0.0	22.1	0	0	0	995
		b	Garage (outdoors)	0.0	0.0	22.1	0	0	0	995
	G28		Lunch Room	0.0	0.0	22.1	0	0	0	992
	G31	a	Gate Clerk	Removed						
		b	New Scale (outside)	0.0	0.0	21.9	0	0	0	995
		c	New Gate Clerk (inside)	0.0	0.1	21.9	0	0	0	995
	G32		Henri's Office	0.0	0.0	21.1	0	0	0	992
	G34		OW-92-18	0.0	0.0	22.2	0	0	0	995
	G35		OW-92-19	0.0	3.6	21.8	0	0	0	995
	G36		Ambient Air (OW92-18, 92-19)	0.0	0.0	22.2	0	0	0	995
	G100		Small Vehicle Drop-Off Area	0.0	0.0	21.9	0	0	0	995

Table 4: Field Monitoring Results - December 2019
WCC - Navan Waste Recycling and Disposal Facility
2019 Landfill Gas Monitoring - Winter Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Combustible Gas COMB % LEL*	Atm. Pressure mBars
AIR VENTS	G38	a	Passive Air Vent	0.0	0.0	20.9	0	0	0	992
		b	Ambient Air	0.0	0.0	20.9	0	0	0	992
	G50	a	New Passive Air Vent	0.0	0.0	21.5	0	0	0	992
		b	Ambient Air	0.0	0.0	21.4	0	0	0	992
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.0	21.5	0	0	0	992
		b	Manhole	Sealed						
FORMER COMPOST AREA	G52		Compost Area East Side	0.0	0.0	21.4	0	0	0	992
	G53		Compost Area North Side	0.0	0.0	21.4	0	0	0	992
	G54		Compost Area South Side	0.0	0.0	21.4	0	0	0	992
	G55		Compost Area West Side	0.0	0.0	21.4	0	0	0	992
AMBIENT AIR COLLECTOR PIPES	G59	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.0	0.0	20.5	0	0	0	992
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.0	0.0	20.5	0	0	0	992
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	0.0	0.0	20.7	0	0	0	992
	G62	a	Pipe E-10	Sealed						
		b	Ambient Air Collector Pipe E-10	0.0	0.0	20.9	0	0	0	992
	G63	a	Pipe E-11	Sealed						
		b	Ambient Air Collector Pipe E-11	0.0	0.0	20.9	0	0	0	992
EAST AND NORTH FACES	G85	a	E-12 Ambient Air	0.0	0.0	21.0	0	0	0	992
		b	E-12 Passive Air Vent	Sealed						
	G89	a	E-13 Ambient Air	0.0	0.0	21.1	0	0	0	992
		b	E-13 Passive Air Vent	Sealed						
	G91	a	G-17 Ambient Air	Not found due to snow cover						
		b	G-17 Passive Air Vent	Part of new landfill cell						
	G200	a	D/E-14 Ambient Air	0.0	0.0	21.3	0	0	0	992
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.0	21.3	0	0	0	992
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	0.0	0.0	21.4	0	0	0	992
		b	D-15/16 Passive Air Vent	Sealed						
	G203		Pipe Cleanout	0.0	0.0	21.3	0	0	0	995
	G204		Pipe Cleanout	0.0	0.0	21.3	0	0	0	995
	G205		Pipe Cleanout	0.0	0.0	21.3	0	0	0	995
	G206		Pipe Cleanout	0.0	0.0	21.4	0	0	0	995
	G207		Pipe Cleanout	0.0	0.0	21.5	0	0	0	995
	G208		Pipe Cleanout	0.0	0.0	21.5	0	0	0	995
CENTRE AREA - MISCELLANEOUS	G64		New Recycling Area	0.0	0.0	21.4	0	0	0	992
	G65		Cont. Soil @ L-16	0.0	0.0	21.4	0	0	0	992
	G66		Cont. Soil @ M-6	0.0	0.0	21.5	0	0	0	992
	G67	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.0	21.4	0	0	0	992
	G68		Active Face (location=J/K-8)	0.0	0.0	21.3	0	0	0	992
	G69		Recycling Area (old)	0.0	0.0	21.3	0	0	0	992
	G70		Grid Line Location G-2	0.0	0.0	20.8	0	0	0	992
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.0	21.5	0	0	0	993
	G74		NEAR MONTE BLUE	0.0	0.0	20.4	0	0	0	992
NAVAN ROAD	G75		3516 Navan Road	0.0	0.0	21.5	0	0	0	992
	G76		3546 Navan Road	0.0	0.0	21.6	0	0	0	992
	G77		Between 3550 and 3588 Navan Road	0.0	0.0	21.6	0	0	0	992
	G78		3602 Navan Road	0.0	0.0	21.6	0	0	0	992
	G79		3626 Navan Road	0.0	0.0	21.6	0	0	0	992
	G80		3650 Navan Road	0.0	0.0	21.6	0	0	0	992
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.0	21.4	0	0	0	992
	GW-2		Gas Extraction Well - Ambient Air	0.0	0.0	21.4	0	0	0	992
	GW-3		Gas Extraction Well - Ambient Air	0.0	0.0	21.3	0	0	0	992
	GW-4		Ambient Air	0.0	0.0	21.4	0	0	0	992

Notes:	The day was:	✓ overcast; _sunny; _cloudy; _ wet; during the ✓ morning; ✓ afternoon
	Temperatures ranged from:	-2.7 degrees Celsius
	Winds were from the:	✓ North; ✓ East; ___ West; ___ South and: ✓ Mild; __ Moderate; __ Strong
	Odours were:	__ not noticeable; __ faint but noticeable; ✓ moderate but not offensive; __ strong
	Additional Notes:	Strong odour at GW-1
	Date: December 17, 2019	Prepared by: RPM Checked by: ETB



WASTE CONNECTIONS of CANADA

0 500 1,000
1:25,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

CLIENT
WASTE CONNECTIONS OF CANADA

PROJECT
REPORT ON 2019 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

CONSULTANT
GOLDER

YYYY-MM-DD	2020-02-14
DESIGNED	ETB
PREPARED	JM
REVIEWED	YJM
APPROVED	PLE

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
19130610	0002	0	

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NAVAN RD
APPROVED WASTE LIMITS
ACTIVE FACE (AS OF DECEMBER 2019)
APPROVED WASTE LIMITS
GW1
GW2
GW3
GW4
LEGEND
EXISTING MAINTENANCE HOLE
EXISTING LANDFILL GAS EXTRACTION WELL
EXISTING BUILDING
GRAVEL ROAD
WSC PROPERTY LIMITS
FENCE LINE
EAST - WEST GRID LINE AND DESIGNATION
NORTH - SOUTH GRID LINE AND DESIGNATION
IMPERVIOUS AIR COLLECTOR PIPES
GENERAL AREA MIX COLLECTORS
AIR VENTS
WEST AND SOUTH FACES
DECOMMISSIONED AREA
PLANNED COMPOST AREA
NORTH AND EAST FACES
REFERENCE(S)
1. BASED ON SURVEY BY THE IMAGE MAPPING CO. LTD DATED APRIL 30, 2019
GAS MONITORING POINTS SHOWN
NOTE(S)
1. GW1 TO GW4 ARE LOCATED OFF-SITE
2. LOCATION OF GAS MONITORING PROBE HEADER AND TARGETED FOR EXACT LOCATION
0
100
200
1:6,000
METRES
WASTE CONNECTIONS OF CANADA
GOLDER
CLIENT
WASTE CONNECTIONS OF CANADA
PROJECT
REPORT ON 2019 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO
TITLE
LANDFILL GAS MONITORING LOCATIONS
PROJECT NO.
19139510
DRAWING
0002
REV
0
FIGURE
2

APPENDIX A

2009 Landfill Gas Characterization

Appendix A: Landfill Gas Monitoring Data (29 September 2009)

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM 2000			QRAE	GEM 2000			
Manhole MH-6 (tubing inside manhole)	0.1	1.1	20.5	22.6	2	0	3	1	984	76.2	-8.5
Manhole MH-6 (ambient air)	0.0	0.1	20.9	22.1	0	0	0	0	984	77.8	-5.1
Manhole MH-5 (tubing inside manhole)	0.1	1.1	20.8	22.1	2	0	3	0	984	76.7	-6.2
Manhole MH-5 (ambient air)	0.0	0.1	20.5	21.6	0	0	0	0	984	76.3	-2.7
Manhole MH-4 (tubing inside manhole)	0.9	2.3	19.6	20.7	1	0	21	18	985	76.1	-1.6
Manhole MH-4 (ambient air)	0.0	0.1	20.7	22.1	1	0	0	0	984	77.8	-5.1
Manhole MH-3 (tubing inside manhole)	0.1	0.7	20.5	21.7	0	0	0	2	984	77.5	-3.9
Manhole MH-3 (ambient air)	0.1	0.1	20.9	22.3	0	0	0	0	984	77.6	-6.1
Manhole MH-2 (tubing inside manhole)	0.7	0.9	20.4	21.9	1	0	30	0	984	76.5	-6.8
Manhole MH-2 (ambient air)	0.0	0.0	20.9	22.2	0	0	0	0	984	77.8	-5.5
Manhole MH-1 (tubing inside manhole)	10.7	8.2	17.5	18.0	0	0	>100	>60	984	63.1	-4.4
Manhole MH-1 (ambient air)	0.0	0.0	20.9	22.3	0	0	0	0	984	77.7	-5.9
Cleanout E-12 (ambient air)	0.1	0.1	20.9	22.3	0	0	2	1	983	77.5	-6.1
Cleanout E-12 (tubing inside cleanout)	53.5	47.3	2.2	0.2	39	169	43	>60	983	-1.0	-1.6
Cleanout E-13 (ambient air)	0.0	0.1	20.9	22.4	0	0	0	0	983	77.5	-6.5
Cleanout E-13 (tubing inside cleanout)	55.0	48.2	20.9*	0.5	7	161	>100	>60	983	-3.7	-5.6
Cleanout I-17 (ambient air)	0.0	0.1	20.9	22.4	0	0	0	0	984	77.5	-6.5
Cleanout I-17 (tubing inside cleanout)	0.8	3.6	17.8	18.5	0	0	32	16	983	77.1	7.7
Cleanout K-17 (ambient air)	0.0	0.0	20.9	22.4	0	0	0	0	984	77.6	-6.4
Cleanout K-17 (tubing inside cleanout)	48.7	34.3	5.7	2.9	12	15	>100	>60	983	14.2	3.7
Cleanout L-17 (ambient air)	0.0	0.0	20.9	22.4	0	0	0	0	983	77.6	-6.4
Cleanout L-17 (tubing inside cleanout)	20.4	20.1	11.4	11.1	2	0	>100	>60	983	48.4	6.8
Cleanout M-17 (ambient air)	0.0	0.0	20.9	22.5	0	0	0	0	983	77.5	-6.9
Cleanout M-17 (tubing inside cleanout)	0*	0.0	18.0	19.0	0	188	>100	>60	983	61.0	9.6
Cleanout G-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	983	77.4	-7.3
Cleanout G-17 (tubing inside cleanout)	0.2	0.4	20.3	22.1	0	0	5	3	984	77.5	-5.6
Cleanout N-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	983	77.4	-7.3
Cleanout N-17 (tubing inside cleanout)	N/A (monitoring location blocked/clogged)										
Cleanout H-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	992	77.4	-7.3
Cleanout H-17 (tubing inside cleanout)	N/A (monitoring location blocked/clogged)										
Cleanout E-16 (ambient air)	0.0	0.1	20.9	22.5	0	0	0	0	1000	77.4	-7.0
Cleanout E-16 (tubing inside cleanout)	51.3	50.8	2.4	0.8	68	169	>100	>60	1000	-2.7	-4.9
Cleanout F-16 (ambient air)	0.0	0.3	20.9	22.3	0	0	1	0	1000	77.4	-8.2
Cleanout F-16 (tubing inside cleanout)	8.2	11.1	12.9	13.1	0	0	>100	>60	1000	67.6	18.5
Cleanout F-17 (ambient air)	0.0	0.1	20.9	22.5	0	0	0	0	999	77.4	-7.0
Cleanout F-17 (tubing inside cleanout)	0.0	3.1	18.6	20.1	0	0	0	0	999	76.0	1.4
Cleanout G-16 (ambient air)	0.0	0.1	20.9	22.6	0	0	0	0	999	77.3	-7.4
Cleanout G-16 (tubing inside cleanout)	8.6	1.8	19.5	21.1	0	0	0	0	999	77.1	-2.0
Central Manhole (tubing inside)	54.6	38.4	2.4	1.6	19	166	>100	>60	983	5.2	-1.8
Central Manhole (ambient air)	0.0	0.0	20.9	22.5	0	0	0	0	983	77.5	-6.9

Note: * Possible erroneous reading based on other measurement at this monitoring location

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Appendix A: Landfill Gas Monitoring Data (09 October 2009)

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			ORAE	GEM-2000			ORAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	10.5	4.6	17.7	16.9	0	0	>100	>60	997	68.0	4.6
Manhole MH-10 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	997	79.4	2.5
Manhole MH-9 (tubing inside manhole)	15.1	8.6	16.2	15.4	56	0	>100	>60	996	62.9	5.2
Manhole MH-9 (ambient air)	0.0	0.1	20.9	20.3	0	0	0	0	996	79.6	3.5
Manhole MH-8 (tubing inside manhole)	18.6	9.8	14.5	13.5	12	0	>100	>60	997	58.1	7.5
Manhole MH-8 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	997	79.5	3.0
Manhole MH-7 (tubing inside manhole)	0.7	0.5	20.9	20.1	0	0	33	15	997	78.7	3.3
Manhole MH-7 (ambient air)	0.1	0.2	20.9	20.3	0	0	0	1	997	79.4	3.3
Manhole MH-6 (tubing inside manhole)	0.0	0.5	20.3	19.7	22	0	0	1	1001	79.5	5.6
Manhole MH-6 (ambient air)	0.0	0.1	20.9	20.2	0	0	0	0	1001	79.7	4.0
Manhole MH-5 (tubing inside manhole)	1.1	4.6	18.3	17.7	0	0	47	22	1001	77.2	10.8
Manhole MH-5 (ambient air)	0.0	0.1	20.9	20.2	0	0	0	0	1001	79.7	4.0
Manhole MH-4 (tubing inside manhole)	9.0	6.9	20.5	19.9	28	0	7	2	1001	79.2	4.6
Manhole MH-4 (ambient air)	0.0	0.1	20.9	20.3	0	0	0	0	1001	79.6	3.6
Manhole MH-3 (tubing inside manhole)	0.6	1.4	20.2	19.7	0	0	26	13	1001	78.3	4.4
Manhole MH-3 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	1001	79.5	3.0
Manhole MH-2 (tubing inside manhole)	10.3	9.3	16.7	15.7	20	0	>100	>60	1001	64.7	5.8
Manhole MH-2 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	1001	79.4	2.5
Manhole MH-1 (tubing inside manhole)	0.0	0.5	20.5	20.2	0	0	0	1	1001	79.5	3.3
Manhole MH-1 (ambient air)	0.0	0.1	20.9	20.6	0	0	0	0	1001	79.3	2.1
Cleanout E-12 (ambient air)	46.0	3.2	20.9	18.6	0	28	>100	>60	996	32.2	-57.6
Cleanout E-12 (tubing inside cleanout)	N/A (gas outlet too strong, measurements not recorded due to safety)										
Cleanout E-13 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	996	79.6	3.0
Cleanout E-13 (tubing inside cleanout)	>60	53.0	2.4	0.4	30	157	>100	>60	996		
Cleanout I-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	999	79.5	3.6
Cleanout I-17 (tubing inside cleanout)	1.1	6.1	13.9	13.6	8	0	54	23	999	79.2	28.2
Cleanout K-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	1	999	79.5	3.0
Cleanout K-17 (tubing inside cleanout)	59.3	39.3	3.4	0.1	9	1	>100	>60	999	1.9	0.9
Cleanout L-17 (ambient air)	0.0	0.1	20.9	20.0	0	0	0	1	999	79.3	4.9
Cleanout L-17 (tubing inside cleanout)	9.6	10.6	14.8	13.6	25	0	>100	>60	999	66.2	15.2
Cleanout M-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	999	79.5	3.0
Cleanout M-17 (tubing inside cleanout)	8.0	6.0	17.2	16.5	1	160	>100	>60	999	68.5	5.6
Cleanout G-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	1	998	79.5	3.0
Cleanout G-17 (tubing inside cleanout)	0.4	1.6	19.0	18.6	0	0	0	0	998	79.4	9.7
Cleanout N-17 (ambient air)	N/A										
Cleanout N-17 (tubing inside cleanout)	N/A										
Cleanout H-17 (ambient air)	N/A										
Cleanout H-17 (tubing inside cleanout)	N/A										
Cleanout E-16 (ambient air)	0.2	0.2	20.9	20.4	0	0	0	1	996	79.2	2.7
Cleanout E-16 (tubing inside cleanout)	> max. limit	52.4	2.4	0.5	61	59	>60	>60	996		
Cleanout F-16 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	1	996	79.4	2.5
Cleanout F-16 (tubing inside cleanout)	0.0	5.6	15.3	14.8	0	0	3	2	996	79.6	24.1
Cleanout F-17 (ambient air)	0.0	0.1	20.8	20.4	4	0	0	0	996	79.5	3.0
Cleanout F-17 (tubing inside cleanout)	18.6	20.7	2.4	3.1	35	0	>100	>60	996	57.5	46.0
Cleanout G-16 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	996	79.4	2.5
Cleanout G-16 (tubing inside cleanout)	0.0	7.2	3.0	14.5	0	0	14	0	996	78.3	23.9
Central Manhole (tubing inside)	56.2	43.0	2.7	0.3	26	160	>100	>60	999	0.6	-0.6
Central Manhole (ambient air)	0.0	0.2	20.9	20.3	0	0	0	2	999	79.5	3.4

Appendix A: Landfill Gas Monitoring Data (16 October 2009)

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			ORAE	GEM-2000			ORAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	4.0	2.0	19.9	20.0	13	0	>100	>60	1003	74.0	-1.0
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	12.1	5.3	17.5	17.4	23	0	>100	>60	1003	65.2	0.0
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	2.8	1.8	19.8	20.3	41	0	>100	>60	1003	75.4	-0.7
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.2	0.3	20.9	21.2	57	0	0	4	1003	78.3	-1.2
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.0	0.5	20.9	20.4	0	1	0	0	1005	79.1	2.6
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	0.5	1.8	19.6	19.9	53	0	14	11	1005	77.8	3.2
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	0.0	0.4	20.9	21.2	178	4	0	0	1005	78.4	-1.1
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	1.2	2.1	19.9	20.8	37	70	27	24	1005	75.9	-2.1
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	29.8	22.6	10.4	10.5	78	0	>100	>60	1005	37.4	-1.2
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	0.2	20.1	21.9	23	0	19	1	1005	77.9	-4.2
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	50.5	46.1	1.8	1.8	28	1	>100	>60	1003	1.6	-5.2
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	50.0	42.5	8.1	1.8	7	1	>100	>100	1003	4.7	-2.4
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.2	0.9	20.9	20.8	3	0	0	4	1005	78.1	0.1
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	33.9	24.1	10.8	8.8	69	7	>100	1	1005	33.3	0.3
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	0.7	1.2	19.5	20.7	40	0	41	15	1004	77.4	-0.2
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	1.2	1.3	20.2	20.6	33	3	38	25	1004	76.9	-0.3
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	45.7	50.3	5.9	7.7	45	198	>100	>60	1004	-3.7	-32.6
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	13.8	13.7	3.7	15.6	78	0	>100	>100	1003	56.9	-1.6
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	0.0	0.1	20.9	20.1	0	0	0	0	1003	79.3	4.4
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	8.6	10.8	11.6	13.0	44	0	>100	>100	1003	67.6	16.9
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	0.2	20.1	21.1	46	0	0	0	1003	78.7	-0.4
Central Manhole (tubing inside)	59.4	40.1	3.8	0.3	4	255	>100	>60	1002	0.2	-0.9
Central Manhole (ambient air)											

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Appendix A: Landfill Gas Monitoring Data (05 November 2009)

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			GRAE	GEM-2000			GRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)											
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	10.2	5.2		12.1						72.5	27.1
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	12.2	6.8		16.1						64.9	4.5
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)											
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)											
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)											
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)											
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)											
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)											
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)											
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)											
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)											
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)											
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)											
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)											
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)											
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)											
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)											
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)											
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)											
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)											
Central Manhole (tubing inside)											
Central Manhole (ambient air)											

Appendix A: Landfill Gas Monitoring Data (10 November 2009)

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			GRAE	GEM-2000			GRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	0.4	0.5		21.0				8	1017	78.1	-0.7
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	0.2	1.2		20.9				4		77.7	-0.7
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	1.1	2.5		20.3				21		76.1	0.0
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.0	0.1		21.2				1		78.7	-0.8
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.1	3.4		20.3				2		77.2	1.1
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	2.1	6.5		18.6				42		72.8	3.1
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	0.0	0.0		21.3				0		78.7	-1.2
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	11.2	9.9		15.6				>100		63.3	4.8
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	2.5	3.9		19.6				61		74.0	0.5
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	0.8		21.0				0		78.2	-0.8
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	49.6	45.9		2.4				>100		2.4	-8.9
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	55.5	43.2		1.0				>100		0.3	-3.5
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.2	2.4		18.4				5		79.0	10.0
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	46.5	32.6		2.8				>100		18.1	7.6
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	3.2	1.0		13.1				64		82.7	33.6
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	2.6	2.5		19.6				53		75.3	1.8
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	0.0	0.9		20.0				0		79.1	4.1
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	52.8	46.2		0.9				>100		0.0	-3.4
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	12.5	17.5		4.7				>100		65.3	47.7
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	0.9	4.9		16.3				0		78.8	17.7
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	2.0		19.6				0		79.0	7.8
Central Manhole (tubing inside)	7.6	8.8		16.4				>100		67.0	5.5
Central Manhole (ambient air)											

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Appendix A: Landfill Gas Monitoring Data (11 November 2009)

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	0.7	0.7		21.3					1017	77.3	-2.6
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	0.5	1.6		21.1		0				76.6	-2.5
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	0.3	1.4		21.2		0				77.1	-2.4
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.0	0.2		21.7		0				78.1	-3.3
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.0	1.6		21.1		0				77.1	-2.0
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	2.0	6.6		18.7		0				72.7	2.6
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	12.8	9.7		15.7		0				61.8	2.9
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	24.0	19.3		10.0		0				46.7	9.2
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	2.8	5.0		19.5		0				72.9	-0.2
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	1.3		21.1		0					
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	48.9	45.4		2.8		204		>100		2.9	-7.8
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	54.2	45.5		0.2		204		>100	1024	0.1	-0.7
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.4	3.2		17.8		0				78.6	11.9
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	47.7	33.0		2.9		2				16.4	5.5
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	4.8	11.2		12.0		0				72.0	27.0
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	2.0	2.1		19.9		0				76.0	1.4
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	0.0	0.9		20.0		0				79.1	4.1
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	52.0	46.8		0.5		54		>100		0.7	-1.2
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	16.6	16.6		5.5		5		>100		67.4	46.8
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	0.6	4.5		17.1		0		0		78.4	14.3
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	2.0		19.5		0		0		78.5	5.4
Central Manhole (tubing inside)	5.6	7.6		17.2		0				68.6	4.1
Central Manhole (ambient air)											

ATTACHMENT 3

Technical Memorandum Regarding WCC Navan Facility Noise Monitoring 2019

GOLDER

TECHNICAL MEMORANDUM

DATE March 10, 2020 **Project No.** 18113613

TO Henri Huneault, Landfill Site Manager
Waste Connections of Canada

CC joe_tomaselli@golder.com

FROM Tomasz Nowak **EMAIL** tomasz_nowak@golder.com

WASTE CONNECTIONS OF CANADA NAVAN FACILITY NOISE MONITORING 2019

Dear Mr. Huneault:

Golder Associates Ltd. (Golder) was retained to carry out annual noise monitoring for the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (WCC Navan Facility) in the eastern portion of Ottawa, Ontario. Noise monitoring was carried out to fulfill the requirements as outlined in Section 9.5 of the Design & Operations Report Navan Landfill Site Expansion Approvals (January 2008). This memorandum provides a summary of the noise monitoring results for 2019.

Site Operations

The WCC Navan Facility is a waste management facility that handles solid, non-hazardous industrial and commercial waste (including construction and demolition waste), asbestos waste, dry non-putrescible (i.e., non-organic) domestic waste and impacted soil. The facility operates six days a week, from 7:00 am to 5:00 pm on weekdays and 8:00 am to 1:00 pm on Saturday. The existing operations allow for a maximum of 234,750 tonnes of waste per year to be landfilled with an average daily maximum of 1,500 tonnes. Figure 1 (attached) shows a key plan of the site and surrounding area.

Methodology

An annual noise monitoring program was completed in 2019 using two Larson Davis 820 sound level meters located at the nearest residential receptors (i.e., points of reception (POR(s))) to the WCC Navan Facility. Noise data was logged every hour for the duration of the monitoring period. The monitoring was carried out from September 17 to September 24, 2019. Monitoring locations are shown in Figure 1 (attached). All monitoring data is summarized in Attachment A. Weather data during the monitoring program is provided in Attachment B.

Results

Table 1 summarizes the noise monitoring results for the 2019 monitoring program.

Table 1: Summary of Daytime Noise Levels

Monitoring Site	Minimum Daytime Hourly L_{eq} (dBA)	Minimum Daytime Hourly L_{90} (dBA)	Average Daytime Hourly L_{eq} (dBA)	Average Daytime Hourly L_{90} (dBA)
Monitoring Site 1	40	35	51	44
Monitoring Site 2	46	32	55	48

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6925 Century Avenue, Suite #100, Mississauga, Ontario, L5N 7K2, Canada T: +1 905 567 4444 F: +1 905 567 6561

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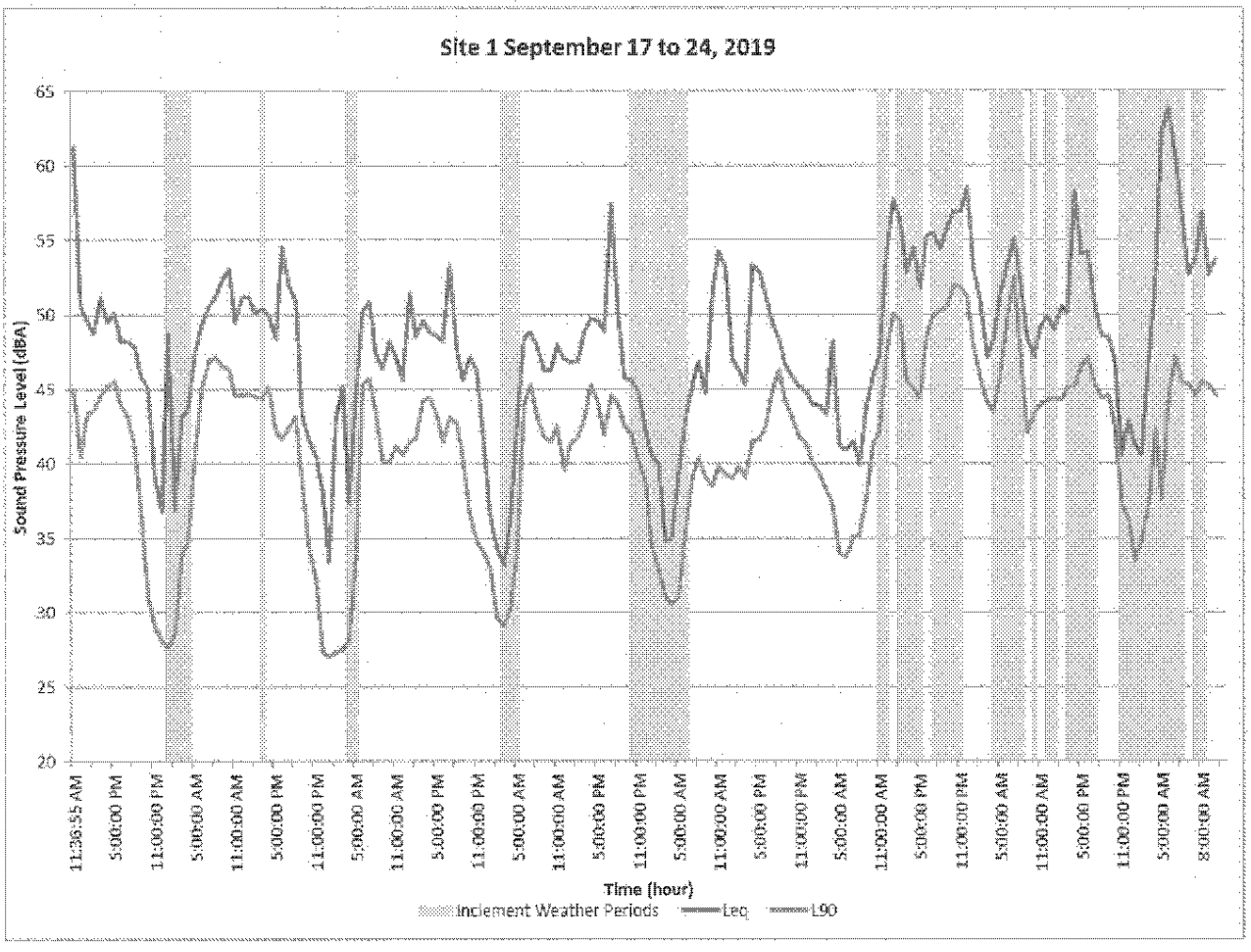
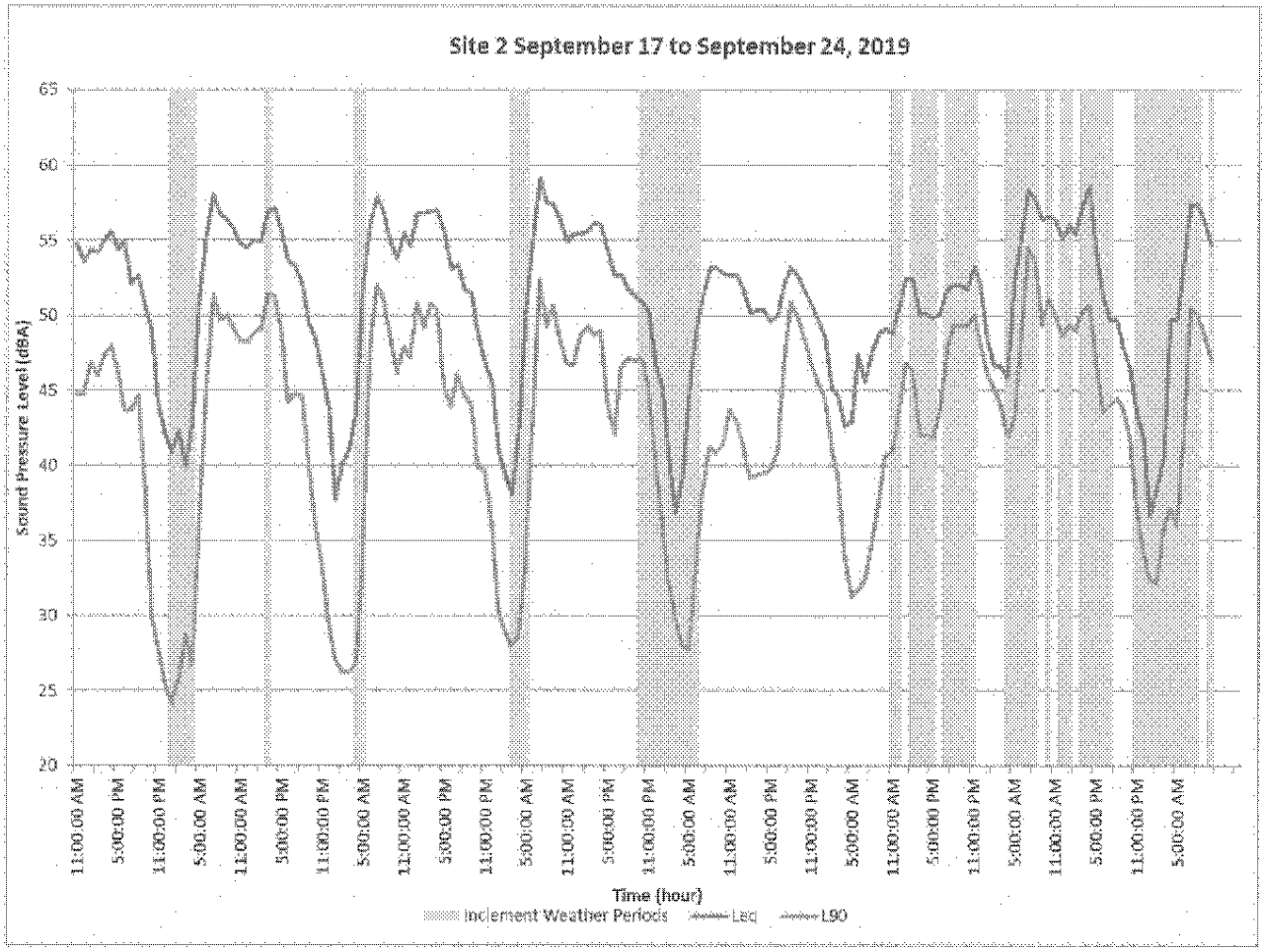
Data collected during periods of inclement weather (i.e. rain and/or high wind speeds, in excess of 18 km/h, the limit described in International Standards Organization (ISO) 1996-2 (2007) Standard *Acoustics – Description, measurement and assessment of environmental Noise – Part 2: Determination of environmental noise levels* for favourable sound propagation conditions) were excluded from the calculated levels provided in Table 1.
The periods of monitoring for which data was excluded from the calculation are shown in Plots 1 and 2 as shaded regions.



Plot 1: September 2019 Noise Monitoring Results – Monitoring Site 1



Plot 2: September 2019 Noise Monitoring Results – Monitoring Site 2

Criteria and Guidelines

The WCC Navan Facility and PORs are located on Parts of Lots 2, 3 and 4, Concession 4, Ottawa Front (formerly the City of Gloucester). The noise criteria for the WCC Navan Facility are based on the Ministry of Environment, Conservation and Parks (MECP) (formerly known as the Ministry of the Environment and Climate Change (MOECC)) Noise Guidelines for Landfill Sites (October 1998) and Noise Pollution Control (NPC) publication NPC 300 (August 2013). The Landfill Guideline outlines the sound level limit criteria for evaluating landfill site operations (i.e. landfilling activities) and NPC 300 provides the criteria for on-site stationary noise sources (i.e. non-landfilling activities). Table 2 summarizes the sound level limits at a POR due to landfill site operations.

Table 2: Applicable Noise Limits

	Daytime (07:00 – 19:00)	Night-time (19:00 – 07:00)
Landfilling Operations – 1-Hour Equivalent Sound Level – L_{eq} (dBA)	55	45
Stationary Sources – 1-Hour Equivalent Sound Level – L_{eq} (dBA)	50	45

Discussion

Based on site observations, the noise levels at the two PORs are dominated by road traffic noise along Navan Road and with audible noise from landfilling operations of the WCC Navan Facility, as confirmed during Golder staff visits (i.e., deployment and collection of the monitoring equipment). Golder's January 2008 report predicted a noise impact level for the existing site operations of the WCC Navan Facility on the surrounding PORs to be between 27 and 37 dBA due to site operations. The measured average hourly noise levels were equal to 51 dBA and 55 dBA at Monitoring Location 1 and Monitoring Location 2, respectively. These levels are at or below the noise limits established in the MECP Landfill Guidelines. It is expected that, at both sites, the noise level is predominantly influenced by traffic on the adjacent road and to a lesser extent from operations of the Facility.

Proposed Future Noise Monitoring

As discussed above, the noise levels in the area are dominated by traffic along Navan Road. Based on the findings from the 2019 and previous monitoring programs, Golder recommended that the noise monitoring at the WCC Navan Facility continue to be conducted on an annual basis with one monitoring session per year. It is understood landfill operations at the WCC Navan Facility have been substantially completed in various areas within the landfill. It is further understood, in 2020, the activities will be occurring in the north-east area, potentially closer to the identified receptor. Accordingly, Golder recommends monitoring to continue in 2020.

Closure

Golder Associates Ltd. was retained to carry out noise monitoring for Waste Connections Canada (WCC) at the WCC Navan Facility in the eastern portion of Ottawa, Ontario. The monitoring results and site observations indicate that the landfilling noise levels, expressed in average 1-hour Leq is observed to be below the noise limit at both monitoring sites. Based on these results, the operations of the WCC Navan Facility are expected to be operating in compliance with the MECP Landfill Guideline and NPC 300 limits as summarized in Table 2, where applicable.

If you have any further questions or concerns, please do not hesitate to contact the undersigned at your earliest convenience.

Golder Associates Ltd.

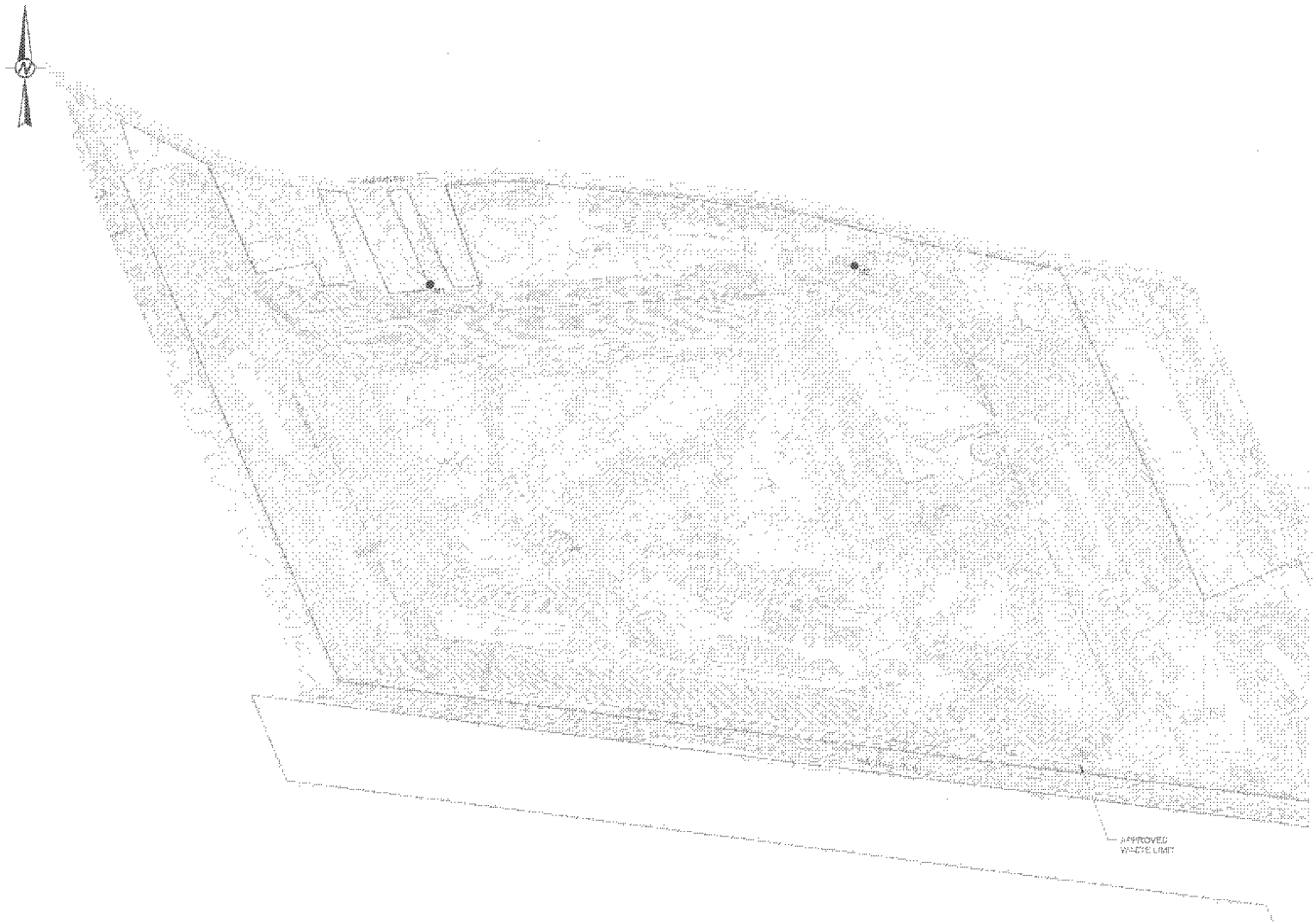
Tomasz Nowak M.Sc., M.Eng.
Acoustic, Noise and Vibration Specialist

Joe Tomaselli M.Eng., P.Eng.
Associate/Senior Acoustic, Noise and Vibration Engineer

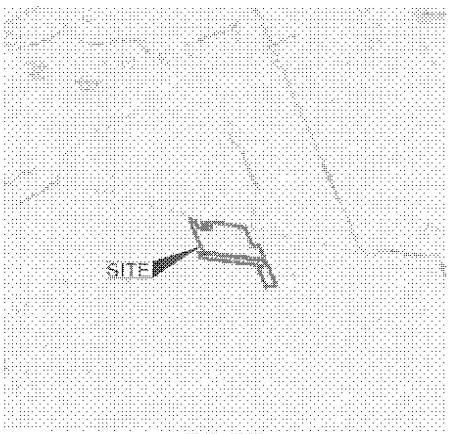
TN/JT/sg
https://golderassociates.sharepoint.com/sites/101384/technical work/phase 3000 noise monitoring/reporting/18113613 -tm-rev0 waste connections of canada navan_10mar2020.docx

Attachments: Figure1 – Noise Monitoring Locations
Appendix A – Noise Data
Appendix B – Weather Data September 17 to 24, 2019

FIGURE



KEY MAP



SCALE 1:100,000

LEGEND

- MONITORING LOCATION
- VERTICAL / HORIZONTAL CONTROL
- INDEX / INTERMEDIATE CONTOURS (APRIL 2019)
- SPOT ELEVATION
- HEDGE LINE
- GUARD RAIL
- RETAINING WALL
- FENCE LINE
- WOODED AREA
- SINGLE TREE
- SHORELINE AND WATER ELEVATION (RIDEAU STREAM) M-HCH
- BUILDING
- POST
- AREA OUTLINE
- PAVED / GRAVEL ROAD
- PROPERTY BOUNDARY

REFERENCE(S)

1. PROPERTY LINE PROVIDED IN ELECTRONIC FORMAT BY FARLEY, SMITH & DENIS SURVEYING LTD. FILE NO. 50606, DATED APRIL 15, 2007.
2. BASE INFORMATION PROVIDED BY THE BATEMAN GROUP LTD. IN A DIGITAL FORMAT FROM CONTRACT NO. 3706-19 DATED APRIL 08, 2019.
3. COORDINATE SYSTEM: NAD 83 (CSRS) MTM ZONE 9 (NAD 83 GEODETIC).

0 100 200
METRES

PROJECT

NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

CONSULTANT

GOLDER

DESIGNED	2019-10-11
DESIGNED	YJM
PREPARED	ASO
REVIEWED	YJM
APPROVED	PLE

TITLE

NOISE MONITORING LOCATIONS

PROJECT NO.	PHASE NO.	REV.	FIGURE
19113613	0007	0	1

000263

APPENDIX A

Noise Data

Table 1 summarizes noise levels measured at Monitoring Site 1 and Monitoring Site 2.

Table 1: Measured Noise Levels [dBA]

Date	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
September 17, 2019	11:36:55	61.3	45.0	54.8	44.8
September 17, 2019	12:00:00	50.6	40.5	53.6	44.8
September 17, 2019	13:00:00	49.6	43.4	54.4	46.9
September 17, 2019	14:00:00	48.7	43.6	54.2	46.0
September 17, 2019	15:00:00	51.1	44.5	55.0	47.3
September 17, 2019	16:00:00	49.5	45.2	55.6	48.0
September 17, 2019	17:00:00	50.1	45.6	54.4	46.2
September 17, 2019	18:00:00	48.2	44.0	55.0	43.7
September 17, 2019	19:00:00	48.2	43.2	52.1	43.7
September 17, 2019	20:00:00	47.9	41.2	52.7	44.6
September 17, 2019	21:00:00	45.9	37.1	50.6	38.4
September 17, 2019	22:00:00	45.1	31.2	49.1	30.0
September 17, 2019	23:00:00	39.1	29.1	44.0	27.7
September 18, 2019	0:00:00	36.8	28.1	42.1	25.3
September 18, 2019	1:00:00	48.7	27.6	40.9	24.2
September 18, 2019	2:00:00	36.9	28.6	42.3	25.9
September 18, 2019	3:00:00	43.2	34.0	39.9	28.7
September 18, 2019	4:00:00	43.7	34.7	42.6	26.7
September 18, 2019	5:00:00	47.5	40.7	51.1	36.5
September 18, 2019	6:00:00	49.4	45.1	55.3	45.5
September 18, 2019	7:00:00	50.6	46.9	58.0	51.4
September 18, 2019	8:00:00	51.2	47.2	56.8	49.7
September 18, 2019	9:00:00	52.3	46.6	56.4	50.0
September 18, 2019	10:00:00	53.1	46.4	55.8	49.1
September 18, 2019	11:00:00	49.5	44.6	54.8	48.3
September 18, 2019	12:00:00	51.2	44.6	54.5	48.2
September 18, 2019	13:00:00	51.2	44.7	55.0	48.9
September 18, 2019	14:00:00	50.1	44.5	54.9	49.1
September 18, 2019	15:00:00	50.4	44.4	56.8	51.4
September 18, 2019	16:00:00	49.9	45.1	57.2	51.3
September 18, 2019	17:00:00	48.4	42.2	55.6	48.8
September 18, 2019	18:00:00	54.6	41.7	53.7	44.2
September 18, 2019	19:00:00	52.0	42.4	53.3	44.8
September 18, 2019	20:00:00	50.9	43.2	52.2	44.6

000267

Date	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
September 18, 2019	21:00:00	43.3	38.9	49.5	39.9
September 18, 2019	22:00:00	41.6	34.4	48.5	36.2
September 18, 2019	23:00:00	40.5	32.3	46.2	33.3
September 19, 2019	0:00:00	38.1	27.4	43.8	29.4
September 19, 2019	1:00:00	33.4	27.0	37.7	27.1
September 19, 2019	2:00:00	43.0	27.3	40.1	26.3
September 19, 2019	3:00:00	45.2	27.5	41.1	26.3
September 19, 2019	4:00:00	37.4	28.1	43.8	26.8
September 19, 2019	5:00:00	44.5	33.7	51.8	33.5
September 19, 2019	6:00:00	50.2	45.4	56.0	47.8
September 19, 2019	7:00:00	50.8	45.7	57.9	52.0
September 19, 2019	8:00:00	47.4	43.5	57.0	51.2
September 19, 2019	9:00:00	46.4	40.2	54.9	48.6
September 19, 2019	10:00:00	48.2	40.1	53.8	46.2
September 19, 2019	11:00:00	47.2	41.2	55.5	47.9
September 19, 2019	12:00:00	45.7	40.6	54.6	47.2
September 19, 2019	13:00:00	51.4	41.5	56.8	50.8
September 19, 2019	14:00:00	48.5	41.7	56.8	49.2
September 19, 2019	15:00:00	49.6	44.2	56.9	50.8
September 19, 2019	16:00:00	48.8	44.4	57.0	50.4
September 19, 2019	17:00:00	48.6	43.3	55.5	45.2
September 19, 2019	18:00:00	48.2	41.5	53.1	43.9
September 19, 2019	19:00:00	53.3	43.1	53.4	46.1
September 19, 2019	20:00:00	47.6	42.7	51.7	44.7
September 19, 2019	21:00:00	45.6	40.3	51.5	44.1
September 19, 2019	22:00:00	47.2	36.6	48.8	39.9
September 19, 2019	23:00:00	46.2	34.8	46.9	39.7
September 20, 2019	0:00:00	41.3	34.0	45.6	36.3
September 20, 2019	1:00:00	36.5	33.0	40.8	30.3
September 20, 2019	2:00:00	34.3	29.6	39.5	29.0
September 20, 2019	3:00:00	33.2	29.1	38.1	28.0
September 20, 2019	4:00:00	36.1	30.3	42.7	28.7
September 20, 2019	5:00:00	42.7	34.1	50.2	33.2
September 20, 2019	6:00:00	48.4	43.9	55.0	42.8
September 20, 2019	7:00:00	48.9	45.3	59.2	52.3
September 20, 2019	8:00:00	47.9	43.2	57.5	49.3
September 20, 2019	9:00:00	46.3	41.8	57.4	50.7

000268

Date	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
September 20, 2019	10:00:00	46.3	41.5	56.4	48.4
September 20, 2019	11:00:00	48.0	42.5	54.9	46.8
September 20, 2019	12:00:00	47.0	39.6	55.4	46.6
September 20, 2019	13:00:00	46.8	41.4	55.4	48.6
September 20, 2019	14:00:00	46.9	41.8	55.6	49.3
September 20, 2019	15:00:00	48.8	42.9	56.2	48.7
September 20, 2019	16:00:00	49.7	45.3	56.0	49.0
September 20, 2019	17:00:00	49.6	44.1	54.2	44.1
September 20, 2019	18:00:00	48.9	42.0	52.6	42.0
September 20, 2019	19:00:00	57.4	44.6	52.7	46.5
September 20, 2019	20:00:00	49.9	44.0	51.8	47.2
September 20, 2019	21:00:00	45.8	42.6	51.3	47.0
September 20, 2019	22:00:00	45.6	42.0	50.9	47.1
September 20, 2019	23:00:00	44.8	40.2	50.3	45.4
September 21, 2019	0:00:00	42.2	38.8	46.7	40.4
September 21, 2019	1:00:00	40.6	34.6	45.2	36.4
September 21, 2019	2:00:00	40.0	32.9	40.7	32.5
September 21, 2019	3:00:00	34.7	31.1	36.8	30.1
September 21, 2019	4:00:00	35.1	30.6	39.3	28.0
September 21, 2019	5:00:00	39.3	31.0	45.3	27.7
September 21, 2019	6:00:00	43.0	35.5	49.0	32.8
September 21, 2019	7:00:00	45.3	39.1	51.3	38.3
September 21, 2019	8:00:00	46.9	40.4	53.2	41.3
September 21, 2019	9:00:00	44.7	39.1	53.2	40.8
September 21, 2019	10:00:00	51.4	38.5	52.8	41.5
September 21, 2019	11:00:00	54.3	39.8	52.7	43.7
September 21, 2019	12:00:00	53.2	39.3	52.7	42.9
September 21, 2019	13:00:00	47.0	39.0	51.8	41.3
September 21, 2019	14:00:00	46.2	39.8	50.2	39.2
September 21, 2019	15:00:00	45.3	39.1	50.3	39.4
September 21, 2019	16:00:00	53.3	41.5	50.4	39.5
September 21, 2019	17:00:00	52.9	41.6	49.6	39.8
September 21, 2019	18:00:00	51.3	42.4	50.0	40.9
September 21, 2019	19:00:00	49.4	44.9	52.2	47.2
September 21, 2019	20:00:00	48.3	46.3	53.2	50.9
September 21, 2019	21:00:00	46.6	44.2	52.7	49.9
September 21, 2019	22:00:00	45.8	43.1	51.6	48.3

Date	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
September 21, 2019	23:00:00	45.2	41.8	50.8	46.9
September 22, 2019	0:00:00	44.8	41.4	49.7	45.6
September 22, 2019	1:00:00	44.0	40.1	48.6	44.5
September 22, 2019	2:00:00	43.9	39.3	45.2	41.1
September 22, 2019	3:00:00	43.3	38.3	44.6	39.2
September 22, 2019	4:00:00	48.2	37.4	42.6	33.9
September 22, 2019	5:00:00	41.2	34.0	43.0	31.3
September 22, 2019	6:00:00	40.9	33.8	47.4	31.8
September 22, 2019	7:00:00	41.5	35.1	45.6	32.3
September 22, 2019	8:00:00	39.9	35.2	47.6	34.9
September 22, 2019	9:00:00	43.9	37.7	48.8	37.7
September 22, 2019	10:00:00	46.0	41.3	49.1	40.7
September 22, 2019	11:00:00	47.3	42.1	48.8	41.0
September 22, 2019	12:00:00	54.1	47.1	50.7	43.9
September 22, 2019	13:00:00	57.7	50.1	52.4	46.8
September 22, 2019	14:00:00	56.2	49.6	52.5	46.4
September 22, 2019	15:00:00	52.8	45.7	50.1	42.0
September 22, 2019	16:00:00	54.5	45.0	50.1	42.1
September 22, 2019	17:00:00	51.8	44.4	49.9	41.9
September 22, 2019	18:00:00	55.3	48.5	50.1	43.7
September 22, 2019	19:00:00	55.4	50.0	51.8	47.8
September 22, 2019	20:00:00	54.4	50.2	52.0	49.3
September 22, 2019	21:00:00	55.9	50.5	52.0	49.3
September 22, 2019	22:00:00	56.9	52.0	51.7	49.3
September 22, 2019	23:00:00	56.9	51.9	53.3	50.1
September 23, 2019	0:00:00	58.5	51.2	52.1	48.1
September 23, 2019	1:00:00	53.1	48.0	48.4	46.1
September 23, 2019	2:00:00	50.9	45.8	46.7	45.1
September 23, 2019	3:00:00	47.1	44.1	46.6	44.1
September 23, 2019	4:00:00	48.3	43.5	45.9	41.9
September 23, 2019	5:00:00	51.5	46.0	52.3	43.2
September 23, 2019	6:00:00	53.3	49.7	55.4	49.2
September 23, 2019	7:00:00	55.1	52.6	58.3	54.5
September 23, 2019	8:00:00	52.2	47.3	57.8	53.6
September 23, 2019	9:00:00	48.4	42.1	56.4	49.4
September 23, 2019	10:00:00	47.2	43.4	56.6	51.2
September 23, 2019	11:00:00	49.1	44.0	56.4	50.0

Date	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
September 23, 2019	12:00:00	49.9	44.3	55.1	48.7
September 23, 2019	13:00:00	49.0	44.4	56.0	49.4
September 23, 2019	14:00:00	50.5	44.3	55.4	49.0
September 23, 2019	15:00:00	50.1	45.1	57.4	50.4
September 23, 2019	16:00:00	58.2	45.2	58.6	50.7
September 23, 2019	17:00:00	54.1	46.6	54.5	47.1
September 23, 2019	18:00:00	54.2	47.1	51.3	43.6
September 23, 2019	19:00:00	50.7	45.3	49.8	44.0
September 23, 2019	20:00:00	48.6	44.4	49.7	44.5
September 23, 2019	21:00:00	48.5	44.6	47.9	43.9
September 23, 2019	22:00:00	47.0	42.5	46.5	41.7
September 23, 2019	23:00:00	40.6	37.3	43.4	37.1
September 24, 2019	0:00:00	42.9	36.2	42.0	34.4
September 24, 2019	1:00:00	41.3	33.5	36.7	32.4
September 24, 2019	2:00:00	40.6	34.9	38.6	32.2
September 24, 2019	3:00:00	46.8	37.3	40.6	35.8
September 24, 2019	4:00:00	52.1	42.4	49.7	37.2
September 24, 2019	5:00:00	62.1	37.6	49.8	36.0
September 24, 2019	6:00:00	63.9	44.6	53.8	42.5
September 24, 2019	7:00:00	60.7	47.2	57.4	50.5
September 24, 2019	8:00:00	56.9	45.5	57.4	50.0
September 24, 2019	9:00:00	52.7	45.3	56.2	48.7
September 24, 2019	10:00:00	53.7	44.6	54.7	47.1

Notes: Rows highlighted in yellow represent data monitored during the Facility daytime period of operations.

APPENDIX B

Weather Data September 17 to 24, 2019

Station Name	OTTAWA INT'L
Province	ONTARIO
Latitude	45.32
Longitude	-75.67
Elevation	114
Climate Identifier	6106001
WMO Identifier	71628
TC Identifier	YOW

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Table 1: Weather Data September 17 to September 24, 2019

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2019-09-17 11:00	18.2	7.3	48	36	2	101.04	NA
2019-09-17 12:00	20.1	8.1	45	32	8	101	NA
2019-09-17 13:00	21.1	8	42	36	11	100.94	Clear
2019-09-17 14:00	21.2	7.7	41	33	7	100.91	NA
2019-09-17 15:00	22.2	6.7	36	35	18	100.87	NA
2019-09-17 16:00	21.9	6.3	36	36	16	100.88	Clear
2019-09-17 17:00	20.9	6	37	1	14	100.89	NA
2019-09-17 18:00	18	6.7	47	6	9	100.87	NA
2019-09-17 19:00	14.7	6.5	58	4	8	100.91	Mainly Clear
2019-09-17 20:00	14	7.5	65	6	9	100.93	NA
2019-09-17 21:00	11.5	6.7	72	11	8	100.95	NA
2019-09-17 22:00	12.1	6.7	69	9	8	100.97	Mainly Clear
2019-09-17 23:00	12.2	7.5	73	13	8	100.99	NA
2019-09-18 0:00	8	6.5	90	9	8	101.03	NA
2019-09-18 1:00	8.6	7.1	90	10	7	101.08	Clear
2019-09-18 2:00	9.1	7.9	92	6	8	101.1	NA
2019-09-18 3:00	9.2	8.1	93	4	8	101.18	NA
2019-09-18 4:00	9.7	8.4	92	6	8	101.19	Rain
2019-09-18 5:00	9.7	8.4	91	5	12	101.24	NA
2019-09-18 6:00	9.9	8.5	90	8	10	101.28	NA
2019-09-18 7:00	11.2	9.1	87	8	13	101.31	Mainly Clear
2019-09-18 8:00	11.7	9.3	85	10	14	101.36	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2019-09-18 9:00	15.2	10.1	71	10	16	101.35	NA
2019-09-18 10:00	17.1	8.6	57	9	14	101.37	Mainly Clear
2019-09-18 11:00	18.6	8.6	52	10	16	101.32	NA
2019-09-18 12:00	19	8.5	50	12	12	101.33	NA
2019-09-18 13:00	19.8	8.4	47	10	13	101.29	Clear
2019-09-18 14:00	20	8.2	46	15	13	101.29	NA
2019-09-18 15:00	20.4	9.5	49	11	8	101.24	NA
2019-09-18 16:00	19.9	8.3	46	12	12	101.23	Mainly Clear
2019-09-18 17:00	19.1	8.8	51	14	10	101.22	NA
2019-09-18 18:00	15.6	9.1	65	13	6	101.23	NA
2019-09-18 19:00	12.6	8.4	76	12	14	101.23	Clear
2019-09-18 20:00	12.6	7.9	73	12	12	101.24	NA
2019-09-18 21:00	11.3	7.2	75	12	12	101.25	NA
2019-09-18 22:00	10.6	6.9	78	12	13	101.25	Mainly Clear
2019-09-18 23:00	11.1	6.9	75	15	10	101.24	NA
2019-09-19 0:00	9.7	6.5	81	36	2	101.28	NA
2019-09-19 1:00	9.1	6.6	84	4	8	101.29	Mainly Clear
2019-09-19 2:00	9.4	6.6	83	3	9	101.27	NA
2019-09-19 3:00	8.6	6.3	85	35	10	101.25	NA
2019-09-19 4:00	8.2	6	85	6	9	101.26	Clear
2019-09-19 5:00	6.3	5.4	94	10	9	101.25	NA
2019-09-19 6:00	6.5	5.6	94	9	3	101.26	NA
2019-09-19 7:00	9.2	7	86	7	7	101.32	Clear
2019-09-19 8:00	11.1	8.3	83	19	9	101.33	NA
2019-09-19 9:00	14.6	8.7	68	18	5	101.3	NA
2019-09-19 10:00	17	10.2	64	19	4	101.24	Mainly Clear
2019-09-19 11:00	19.6	10.8	57	20	3	101.19	NA
2019-09-19 12:00	20.5	10.7	53	16	7	101.15	NA
2019-09-19 13:00	22	10.3	47	20	8	101.14	Mainly Clear
2019-09-19 14:00	23.4	12.2	49	15	11	101.08	NA
2019-09-19 15:00	23.5	10.8	44	16	18	101	NA
2019-09-19 16:00	23.4	11.3	46	16	14	101	Mainly Clear

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2019-09-19 17:00	22.2	11.1	49	17	12	100.99	NA
2019-09-19 18:00	19.4	11.2	59	17	7	100.98	NA
2019-09-19 19:00	17.8	10.8	63	19	10	100.97	Mostly Cloudy
2019-09-19 20:00	16.4	10.6	68	20	9	100.98	NA
2019-09-19 21:00	14.9	10	72	18	10	100.97	NA
2019-09-19 22:00	14.5	9.7	72	19	9	100.95	Mostly Cloudy
2019-09-19 23:00	14.1	9.5	74	20	7	100.93	NA
2019-09-20 0:00	13.2	9.6	78	27	7	100.91	NA
2019-09-20 1:00	11.4	9.4	88	19	6	100.9	Mainly Clear
2019-09-20 2:00	11.5	9.5	87	19	9	100.87	NA
2019-09-20 3:00	11.5	9.4	87	36	3	100.9	NA
2019-09-20 4:00	10.1	9.3	95	20	8	100.89	Mostly Cloudy
2019-09-20 5:00	10.2	9.1	93	20	11	100.88	NA
2019-09-20 6:00	10	8.9	93	18	12	100.93	NA
2019-09-20 7:00	11.2	9.6	89	18	13	100.96	Mostly Cloudy
2019-09-20 8:00	14.3	11	80	20	13	101	NA
2019-09-20 9:00	17.7	12.8	73	23	7	100.97	NA
2019-09-20 10:00	20	11.7	58	25	10	100.92	Mainly Clear
2019-09-20 11:00	22	12	52	24	8	100.86	NA
2019-09-20 12:00	23.3	11.7	48	26	4	100.8	NA
2019-09-20 13:00	24.8	11.6	43	29	9	100.73	Mainly Clear
2019-09-20 14:00	25.2	12.1	44	30	10	100.68	NA
2019-09-20 15:00	26.1	12.2	42	28	12	100.67	NA
2019-09-20 16:00	25.9	12.9	44	28	12	100.65	Mainly Clear
2019-09-20 17:00	24.6	12.9	48	25	10	100.69	NA
2019-09-20 18:00	22.9	10.3	45	24	6	100.72	NA
2019-09-20 19:00	19.7	12.7	63	21	11	100.72	Mainly Clear
2019-09-20 20:00	18.4	13.2	71	19	10	100.72	NA
2019-09-20 21:00	17.9	14.6	81	21	9	100.78	NA
2019-09-20 22:00	17.5	14.9	85	22	11	100.76	Mainly Clear
2019-09-20 23:00	15.9	14.4	91	20	9	100.74	NA
2019-09-21 0:00	15.5	14.4	93	21	11	100.76	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2019-09-21 1:00	14.7	13.9	95	20	8	100.78	Clear
2019-09-21 2:00	14.3	14.1	99	23	4	100.82	NA
2019-09-21 3:00	13	12.8	98	23	9	100.79	NA
2019-09-21 4:00	12.7	12.5	99	36	3	100.82	Clear
2019-09-21 5:00	12.7	12.6	99	19	8	100.83	NA
2019-09-21 6:00	12.4	12.3	99	23	5	100.88	NA
2019-09-21 7:00	14.7	14.3	98	31	4	100.97	Mainly Clear
2019-09-21 8:00	17.6	15	85	4	6	101	NA
2019-09-21 9:00	19.1	15.3	78	16	6	100.98	NA
2019-09-21 10:00	22.3	16.1	68	16	4	100.92	Mainly Clear
2019-09-21 11:00	24.2	15.6	58	21	5	100.88	NA
2019-09-21 12:00	25.3	15.8	55	20	10	100.8	NA
2019-09-21 13:00	26.1	16	53	17	7	100.71	Mainly Clear
2019-09-21 14:00	27.3	15.8	49	20	15	100.67	NA
2019-09-21 15:00	27	15.9	50	21	13	100.64	NA
2019-09-21 16:00	27.3	16.6	51	22	11	100.61	Mostly Cloudy
2019-09-21 17:00	25.8	16.2	55	21	15	100.61	NA
2019-09-21 18:00	23.6	15.9	62	19	12	100.58	NA
2019-09-21 19:00	21.2	15.6	70	19	7	100.59	Mainly Clear
2019-09-21 20:00	20.4	14.2	67	20	12	100.6	NA
2019-09-21 21:00	19.7	13.7	68	20	10	100.58	NA
2019-09-21 22:00	19.3	13.4	68	21	9	100.57	Clear
2019-09-21 23:00	18.4	13.2	71	19	9	100.51	NA
2019-09-22 0:00	17.6	13.2	75	16	7	100.47	NA
2019-09-22 1:00	17.1	13.5	79	19	5	100.49	Mainly Clear
2019-09-22 2:00	16.1	13.6	85	17	8	100.45	NA
2019-09-22 3:00	16	13.7	86	16	11	100.38	NA
2019-09-22 4:00	15.6	13.2	86	17	9	100.33	Mainly Clear
2019-09-22 5:00	15.8	13.3	85	18	11	100.32	NA
2019-09-22 6:00	15.8	13.4	86	19	10	100.28	NA
2019-09-22 7:00	17.3	14.7	84	19	12	100.26	Mainly Clear
2019-09-22 8:00	19.4	16.2	82	22	11	100.23	NA

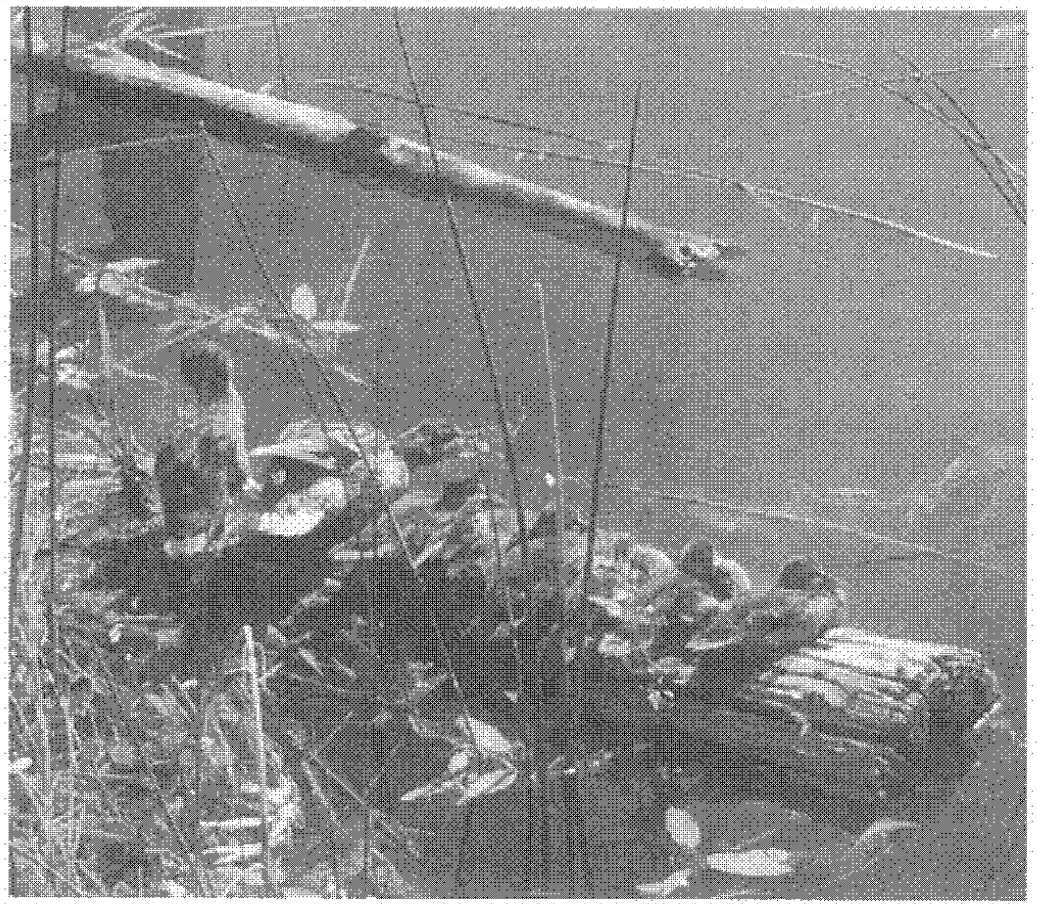
Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2019-09-22 9:00	20.3	17.1	82	21	16	100.21	NA
2019-09-22 10:00	22.2	18.6	79	22	17	100.15	Mostly Cloudy
2019-09-22 11:00	23.3	18.7	75	20	18	100.1	NA
2019-09-22 12:00	24.6	18.9	70	20	21	100	NA
2019-09-22 13:00	24	19.2	74	20	20	99.91	Cloudy
2019-09-22 14:00	24.6	19.4	72	19	12	99.84	NA
2019-09-22 15:00	26.5	19.4	64	19	21	99.73	NA
2019-09-22 16:00	27.4	17.9	56	21	26	99.66	Mostly Cloudy
2019-09-22 17:00	26.8	18.5	60	20	22	99.63	NA
2019-09-22 18:00	25.2	18.5	66	20	21	99.61	NA
2019-09-22 19:00	24.5	18.4	69	19	17	99.57	Mostly Cloudy
2019-09-22 20:00	24.4	17.3	64	20	20	99.53	NA
2019-09-22 21:00	24.7	15.8	57	21	21	99.49	NA
2019-09-22 22:00	24.8	14.8	53	21	26	99.41	Cloudy
2019-09-22 23:00	25.3	14.2	50	22	26	99.37	NA
2019-09-23 0:00	24.9	14.4	52	22	23	99.33	NA
2019-09-23 1:00	22.9	15.5	63	22	17	99.32	Rain Showers
2019-09-23 2:00	21	16.7	76	20	10	99.3	Rain Showers
2019-09-23 3:00	21.1	16.8	76	21	16	99.25	NA
2019-09-23 4:00	20.8	16.8	77	23	13	99.29	Rain Showers
2019-09-23 5:00	18.7	17.5	92	23	5	99.27	Rain Showers
2019-09-23 6:00	18.7	17.8	94	20	13	99.24	Rain, Fog
2019-09-23 7:00	18.5	18	97	18	8	99.17	Rain, Fog
2019-09-23 8:00	18.7	18.3	97	19	14	99.16	Rain, Fog
2019-09-23 9:00	20	18.8	93	21	16	99.12	NA
2019-09-23 10:00	20.9	19.2	90	22	17	99.12	Cloudy
2019-09-23 11:00	22.1	19.1	83	23	23	99.08	NA
2019-09-23 12:00	22.4	19	81	23	16	99.05	NA
2019-09-23 13:00	23	18.9	77	23	19	99	Cloudy
2019-09-23 14:00	23.6	18.8	74	23	15	98.95	NA
2019-09-23 15:00	23.9	19.1	74	22	10	98.89	NA
2019-09-23 16:00	22.4	19.8	85	29	17	98.88	Mostly Cloudy

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2019-09-23 17:00	21.3	16.9	76	28	30	98.95	NA
2019-09-23 18:00	19.2	16	82	28	31	99.04	NA
2019-09-23 19:00	17.7	15.3	86	28	20	99.09	Mainly Clear
2019-09-23 20:00	17	15.2	89	27	17	99.15	NA
2019-09-23 21:00	17.2	15.4	89	28	17	99.17	NA
2019-09-23 22:00	15.5	13.4	87	31	18	99.17	Mostly Cloudy
2019-09-23 23:00	14.5	12.6	88	35	13	99.2	NA
2019-09-24 0:00	13.6	12.3	92	30	10	99.2	NA
2019-09-24 1:00	13.8	12.5	91	30	18	99.22	Mostly Cloudy
2019-09-24 2:00	13.8	12.8	94	28	10	99.21	NA
2019-09-24 3:00	13.4	12.1	92	32	18	99.23	Rain
2019-09-24 4:00	13.2	11.8	91	32	21	99.27	Rain
2019-09-24 5:00	12.8	11.3	91	31	19	99.35	NA
2019-09-24 6:00	12.6	11	90	32	19	99.41	NA
2019-09-24 7:00	12.8	10.6	86	33	22	99.47	Mostly Cloudy
2019-09-24 8:00	13.4	10.6	83	31	19	99.51	NA
2019-09-24 9:00	14.5	10.1	75	32	21	99.55	NA
2019-09-24 10:00	14.1	9.9	75	30	18	99.59	Mostly Cloudy

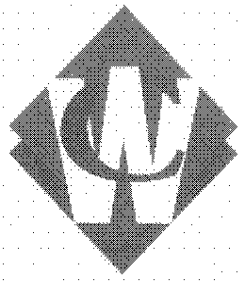
WASTE CONNECTIONS CANADA

NAVAN WASTE RECYCLING AND DISPOSAL FACILITY

3354 NAVAN ROAD, OTAWA, ON K4B 1H9



OPERATIONS AND MONITORING REPORT 2019



WASTE CONNECTIONS OF CANADA

3354 NAVAN ROAD, OTAWA, ON K4B 1H9
Tel: 613-824-7289 Fax: 613-824-6730

2019
OPERATIONS AND MONITORING REPORT

Waste Connections of Canada Inc.
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 Navan Road, Ottawa, Ontario

March, 2020

EXECUTIVE SUMMARY

The Navan Waste Recycling and Disposal Facility is a 91.87 ha waste management facility that includes a 40 ha landfill as well as processing (recycling) operations. The Site is located in the east end of the City of Ottawa (formerly the City of Gloucester) and is owned and operated by Waste Connections of Canada Inc. (WCC).

The site currently operates under amended Environmental Compliance Approval (ECA) for a waste disposal site (ECA # A460702) re-issued April 16th, 2009 with subsequent amendments (Notices 1 through 11) as well as an ECA for Industrial Sewage Works, ECA # 5616-86NKNW amendment dated June 29th, 2010 and ECA Air # 3536-8APNZD amendment dated November 24th, 2010 and ECA # 4024-9WFQE5 dated June 8th, 2015 and ECA # 2427-AETKQ5 dated November 14, 2016. The waste ECA also incorporates and makes reference to the Design and Operations (D&O) Report for the Site prepared by Golder Associates and dated January 2008.

The Facility is approved to receive solid non-hazardous and asbestos waste, excluding putrescible waste. Landfilling is restricted to waste generated within the Province of Ontario, excluding the City of Toronto. The site includes a processing facility for the recycling of waste materials and treatment of hydrocarbon impacted soils. The processing site is approved to receive solid non-hazardous waste, excluding putrescible waste, generated within the Outaouais Region of the Province of Quebec and within the Province of Ontario, excluding the City of Toronto. The site is also approved to host household hazardous waste (HHW) day events whereby the waste is received by a carrier approved through valid certificates of approval to receive, temporarily store and transport HHW to an approved waste disposal site. Other than during HHW events, no hazardous or liquid industrial wastes, as defined in O. Reg. 347, R.R.O. 1990, are permitted at the site. Most of the waste handled at the Site is generated within the City of Ottawa and neighbouring municipalities.

In 2019, a total of 428,386 tonnes of materials entered the site. Of this total, 222,976 tonnes (52.05%) were received as landfill material; 11,025 tonnes (2.57%) were recycled and removed from the site; and an estimated 37 tonnes (0.01%) were waste materials rejected and removed from the site by WCC for alternative disposal at another licensed facility. Other materials received for re-use on site included 5,949 tonnes (1.39%) of rock, brick, shingles, concrete and rubble re-used as aggregate for road construction; 11,151 tonnes (2.60%) of clean fill, topsoil, and asphalt re-used on site for final grading, road/pad construction and engineered fill; 67,249 tonnes (15.70%) of treated soils re-used for final cover and structural fill in the east buffer area; and 110,000 tonnes (25.68%) of special materials such as storm sewer screenings and impacted non-hazardous soils received at the site for re-use as daily cover material.

Golder Associates Ltd. estimated the air space used by measuring the volumetric changes between topographic mapping generated from aerial photography obtained on April 30th 2019 and the previous year on May 1st 2018. The net estimated air space used (ASU) between the last two aerial survey dates was reported to be 235,639 m^3. Records indicate that the ASU during that period of time was consumed by approximately 347,329 tonnes of waste, daily cover material and other materials resulting in a density calculation of 1.47 tonnes/m^3 and a five year average density of 1.42 tonnes/m^3. Air space used was also calculated based on assigning assumed waste densities to the various waste streams received and

landfilled, cover material and re-used materials placed within the air space from May 1st to December 31st, 2019. Using this approach, it is estimated that approximately 227,938 m^3 of remaining air space was used and excludes materials diverted off site for recycling and some materials re-used outside the air space. Based on this approach, the weighted average of the in-place density for all of the materials used in the air space calculation was estimated to be 1.18 tonnes/m^3. The variance in density calculations could be attributed to factors such as cell excavation and settlement which influence the year over year volume calculations. The air space remaining as of January 1st, 2020 was estimated to be 1,896,722 m^3.

Under the present Environmental Compliance Approval (ECA), the life expectancy remaining for the Navan Waste Recycling and Disposal Facility as of January 1st, 2020 is estimated to be 6.5 yrs (2026) to 7.9 years (2027) based on future projected maximum annual waste receipts for landfilling including daily cover of 344,750 tonnes and a waste density varying from 1.18 to 1.42 tonnes/m^3. The actual life of the landfill will vary based on annual fill rates, in-place waste densities, waste diversion and recycling initiatives at the Facility, and the rate of air space development.

Diversion through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the Navan Facility. For example, all daily and intermediate cover needs are met by substituting the use of virgin soils with the re-use of significant quantities of impacted soils. Brick, concrete, asphalt and rubble are also recovered for re-use each year in the construction of access roads. Roofing shingles free of paper and other debris are also re-used on site as a sub-base for roads and pads over which a base of aggregate or recycled asphalt is placed. In addition, steel, aluminum, wood, tires and white goods are recovered daily from the active face for recycling. Recycling of E-waste and drywall was continued in 2019 as a service to the local community. Hydrocarbon contaminated soils treated in 2019 were re-used at the site as final cover material and structural fill within the east buffer area.

Materials received by the Navan Waste Recycling and Disposal Facility are those which IC&I generators have generally deemed to be waste and of no further value (i.e., post diversion at the source). Many of the waste generators serviced by waste collection contractors who bring waste to the Site also divert materials from landfill at their place of business prior to collection. Recycling within the IC&I sector is regulated by the Ministry of the Environment, Conservation and Parks under Regulations 101, 103 and 104. While the Site receives post-diversion waste materials from the IC&I sector, WCC has procedures in place to screen the incoming waste for recyclable material in what is known as a "last chance harvest" which is a "positive" sort where the recyclable item must be removed from the mixed waste mass. In this case, the majority of the material is not recyclable (i.e. it is waste). This is very different than recycling from "source separated" material, which results in a "negative" sort, where the waste components are removed from what is predominantly recyclable material. WCC also encourages and receives "clean" recyclable materials such as drywall, metal, electronics and glass where such materials can be shipped to market in bulk in efforts to make the recycling of such materials more economically viable.

The Navan Waste Recycling and Disposal Facility diverted over 93,374 tonnes of material from disposal in 2019, and over 407,384 tonnes during the past 5 years. For 2019, this represents a "last chance harvest" diversion rate of 29.5 % and excludes the re-use of impacted soils for daily cover material. This is in addition to the 17%-18% diversion rate for IC&I waste considered to occur at the source. WCC will continue to improve waste diversion and recycling initiatives at the Navan Facility and pursue economically viable waste diversion opportunities to help the local community and WCC clients achieve a better IC&I recycling rate.

Significant activities and capital works undertaken between January 1st and December 31st, 2019 included active landfilling in the Phase 4 and Phase 6 areas of the site (refer to Figure 2.4); excavation of the east cell

identified as Phase 6 was completed; continued recycling operations at the facility with treatment of hydrocarbon impacted soils; pre-treatment and disposal of collected leachate to ROPEC for off-site treatment; retained Dillon Consulting Limited to undertake Airborne Contaminant Discharge Monitoring and Reporting requirements for the landfill site as well as the National Pollutants Release Inventory and Green House Gas reporting; retained Golder Associates to carry out surface water, groundwater, leachate, gas and noise monitoring and reporting programs; hosted a Hazardous Waste Day event for the City of Ottawa; added clay cover to completed fill areas of the landfill; retained Base Mapping to undertake aerial photos and prepare topographic mapping of the site; constructed four additional vertical landfill gas wells in the Phase 4 area; and, constructed a large diameter culvert in the surface water drainage ditch at the north and northeast corner of the waste cell in the Phase 6 area.

Leachate generated by the landfill is collected by a drainage system consisting of three separate components that gravity flow to a leachate treatment and pumping station located at the southeast corner of the waste pile and a fourth located in the east cell that is pumped to the on-site treatment station. Presently, the disposal method of choice for the pre-treated leachate is direct discharge to the City sewer system via approximately 2 km of forcemain. In 2019, a total of 148,817 m^3 of pre-treated leachate was discharged to the City of Ottawa wastewater system, a 46.1% increase over 2018. The increase is attributed to increased precipitation in 2019 and the collection of leachate from the east cells in Phase 1 and Phase 6. There were no issues reported with the operation of the leachate treatment and pumping system in 2019.

The WCC Facility is ideally situated on a thick deposit of Champlain Sea Clay (Leda Clay). The clay deposit at this site ranges from 22 metres to greater than 33 metres in depth. A clay ridge that cuts across the site rises approximately 18 m above the floor of an abandoned Ottawa River Channel. This results in surface water and shallow groundwater flowing in a southward direction. The Site is located on the northern fringe of the Mer Bleue Bog, a well known salt water bog that is an Area of National Scientific Interest (ANSI). These natural features are ideal for the control and monitoring of leachate at the site.

Environmental control systems and operational activities that include the operation and maintenance of an elaborate perimeter leachate collection system (LCS) and surface water diversion works are monitored in accordance with the conditions of the ECA. Monitoring carried out to identify areas of environmental concern includes measuring water quality parameters in surface water and in groundwater at the site's boundary as well as in the leachate generated by the landfill. Monitoring for the presence of landfill gas was also carried out. In addition, sediment quality monitoring at three locations within the Mer Bleue Bog that was started in 2000 at the request of the National Capital Commission (NCC) was continued. The monitoring program carried out in 2019 was a continuation of the monitoring program already in place for this site.

Based on the groundwater levels obtained during the 2019 monitoring program, no significant change in groundwater flow patterns has been observed.

Groundwater at the Navan Waste Recycling and Disposal Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (unweathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present in each of these units up-gradient, at the down-gradient edge of the waste pile (used to assess compliance) and further down-gradient of the landfill within the buffer zone.

The objectives of the 2019 Environmental Monitoring Program were to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702; to assess any potential impacts on water quality at the site resulting from landfill operations; to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the Facility; to document the chemical composition of groundwater and surface water in the vicinity of the Facility; to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate; and to document the chemical composition of sediment at three locations in the Mer Bleue Bog.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2018 background range.

Leachate quality monitoring results for 2019 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Trigger concentrations exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

In 2019, only one trigger exceedance of the background range was reported: it was for magnesium at MW92-10, in the weathered clay stratigraphic unit. No other continued increase in concentration for other parameters beyond the background range was reported in 2019 in the sand stratigraphic unit or the weathered clay stratigraphic unit, due to stabilizing or decreasing concentrations following WCC actions.

In a continuing effort to achieve a drained state in the leachate collection system, WCC intends to proactively maintain the forcemain in good working condition and acquired a spare 35 horsepower leachate pump to reduce down time when a pump requires servicing. Discharge pumps were already upgraded in the fall of 2011 from 20 horsepower to 35 horsepower in an effort to achieve and maintain a discharge of 17 litres per second. Treatment modifications were commissioned in 2012, increasing pumping capability, which resulted in the ability to maintain the leachate collection system in as much a drained state as possible and to better manage the peak discharge periods. A similar course of action is proposed to be followed in 2020.

Results from the upcoming spring 2020 monitoring session will be analyzed to determine if the effect of these actions are detected in groundwater quality with a decrease in concentrations of Leachate Indicator Parameters at trigger locations, including in the intact clay and glacial till/upper bedrock units. At that point, the need for a formal contingency plan will be assessed in collaboration with the MECP.

The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

In 2002/2003, an assessment of the WCC Navan Facility operations was undertaken in support of a WCC-NCC (WSI-NCC) exchange of land parcels located south of the Navan Facility along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

A Monitoring and Screening Checklist prepared and signed by a Competent Environmental Practitioner (CEP) is included with the Golder 2019 Landfill Monitoring Report attached as Appendix 'I'.

The proposed 2020 Environmental Monitoring Program is the same as was conducted in 2019, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program and sediment monitoring which is proposed to be discontinued. As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as has been done between 2014 and 2018 (due to dry conditions in the summer of 2019, they were sampled in the fall where possible).

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the November 2018 monitoring session and will be monitored again in the spring of 2020.

In 2019, Golder Associates Ltd. (GAL) was retained to carry out the landfill gas monitoring program. The monitoring program undertaken was a continuation of the monitoring program already in place for this site

and the results of the monitoring events undertaken are presented in more detail in the GAL report provided in Appendix '2'.

LFG monitoring was undertaken in June, August and December 2019. At most locations monitored, methane gas was less than 5 percent (%) of the Lower Explosive Limit (LEL). Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 25% LEL (or 1.25% by volume for the spring session) at monitoring well OW92-8 (G15) in December 2019; MH-10 (G-2a) in August and December 2019; MH-9 (G3-a), MH-7 (G5-a), MH-6 (G6-a), MH-4 (G-12a), MH-3 (G13-a) and the tank truck loading station MH (G-84a) in December 2019.

It is noted that no location during the spring 2019 monitoring session reported a methane concentration neither in excess of 25% LEL nor in excess of 1.25% by volume.

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the WCC Navan Facility based on the 2019 monitoring results. Although no monitoring locations are available below surface at the property boundary, it is anticipated that the WCC Navan Facility met the property boundary requirements in 2019.

Hydrogen sulfide was not detected at any location during the 2019 monitoring events, with the exception of Monitoring Wells OW-94-2 (G-8), 05-R3 (G-9) and MH-4 (G-12a) in June 2019; collector MH (G-26i) in August 2019.

It is noted that an interim LFG odour control system was installed in 2011 and commissioned in April 2012. Extensions to the LFG odour control system were installed in the fall of 2016 and the fall of 2017 and in 2019. The additional wells installed in 2017 and 2019 are intended to be part of the future permanent LFG collection system. The purpose of this system is to control potential odorous emissions from the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells.

During the 2019 monitoring events, no odours were detected by Golder technician at the WCC Navan Facility during the spring and summer monitoring sessions. During the 2019 winter monitoring session, moderate, but not offensive odours were noted at the site. Strong odours were specifically noted at gas extraction well GW-1. Historically, odours have been detected in some areas (near the active face); however, they were transient and dissipated at a short distance from the source. As previously mentioned, gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2019, WCC personnel responded to twenty-one odour

related complaints. The Public Advisory Committee subsequently mailed out four thousand notices to inform stakeholders of a public meeting organized by the Committee. A total of twelve people attended the public meeting and none of the people in attendance had submitted a complaint. Four vertical wells were installed on site in 2019 as part of the permanent LFG collection system which will help mitigate some of the odour.

Dillon Consulting Limited (Dillon) was retained by Waste Connections of Canada Inc. (WCC) in 2019 to complete the following for the Navan Landfill:

- An assessment to determine the reporting requirements under the *National Pollutant Release Inventory* (NPRI) for the 2018 calendar year;
- An assessment to determine the reporting requirements under *Ontario Regulation 127/01 – Airborne Contaminant Discharge Monitoring and Reporting* (O.Reg. 127/01) for the 2018 calendar year;
- Greenhouse Gas Reduction Reporting as required under *Ontario Regulation 347*;
- An assessment to determine the reporting requirements under *Ontario Regulation 452/09 – Greenhouse Gas Emissions Reporting* (O.Reg. 452/09) and the Federal Government Greenhouse Gas Reporting Program for the 2018 calendar year; and
- Assist with data input and submission for Environment Canada's online Single Window Information Manager (SWIM) module, if required.

Based on Dillon's assessment, the Navan Landfill was required to report to NPRI for the year 2018. The total annual on-site releases and off-site transfers of the reportable NPRI Part 1, Part 2, and Part 3 substances are summarized in Section 8 of the report. Annual air releases for the NPRI Part 4 and Part 5 substances are also summarized in Section 8. An NPRI emissions report was submitted for asbestos, mercury, PM10 – particulate matter and PM2.5. The reports were made based on estimates and not measured values. Many of the parameters that are reportable are the result of handling high volumes of materials on site which are above the manufactured, processed or otherwise used reporting threshold, e.g. leachate and asbestos, but do not result in airborne emissions from the facility. The reporting of mercury was triggered by shipments of contaminated soils received at the site for disposal that contained elevated concentrations of mercury. The reporting of the emissions of PM10 was triggered by fugitive dust emissions from roads and is generally also reported by all industrial operations in Ontario due to very low thresholds.

Ontario Regulation 347 requires landfill sites larger than 1.5 million cubic meters to report annually on the greenhouse gas reductions being achieved at the site. The Navan Landfill meets the regulation requirements and submitted the required Landfill Data Collection Form electronically to the Ontario Ministry of the Environment, Conservation and Parks for 2018.

It is noted that an interim landfill gas odour control system was installed in 2011 and commissioned in April 2012. The purpose of this system is to control potential odorous emissions from the site until the full-scale landfill gas collection system is installed. The interim landfill gas odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical landfill gas extraction wells.

Based on this assessment, the Navan Landfill does not meet the reporting requirements for O.Reg. 127/01, or the Federal or Ontario GHG reporting programs and was therefore not required to report for the 2018 calendar year.

In 2020, WCC will continue to develop the landfill in a manner consistent with their past operating practices and proceed with capital projects required for the site operations as presented in the revised D&O (Golder, 2008). Over the past number of years, landfilling has progressed in a counter-clockwise pattern starting in the northwest corner of the site (area indicated as north half of Phase 3 on Figure 10.1). To date waste has been placed over the entire permitted waste footprint of the landfill as shown on Figure 10.1 with Phases 2 and 3 having been completed. In areas where significant settlement has occurred, re-grading will be carried out. In 2020, landfilling will continue in the last completed cell identified as Phase 6. Closure work will continue at the top of Phase 4 and in parts of Phase 5 and a small area in Phase 1 where final waste grades have been reached.

The development of the remaining landfill capacity in the area of Phase 6 (east cell expansion) requires the the filling and compaction of approximately 15,300 m^3 of clay material including side slopes (as of the last aerial photo taken April 30th 2019). Soil management practices will include the following:

- Excavation of clay from the Phase 5 area;
- Sediment control measures will be taken so that inactive areas such as soil stockpile side slopes are seeded; silt fences are installed as required around the perimeter of disturbed areas; and surface runoff from the stockpile areas will be channeled to the internal ditch system which will drain to the site's stormwater retention ponds.

Along with landfilling operations, other site operations expected to be carried out in 2020 will consist of the following:

- Provide additional landscaping to completed final cover areas on the south and southeast slopes of Phase 1 as well as adding additional trees in previously completed areas.
- Complete final cover construction in completed areas of fill.
- Re-align surface runoff away from fill areas and cell construction areas.
- Raise grades in the east buffer adjacent to the waste footprint on the east side and grade to direct surface runoff away from waste.
- "Last Chance Harvest" of recyclable waste will continue in the active face using specialized heavy equipment as per present practice.
- Increase efforts to sort and divert waste from small vehicles at the small vehicle drop-off area and provide incentives to clients to sort materials at source, prior to arrival at the Site.
- Establish markets for new recyclable materials and increase the types of materials to be recycled at the site.
- Enhance/research treatment of hydrocarbon impacted soils.
- Construct a working pad in the area of Phase 4 for recycling activities.
- Where required, add additional wells (horizontal and/or vertical) to the landfill gas flaring system to enhance and control fugitive gas in fill areas and odours from the landfill.
- Obtain TSSA approval of the detailed engineering design for the permanent flaring system designed by Golder Associates Ltd.
- Complete the construction of the north and northeast upper cell walls in Phase 6 to accommodate additional lifts of waste materials.

The 30 m buffer at the northern, eastern and western perimeter of the landfill and the 10m buffer at the southern perimeter will continue to be maintained as required by the ECA. Aesthetic improvements at the

site will continue to be an on-going objective.

In August 2007, WCC (WSI) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Approval under the Ontario Environmental Protection Act (EPA) as well as other legislation were also received which culminated in the issuance of the above noted Certificates of Approval for the Site. Condition 4 of the EAA approval required that WCC (WSI) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WCC's compliance monitoring program (EAAB File # is EA 02 08 02). In accordance with Condition 3 of the EA approval, WCC has previously submitted a separate document proposing an EA Compliance Monitoring Program. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of follow up EACMRs with submission of the Annual Operations and Monitoring Report. Accordingly, this EACMR is submitted as Appendix 5 to this Annual Report and covers the period January 1st to Dec. 31st, 2019. No non-compliance issues were identified during the reporting period.

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1. INTRODUCTION

The Waste Connections of Canada Inc. (WCC) Navan Waste Recycling and Disposal Facility operates under the Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) for a Waste Disposal Site number A460702 as amended. The site is approved to receive solid non-hazardous and asbestos waste, excluding putrescible waste. Landfilling is restricted to waste generated within the Province of Ontario, excluding the City of Toronto. The processing site is approved to receive solid non-hazardous waste, excluding putrescible waste, generated within the Outaouais Region of the Province of Quebec and within the Province of Ontario, excluding the City of Toronto. The site is also approved to host household hazardous waste (HHW) day events whereby the waste is received by a carrier approved through valid certificates of approval to receive, temporarily store and transport HHW to an approved waste disposal site. Other than during HHW events, no hazardous or liquid industrial wastes, as defined in O.Reg 347, R.R.O. 1990, are permitted at the site. Most of the waste handled at the site is generated within the City of Ottawa and neighbouring municipalities. The site is also approved to treat contaminated soils.

This report presents the annual operating and monitoring conditions for the site to the Ministry of the Environment , Conservation and Parks (MECP) pursuant to Conditions 135 and 136 of the ECA No. A460702. The site is located in the eastern portion of Ottawa, Ontario on Part of West Half of Lot 2, Part of Lots 3 and 4, Concession IV, Ottawa Front (Parts 1, 2 and 3 on Plan 4R-19707, Parts 1 and 2 on Plan 5R-13200, Parts 1, 2, 3, 5 and 6 on Plan 5R-11073, Parts 1 and 2 on Plan 5R-11716 also referred as Parts 1, 2 and 3 on Plan 4R-21920), 3354 Navan Road, Township of Gloucester, now in the City of Ottawa, UTM Easting: 460570, UTM Northing: 5030570 at the front entrance to the site (see Key Plan, Figure 1.1 and Survey Plan, Figures 1.2 and 1.3).

1.1 BACKGROUND

The site was formerly owned and operated by Huneault Waste Mangement Ltd. which changed names in 2000 to Waste Services Inc. (WSI). In 2002 WSI was acquired by Capital Environmental Services Inc. (CERI) who kept the operating name of WSI and in July 2010 merged with BFI Canada Inc. BFI Canada Inc. changed name to Progressive Waste Solutions Canada Inc. and later merged with Waste Connections Inc. now operating as Waste Connections of Canada Inc. The Site started operations in 1960, and is operated under the Environmental Compliance Approval (ECA) No. A460702 issued by the Ministry of the Environment, Conservation and Parks (MECP). This approval officially revoked and replaced the previous approval that was dated May 12, 2006 due to the site's expansion in 2009. The following summarizes the notices that have amended ECA No. 460702:

- Notice No. 1 dated October 9, 2009: Permitted construction of base liner and leachate collection system for the east cell expansion.
- Notice No. 2 dated August 4, 2010: Widening of Navan Road.
- Notice No. 3 dated November 1, 2010: Landfill Gas Odour Control System.
- Notice No. 4 dated April 29, 2011: Financial assurance update (processing site)

- Notice No. 5 dated June 13, 2012: Financial assurance update (processing site)
- Notice No. 6 dated April 19, 2013: Financial Assurance update (processing site)
- Notice No. 7 dated February 25, 2014: Financial assurance update (landfill)
- Notice No. 8 dated June 8, 2015: Soil Treatment Pad
- Notice No. 9 dated February 1, 2016: Financial assurance update (landfill)
- Notice No. 10 dated March 14, 2017: Landfill and Processing Facility Financial Assurance
- Notice No. 11 dated June 19, 2018: Landfill and Processing Facility Financial Assurance

The site also operates under an ECA for Industrial Sewage Works, ECA # 5616-86NKNW amendment dated June 29th, 2010 and ECA Air # 3536-8APNZD amendment dated November 24th, 2010, ECA # 4024-9WFQE5 dated June 8, 2015 and ECA # 2427-AETKQ5 dated November 14, 2016. The waste ECA also incorporates and makes reference to the Design and Operations (D&O) Report for the site prepared by Golder Associates dated January 2008.

The site occupies a 91.87 hectare (ha) property (blue and green areas on Fig. 1.2) that includes a 40 ha area currently approved for recycling and disposal (red area on Fig. 1.2). Figure 1.2 depicts the existing approved waste boundaries at the site including the total land area currently owned by WCC. The site receives solid, non-hazardous industrial, commercial and institutional (IC&I) waste including construction and demolition (C&D) waste, asbestos waste, dry non-putrescible (i.e., non-organic) domestic waste and impacted soil. The approved service area for the receipt of waste for disposal is the Province of Ontario excluding the City of Toronto. The approved service area for processing/recycling and transfer includes the Province of Ontario (excluding the City of Toronto) and the Outaouais Region of the Province of Quebec (consisting of Quebec Region 7 including La Vallée-de-la-Gatineau, Pontiac, les Collines-de-l'Outaouais, Papineau and the City of Gatineau). Solid non-hazardous industrial and commercial waste including C&D waste and dry domestic recyclable waste may be received for processing. In 2015 the site was approved for the treatment of contaminated soils (ECA Amendment Notice 8) as part of its processing operations.

The remaining operating life for the landfill disposal site is influenced significantly by a number of factors such as the waste mix, the annual waste receipts, materials recycled and re-used, and the density of the in-place waste to name a few. Consequently, the remaining life has been estimated to extend to the years 2026 - 2027 based on current site approvals and projected annual waste receipts (refer to Section 5).

The expansion of the Navan Waste Recycling and Disposal Facility received approval under the Ontario Environmental Assessment Act (EAA) in 2007 and approval under the Ontario Environmental Protection Act (EPA) as well as other legislation in 2009. Major amendments to the Environmental Compliance Approval for a waste disposal site (ECA # A460702) were issued as listed above. An Environmental Compliance Approval for Industrial Sewage Works, ECA # 4816-7C7M6C issued on April 16th, 2009 was amended by ECA # 5616-86NKNW on June 29th, 2010 and an Environmental Compliance Approval Air, ECA # 6733-7BYS9A issued on April 16th, 2009 was amended by ECA # 3536-8APNZD on November 24th, 2010, by ECA # 4024-9WFQE5 on June 8th, 2015 and by ECA # 2427-AETKQ5 dated November 14, 2016.

The site is situated on a thick deposit of Leda clay and is located immediately north of a large bog (Mer Bleue). The underlying clay deposit serves as a natural liner system. Leachate management activities include the operation of a leachate collection system that consists of a perimeter collector and an underdrain system. A leachate pre-treatment/pumping station and forcemain connection to the City of Ottawa sanitary sewer system was completed in 2007 and commissioned in early 2008. It continues to be used for the management of leachate generated by the facility. Surface water is diverted around the landfill footprint through a series of berms, swales and ditches. Landfill gas generated by the facility continues to be monitored and an interim landfill gas odour control system approved by the Technical Standards and Safety Authority (TSSA) was constructed and commissioned in early 2012. Design details for a permanent landfill gas collection and enclosed flaring system has been completed by Golder Associates Ltd. and continues to be revised and updated.

1.2 *PURPOSE AND ORGANIZATION OF REPORT*

This document is referred to as the Operation and Monitoring (O&M) Report. The O&M components specifically described in this document include the following:

- Zoning and surrounding land uses;
- Existing facilities and utilities;
- Geology;
- Hydrogeology;
- Surface water flow system;
- Mer Bleue Bog;
- Description of operations (2019);
- Waste quantities and characteristics;
- Site capacity and life expectancy;
- Surface water management;
- Leachate management;
- Landfill gas management;
- Groundwater quality assessment;
- Leachate water quality assessment;
- Surface water quality assessment;
- Sediment quality assessment;
- Landfill gas monitoring results;
- Diversion of waste and other materials from disposal; and
- Proposed 2020 operations.

All O&M components described in this report have been prepared to address the Conditions of the ECA for the Navan Waste Recycling and Disposal Facility, ECA No. A460702.

1.3 *WASTE QUANTITIES*

The maximum total amount of waste that may be received at the site for disposal is controlled by the site's approved final waste contour plan. Base on the final waste contour plan approved, the estimated total air space for the site was approximately 7.6 million cubic metres. Under the current ECA (#A460702), the maximum annual amount at which the site can receive waste for disposal (excluding daily and interim cover material) is 234,750 tonnes per year. The maximum daily rate, averaged over a year, at which the site can receive waste (including daily and interim cover material), is 1500 tonnes per day. The maximum amount of unprocessed material and residuals from the processing operation that may be stored on site at any one time is 225 tonnes.

Diversion, through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the Navan Waste Recycling and Disposal Facility. Management is constantly searching for on-site and off-site diversion or re-use opportunities to ensure that approved disposal capacity is preserved and used for the disposal of waste material of least commercial value. Given the provincial policy and regulations concerning waste diversion from landfill, the site will continue to provide critical support to the City and Province in their efforts to meet diversion targets while at the same time ensuring essential disposal capacity is available locally.

1.4 *ECA AMENDMENTS (2019)*

The site currently operates under amended Environmental Compliance Approval (ECA) for a waste disposal site (ECA # A460702) re-issued April 16th, 2009 with subsequent amendments (Notices 1 through 11). In 2019, no amendments to ECA #A460702 were required.

1.5 *ENVIRONMENTAL ASSESSMENT COMPLIANCE MONITORING REPORT (EACMR)*

In August 2007, WCC (formerly WSI) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Approval under the Ontario Environmental Protection Act (EPA) as well as other legislation were also received which culminated in the issuance of the above noted Environmental Compliance Approval for the site. Condition 4 of the EAA approval required that WCC (WSI) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WCC's compliance monitoring program. In accordance with Condition 3 of the EA approval, WCC had previously submitted a separate document proposing an EA Compliance Monitoring Program. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of follow up EACMRs with the submission of the annual Operations and Monitoring Report. Accordingly, this EACMR is submitted as Appendix 5 to this annual report and covers the period January 1st to Dec. 31st, 2019.

No non-compliance issues were identified during the 2019 reporting period.

The Ministry's EAAB File # is EA 02 08 02.

1.6 *HISTORY OF THE FACILITY*

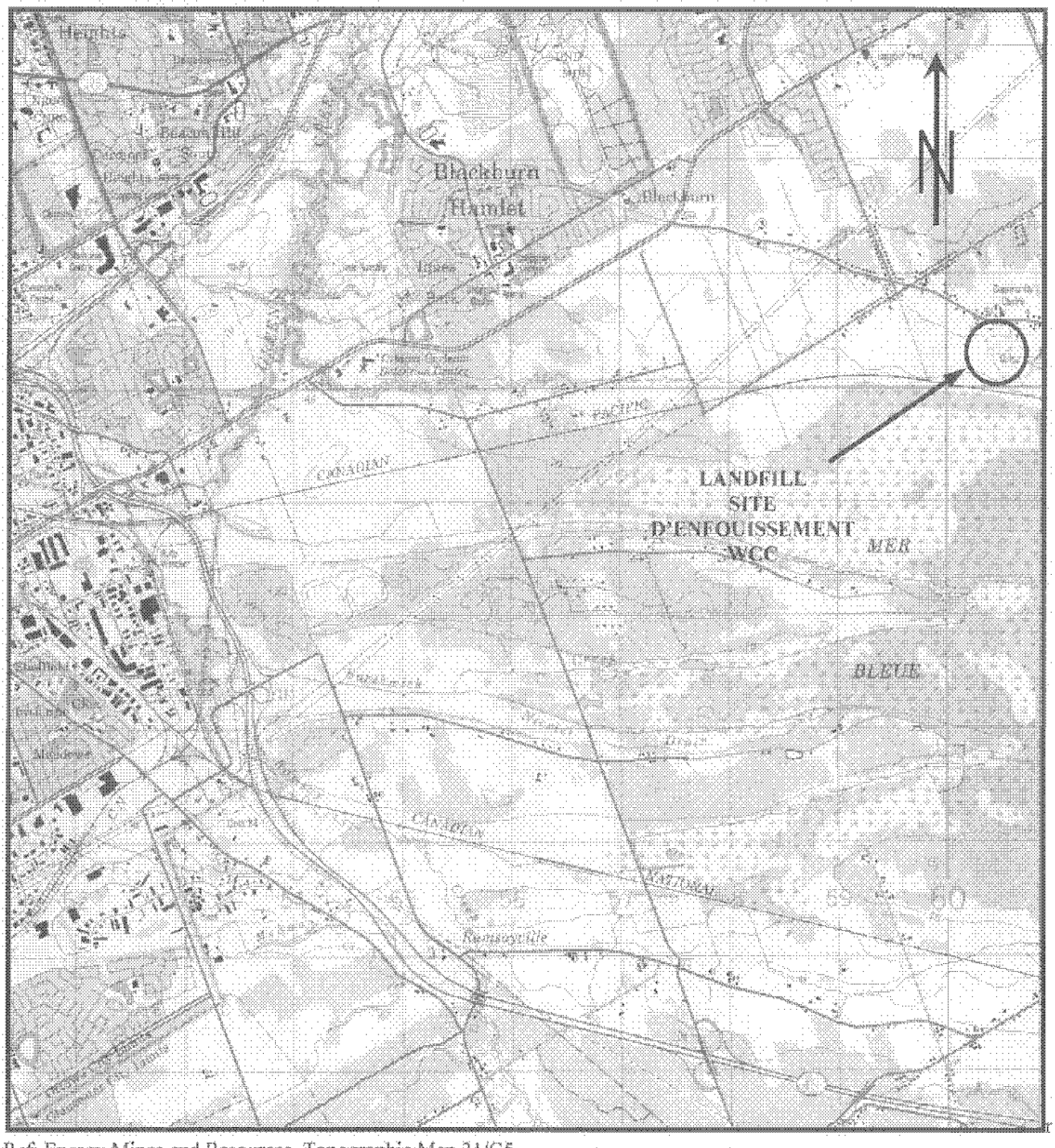
Landfilling at the site started in the early 1960s and served, at the time, as a rural dump operation for local residents. In 1971, the Ministry of the Environment (MOE) issued an Environmental Compliance Approval (CofA No. 460702) to Mr. D. J. Huneault for disposal of industrial waste including construction and demolition waste. Currently the site receives all types of solid, non-hazardous waste for disposal excluding putrescible waste. In 1995, the CofA was amended for the operation of waste processing and composting facilities at the site. Composting operations were later suspended with the issuance of the ECA amendments in April 2009 for the landfill expansion.

Annual monitoring of groundwater and surface water was initiated in 1987 and has evolved into a comprehensive monitoring program that is reported to the MECP on an annual basis. In 1992, a leachate collection system was constructed along the down-gradient toe of the landfill and surface water diversion ditches were constructed up-gradient within the north buffer zone. Leachate was initially collected in retention ponds and re-circulated onto and into the landfill following treatment through a peat filter and constructed wetland system. Transport of leachate by tanker truck to the municipal wastewater treatment plant was initiated in 1997 following odour issues related to leachate storage ponds. Presently, leachate is pre-treated on site and discharged to the City of Ottawa sewer system for treatment at the Robert O. Pickard Environmental Centre (ROPEC). Construction of the existing leachate pre-treatment/pumping station and forcemain connection to the sanitary sewer system was completed in 2007 and commissioned in early 2008.

In 2011, a landfill gas collection and flaring system was constructed as an interim odour control system. This system was commissioned and approved in April of 2012 by the Technical Standards and Safety Authority (TSSA) and has since remained operational. In 2019, four permanent vertical gas wells were added in the Phase 4 area of the landfill.

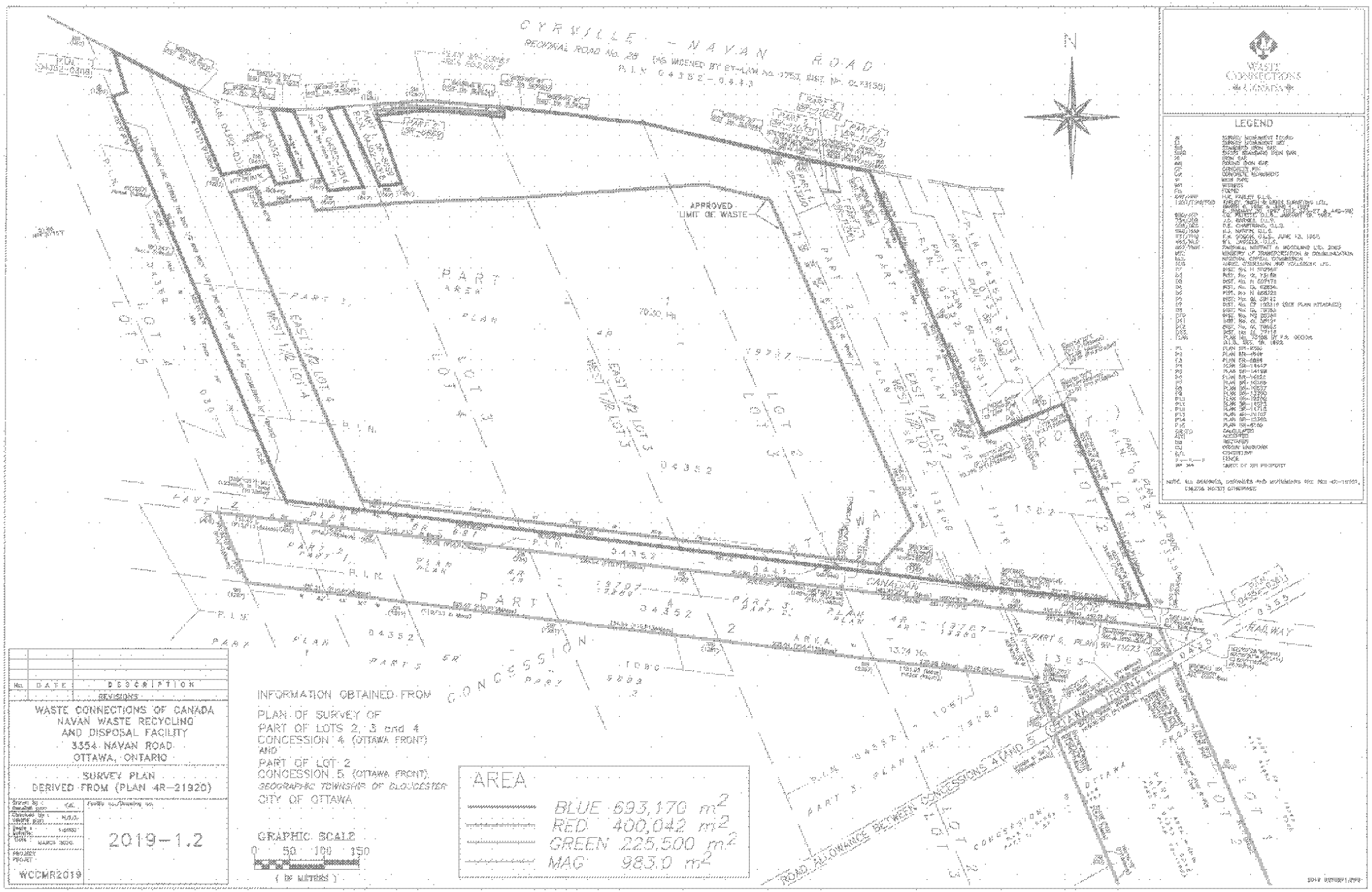
In June of 2015, the site was approved for the treatment of contaminated soils as part of the site's processing operations and treatment of hydrocarbon impacted soils has since been on-going.

A more detailed record of milestones in the site's history is presented in Appendix 4 – Schedule 'C'.



Ref: Energy Mines and Resources, Topographic Map 31/G5

FIGURE 1.1	**KEY PLAN**	WASTE CONNECTIONS OF CANADA


WASTE CONNECTIONS of CANADA
LEGEND
APPROVED LIMIT OF WASTE
PART 1
PART 2
PART 3
PART 4
PART 5
PART 6
PART 7
PART 8
PART 9
PART 10
PART 11
PART 12
PART 13
PART 14
PART 15
PART 16
PART 17
PART 18
PART 19
PART 20
PART

PLAN OF SURVEY OF
PART OF LOT 3
CONCESSION 4 (OTTAWA FRONT)
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
CITY OF OTTAWA
FAIRLEY, SMITH & DENIS SURVEYING LTD.
2008

SCALE = 1:500

BEARING NOTE

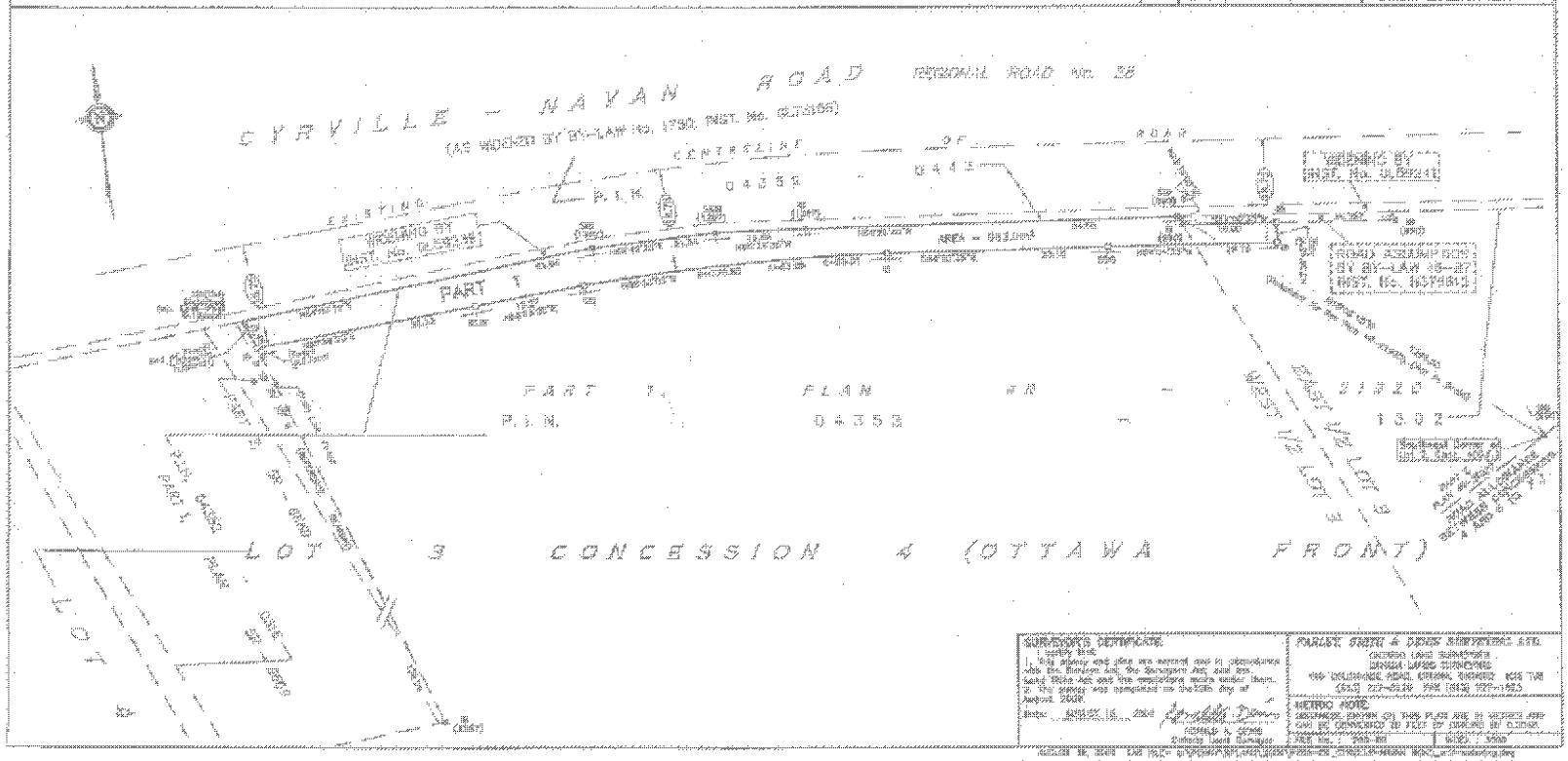
LEGEND

I PREPARE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

PLAN 4R- 23883

SCHEDULE

Part	Lot	Concession	Plan
1	Part of Lot 3	4 (OF)	Part of PLAN 4R-23883



SURVEYOR'S CERTIFICATE

FAIRLEY, SMITH & DENIS SURVEYING LTD.

METRIC NOTE

WASTE CONNECTIONS OF CANADA
NAVAN WASTE RECYCLING
AND DISPOSAL FACILITY
3354 NAVAN ROAD
OTTAWA, ONTARIO

SURVEY PLAN
DERIVED FROM (PLAN 4R-23883)

2019-1.3

WCCMR2019

000304

2. SITE SETTING

2.1 *Site Location and Legal Description*

The Navan Waste Recycling and Disposal Facility is located in the eastern portion of Ottawa, Ontario on Part of West Half of Lot 2, Part of Lots 3 and 4, Concession IV, Ottawa Front at 3354 Navan Road, City of Ottawa (formerly the Township of Gloucester), UTM Easting: 460570, UTM Northing: 5030570 at the front entrance to the site. The location is indicated on the Key Plan, Figure 1.1. The latest legal survey plan for the site was registered on April 13th, 2008 as Plan 4R-21920. Parts 1, 2 and 3 of this Plan are lands owned by WCC (refer to Fig. 1.2). A narrow section of land bordering Navan Road west of the site entrance and having an area of 963 m^2 referred to as Part 1 on Plan 4R-23883 dated August 18th, 2009 was severed from WCC property as part of a Site Plan Agreement for the development of the new site facilities (refer to Fig. 1.2 and 1.3) and transferred to the City of Ottawa for the future widening of Navan Road.

2.2 *Location, Zoning, and Surrounding Land Uses*

According to the City of Ottawa's Official Plan (City of Ottawa, 2003) (Schedule B), the site is designated as Solid Waste Disposal site and is located within the Developing Community designation of the Urban Area. The East Urban Community is the southeast portion of the Orléans Community bounded by Mer Bleue Road to the east, a former Canadian Pacific Railway line (VIA Rail ROW) bordering the Mer Bleue Bog and WCC Site to the south, the National Capital Commission (NCC) Greenbelt to the west and a hydro corridor to the north. Generally, it is Urban Area (Developing Community) to the north, west and east, and Significant Wetland to the south (refer to Fig. 2.1, 2.2 and 2.3). Designations in the vicinity of the Site include: General Urban Area, including Mixed Use and Employment Areas to the north, Significant Wetland Area to the south, Natural Environment Area to the immediate west and General Rural Area further to the east.

The Developing Communities designation is used by the City to identify those areas where the detail for the development of the lands requires additional study. The planning process for the Phase 1 lands was completed when City Council approved the Phase 1 Community Development Plan (CDP) document July 2005. The Landfill Site is located within the Phase 2 study area of the East Urban Community as shown on Figures 2.1 and 2.2. The landfill site was clearly identified during the work on each of these studies. The adopted CDP includes policies to protect the landfill site from sensitive land uses being established within 500 metres without a specific study to ensure compatibility. The CDP confirmed the Official Plan policies for road widening along Navan Road and also identified the need for future linkages that would be necessary to create the municipal infrastructure (water, sanitary and storm sewers) to complete the development of the community.

In 2006 a study of a 500 m buffer area around the WCC landfill site was initiated by the city. The purpose of the study was to fulfill the Official Plan requirements and to determine whether any land would be temporarily or permanently undevelopable due to its proximity to the WCC site. The peer reviewed buffer

study was completed in the late spring of 2008. It determined that the landfill posed no constraints to development of any Phase 2 lands. However, the peer review noted that where development occurs within the buffer zone, warning clauses should be placed in the purchase and sale agreements and on title. The clause should state that there is a possibility of occasional dust and odour episodes from the landfill operations.

The City of Ottawa has now adopted a Comprehensive Zoning By-law for the entire Amalgamated City (2001). By-law 250-2008 was adopted by Council in June of 2008 and was subject to numerous appeals, none related to the landfill. In November 2008 the Ontario Municipal Board provided an Order that brought the vast majority of the Zoning By-law into effect. All of the lands in the area of the site are now subject to the provisions of this By-law.

The existing adjacent lands are predominantly residential and rural residential with some scattered non-residential uses. The land is primarily open pasture, wooded areas and the Mer Bleue Bog. Existing land uses adjacent to the site boundaries are as follows:

- **To the North:** Navan Road, formerly known as Regional Road 28, residential and light commercial developments, and a former school now used as a senior's center, medical center and pharmacy.

  The north side of Navan Road is zoned Development Reserve in the Comprehensive Zoning By-law for the City of Ottawa. A Plan of Subdivision Proposal has been approved for approximately 23 hectares of largely undeveloped land, situated north of Navan Road and extending to Renaud Road (refer to Figure 2.2) . The eastern limit of the proposed development abuts the properties of the White Street residential enclave and other undeveloped lands. The lands to the west, known as Eastboro, continue to be under development for residential purposes and include two schools.

  The senior's center property directly across from the WCC Site is in a special Development Reserve Zone (DR) that identifies the community center as an additionally permitted use. A medical center and pharmacy also occupies this property presently.

- **To the East:** woodlots, a small scrap yard, and a small recycling business (abandoned). The lands to the east are also in the DR Zone.

  There was a rezoning for 3628 Navan Road to permit a recycling business to be recognized as a Temporary Use so that an Environmental Compliance Approval could be issued for the use of a portable wood chipper. This exception to the By-law is identified as DR [1616] and it is a Temporary Use permission which expired on December 7th, 2011. This property has been identified by the City of Ottawa as the preferred location for a large storm water management pond to service the Phase 2 CDP. The design for this pond has been approved by the City of Ottawa. This site remains dormant and covered with waste presently undergoing cleanup.

  The balance of the lands to the east is in the same Development Reserve Zone (DR) which replaces the former Future Growth zone;

- **To the South:** VIA Rail right-of-way (ROW) is currently used as a recreational trail, however, railway traffic may resume in the future. This ROW is used as the zoning boundary in the comprehensive by-law. A 100 m strip of land south of the ROW is owned by WCC.

The lands south of the ROW that are within the Provincially Significant Wetland are identified as Environmental Protection (EP) in the zoning by-law. The remaining lands south of the ROW are zoned Rural in the By-law;

- **To the West:** Immediately west is a composting and soil blending operation which is zoned DR, while beyond that point are lands re-zoned and being developed for urban residential (R3VV[1286]), including Open Space (O1) and a portion that remains as a DR Exception [459]-h Zone.

Figure 2.3 summarizes the current zoning that is found in the area as shown in the Comprehensive Zoning By-law for the City of Ottawa.

The lands owned by WCC are within two defined zoning areas. The actual landfill being zoned as Heavy Industrial Exception [2] (IH[2]H(11)) and the buffer area being a separate Exception Zone to recognize its function as a buffer (IH[1483]H(11)). These are the zones found in the Comprehensive Zoning By-law. The WCC lands that lie south of the VIA Rail corridor are zoned as Environmental Protection and Rural as shown on Figure 2.3.

2.3 *Existing Site Design and Facilities*

The existing approved design and operation of the site is described in the Design and Operations report prepared by Golder Associates Ltd. for the site expansion (Golder, January 2008) and the approved Quality Assurance/Quality Control Plan and Specifications for the WSI Landfill Leachate Collection and Management System – Lateral Expansion Area (Golder, June 2009 and MOE reference Number 1851-7SUSJ9). The following sections summarize some of the current facilities and systems described therein.

2.3.1 Existing Facilities

A gated entrance from Navan Road at the north end of the site presently serves as the only access point into the landfill. The gate is locked after operating hours and monitored by security personnel. Access during operating hours is controlled by an attendant at the scales, operating from a scale house. The scale house is in close proximity to the equipment maintenance garage and administrative office building.

Internal roads are constructed and relocated as necessary to provide access to the active landfill areas and other site facilities. The internal roads are generally constructed using recycled asphalt, brick or crushed concrete over a sub-base of re-used shingles. The current approximate road network is illustrated in plan view on Figure 2.4.

A waste processing area has been built on interim-covered waste in the south-central part of the waste footprint to facilitate stockpiles of recycled and processed materials (refer to Figure 2.4). A small vehicle pad consisting of reinforced concrete retaining walls was constructed south of the scale house for the unloading and sorting of waste from small vehicles. Concrete block bunkers are available for the

separation of larger volumes of recyclable materials such as shingles, aggregates, clean fill, windshield glass, etc.

A minimum buffer width of 30 metres is maintained around the west, north and east sides of the approved waste disposal area. A 10 metre buffer is maintained between the southern limit of the waste footprint and the VIA rail corridor. Additional buffer lands owned by WCC exist to the east and west with a minimum 100 metres wide strip of land extending the full width of the site south of the VIA right-of-way (see Figure 2.4).

2.3.2 Leachate Management and Groundwater Protection System

The existing leachate management system at the Navan Waste Recycling and Disposal Facility includes an underdrain system in the northwest corner of the existing waste footprint north of Grid Line I and between Grid Lines 3 and 6 (refer to drawing 6.2). This area is connected via perforated HDPE pipe to a perimeter leachate collection trench. It consists of a granular-filled trench and perforated drainage pipe which runs along the west edge of the waste mound (Grid Line 1) and the south toe of the waste mound (between Grid Lines Q & R).

An underdrain leachate collection system also exists in the southeast corner of Phase 8 consisting of a combination of perforated collection pipes, French drains and sand drainage blanket. This drainage layer extends from Grid Line N to the south toe of the waste mound and between Grid Lines 14 and 16.

An underdrain leachate collection system also exists in the north central area of the waste footprint in the Phase 4 and 5 area of the site (refer to Fig. 2.4) consisting of a combination of perforated collection pipes, French drains and sand drainage blanket. This large drainage system extends from the north toe of the waste mound to Grid Line L and between Grid Lines 6 and 16.

The leachate drainage system in the east expansion cell (Phase 1) was constructed in 2014/2015 and consists of a network of perforated HDPE pipe, separation and filter geotextiles, a clear drainage stone layer and a sand protective layer. A similar system was constructed in 2018/19 for the new cell to the north in Phase 6. A pump station was constructed at the northwest corner of Phase 1 to assist with the drainage of the east expansion cells.

The existing leachate collection systems are illustrated in Figure 6.2 and discussed in greater detail in Section 6.3.

All leachate collected in the existing leachate collection system is designed to gravity drain or pumped to a wet well and a pre-treatment/pump station located in the south buffer near Grid Lines R-16. Pre-treatment of leachate consists of air stripping hydrogen sulphide (H_2S) and Volatile Organic Carbons (VOCs) with the use of activated carbon filters prior to discharge. During 2019, all leachate was pre-treated and pumped via forcemain to the City of Ottawa sewer system for final treatment at the City's municipal sewage treatment plant. The leachate forcemain was flushed and cleaned twice during 2019. No operational issues with the treatment and pumping station were reported in 2019.

A vertical manhole, connected to the leachate collection system in the centre of the existing waste footprint (referred to as "the central manhole"), provides an alternative point of access to evacuate leachate from this part of the leachate collection system in the event that positive drainage to the wet well

and pump station cannot be maintained due to sub-grade settlement. This manhole has been raised to an elevation of 101 metres and will require that it be raised with additional MH sections in 2019.

Access to the leachate collection pipes in the Phase 4 and 5 area (refer to Fig. 2.4) is provided via a series of cleanouts along the north side of the existing waste footprint. Cleanouts are also provided along the east perimeter for leachate collection pipe access in the east cell expansion. Access to the west and south perimeter leachate collection system is provided via a series of manholes. The system was checked for drainage to ensure proper performance of the drainage/collection system. Low permeability cover soils are currently used to minimize infiltration of precipitation into the waste column. At present, clay soil cover is located on the north, west and south facing slopes as well as the surface of completed fill areas in Phase 3 and the north part of Phase 4. Leachate containment is currently provided by a thick deposit of natural low-permeability clay soil which underlies the entire site and a constructed final clay cover.

2.3.3 Landfill Gas and Odour Management System

The Certificate of Approval (Air), ECA # 6733-7BYS9A issued on April 16th, 2009 was amended by ECA (Air) # 3536-8APNZD on November 24th, 2010 to add one (1) candlestick flare, used to combust a maximum of 0.24 actual cubic metres per second (500 scfm) of landfill gas (LFG) collected from three (3) vertical landfill gas wells and gas collected from the Leachate Collection System (refer to Fig. 8.1). Construction of the approved candlestick flare was completed at the end of 2011 and was commissioned and approved by the Technical Standards and Safety Authority (TSSA) in April of 2012. Horizontal and vertical wells were later added in the area of Phase 4, Phase 3 and Phase 1 to enhance the odour control system. Details are provided in Section 8.

A fixed line misting system powered by a portable generator was added at the end of 2017 to be on hand ready to be implemented as an emergency response system to assist in addressing odour issues and was utilized on occasion in 2019. In 2019, a 100 KV generator was acquired to enhance the continuous power supply for the misting system.

2.3.4 Surface Water Management System

The regional surface water flow system in the area of the landfill is discussed in sub-section 2.7 and existing surface water control features are shown on Figures 2.4 and 6.1. Existing controls can be summarized as follows:

a) Upstream flows originate north and northwest of the site. This flow is diverted around the landfill by ditches that exist along the north perimeter of the site buffer zones.

b) A diversion ditch has been constructed along the northern limits of the landfill that discharges into the east perimeter ditch at the northeast corner of the landfill. The east perimeter ditch conveys flows southward to storm water management ponds located at the south-east corner of the site. These ponds discharge into a perimeter ditch that flows south under the VIA ROW onto and through WCC property and drains to the Mer Bleue drainage basin.

c) Another diversion ditch has been constructed northwest of the site in the north buffer area. This ditch discharges further west into a natural drainage channel termed the west perimeter ditch

which is not well defined. Surface water from the completed west parts of the site is controlled and discharges into a storm water pond located at the northwest corner. This pond discharges into a ditch located on WCC property which drains into the west perimeter ditch. The west perimeter ditch conveys flows southward and then westward north of the VIA ROW to the Mud Creek drainage basin.

d) An east diversion ditch was constructed in accordance with South Nation Conservation Authority requirements for a fish habitat and was commissioned following approval in the fall of 2009.

e) Interim clay cover has been placed over inactive portions of the existing waste mound. Finished slopes are covered with clay soil and topsoil, graded and seeded. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control. To protect the perimeter clay slopes against erosion, clay diversion dikes and drainage swales have been constructed to collect surface run-off above the slope. Storm water collected by the swales is directed down the landfill side slopes via rip-rap lined drainage chutes. Culverts exist at the top of each drainage chute to provide surface runoff across the perimeter access road, with the access road itself serving as a berm.

2.4 *Climatic Setting*

The landfill is located 17 km northeast of the meteorological station located at the Ottawa International Airport (OTAWA INTL. A, climate ID 6106001). Climatic conditions at the site are presented on Figures 2.5 and 2.6 and summarized as follows:

a) The average monthly temperatures in 2019, obtained from Environment Canada Atmospheric Environment Service, varied from an average low of about -12.2°C in January to an average high of 22.3°C in July with an annual average temperature of 5.9°C. The 58 year average ranges from a low of -10.5°C to a high of 20.9°C and an annual average of 6.1°C.

b) The average (1961 to 2019) annual precipitation at the Ottawa International Airport station is 921.3 millimetres. The driest month is generally February at an average of 55.6 mm and the wettest month being July at an average of 92.3 mm. Total precipitation for 2019 was 899.5 mm and ranged from a low of 39.8 mm in November to a high of 131.4 mm in October.

c) The average annual water surplus (i.e. precipitation minus evaporation) for the Ottawa vicinity is in the order of 320mm (12.5 in.). The water surplus provides an estimate of the amount of water available for infiltration into the site and for surface run-off during a 12-month period.

2.5 *Geology*

Regionally, the site is located within the Ottawa Valley clay plain at the western edge of the Prescott and Russell sand plains. The lowland region is composed of unconsolidated glacial deposits of till, varved clays and marine beds of clay and sand from the post-glacial Champlain Sea. The region is bound to the north by Precambrian formations of the Canadian Shield and underlain by interbedded Paleozoic bedrock that outcrops in ridges and scattered exposures due to faulting and downdrop fault blocks. The WCC Facility is situated on the banks of the Ottawa River Channel. The post-glacial Ottawa River Channels,

east of Ottawa, are from 3 kilometres to 10 kilometres wide and up to 18 metres deep. They are floored with clay and silt and bordered by sand deltas. Figure 2.7 shows the surficial geology of the area.

Sand deposits cover the escarpment that runs through the site. Sands are found to be 0.6 metres to 2 metres deep in the area of the Facility above the escarpment. For the most part, the sand below the escarpment has been eroded, leaving behind only a thin sand blanket. A thick (20 to 35 m) marine clay deposit underlies the entire area and has been exposed by the deep erosion channels that have cut through the escarpment and wherever the thin sand deposit has been eroded. The bedrock beneath the site is shown to consist of shale of the Billings Formation (Figure 2.8). A review of MECP water well records within the site vicinity study area indicated that the Site is underlain by limestone or shale.

2.6 *Hydrogeology*

The regional groundwater flow direction in the deep bedrock is east (Charron, 1978). In the general area of the site, groundwater flows from a north to south direction, toward the Mer Bleue bog located south of the site. Figure 2.9 indicates the groundwater flow direction and the interpreted groundwater recharge, transitional and discharge areas as described in studies undertaken for this area (A.J. Robinson and Associates Inc., 1987, Gore & Storrie Limited, 1992).

The thick clay deposit which underlies the site and surrounding area acts as an acquitard, such that lateral flow is directed through the surface sand unit and the upper weathered clay (total thickness of a few metres). Shallow groundwater flow is strongly influenced by topography, the depth of the surficial sand layer, the underlying weathered clay, the natural drainage systems and recently constructed drainage systems. Shallow groundwater flow occurs at the site generally in a north to south direction, as shown schematically on Figure 2.10.

The results of water levels measured at up-gradient wells at the site indicate the shallow water table to be typically located approximately 1 to 2 metres below ground surface with only small fluctuations in water levels indicated for recent years. A downward hydraulic gradient has been profiled up-gradient to the site. The only variation in the direction of the hydraulic gradient is indicated in the upper 5.6 metres to 10.4 metres below ground surface, from a downward gradient to an upward gradient in the weathered clay. These results may be attributed to a perched water table at the interface of the weathered clay and the intact clay. The relatively weak downward gradient from the sand to the weathered clay suggests a hydraulic interconnection between these units. The downward gradient is quite pronounced from the weathered clay down to the lower reaches of the intact clay deposit. It is interpreted that the intact clay deposit at depth beneath the landfill site acts as a barrier to groundwater flow.

The results of the water levels measured at the down-gradient wells at the site indicate the shallow groundwater table lies within the sand deposit close to the original ground surface ranging in elevation from about 68.8 metres to 70.2 metres. Seasonal variations of nearly 1 metre have been observed. The high water levels generally occur during the wet spring whereas the lower water levels are recorded during the dry summer months and fall. Unlike the up-gradient groundwater level profiles, the down-gradient profiles generally indicate a slight upward vertical gradient, although a localized weak downward gradient is observed at times between the upper 6.3 metres to 7.6 metres within the weathered clay. The upper sand and fractured clay layers appear to be hydraulically connected with near vertical or hydrostatic water level profiles. A slight upward gradient at the down-gradient

boundary of the landfill suggests there is upward vertical flow of shallow groundwater at this location which would retard the potential for leachate migration into the deeper groundwater system.

Water levels obtained further down-gradient of the landfill indicate the shallow groundwater table is close to the ground surface within the upper sand or organic deposit with artesian conditions within the clay. Hydraulic head profiles illustrate an upward gradient through most of the profile with a weak downward gradient from the sand to the weathered clay. Historically, there has been an upward gradient through the entire profile. The presence of an upward gradient suggests upward groundwater flow is occurring south of the landfill. These results may also suggest upward leaching of pore water from the Champlain Sea clay, a brackish water deposit, may be occurring at the southern boundary of the landfill. North of the landfill, downward leaching of the clay pore water is indicated.

The horizontal hydraulic gradient in the shallow sand deposit and weathered clay at this site is consistent with the relief of the property which changes in elevation by approximately 15 metres to 18 metres between the up-gradient and down-gradient boundaries of the landfill. Since the shallow water table appears to be a reflection of the original surface topography, horizontal hydraulic gradients are expected to vary between 0.7% in the plateau above the escarpment and 1.4% in the valley below. Water levels measured south of the landfill indicate shallow groundwater is flowing in a south to southwest direction with a small hydraulic gradient ranging between 0.5% and 2%. The horizontal gradients in the bog area are influenced by seasonal fluctuations in the surface water levels. Hydraulic gradients could also be influenced by the leachate collection system (LCS) located along the south toe of the landfill. Keeping the LCS drained could result in a lowering of the water table by more than 3 metres below the original grade at the southeast corner of the landfill and by 2 metres at the southwest corner. This water table lowering could significantly influence the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient side of the LCS was constructed to alleviate any potential problems related to lowering of the groundwater table south of the landfill.

Water levels measured within the glacial till/upper bedrock up-gradient and down-gradient of the site indicate a difference in water levels of about 6 metres, which represents a hydraulic gradient of approximately 1% across the site within the glacial till/upper bedrock.

Many factors, such as mounding within the waste pile, the installation of the leachate collection system and the construction of waste cells with under drainage will influence the rate of groundwater flow across the site.

Within the study area MECP water well records indicate that former groundwater users obtained their groundwater from the overburden and bedrock interface. This interface is considered the main aquifer in the study area. Down-gradient of the landfill, in the direction of groundwater flow, there are no potential groundwater users and the marine clays present in the Mer Bleue bog area produce saline water.

2.7 *Surface Water Flow System*

The Navan Landfill is located on a watershed divide between two major drainage watersheds - the Rideau River watershed to the west and the South Nation River watershed to the east (see Figure 2.11). Surface runoff drains to both the east and west of the site. The east side of the site drains to the Bear Brook drainage basin, which is part of the South Nation River watershed. The west side drains into the Mud

Creek drainage basin which in turn drains into Green's Creek; part of the Rideau River watershed. The Mer Bleue bog, a unique and internationally recognized ecological feature, is located to the south of the landfill as seen on Figure 1.1.

2.8 *Mer Bleue Bog*

The Mer Bleue bog, located south of the site, is an important ecological and hydrologic feature in the Ottawa area. This 4,106 ha area was formed approximately 9,500 years ago, following the last ice age, (Frasier et al., 2001) when the Champlain Sea occupied the Ottawa Valley and laid down deep marine clay deposits. As the glaciers began to melt, a spillway channel formed south of the present day Ottawa River. Melt water flowing through the southern channel eroded the floor of the Champlain Sea. As the melt waters receded and isostatic rebound forced sea water eastward to the Atlantic Ocean, the southern channel ceased flowing and a lake formed in the present location of the Mer Bleue bog. Plant growth progressively filled in the lake, forming a raised peat dome Sphagnum bog. The peat thickness is reported to be about 6 to 7 m.

The Mer Bleue is underlain by Ordovician limestone and shale, deposited as marine sediments 445 million years ago (Brunton, 1984). The bedrock layer is deeply buried by organic deposits over the central portion of the Mer Bleue with marginal deposits of marine clay, and sand deposits along two prominent ridges. The marine clay deposits are very thick, ranging from 12 to 45 m in depth (Hobson et al., 1969). There are also sandy shoreline deposits located on the northern and southern margins of the Mer Bleue bog (Brunton, 1984).

The hydrologic features of the bog are very unusual. Being a domed bog, surface water drainage in the bog flows radially outwards from the centre towards the edges of the bog and then flows in the "lagg" along the perimeter of the bog. The elevation at the centre of the bog is approximately 70 m above sea level, sloping gradually down to about 67 m at the perimeter of the bog. Groundwater flow into the bog is very small given the low permeability of the underlying clay soils. Surface water inflow to the bog is also very limited because the contributing drainage watersheds are quite small; consequently the bog receives most of its water and nutrients in the form of atmospheric precipitation (for this reason the Mer Bleue is referred to as an "ombrotrophic bog").

Surface water flowing radially outwards from the centre of the bog enters the lagg around the perimeter of the bog which is basically a channel of standing or very slowly flowing water flowing along the perimeter of the bog. The lagg receives water from the bog and distributes it through the surrounding lands. On the western portion of the bog, drainage channels drain bog waters westward to Greens Creek. On the eastern portion of the bog, drainage from the bog ultimately discharges to Bear Brook Drain to the southwest.

Attempts were made in the late 1800's to drain portions of the bog for agricultural purposes; however, these drainage ditches no longer function because of the many beaver ponds which started up in the late 1950's. Now the water level in the Mer Bleue is at or near the surface of the bog for most of the year. The Savage Drain is an example of an agricultural drain which is quite visible in aerial photographs of the bog as a prominent linear feature on the eastern side of the bog. Flow in the drain in the northern part of the bog (nearest the landfill) is northward and then eastward along the lagg on the perimeter of the bog. There are a number of agricultural drains along the northern and eastern parts of the bog which receive surface water from the bog.

Shoreline erosion is not a concern as the surface water flow rates are nil to minimal. Flooding in the bog is also not a concern as water levels are controlled naturally through beaver dams and the ability of sphagnum to absorb large amounts of water.

In addition to its hydrologic function, the lagg is also a transition zone for plant communities and water quality, where the water regime changes from acid dominated waters in the bog to increasing calcium and basic waters.

Fraser et al., (2001) studied flow patterns and geochemistry in the peat in the Mer Bleue bog. The researchers found that vertical groundwater flow patterns in the bog alternated annually between periods of recharge and discharge in accordance with changes in precipitation, evapotranspiration and the differential head response of the lower peat layer to changes in water table. A sustained moisture deficit during the summer maintained a flow reversal for about a month until a significant rainfall raised the water table. One of the reasons that the researchers selected the Mer Bleue for their study of flow reversals was that the large peatland was isolated from the regional groundwater flow (Fraser, et al., 2001).

The surface vegetation in the Mer Bleue bog has, to some extent, become a shrub-rich bog as a result of the extensive drainage activities and peat mining of the 19th and early 20th centuries. These disturbances reduced the wetland size by 20%, accelerated the maturation of the peatland and accelerated the rate of tree establishment. The re-establishment of beaver populations along the margins of the peatland have helped restore pre-disturbance water levels, however many bog species have already been reduced (Brunton, 1992).

Ponding due to beaver activity has the potential to convert the bog vegetation to marsh communities. There is a concern about the spread of invasive and/or non-native plant species; in particular, purple loosestrife, grey birch, glossy buckthorn and European frog-bit (Wetlands International, 2001).

East Urban Community
COMMUNITY DESIGN PLAN

Communauté urbaine de l'Est
PLAN DE CONCEPTION COMMUNAUTAIRE

- Proposed School / École proposé
- Future Institutional Site / Futur emplacement institutionnel
- 15m Overland Flow Corridor / Couloir d'écoulement de surface 15m
- Existing and Proposed Parks / Parc existant et proposé
- Wooded Area / Zone boisée
- RH Waste Disposal Site / Décharge de RH
- Storm Water Management Pond / Bassin de rétention des eaux pluviales
- Slope Stability Setback / Marge de recul pour la stabilité des pentes
- Aquatic Habitat Setbacks from top of Bank / Marge de recul pour les habitats aquatiques à partir du haut de la rive
- Buffer to Mer Bleue Bog / Zone tampon de la tourbière de la Mer Bleue
- Proposed Street / Rue proposé
- Future Mixed Use Area / Future zone à usages mixtes
- Phase 2 Area / Phase 2

NOT TO SCALE

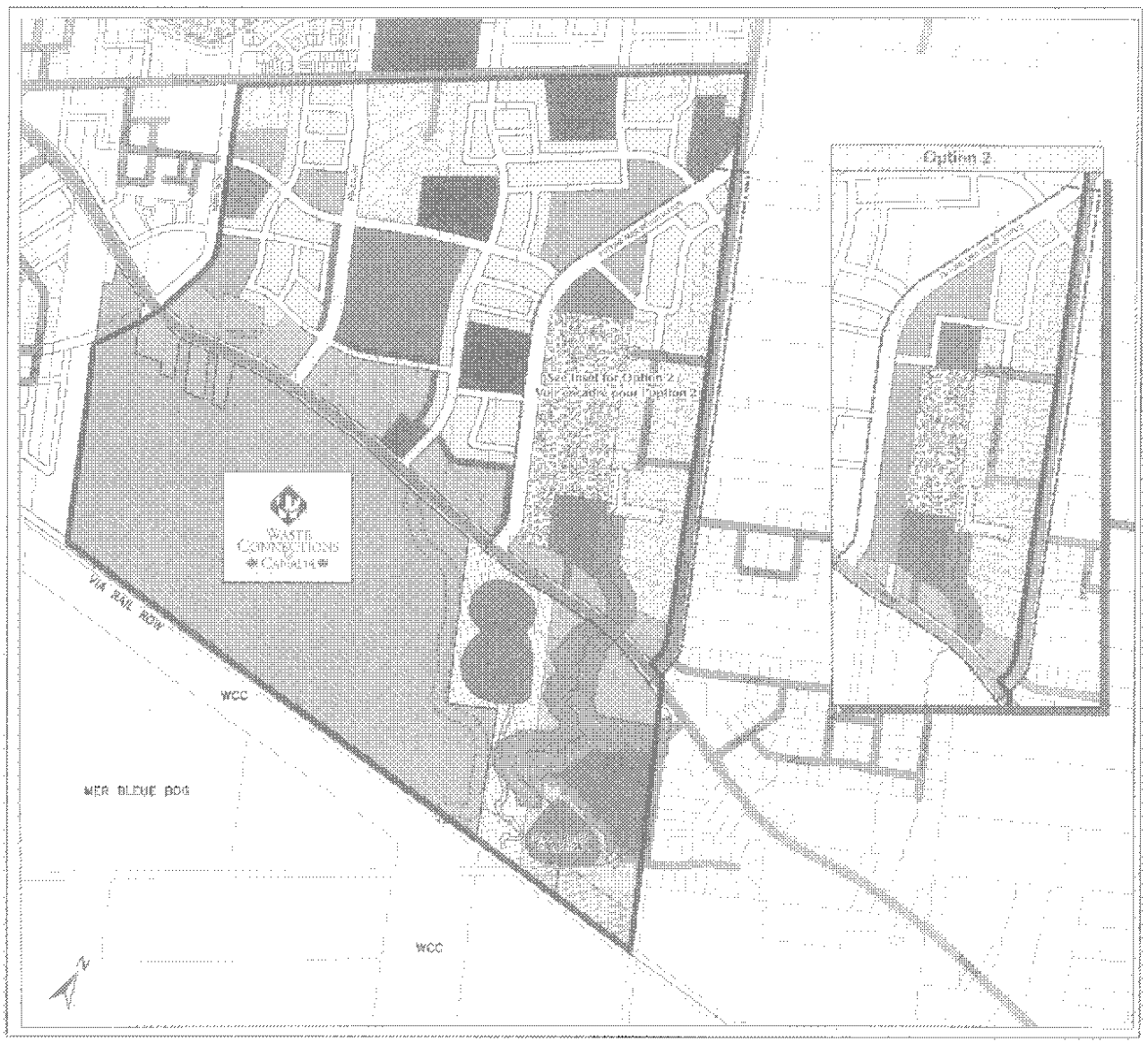
REFERENCE:

Base map by: Planning and Growth Management Department, Mapping & Property Data
Plan de base fourni par : Direction générale de la planification, de la croissance et de la gestion immobilière, Service de la cartographie et des données immobilières

FIGURE 2.1

2019-Z-2.dwg

000315



NOT TO SCALE

East Urban Community - Phase 2
COMMUNITY DESIGN PLAN
A
Communauté urbaine de l'Est- Phase 2
PLAN DE CONCEPTION COMMUNAUTAIRE

LAND USE / UTILISATION DU SOL

- School / École
- Institutional / Institutionnel
- 15m Overland Flow Corridor / Couloir d'écoulement de surface 15m
- Park / Parc
- Wooded Area / Zone boisée
- Bell Waste Disposal Site / Décharge Bell
- Storm Water Management Pond Area / Zone de rétention des eaux pluviales
- Slope Stability Setback / Marge de recul pour la stabilité des pentes
- Aquatic Habitat Setback from top of Bank / Marge de recul des habitats aquatiques à partir du haut de la rive
- Existing Residential - Potential for long term redevelopment to low/medium density residential / Résidentiel existant - Potentiel, à long terme, de réaménagement en résidentiel de densité faible à moyenne
- Future Residential – low/medium density / Résidentiel futur – faible/moyenne densité
- Future Residential – medium/high density / Résidentiel futur - moyenne/haute densité
- Mixed Use – institutional, office, commercial / Secteur polyvalent – institutionnel, bureau, commercial
- Leisure recreational uses - Significant access, toilets and sanitary servicing constraints limit development potential / Utilisations de loisir et récréatives – Les contraintes d'accès, de toilettes publiques et domestiques limitent le potentiel d'aménagement.
- Future development potential to low density residential only if storm and sanitary servicing constraints can be overcome / Potentiel d'aménagement futur en lotissement résidentiel de faible densité, uniquement si les contraintes de conduites pluviales et domestiques peuvent être résolues
- Railway right-of-way / Corridor / Zone tampon de la voie de chemin de fer
- Proposed Street / Rue proposée

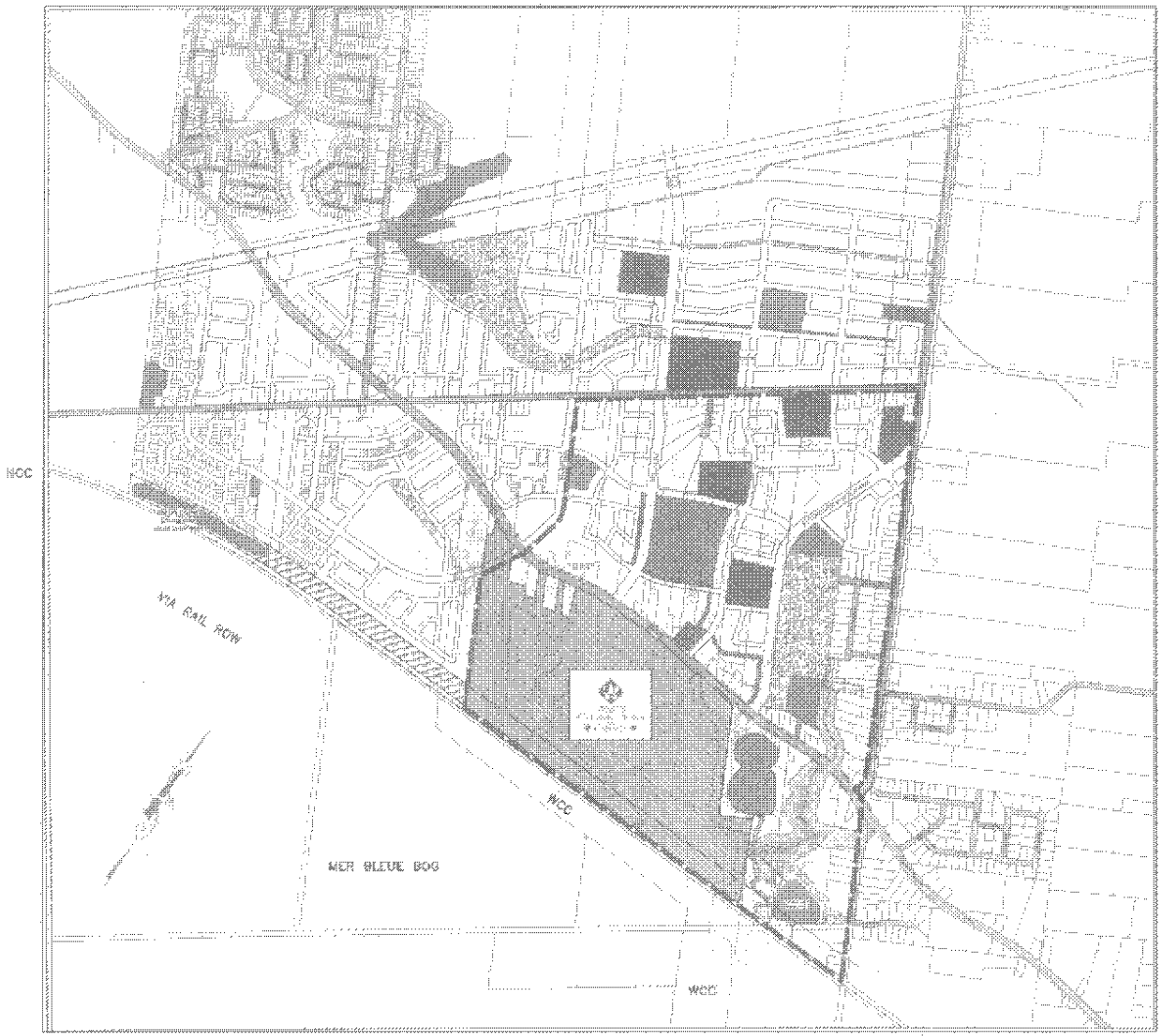
Ottawa

FIGURE 2.2

REFERENCE:

2119-2-A.DWG

000316



East Urban Community
COMMUNITY DESIGN PLAN

Communauté urbaine de l'Est
PLAN DE CONCEPTION COMMUNAUTAIRE

- Proposed School / École proposé
- Future Institutional Site / Futur emplacement institutionnel
- Open Overland Flow Corridor / Couloir d'écoulement de surface 15m
- Existing and Proposed Parks / Parc existant et proposé
- Viaduct Area / Zone hélée
- RFI Waste Disposal Site / Décharge de RF
- Storm Water Management Pond / Bassin de rétention des eaux pluviales
- Slope Stability Setback / Marge de recuiement de la stabilité des pentes
- Aquatic Habitat Setbacks from top of Bank / Marge de recuiement des habitats aquatiques, à partir du haut de la rive
- Buffer to Mer Bleue Bog / Zone tampon de la tourbière de la Mer Bleue
- Proposed Street / Rue proposé
- Future Mixed Use Area /
- Phase 2 Area /

NOT TO SCALE

REFERENCE:

Source: City Planning and Development Department, Geomatics Section, City of Ottawa
Tirée des Services de l'urbanisme et de la gestion de la croissance, Section de la cartographie et de la géomatique, Ville d'Ottawa

FIGURE 2.1

2818-C-4.dgn

East Urban Community - Phase 2

A

COMMUNITY DESIGN PLAN

Communauté urbaine de l'Est- Phase 2

PLAN DE CONCEPTION COMMUNAUTAIRE

LAND USE / UTILISATION DU SOL

- School / École
- Institutional / Institutionnel
- Open Space / Parkland / Corridor / Espace libre / Parc / Corridor
- Park / Parc
- Wetland / Terre humide
- Solid Waste Disposal Site / Décharge DEP
- Storm Water Management Pond Area / Zone de rétention des eaux pluviales
- Slope Stability Setback / Marge de recul pour la stabilité des pentes
- Aquatic Habitat Setback from top of Bank / Marge de recul pour les habitats aquatiques à partir du haut de la rive
- Future Residential – Potential for long term redevelopment to low/medium density residential / Résidentiel futur – Potentiel, à long terme, de réaménagement en résidentiel de densité faible à moyenne
- Future Residential - low/medium density / Résidentiel futur - faible/moyenne densité
- Future Residential - medium/high density / Résidentiel futur - moyenne/haute densité
- Mixed Use – Industrial, office, commercial / Secteur polyvalent – Institutionnel, bureau, commercial
- Future recreational use - Significant bedrock, storm and sanitary servicing constraints limit development potential / Utilisation de loisir et récréative - Les contraintes d'accès, de conduites pluviales et domestiques limitent le potentiel d'aménagement.
- Future development potential for low density residential only if storm and sanitary servicing constraints can be overcome / Potentiel d'aménagement futur en lotissement résidentiel de faible densité, uniquement si les contraintes de conduites pluviales et domestiques peuvent être réglées
- Buffer zone from the rail corridor / Zone tampon de la voie de chemin de fer
- Proposed Street / Rue proposée

Ottawa

FIGURE 2.2

REFERENCE:

Figure 2.2 Community Design Plan / Plan directeur communautaire

2010-2-4.BMP

000318

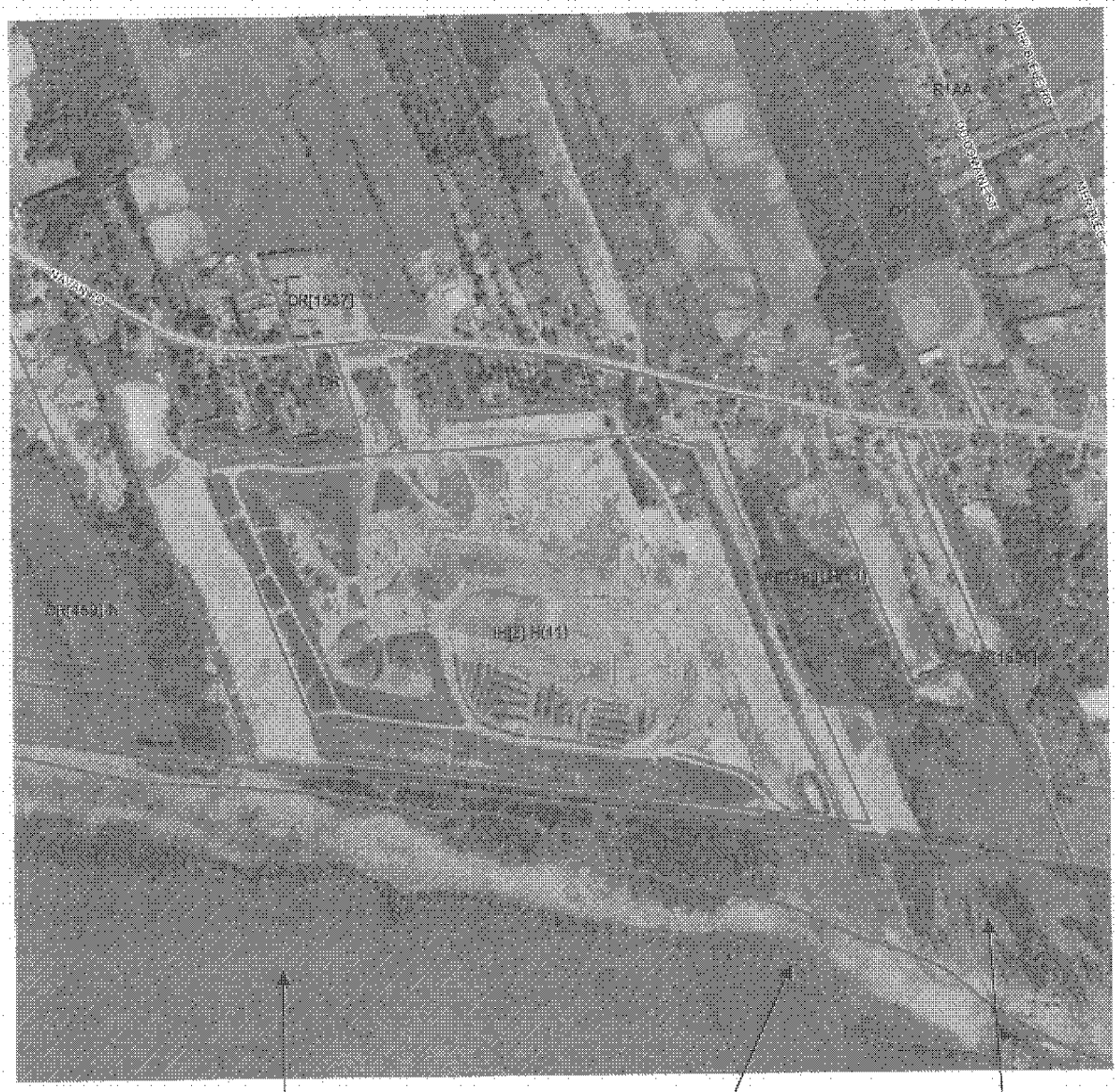
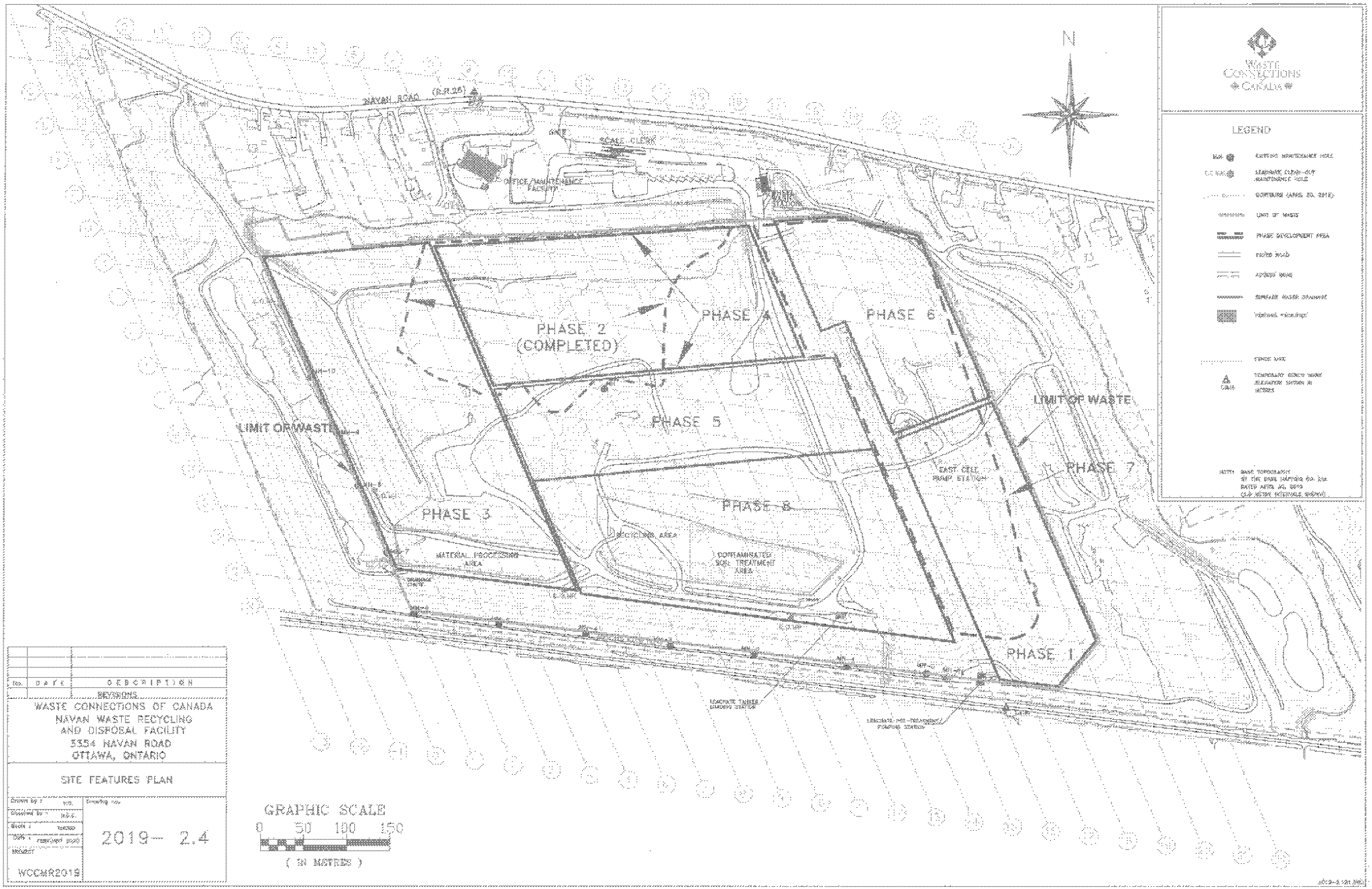


FIGURE 2.3

CURRENT ZONING OF SITE AND SUROUNDING AREA

WASTE CONNECTIONS OF CANADA



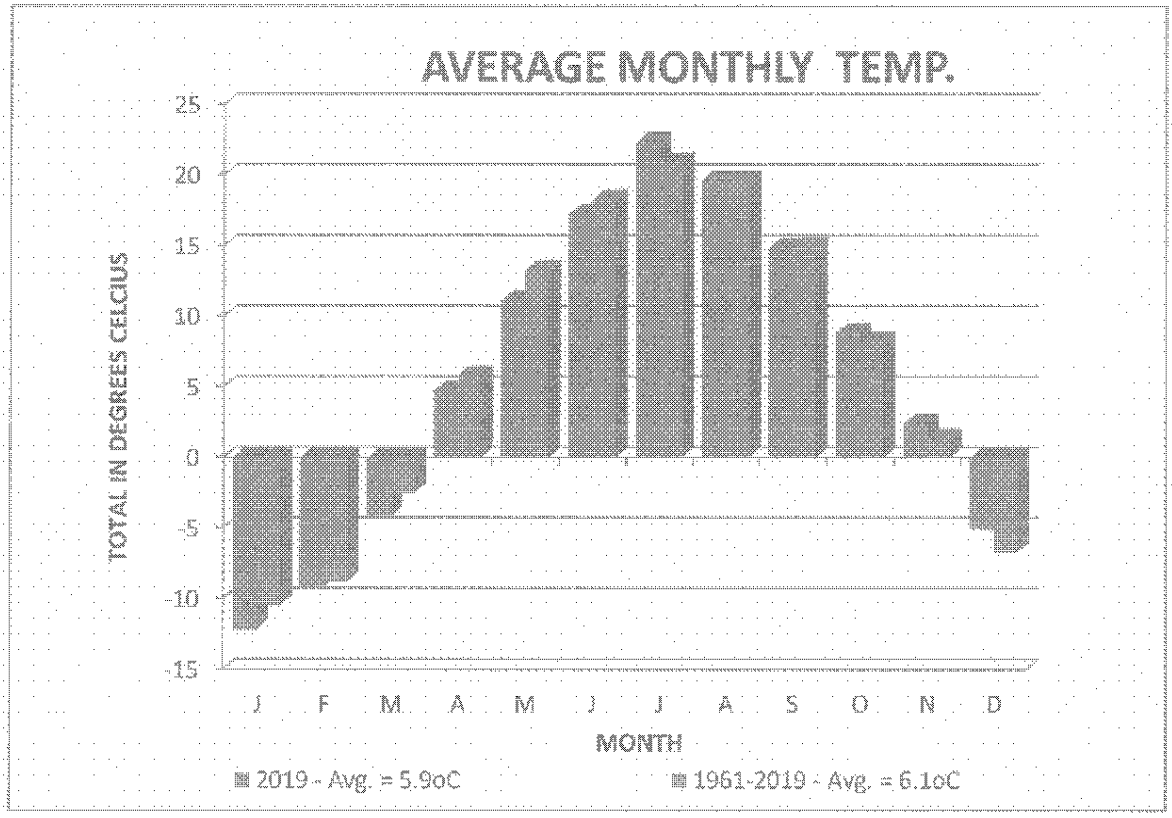
NO.	DATE	DESCRIPTION
		REVISIONS

WASTE CONNECTIONS OF CANADA
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD
OTTAWA, ONTARIO

SITE FEATURES PLAN

Drawn by :	MD.
Checked by :	M.S.
Appr. :	MARCH 2020
Date :	FEBRUARY 2020
Project	WCCNR2019
Drawing no.	2019– 2.4

000320



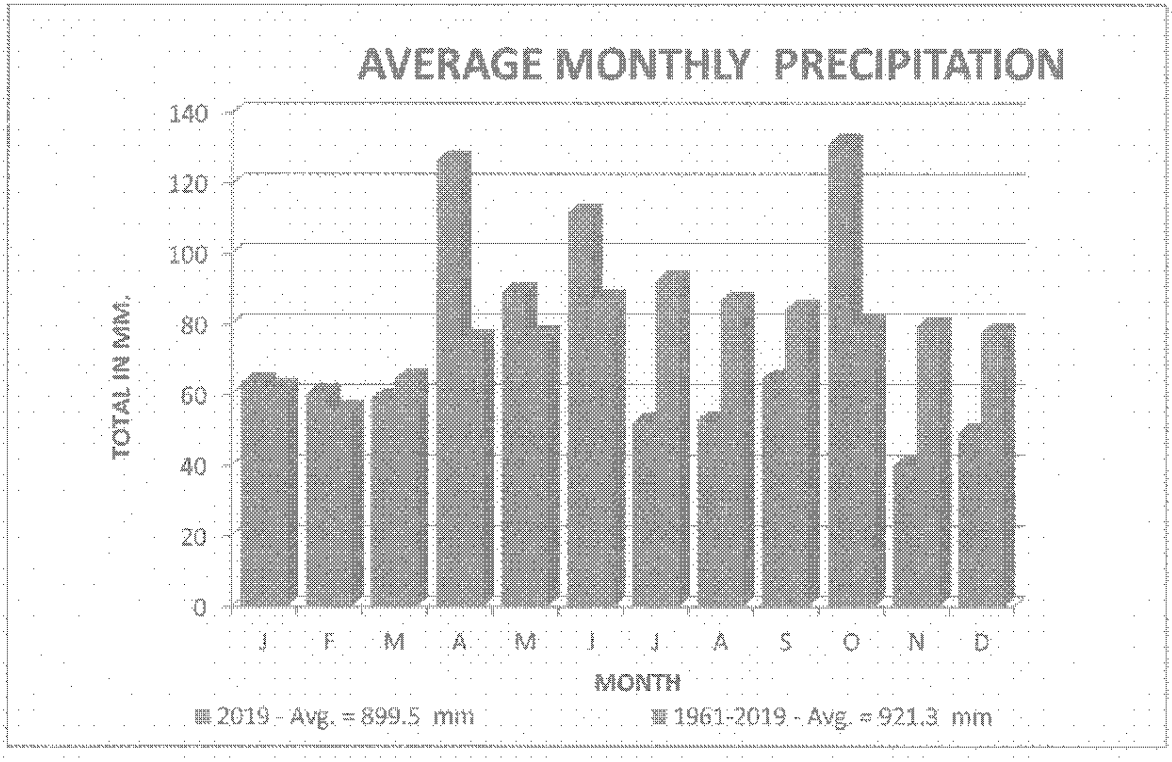
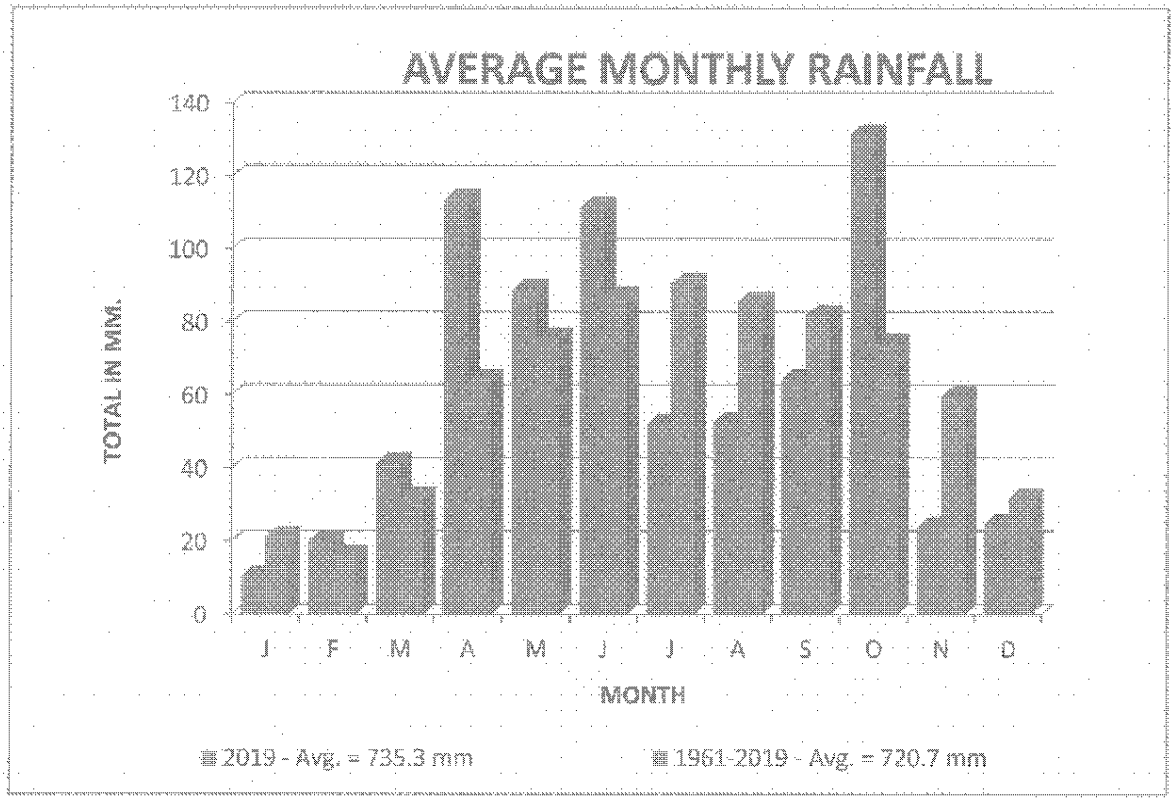


Figure 2.5: Average MonthlyTemperature and Precipitation for 2019



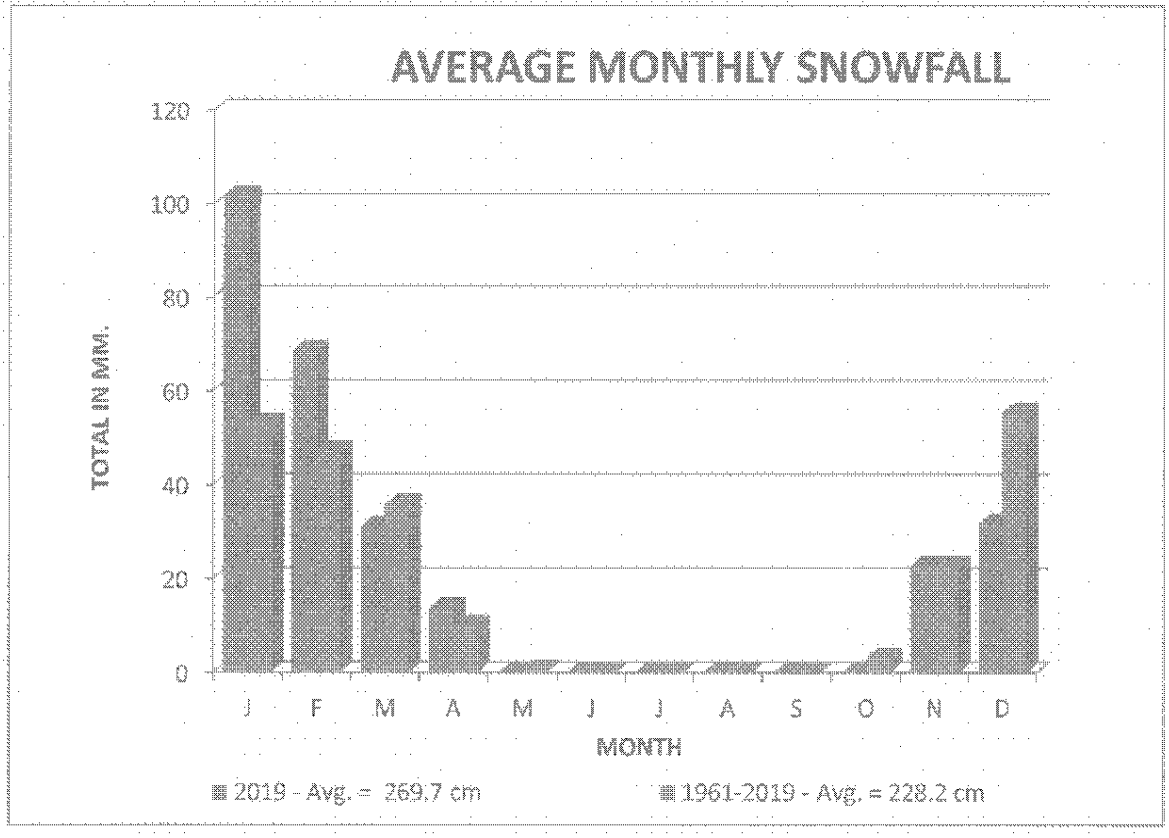
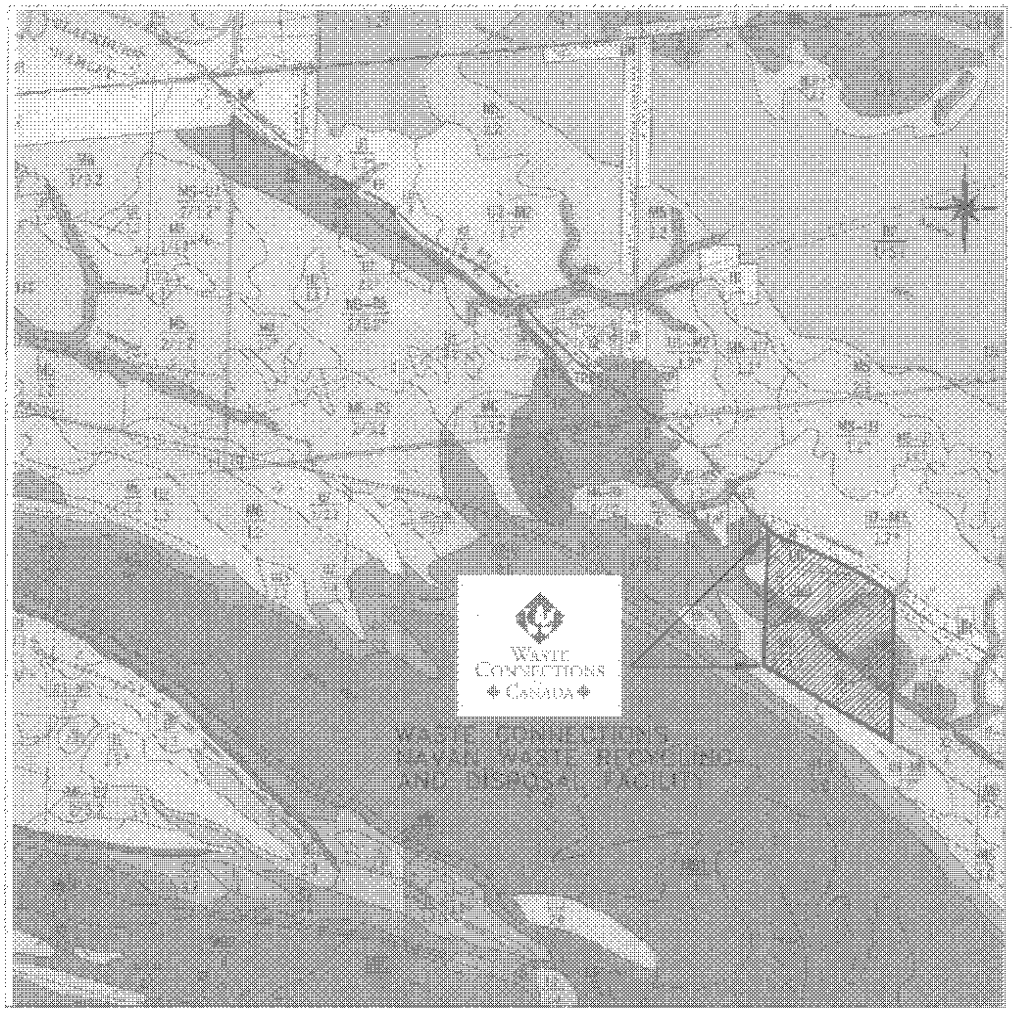


Figure 2.6: Average Monthly Rainfall and Snowfall for 2019



Scale 1:25,000

Kilometres 0 1 2 3 Kilometres

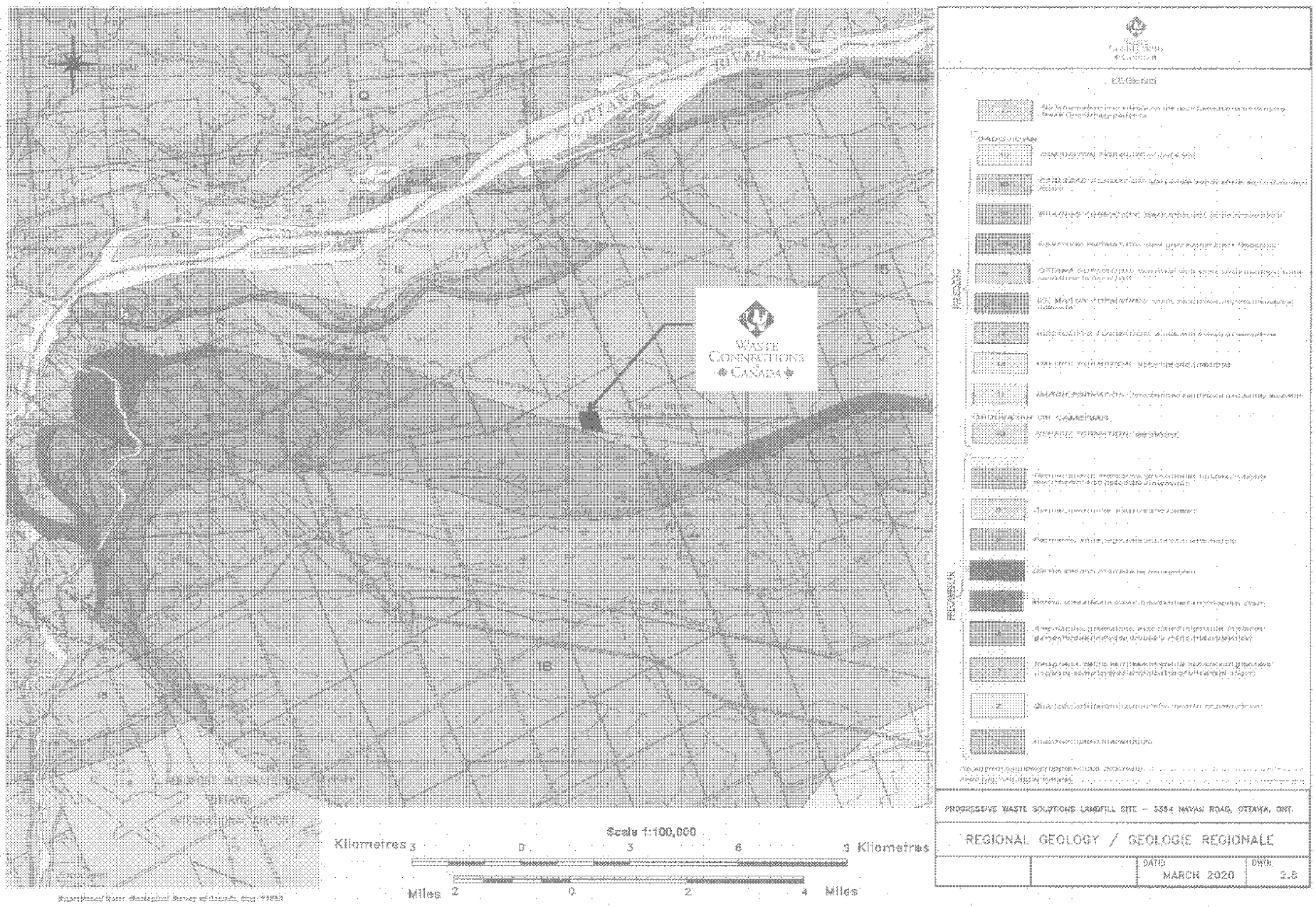
SOURCE: AGRICULTURE CANADA. SOILS, CAPABILITY AND LAND USE IN THE OTTAWA URBAN FRINGE, REPORT No. 47 ONTARIO SOIL SURVEY 1979

WASTE CONNECTIONS CANADA

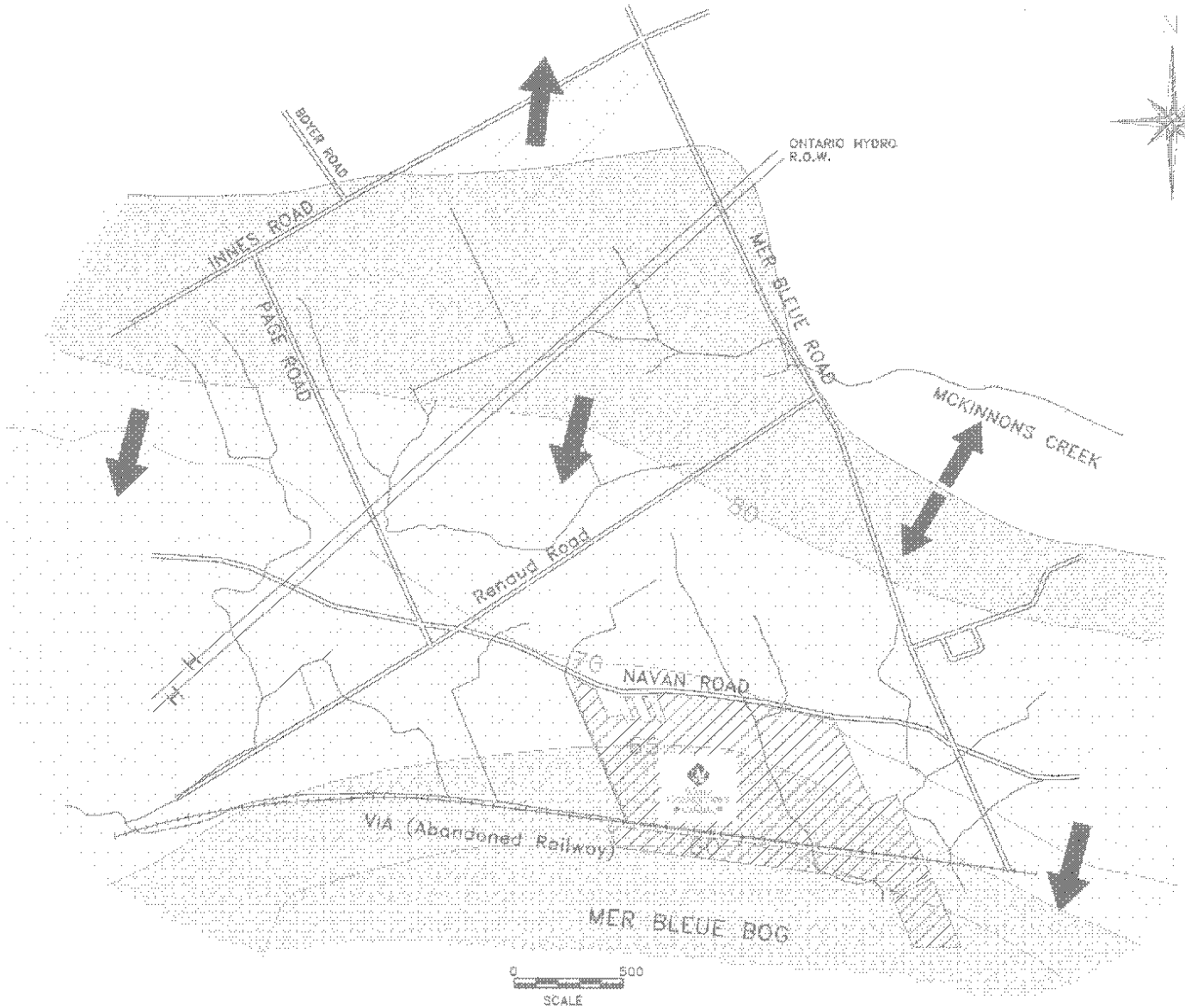
SURFICIAL SOIL CLASSIFICATION

SCALE : AS SHOWN	FIGURE NO. 2.7
DATE : MARCH 2020	

000323


WASTE CONNECTIONS CANADA
OTTAWA
INTERNATIONAL AIRPORT
LEGEND
PROTEROZOIC
PALEOZOIC
PROGRESSIVE WASTE SOLUTIONS LANDFILL SITE – 5554 NAVAN ROAD, OTTAWA, ONT.
REGIONAL GEOLOGY / GEOLOGIE REGIONALE
DATE: MARCH 2020
DWG. 2.8
Scale 1:100,000
Kilometres 3 0 3 6 9 Kilometres
Miles 2 0 2 4 Miles

000324



WASTE CONNECTIONS of CANADA

RECHARGE AREA

TRANSITIONAL AREA

DISCHARGE AREA

BEDROCK AQUIFER WATERSHED BOUNDARY

BEDROCK AQUIFER POTENTIOMETRIC CONTOUR (METRES GEODETIC)

GROUNDWATER FLOW DIRECTION

SOURCE CITY OF GLOUCESTER EAST URBAN COMMUNITY MASTER DRAINAGE PLAN

No.	DATE	DESCRIPTION
		REVISIONS
1	MARCH 2005	UPDATES

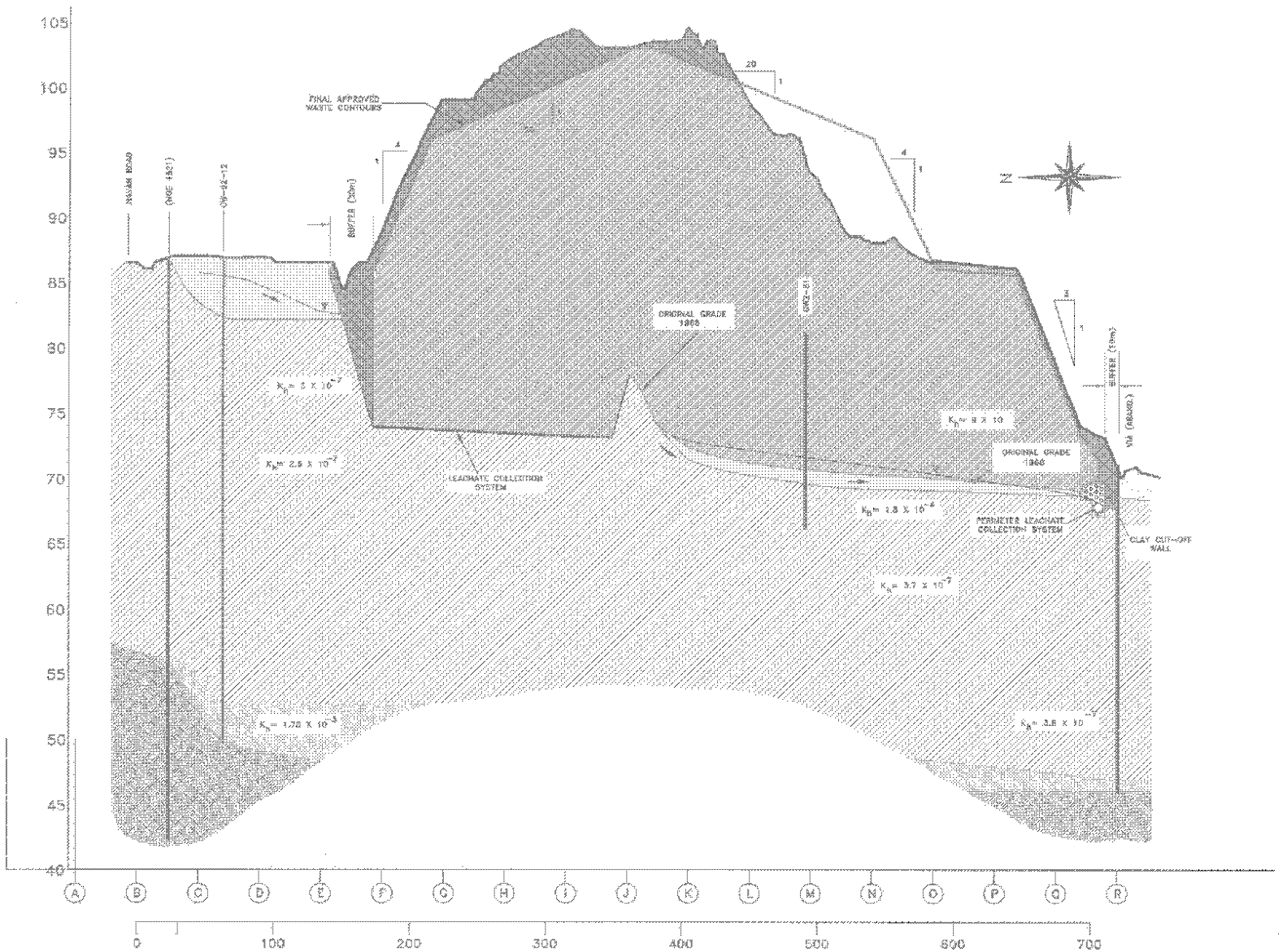
WASTE CONNECTIONS OF CANADA
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD
OTTAWA, ONTARIO

LOCAL HYDROGEOLOGY

Drawn by : V.K.
Checked by : K.M.C.
Scale : 1:25,000
Date : JANUARY 2020
Project WCCMR2019

2019-2.9

000325



LEGEND

- LIMESTONE BEDROCK
- GLACIAL TILL
- SAND
- CLAY BLUE/GREY
- REFUSE
- CLAY FILL
- CLEAR CRUSHED STONE
- GROUND WATER FLOW PATH
- WATER TABLE
- OBSERVATION WELL
- FINAL APPROVED WASTE CONTOURS
- K_h HYDRAULIC CONDUCTIVITY (cm / sec.)
- (B) EAST - WEST GRID LINE DESIGNATION

WASTE CONNECTIONS of Canada

No.	DATE	DESCRIPTION
		REVISIONS

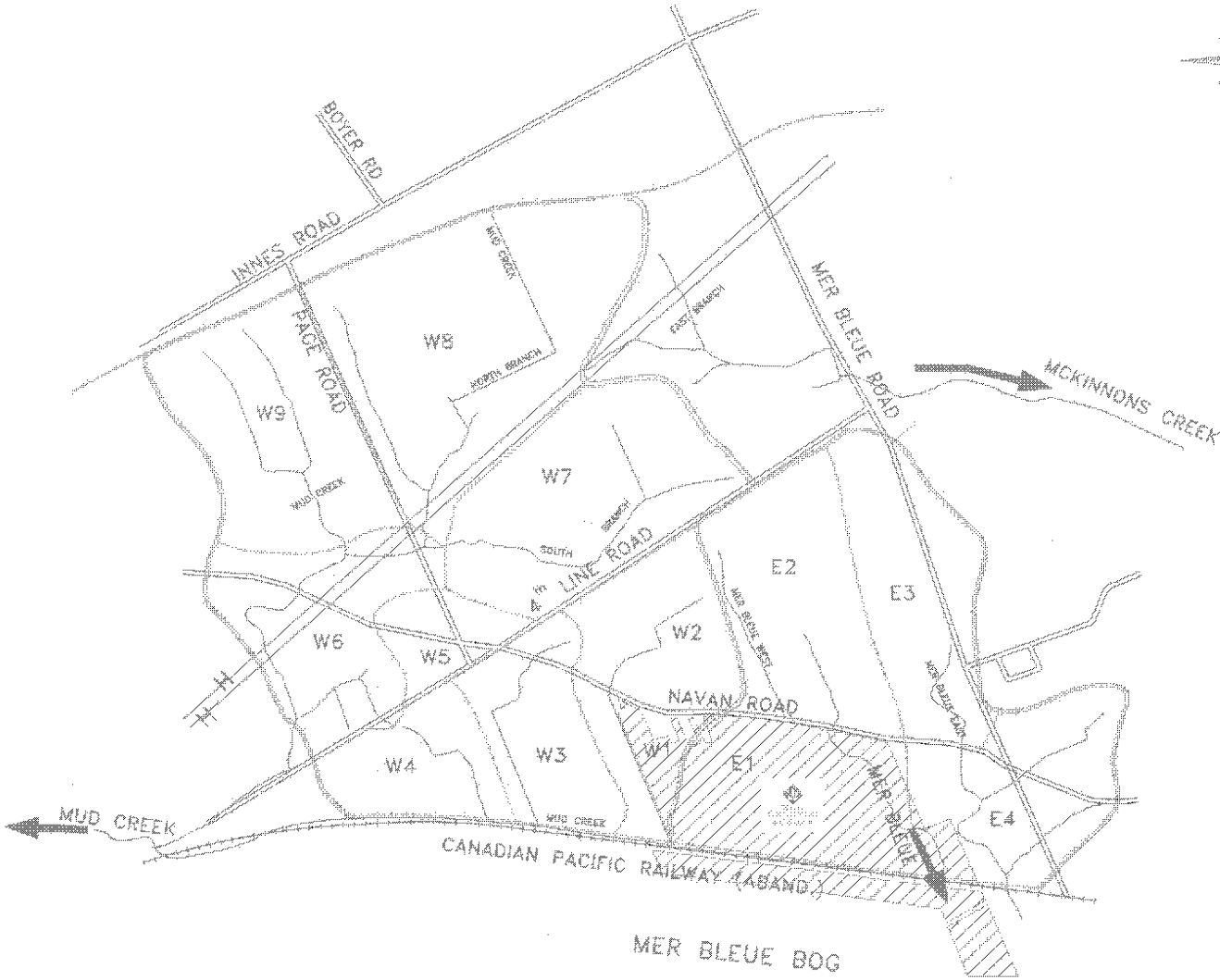
WASTE CONNECTIONS OF CANADA
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD
OTTAWA, ONTARIO

CROSS-SECTION ALONG GRID LINE 7

Drawn by: P.D.L.
Checked by: P.D.L.
Scale: As shown in brackets
Date: January 2020
Project: WCOMR2019

Drawing number: 2019-2.10

000326



MAJOR WATERSHED BOUNDARIES

SUB-WATERSHED BOUNDARIES

OVERLAND (MAJOR) STORMWATER FLOW ROUTE

NAVAN WASTE RECYCLING AND DISPOSAL FACILITY

SOURCE CITY OF GLOUCESTER
EAST URBAN COMMUNITY
MASTER DRAINAGE PLAN

WATERSHED AND SUB-BASIN DELINEATION

Scale : AS SHOWN

Date : MARCH 2020

FIGURE NO.
2.11

2019-2-4.DWG

000327

3. OPERATIONS - 2019

3.1 *Description of Operations*

The Navan Waste Recycling and Disposal Facility has evolved over the years from being simply a disposal site into an integrated waste management facility with increased focus on re-use and recycling.

Prior to 1981, landfilling was carried out by end-dumping over an existing east-west oriented ridge with minimal base preparation. Following an ownership change in 1981, the site was operated using an area method with waste being placed in the southern half of the landfill (i.e., below the escarpment). As-built survey information collected during the construction of the leachate collection system indicated the base elevation of the waste varied between 68 and 70 m ASL below the escarpment along the perimeter of the waste footprint. The landfill expansion approvals received in 2009 added 3,600,000 m^3 of air space bringing the total estimated waste capacity for the site to 7.6 million m^3, which included the previously approved capacity.

Prior to expansion, cell development in the northeast quadrant of the landfill footprint consisted of stripping topsoil and excavating native sand and clay soils to the required elevations for the construction of a leachate collection system. These base grades varied from 69.5 m ASL at the low point of the system in the S-E corner of the cell (Grid M-16) to approximately 73.2 m ASL at the high point of the system in the N-W corner of the cell (Grid F-7). The base grades were sloped downward at 0.5% draining in a south-easterly direction to the S-E corner of the cell (Grid M-16). The cell construction maintained gravity flow of leachate to the pump station located southeast of the waste footprint (Grid Q/R-16) entering the pump station at about elevation 67 m. Construction of the east cell expansion (Phase 1) was completed in 2015 with a leachate collection system overlying a clay floor ranging in elevation from 70.1 m to 72.1 m. The design of the leachate collection system is summarized in Section 6.3.

The landfill will continue to be developed until the upper approved final waste contours are achieved. Figure 3.1 presents the current approved top of waste grades. The final cover, which at a minimum will have a 1.0 m thickness, will be superimposed on top of the final grades. Generally, an interim clay cover is constructed immediately upon reaching the approved fill heights in an effort to reduce water infiltration and the volume of leachate generated at the site. Clay cover has been placed in areas such as the north, west, south and southeast slopes and the top of waste where final waste grades have been reached in the area of Phase 3 and the north half of Phase 4.

Active landfilling continued from January to October of 2019 in Phase 4 and was then moved to the Phase 6 east cell area in October to the end of December.

Significant activities and capital works undertaken between January 1st and December 31st, 2019 included the following:

1. Active landfilling in Phases 4 & 5 and in new east cell (Phase 6);
2. Excavated clay from the Phase 4 and Phase 5 areas (grid Lines H-K/11-14) to create air space for landfilling of waste;
3. Completion of excavation and drainage layer construction in the east cell (Phase 6);
4. On-going recycling operations at the facility;
5. Treatment of hydrocarbon contaminated soils in the material processing area of the site;
6. Continued pre-treatment of collected leachate and disposal to ROPEC for off-site treatment;
7. Retained Dillon Consulting Limited to complete the reporting requirements under the National Pollutants Release Inventory (NPRI); to determine the reporting requirements under Ontario Regulation 127/01 – Airborne Contaminant Discharge Monitoring and Reporting; to assess the Greenhouse Gas Reduction Reporting as required under Ontario Regulation 347; to determine the reporting requirements under Ontario Regulation 452/09 – Greenhouse Gas Emissions Reporting and the Federal Government Greenhouse Gas Reporting Program;
8. Retained Golder Associates to carry out surface water, groundwater, leachate, gas and noise monitoring and reporting programs;
9. Hosted a Household Hazardous Waste Day Event
10. Added clay cover to completed fill areas of the landfill;
11. Constructed a stormwater culvert along the north and northeast corner of the waste cell in Phase 6;
12. Retained Base Mapping Ltd. to undertake aerial photography and produce an updated topographic map of the site; and
13. Constructed four additional vertical wells for gas collection in Phase 4.

A brief description of the major activities and capital works follows.

3.1.1 Active Landfilling

From January to October of 2019, active landfilling took place in the Phase 4 and Phase 5 areas of the landfill. Access to the fill area was provided by a north-south access road running along the east side of grid line 14 south to Grid Line P-13 then running west to about Grid Line O-6 then turning north to about

K-6 and then east at the top of the existing waste pile in Phase 4. Excavation of existing clay cover in Phase 5 was required to create air space for landfilling of waste.

From October to the end of December of 2019, active landfilling was moved to the bottom of the newly completed east cell in Phase 6. Operations in this area focused on constructing an access road and a receiving pad for haul trucks and placing the first lift over the drainage layer. Construction of the east buffer wall against which waste could be placed was achieved with the use of treated soils at the south east corner of Phase 6. Access to the active fill area was provided by a north-south access road along the west edge of the east cell area running along the east side of grid line 14 then turning east at Grid Line J and down into the cell.

3.1.2 Cell Development

On-going excavation for the construction of the east cell defined as Phase 6 was carried out concurrently as other landfilling operations progressed. The excavated clay soils were used for the construction of berms, perimeter clay barriers, top cover material, closure, and to raise the grade along the landfill perimeter to provide more gentle side slopes. Construction of the leachate collection system on the excavated floor of the cell was completed in September of 2019.

3.1.3 Processing (recycling)

Recycling operations continued throughout 2019 making use of an excavator equipped with a grappler and magnet for the removal of metals, wood and bulky items from the waste stream received at the active face. Wood and metals recovered were moved to a recycling area located on site within the waste footprint where metals and wood are stored for further processing and/or bulk removal. A resident mobile wood grinder is used on site to reduce the wood into chips suitable for use as bio-fuel at a local mill or re-used at a local organic waste composting facility. A Duratech EJ100 Wood Grinder was used for the grinding of recycled wood into wood chips. A refrigerant recovery program established at the site continued to assist clients wanting to properly dispose of their appliances containing refrigerants. Materials such as brick, concrete, rubble, clean roofing shingles and asphalt continued to be separated for beneficial re-use in the construction of access roads, turn areas at the active face and storage pads. Other materials recycled and/or re-used at the site consist of cardboard, drywall, glass, tires, electronic waste, batteries and propane cylinders found within the waste. Further details on recycling and material volumes are provided in Section 9.

3.1.4 Contaminated Soil Treatment

The treatment of hydrocarbon contaminated soils was on-going throughout 2019 in the soil processing area of the landfill along Grid Line O between Grid Lines 9 and 13 (refer to Dwg 2.4). A total of 60,983 tonnes of treated soils meeting the target parameters were received at the treatment area and re-used as a construction fill material in the east buffer along Grid Line 20 between Grid Lines H and P in accordance with ECA conditions for the site. A total of 6,266 tonnes of impacted soils were re-used as construction material with the waste footprint of the landfill.

3.1.5 Soil Screening Plant

A METSO rock screening plant was used for the screening of rock and rubble greater than 50 mm. This plant separates materials 150 – 600 mm and 50 – 150 mm. The rock was re-used as general fill and as construction materials such as rip-rap for drainage chutes and erosion control. Material, finer than 50 mm, was landfilled or re-used as cover material. A total of 3,064 tonnes of rock was re-directed from landfill airspace.

3.1.6 Leachate Management

Leachate generated by the landfill continued to be collected through a leachate collection system and directed to an on-site leachate pre-treatment/pumping station. In 2019, leachate from the cell in Phase 1 was collected and re-directed for pre-treatment and discharge to the City of Ottawa sewer system. In 2019, a total of 148,817 m^3 of leachate was pre-treated and pumped via force main to the City of Ottawa sewer system for final treatment at the Robert. O. Pickard Environmental Centre (ROPEC), the City of Ottawa wastewater treatment plant. The forcemain conducting leachate to the sewer system was flushed and cleaned twice in 2019. No operational problems were experienced with the leachate discharge operations at the landfill in 2019.

3.1.7 Stormwater Management

Stormwater and snow melt water at the site is managed to direct surface runoff to the east and west watersheds using a series of natural and constructed ditches, swales, chutes, culverts and stormwater ponds. In 2019, a 237 m long culvert was constructed at the north and northeast corner of the cell in Phase 6. The culvert consists of a 900 mm diameter corrugated smooth interior HDPE pipe joined with bell and spigot c/w gasket and pre-fabricated concrete headwalls at both ends. A sediment trap was also constructed in front of the inlet structure.

3.1.8 Landfill Gas Monitoring

Monitoring of methane gas at the landfill site was performed by Golder Associates Ltd. on three separate occasions in 2019. Results of the monitoring programs and interpretation of the data are presented in Section 8 and Appendix '2' of this report. Construction of the candlestick flaring system for the Interim Odour Control System designed by Golder and approved by the MECP was completed in late 2011. In early 2012 the flaring system was commissioned and approved by the Technical Standards and Safety Authority (TSSA) and has since been in continuous operation.

In 2014, the landfill gas collection system was expanded to collect gas from the central manhole and from horizontal wells constructed at the top of the Phase 3 area in efforts to mitigate fugitive emissions from these areas. In 2016, additions to the gas collection system were required and five horizontal collectors were constructed. In 2017, seven vertical wells and one horizontal well were added. In 2019, four additional vertical wells were constructed in Phase 4.

Dillon Consulting Limited was retained to complete the previous year (2018) reporting requirements under the National Pollutants Release Inventory (NPRI); to determine the reporting requirements under Ontario Regulation 127/01 – Airborne Contaminant Discharge Monitoring and Reporting; to assess the Greenhouse Gas Reduction Reporting as required under Ontario Regulation 347; to determine the reporting requirements under Ontario Regulation 452/09 – Greenhouse Gas Emissions Reporting and the Federal Government Greenhouse Gas Reporting Program.

3.1.9 Noise Monitoring

Monitoring of noise levels at the WCC Navan Facility was performed by Golder Associates Ltd. at two points of reception (POR) nearest residential receptors for the period of September 17th to September 24th, 2019. Monitoring results are presented in a Technical Memorandum provided in Appendix 3. The measured average hourly noise levels were equal to 51 dBA and 55 dBA at Monitoring Location1 and Monitoring Location 2, respectively. These levels are at or below the noise limits established in the MECP Landfill Guidelines. It is expected that at both sites, the noise level is predominantly influenced by traffic on the adjacent road and to a lesser extent from landfill operations. In addition, landfill operations at the WCC Navan Facility have been substantially completed along the northwest and west areas and work at the landfill is progressing to the east, away from the receptors to the west. In 2020, landfilling will be predominantly in the northeast cell (Phase 6).

3.1.10 Surface Water, Groundwater and Leachate Monitoring

Water quality monitoring programs are carried out twice annually for groundwater, and three times per year for surface water and leachate by Golder Associates Ltd. Surface water quality monitoring events were carried out on June 20th, August 28th, and November 21st of 2019. Leachate was also sampled by Golder at the pump station on June 20th, August 28th, and November 21st of 2019. Groundwater quality monitoring was carried out on June 19th and November 20-21, 2019. Groundwater monitoring wells further in the Mer Bleue Bog were sampled on November 21st as frozen well conditions prevent winter sampling. Additional monitoring of surface water, groundwater and sediments requested by the National Capital Commission (NCC) in early 2000 was continued. Results of the monitoring programs and interpretation of the data reported by Golder Associates Ltd. are presented in Appendix '1' of this report and discussed in Section 7.

3.1.11 Household Hazardous Waste Day

A Household Hazardous Waste Day was hosted for the City of Ottawa on Sunday June 2nd, 2019. This event was managed by Drain-All Ltd. under their mobile C of A #A420013. This event was very well attended between the hours of 9:00 am and 4 pm. WCC supervisory personnel were on site for the duration of this event.

3.1.12 Closure

Closure consisting of placing clay fill material of at least 1.0m in thickness was continued where final waste grades were reached in the area of Phases 1 and 4. These areas are also used for staging excavated wet clay for drying and re-use purposes. Placing of topsoil and seeding will be carried out in these areas at a later date.

3.1.13 Aerial Photography

Base Mapping Co. Ltd. of Ottawa was again retained to undertake aerial photography of the Navan Waste Recycling and Disposal Facility. Digitized topographic maps of the site with 0.5 metre contour intervals were obtained for April 30th, 2019. The 2019 topography with 2 metre contour intervals is shown on most drawings. To date, a total of 195,440 m^2 of the waste footprint has received clay cover as shown of Figure 3.2.

3.2 *Daily Site Operations*

The site continues to be operated in accordance with the approved Design and Operations report (Golder, 2008) and the amended Certificate of Approval. Daily site operations are described in the following sub-sections.

3.2.1 Access

The site is well serviced by Regional Roads, being located on Regional Road 28, locally known as Navan Road (refer to Figure 1.1). Most of the traffic at the site is generated by commercial vehicles which access the site via Innes Road (Regional Road 30) and Navan Road. The Tenth Line Road (Regional Road 47) and Milton Road (Regional Road 31) also provide access from East Ottawa (Cumberland Township).

Access to the site is provided by one entrance located off Navan Road. The gate is kept locked after hours to restrict access. The access road is paved between Navan Road and a distance past the scale house and wheel wash station (Grid Lines C-15). A well-maintained all-weather road provides access to the designated unloading areas. Other access roads are provided throughout the site allowing access to water management systems, material stockpiles, site facilities and equipment storage areas (refer to the Site Features Plan - Figure 2.4).

3.2.2 Hours of Operation

Approved hours of operation for the receipt of waste are from 7:00 am to 6:00 pm Monday through Saturday, inclusive, however the site generally closes at 5:00 pm on week days and 1:00 pm on Saturdays and statutory holidays. The site does not receive waste prior to 7:00 am or after 6:00 pm on these days. Waste acceptance outside of these hours requires the approval of the MECP District Manager. Operating hours may vary within the approved hours. On occasion and as required, Landfill excavation and

equipment/site maintenance may occur outside these hours.

The site is secured after operating hours and includes sporadic security patrols by a security services contractor. No scavenging is permitted at the site.

3.2.3 Site Staffing

WCC routinely reviews and monitors its staffing needs for the site and adjusts the staffing level accordingly. Currently 23 fulltime equivalent employees (FTE) are employed locally at the site including management, sales, administrative, clerical, and operations personnel.

The number of employees at the landfill site is variable from time to time and is based on the workload which can be seasonal and personnel turnover. Throughout the year, co-op students are hired to perform general tasks such as grass cutting, general site clean-up, minor site maintenance work, surveying, traffic control, etc. Personnel from other WCC districts are also called upon from time to time to assist with landfill operations. When required, contractors are hired for task specific work such as maintenance, security and landscaping.

3.2.4 Equipment

The following equipment was in use at the landfill site in 2019:

1) 1- 826G & 1- 826H CATERPILLAR WASTE COMPACTOR
   - levelling; compaction; grading of waste

2) D7R CATERPILLAR BULLDOZER (c/w LANDFILL PKG)
   - levelling; placing; grading of waste

3) D6N LGP CATERPILLAR BULLDOZER
   - Levelling; compaction; grading; earth works

4) D6T XW & D6T LGP CATERPILLAR BULLDOZER
   - Levelling; compaction; grading; earth works

5) Volvo EC340DL EXCAVATOR
   - excavating; levelling; ditching; grading; soil movement; berm construction

6) CAT 330 WH EXCAVATOR c/w GRAPPLER
   - recycling; excavating; levelling; ditching; grading; soil movement; berm construction; processing; box scrape outs

7) Volvo EC220 EL EXCAVATOR c/w GRAPPLER AND MAGNET
   - recycling; excavating; levelling; ditching; grading; soil movement; berm construction; processing; box scrape outs

8) JOHN DEERE 310J BACKHOE (c/w ATTACHMENTS)
   - excavating; recycling; levelling; ditching; grading; snow removal; box scrape outs

9) CAT 420F BACKHOE (c/w ATTACHMENTS)
- excavating; levelling; ditching; grading; snow removal; box scrape outs; tree planting

10) 1 – 730 CAT ARTICULATED TRUCK
- 6-wheel drive truck / earthworks; daily cover

11) 2 - A25E VOLVO ARTICULATED TRUCK
- 6-wheel drive truck / earthworks; daily cover

12) 1 - CAT 950H LOADER
- material loading; snow removal; processing; road maintenance

13) 1 - CAT 950M LOADER
- material loading; snow removal; processing; road maintenance

14) DURATECH EJ100 WOOD GRINDER
- wood and drywall grinding

15) 1- MACK ROLL-OFF TRUCK
- on-site container management; dust control

16) 1 – FREIGHTLINER ROLL-OFF TRUCK
- on-site container management; dust control

17) PICK-UP TRUCKS AND ALL-TERRAIN VEHICLES
- site access; road sweeping; snow removal; magnetic sweeps; salting

18) 1 TON DUMP TRUCK (c/w SNOW PLOUGH)
- For general use and snow removal both on-site and off-site

19) 3-35 HP LEACHATE PUMPS
- available throughout the year for leachate management

20) 2- 100 MM GORMAN RUPP PUMPS AND ADDITIONAL GENERAL PURPOSE PUMPS
- available for the handling of leachate and surface water

21) TANKER 22.7 m^3 (5,000 GAL.)
- On-site water needs (dust control; clean roadways; flush leachate MHs etc.)

22) 100 KW GENERATOR, 40 KW GENERATOR AND 20KW GENERATOR
- Power supply for the candlestick flare
- Power supply for the odour misting system
- Pump Station backup power supply.

23) KUBOTA UTILITY VEHICLE
- Equipped with snow blowing and lawn mowing equipment.

24) ARGO UTILITY VEHICLE C/W TRACKS
- All terrain vehicle.

25) LIGHT TOWERS
- Landfill and recycling area lighting and power supply for equipment.

26) METSO SCREENING PLANT
- Screening of oversize materials from soil and rubble.

Vehicles are equipped with 2-way radio equipment along with hand held portable 2-way radios utilized for on-site communication between equipment operators, supervisors, spotter, weigh scale attendants, maintenance personnel and site office.

The size and type of equipment available on site handles the every day and long-term operation of this engineered facility. Additional equipment is brought on site as required to supplement or replace the WCC heavy equipment during repair programs or for special projects.

3.2.5 Equipment Maintenance

A maintenance building completed in 2009 is used for equipment repairs and storage of parts, tools and supplies. A comprehensive preventative maintenance program is in place and equipment maintenance is fully documented. A maintenance schedule is followed in a strict manner. WCC's own staff mechanics perform all lubrication and oil changes as well as most vehicle repairs. Qualified equipment dealers perform major repairs and warranty work when required. A daily pre-trip and post-trip inspection of all equipment in use is performed by equipment operators.

All machinery is equipped with fire suppressant and first aid equipment. First-aid stations are located at various locations on site.

On-site personnel are able to perform routine maintenance on all machinery and employees are trained to operate and maintain different pieces of equipment. A daily, weekly and monthly equipment inspection is carried out and documented for each piece of equipment. Daily records of fuel, lubrication consumption, and hours of operation are maintained.

3.2.6 Scale House and Small Vehicle Pad

Two full-time employees operate the scale house. Two 100 tonne Rice Lake scales installed in early 2009 are in operation to reduce traffic congestion on Navan Road. All vehicles are weighed upon entering and leaving the landfill. Drivers must exit their vehicle and sign the weigh bill at the scale house. The scale clerk records the name of the client, the origin of the waste (customer), the type of waste, driver identification, truck identification and notes using a grid system where the waste was placed within the landfill. All records from these transactions are maintained at the site office and recorded in WCC's computer records.

The scale clerk has contact with the site office, spotter and equipment operators at all times. The site cannot be opened unless the scale clerk and an operator/spotter are present. Rejected loads of waste are recorded and reported to the MECP and a record is kept on site.

A small vehicle unloading area was built southeast of the weigh scales to service small vehicles and promote recycling. The paved area is maintained and kept clean at all times. Concrete bunkers were added in 2012 west of the small vehicle pad to add capacity for small loads of aggregate, shingles, asphalt, metals, wood and recyclable windshield glass.

3.2.7 Site Office

Management and administrative staff work in an office/maintenance building constructed in 2009 located north of the landfill near the Navan Road site entrance. The site office is open Monday to Friday during working hours of the landfill. All records are maintained at the site office. The site office is equipped with several computers to maintain landfill records, employee information and site operation manuals. Areas of active landfilling are recorded daily and referenced to a grid system. The daily operation of the landfill is carried out from this office.

3.2.8 House Keeping and Controls

(a) Site safety

All employees have been instructed in safety procedures and a Joint Occupational Health and Safety Committee meets monthly to discuss health and safety issues at the site. Managers have been tasked as Site Safety Leaders dedicating time to safety related programs, training and safety awareness. On-site employees have completed waste handling safety courses, GHS training (Global Harmonized System of Classification and Labelling of Chemicals), confined space entry, and CPR & basic first aid training courses. On-site first-aid stations are available on the equipment, maintenance facility, scale house, pump station and site office. On-site communication allows for quick response. Emergency spill kits are available at the maintenance garage and site office. All workers have been provided with personal protective equipment (PPE) and must wear hard hats, safety boots, reflective clothing and safety glasses. All vehicles have back-up alarms. A spotter directs all traffic and machinery at the working face of the landfill.

Employees have been instructed in the handling of special materials, in particular impacted soils and asbestos, a designated waste. All employees and haulers follow a documented protocol for the handling of these materials. In brief, the procedure is as follows:

No hauler is allowed to enter the site with these materials without prior approval. All haulers of these materials must give advance warning of their coming to the site. A time slot is then assigned for receipt of the material. A designated spot for the placement of the materials is prepared. Asbestos waste is landfilled and covered without any equipment coming into contact with the waste. Disposable safety coveralls, head covers and respirators are also available on site for the handling of special wastes.

Employees have been instructed as to the types of waste allowed and materials not allowed to be received at the site. All containers must be open and void of any liquid material before they can enter the site. Closed containers are refused. Waste that is inadvertently dumped at the site is either placed back in the hauler vehicle or stored in one of WCC's boxes for later removal. Hauled materials are inspected for any

banned waste and the above procedure followed. Materials rejected from the landfill are reported to the MECP district office. Records of rejected waste and materials removed from the site are kept at the landfill site office.

(b) Scavenging control

No scavenging is permitted at the site. The spotter and equipment operators working at the active face strictly enforce this. On-site personnel carry out recycling of wood, metals and white goods in a controlled and manageable manner at the active face using heavy equipment specially equipped with a grappler and magnet. A small vehicle receiving pad is provided where waste from small vehicles can be received safely and materials can be sorted for recycling by the vehicle operator. Concrete bunkers were added to this area to further assist with the recycling of materials such as asphalt, aggregates, shingles, wood, metals and windshield glass. A program for the recovery of refrigerants is available and this service continued throughout 2019.

(c) Litter control

Litter has not been a problem at the Navan Waste Recycling and Disposal Facility because of the use of daily cover. Periodic checks are made of the finished and active areas of the site for litter. Litter fencing is maintained at the active working face and temporary fencing is maintained in areas of the landfill perimeter as a supplementary litter control measure. Fencing is cleaned of litter as required. At least twice each year WCC personnel collect litter accumulated in the ditches along Navan Road for a distance of 1 km to the east and west of the site entrance. No complaints related to litter were received in 2019.

(d) Vector and vermin control

The presence of vermin and vectors is not a problem at the site primarily due to the dry, non-putrescible nature of the waste stream. Periodic checks have proven that no problems with vermin exist at the site due to proper landfilling procedures. If vermin are detected at the site, a registered pest control company is retained to control the problem. Although some seagulls and crows do frequent the site in summer months, this is not considered a health or environmental problem because of the small numbers present. A bird scare permit has been obtained from the Ministry of Natural Resources. When required, pellet whistlers are shot into the air to control birds during business hours. Abell Pest Control was hired in 2018 to set up bait control stations at various locations throughout the landfill to monitor activity on site and continued their work throughout 2019. No complaints were received in 2019.

(e) Dust management plan

The landfill has the potential to generate fugitive dust emissions. Fugitive dust sources have been assessed in accordance with MECP guidelines. In order to minimize the potential for off-property impacts due to fugitive dust, the following practices are implemented at the site:

- Aggregate (e.g., gravel, crushed limestone) is spread over unpaved roads to reduce silt loading. Repeat applications of aggregate are done on an as-needed basis, dependent on the condition of the roads.
- Watering of unpaved roads is carried out to increase the moisture content of the surface material and reduce the potential for fugitive dust generation. Dust suppressants (e.g., calcium chloride, wood chips) are also used, depending on the ability of watering to appropriately control dust. The frequency of application of water or dust suppressants to roadways is adjusted based on road conditions, weather conditions and traffic loadings. In 2019, watering of access roads for dust suppressant with the use of an on-site water truck was carried out on 85 separate occasions throughout the dry weather months. The company also owns a backhoe equipped with a road brush for sweeping asphalted surfaces. In addition to the use of on-site equipment, mud and dirt was removed from Navan Road and on-site paved roads by a subcontractor retained to vacuum sweep/flush paved surfaces on 7 separate occasions.
- A speed limit of 15 km/h is enforced while vehicles are traveling on unpaved roads. This limit is posted on site and communicated to users of the unpaved roads.
- Where possible, travel distances to material transfers and drop points are kept as short as practical to reduce dust generation.
- A wheel wash station was constructed in 2009 east of the weigh scales and scale house to service vehicles exiting the landfill and to reduce mud drag-out onto Navan Road. The wheel wash station is operational during the non-freezing months of the year.

The site maintains a log to record the date and time of any fugitive dust complaints and a summary is provided in Appendix '4' – Schedule 'A'. This log also describes activities related to the investigation of the complaint, and also records the mitigative measures implemented to address concerns raised. In 2019, WCC received no complaints related to dust or dirty roads.

(f) Noise control

The active face of the landfill operation is sufficiently set back from Navan Road to minimize disturbance resulting from noise. Berms and soil stockpiles are located between active fill areas and nearby homes and offices to act as a sound barrier. Landscaped berms have been constructed along Navan Road east and west of the site access as well as east of the wheel wash station. No complaints related to noise were received in 2019. Noise monitoring was carried out by Golder Associates Ltd. and results are presented in Appendix 3. The results and site observations indicate that elevated background noise levels exist at surrounding receptors due to road traffic noise along Navan Road. Based on these results, the operations of the Navan Landfill are considered to be in compliance with the MECP's Landfill Guideline and NPC-205.

(g) Aesthetic controls

Landscaped berms have been constructed along Navan Road and a tree planting program is in place to improve site aesthetics. Each year efforts are made to further improve site aesthetics. A fish habitat ditch was completed along the east limit of the site complete with vegetation, landscaping and other ditch features. In addition to drainage, the ditch also provides an aesthetic barrier to the landfill.

(h) Fire control

Fire control is maintained by the supervision of all staff including the scale staff, the spotter and equipment operators. A number of non-smoking signs have been erected throughout the site that warns users of the danger of fire in the landfill. Personnel have been instructed on the procedures of handling a landfill fire. The use of the landfill compactor and soil as cover material does not allow a fire to persist. The excavator, compactor, loader and the dozers are available to isolate a fire. Spare cover material, available at the working face, will be used in conjunction with the landfill compactor to smother a fire. The proximity of the Ottawa Fire Department at Blackburn Hamlet (less than 5 kilometres) will allow any superficial fire to be put out in a timely manner. On-site security and the presence of employees who live adjacent to the site will allow for quick action in the event of fire after hours. All machinery is equipped with proper fire extinguishers.

(i) Odour Control (Odour Management Plan)

To ensure the WCC Navan Facility is operated in a manner that minimizes the impact from odour on the public and the natural environment, the following program is in place at the WCC Navan Facility to deal with odour issues.

(1) Odour Monitoring

WCC has a comprehensive program for monitoring odours and for taking remedial action in the event that odours become at all problematic in the operation of the WCC Navan Facility. Any unusual odour events and any measures taken to deal with odour at the site are recorded and filed on-site.

There are no Ontario Government standards for odour. There are no agreed-upon, empirical measurement protocols or odour thresholds that may be used in the operation of a landfill or processing facility. Consequently, the ultimate test of an effective odour-control strategy for any facility can only be that it produces no odour complaints from the surrounding community over an extended period of operation. The operators of the facility need to take preventative and other control measures to ensure that odours never reach a threshold where they can generate complaints. The best odour monitoring program available is to give responsibility to all staff working at the site to use their own senses to constantly monitor for excessive levels of odour on-site. While some level of on site odour is normal and acceptable, it can become a problem when these same odours register off the property. As well, the character of the odour is significant. Many 'aerobic' odours may be very inoffensive, even at a significant concentration, while even very low levels of the types of odour associated with anaerobic activity may be deeply offensive.

It is normal practice at the site to monitor odours in the following way. Every morning, when staff first arrives on the site, a general inspection is undertaken of the facility. While the site manager is looking for anything untoward, the presence of any odours likely to extend beyond the perimeter of the site will be of special concern. In addition, whenever any material at the site is being disturbed by the equipment used at the facility, staff on site periodically stand downwind of the work that is being done, and assure themselves that any odours being created are mild, indicative of fully aerobic activity, and are not likely to be carried off the property.

In the event staff on-site believe any odours may have some potential for off-site impact, they will drive to a location off-site and downwind from the work at the facility to determine at that moment if any off-site impact can be detected. If there is a detectable off-site impact, work on the site will be stopped immediately and remedial measures will be taken (see below). If no off-site impacts are detectable, work at the site will proceed with caution, with further periodic inspections off-site. Remedial measures will again be taken as appropriate.

The key to this approach is that all staff are constantly vigilant for even mild odours produced on-site and will take actions to deal with those odours well before they become evident off-site.

A windsock and flag is installed on the site. This provides a strong visual reminder to site staff of existing wind conditions, such that they can make judgments as to the potential for off-site odours, given that day's planned activities.

No odour monitoring program is of much value unless there is a companion program to control those same odours, once they are detected. What follows is a stepped program, capable of dealing effectively with everything from the mildest odours to the most offensive. It should be noted that all of the measures described below can and are just as likely to be applied to only sections of a site, rather than to the entire site. The source of odour problems can commonly be quite localized.

(2) Prevention

The best odour control strategy is odour prevention. If experienced staff early in the process makes the correct, preventative decisions, odour will not be an issue. Although mild odours are experienced on-site from time to time, they are mild in nature and should not be noticeable off-site.

A perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends below the water table. This drainage system has significantly reduced, if not eliminated, the potential for off-site migration of LFG.

Monitoring of methane gas at the landfill site is performed on three occasions per year generally during the spring, summer and late fall or winter. Results of the monitoring programs and interpretation of the data are presented in Section 8 of this report.

A leachate pumping station has been constructed in the southeast corner of the landfill site and a forcemain connection to the municipal sewage treatment plant commenced in 2007. Presently, the disposal method of choice for leachate generated by the WCC Navan Facility is treatment at the Robert O. Pickard Environmental Centre, a waste water treatment plant. The use of leachate retention ponds has been discontinued. This eliminates the possibility of odours emanating from on-site treatment and leachate retention ponds.

As discussed an interim LFG odour control system was installed in 2011 and commissioned in April 2012. The purpose of the interim LFG odour control system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells. The system was extended in the fall of 2016, the fall of 2017 and in 2019.

(3) Masking the Odour

Principally, these additional measures will consist of using physical, biological and/or chemical methods to mask the odours on the surface of the odour source, so that none of the odours contained within are released to the environment. A number of proven masking techniques are available and can be used at the discretion of the site manager:

- Physically covering the surface of the odour source with a 15 centimetre layer of bulking material is often enough to block the release of most odours for a period of a day or more while remedial work is done;
- A number of biological inoculants are available commercially. These substances, when applied to the surface in a water solution, are felt to effectively reinforce aggressive aerobic activity on the surface by out competing any anaerobic colonies that may be present in the near surface area. In effect, this creates a bio-filter, and biologically processes anaerobic gases as they are released; and/or
- A number of chemical/nutrient mixtures are also available commercially. These substances, when applied to the odour source in much the same manner used with the biological inoculants, can have a very similar or even stronger effect. Manufacturers of these products claim that their compounds rapidly stimulate the growth of one desirable family of microorganisms or another, again to create a bio-filter effect.

Whatever the actual mechanism, these products have been proven effective in the field. In all cases, odour control strategies used at this level can be applied within minutes of the decision to use them, and the effects will be largely felt within 10-15 minutes of that application, if not sooner.

(4) Isolating an Odour Source

The last strategy will consist of using additional measures to isolate and neutralize the offending odour source material. The offensive material may be removed from the problem area, landfilled and covered immediately. This isolation strategy will be used at the discretion of the site manager.

(j) Contingency for winter operations

The following contingency factors have been implemented in the event that very cold conditions cause operating problems:

- Snow removal equipment

A variety of equipment is available for snow removal. Two CAT 950 loaders are mainly used for this purpose. A John Deere and a CAT backhoe along with a one ton truck equipped with snow ploughing equipment are also used. A Kubota utility vehicle equipped with snow blowing equipment is available to assist with snow removal along walkways and vehicle restricted areas.

- Cover material stockpiles

Impacted soil reserved for re-use as daily cover material has been stockpiled in certain areas of the landfill. In case of frost, an excavator equipped with ripping tooth is available for ripping through the frost line. The excavator and 6-wheel drive articulated dump trucks are used to move and stockpile cover as a contingency.

(k) Complaints Procedure

In the event that an odour complaint is received, either by the City of Ottawa or the MECP, it is expected that those parties will immediately contact WCC site staff and notify them of the problem. WCC staff will take immediate steps to determine the extent of the problem and whether or not it is caused by the facility. If the source of the complaint is deemed to be originating from the WCC Navan Facility, appropriate measures as described above will be taken to mitigate the problem. Again, all such measures taken will be documented and a record kept on-site. If the identity of the complainant is made known to WCC staff, staff will contact the complainant that day, listen to their description of the problem, advise them in detail of the measures taken to rectify the problem, and invite them to visit the facility at some point to see for themselves how the site is operated. WCC will also call them back in a week's time to determine whether or not they have been aware of any other site related issues.

WCC staff has found in the past that this kind of immediate and personal attention goes a long way to building community support for a facility and builds community confidence in the management of the site.

The site maintains a log to record the date and time of any complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. A summary of complaints received in 2019 is provided as Schedule 'A' in Appendix '4'. In 2019, WCC personnel received 21 odour related complaints on 13 separate days ranging from one to multiple complaints per day of which 16 were received during the fall of 2019. No other complaints were received by site personnel in 2019.

(l) Record Keeping

Record keeping is in accordance with the requirements of the ECA and as described in the D&O (Golder, 2008) as follows:

Site inspection records and daily waste records are retained at the site for a minimum period of two years. The records include the following information:

a. Type and estimated amount of waste received at the site for landfilling and processing;
b. Area of the site in which landfilling operations are taking place;
c. Type, source and amount of daily and intermediate cover used;
d. Waste types and quantities of recyclable wastes received at the site;
e. Source of their generation (e.g. customer);
f. Waste types and quantities of recyclable wastes transferred off the site;

g. Destination of recyclable wastes transferred off the site;
h. White goods tag numbers tagged at the site;
i. Types of wastes and quantity transferred from the processing area into the landfill area;
j. The calculated total quantity (including volume or weight) of waste remaining on-site at the end of each day;
k. Records of any dust suppression activities undertaken at the site;
l. Maintenance and repairs performed on the equipment used at the site;
m. Records of complaints received and actions taken to resolve them;
n. Summary of emergency situations and actions taken to address them; and
o. Any environmental and operational problems and any mitigative actions taken.

3.2.9 Waste Acceptance and Placement

The mechanics of waste placement at the active disposal face are described as follows:

1. Procedures are in place at the site to pre-screen all special waste materials prior to arrival at the site. Generators/haulers are required to provide information related to the type of waste to be delivered at the site and complete and sign a Special Waste Profile form (SWP) which is screened prior to approval by WCC staff. Once approved, an SWP number is provided and must be presented at the scale prior to entry to the site.

2. The gate clerk registers all vehicles entering the site at the weigh scale. Vehicles are weighed and directed to the active disposal face. Light vehicles are diverted to an unloading area near the entrance to the site and do not enter the working area of the landfill. Appropriate signs are posted to indicate clearly where vehicles are to unload.

3. Vehicles reach the active face via a well-maintained gravel surfaced access road. On arrival, they wait until a ground worker screens the load and directs them to back into the active working face. The working face length is confined to as small an area as possible, but generally is wide enough so that 6 to 8 trucks can operate safely in the working face area at any one time. After dumping, the trucks move a distance of several metres from the active working face where they can be cleaned by the truck operator.

4. Waste is placed and compacted on the active working face using a "push down method" and/or a "push up method" to an average depth of approximately 60 cm.

5. A landfill D7 dozer is used to spread and level the waste as it is received. An 826 CAT compactor works on top of the refuse and compacts and shapes the waste into place. Between 3 and 5 passes with this equipment are made before the required density is obtained. Additional waste is spread evenly by repeated passes of the dozer and compactor to a total average lift depth of 2.5 to 3 metres.

6. Cover material is placed daily and as required. Generally, impacted soil hauled to the active face is used as cover material and spread into a minimum 15 cm thick layer. Areas not visited for an extended period of time are covered with a minimum of 25 cm of interim cover material.

7. All weigh tickets are kept on site along with daily and monthly summaries which are available for review. All rejected waste loads are reported to the Ministry of the Environment, Conservation and Parks (MECP) district office in Ottawa and a record of the report is kept on site.

8. Asbestos waste is landfilled in accordance with Section 17 of Ont. Reg. 347. These procedures consist of the following:

   a. Personnel involved in the disposal of asbestos are trained to recognize the related hazards.
   b. Asbestos is accepted only in containers/bags and not in a loose form. Care is taken to ensure that staff and equipment do not come into contact with the asbestos.
   c. Asbestos is accepted only with 24 hour pre-notification.
   d. Personal protective equipment including disposable coveralls, head covers and respirators are available for the handling of special wastes.
   e. Prior to the arrival of asbestos on-site, a trench is excavated to receive the material.
   f. Other operations in the immediate vicinity of the trench are temporarily suspended while the containers are emptied in the trench.
   g. The trench is immediately covered over with at least 1.25 metres of waste or cover soil.

9. Refrigerant containing appliances are received and handled in accordance with the following procedures:

   a. When refrigerant containing appliances are identified in the waste load, the client will be notified and given the opportunity to reclaim the unit(s) and remove it from the site and a rejected waste form shall be completed by scale personnel if the unit is reclaimed for removal;

   b. Should the client/driver not reclaim the refrigerant containing unit(s), scale personnel shall be notified immediately and the unit(s) shall be recorded on the weigh ticket and the unit(s) shall be removed by landfill and recycling personnel and taken to a designated area on the recycling pad taking all necessary precautions not to damage the refrigerant containing unit;

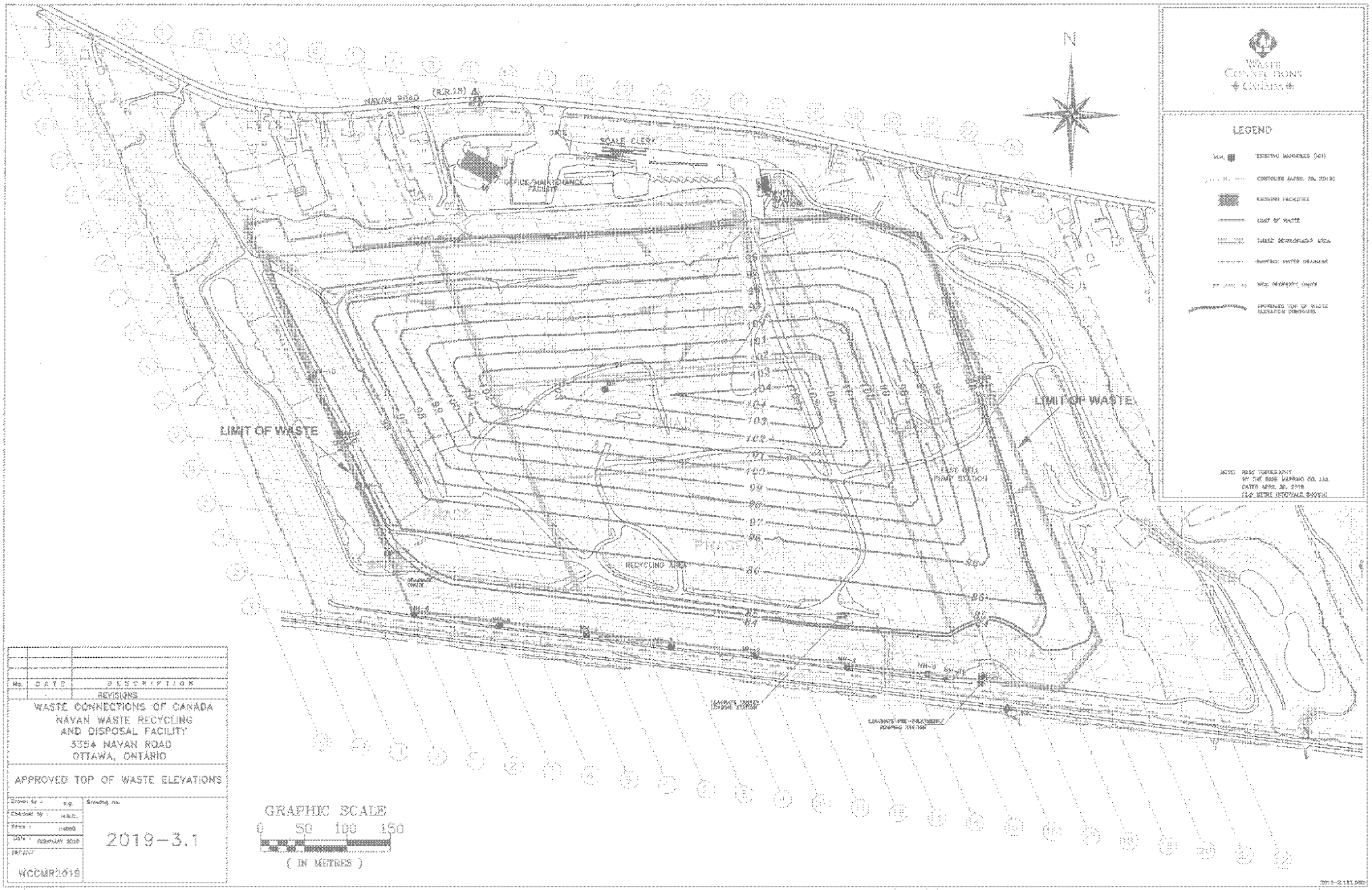
   c. Every effort shall be taken by personnel to store the refrigerant containing unit in the designated area on the recycling pad in an orderly manner that is accessible to the refrigerant removal technician and in an up-right position or, if not possible due to damage, in a manner to prevent damage to the refrigerant containing unit.

   d. Once a sufficient number of units have been stored for removal of refrigerants, or once quarterly, a certified technician shall be retained to safely remove all refrigerants and certify them as completed and a record of the certification shall be kept on file;

   e. Once the unit has been certified it shall be available for removal as scrap metal;

   f. The procedures noted above shall apply for all units received at the site that do not contain a refrigerant removal certificate, including those claimed to no longer contain refrigerant materials.

No waste is accepted, deposited or removed from the site unless the site supervisory personnel is present.



No.	DATE	DESCRIPTION
		REVISIONS

WASTE CONNECTIONS OF CANADA
NAVAN WASTE RECYCLING
AND DISPOSAL FACILITY
3354 NAVAN ROAD
OTTAWA, ONTARIO

APPROVED TOP OF WASTE ELEVATIONS

Drawn By :	S.G.
Checked By :	M.B.C.
Scale :	1:1000
Date :	FEBRUARY 2019
Project	WCCMP2019

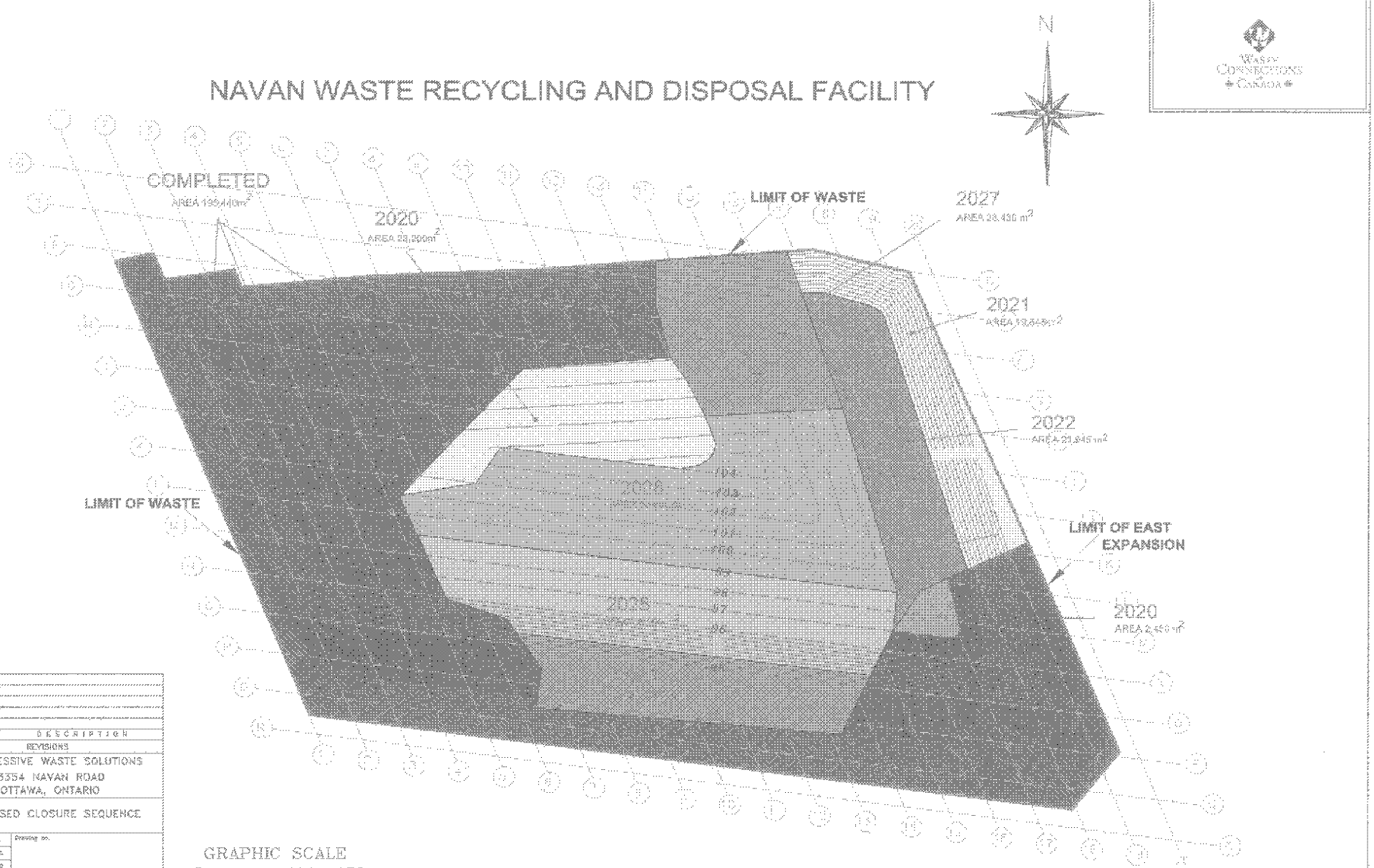
Drawing no.
2019-3.1

GRAPHIC SCALE
0 50 100 150
(IN METRES)

2019-3.1.DWG

000346

NAVAN WASTE RECYCLING AND DISPOSAL FACILITY



No.	DATE	DESCRIPTION
		REVISIONS

PROGRESSIVE WASTE SOLUTIONS
3554 NAVAN ROAD
OTTAWA, ONTARIO

PROPOSED CLOSURE SEQUENCE

Drawn by :	V.G.
Checked by :	M.S.A.
Scale :	1:4000
Date :	FEBRUARY 2019
PROJECT No.	PWSMR2019

Drawing no.
2019-3.2

4. WASTE QUANTITIES AND CHARACTERISTICS

Major private haulers as well as small haulers serving all segments of the Ottawa community, Eastern Ontario and the Outaouais are served by the Navan Waste Recycling and Disposal Facility. Materials processed at the site in 2019 consisted mainly of contaminated soils, construction and demolition waste, IC&I waste including asbestos waste as well as general dry waste and recyclable materials. Materials received at the site for re-use included brick, rubble and small concrete as aggregate, asphalt, granular materials and clean roofing shingles for road/pad construction material.Impacted non-hazardous soils were also received for re-use as cover material or treated for re-use outside the designated air space in accordance with approvals received for the site. Materials such as metals, wood, glass, drywall, cardboard, white goods, tires and electronics were also recycled and removed from the site.

All materials received at the site are weighed upon arrival on one of two scales located at the entrance to the facility. During 2019 a total of 428,386 tonnes of waste and other materials were received at the site of which 222,976 tonnes were landfilled. The total tonnage and number of loads are summarized in Table 4.1 below.

Table 4.1: WCC Material Tonnage, Jan.1 – Dec. 31, 2019

	Tonnage	No. of Loads
Total:	428,386	53,237
Total Landfilled:	222,976	N/A
Total Reused/recycled:	205,410	N/A
Monthly Average:	35,699	4,436
Daily Average:	1,377	171.2

The above material tonnage received in 2019 includes waste landfilled, recycled waste materials, treated contaminated soils, rejected waste removed from the site and other materials received for re-use at the site.

The material distribution is as follows:

- Tonnage landfilled totalled 222,976 tonnes (52.05%) and included IC&I waste, C&D waste and other materials that were received and directed to the active working face for landfilling;
- Recyclable materials such as cardboard, tires, glass, drywall, e-waste, wood, metals and white goods taken off-site to market totalled 11,025 tonnes (2.57%);

- Waste materials rejected and removed from the site by WCC for alternative disposal at a licensed facility totalled an estimated 37 tonnes (0.01%).

- Special materials such as storm sewer screenings and impacted non-hazardous soil received at the site for re-use as cover material totalled 110,000 tonnes (25.68%).

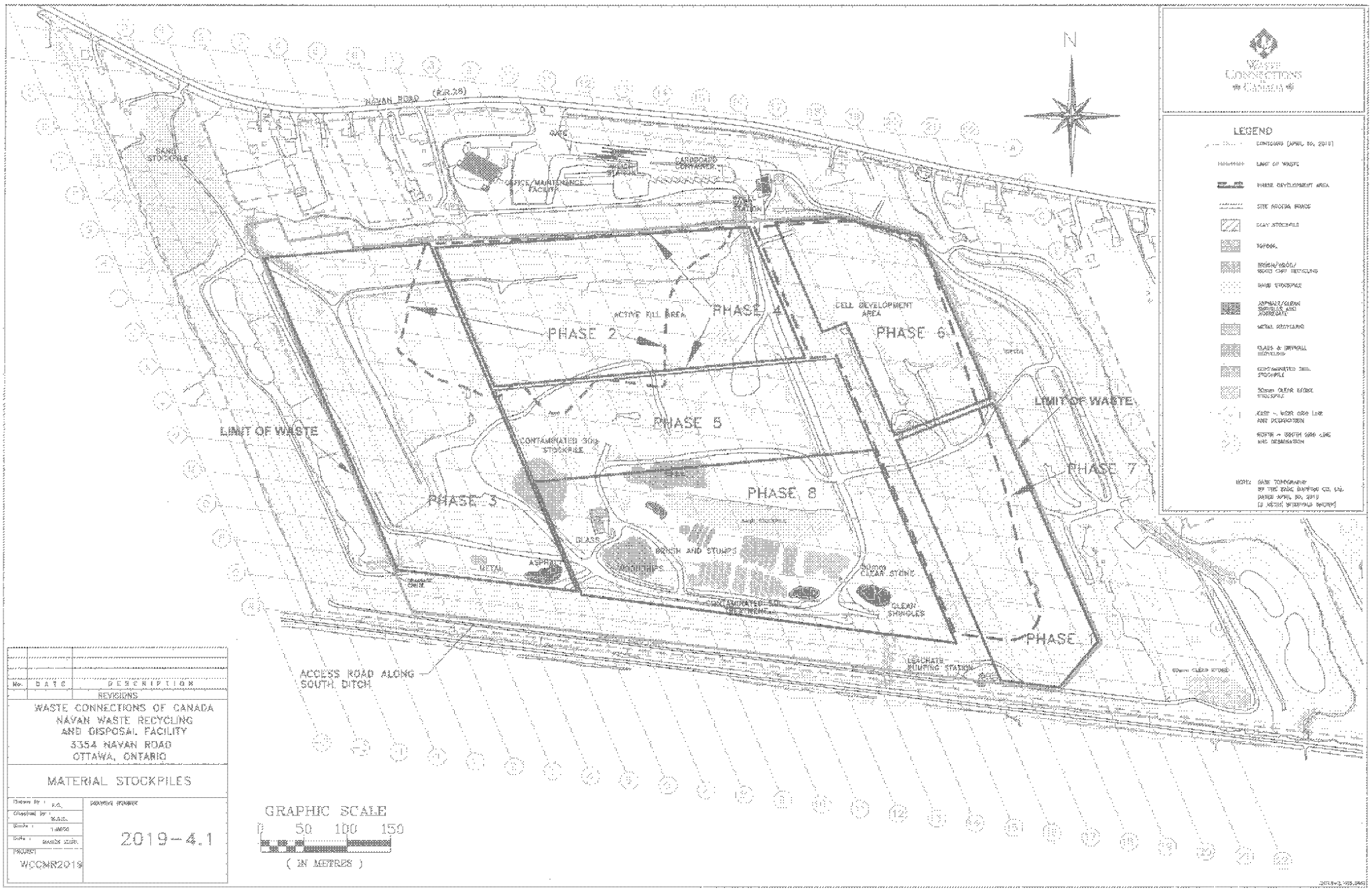
- Impacted soils treated or re-used on site totalled 67,249 tonnes (15.70%). A total of 60,983 tonnes were hydrocarbon impacted soils treated and re-used in the east buffer and 6,266 tonnes were impacted soils re-used within the waste footprint as construction materials.

- Rock, brick, concrete, aggregate, shingles and rubble received and re-used on site as aggregate totalled 5,949 tonnes (1.39%); and

- Clean fill, topsoil and asphalt re-used on site for final grading, road/pad construction and engineered fill totalled 11,151 tonnes (2.60%).

Additional materials were recovered from cell development such as soil, concrete, boulders, stumps and metals and re-used on site or recycled. These materials however, were already on site and were not part of the inbound receipts.

All weigh tickets are kept on site along with daily and monthly summaries which are available for review. All rejected waste loads are reported to the MECP district office in Ottawa and a record of the report is kept on site. A monthly summary of material tonnage received in 2019 is provided as Schedule 'B' in Appendix '4'. The location of materials stockpiled on site is shown on Figure 4.1.


NAVAN ROAD (R.R.19)
SCALE
OFFICE/MAINTENANCE FACILITY
SCALE
LANDFILL GAS FLARE
LANDFILL GAS COMPRESSOR
SCALE
SCALE
SCALE

5. SITE CAPACITY AND LIFE EXPECTANCY

The capacity of the site is a measure of the amount of compacted waste that can be incorporated into the site in a series of lifts in accordance with the approved top of waste elevation contours as shown on Figure 3.1. The total site capacity includes the total volume of daily cover material used for lift and cell construction. The estimate of air space remaining does not include the final cover materials that WCC will place once the waste pile has reached the approved fill height.

Some of the factors that continue to influence the estimated life remaining at the Navan Waste Recycling and Disposal facility are as follows:

- Volume of waste permitted by the approved top of waste elevation contours;
- Annual and daily material tonnage received at the facility for landfilling;
- Characteristics (bulk density) of the waste materials being landfilled;
- Compaction energy provided during the placing of the waste;
- Volumetric cover to waste ratio;
- The degree of cell development optimisation;
- Operational factors such as recycled waste removed from the site and the exclusion of bulky, non-compactable materials that cannot be readily incorporated into the working face;
- The re-use of waste materials received as an alternative construction material for roads and unloading pads;
- The treatment of contaminated soils;
- The volume of loose non-compactable asbestos waste received at the site and cover material required to properly dispose of asbestos waste;
- The re-location of waste from cell development on site;
- Water infiltration and rate of biodegradation of the waste; and
- Settlement/consolidation of the waste pile and underlying soft clay soils.

Factors affecting the remaining life of a site are many and varied and in fact, some will change daily. Therefore, such calculations will only provide a theoretical approximation of the expected life remaining. A factor which appears to be changing year over year is the bulk density of waste received at the landfill. Increased recycling efforts at the source with the diversion of heavy materials such as concrete, brick and rubble along with increased efforts to recycle and divert materials from landfill impact on the bulk density of the waste placed within the air space used. Other factors that affect the in-place density is the volume of impacted soils landfilled, the volume of daily cover used and the volume of impacted soils treated rather than landfilled as a waste material and the volume of bulky asbestos waste that cannot be effectively compacted following burial of this waste.

Information related to site life expectancy is important for the proper management of landfill operations. Daily records of waste landfilled or stored at the site are therefore necessary.

5.1 *Estimate of Air Space Used (ASU) - 2019*

A simplistic approach to the calculation of air space used (ASU) is based on assigning assumed in-place compacted densities to the various types of waste materials landfilled as described below:

- 2.0 tonnes/m^3 for cover soil material;
- 0.9 tonnes/m^3 for IC&I, C&D, and general waste materials;
- 0.9 tonnes/m^3 for excavated waste materials;
- 1.2 tonnes/m^3 for roofing materials
- 1.5 tonnes/m^3 Special Waste Materials (Industrial Waste, Screenings, etc.)
- 0.4 tonnes/m^3 for asbestos waste
- 0.4 tonnes/m^3 for wood waste; and
- 2.0 tonnes/m^3 for materials that are re-usable such as soil, concrete, brick and masonry.

Based on the assumed waste density distribution indicated above, the air space used by waste received, cover material and re-used materials placed within the air space during 2019 as presented in Table 5.1 is estimated at approximately 314,672.5 m^3 and excludes materials diverted off site for recycling and some materials re-used outside the air space. Based on this approach, the weighted average of the in-place density for all of the materials used in the air space calculation for 2019 is estimated to be 1.17 tonnes/m^3.

Table 5.1: ESTIMATED AIR SPACE USED (ASU), Jan.1 – Dec. 31, 2019

Material	Tonnage	Average Assumed Density, (tonnes/m^3)	Estimated Volume (m^3)
Waste Materials Landfilled	194,673	0.9	217,958.3
Special Waste Material	15,364	1.5	10,242.3
Asbestos Waste	3,694	0.4	9,235.1
Daily Cover Soils	136,254	2.0	68,127
Re-use materials (aggregates, asphalt)	14,973	2.0	7,486.3
Shingles used for sub base on road/turn areas	1,948	1.2	1,623.4
Estimated Air Space Used	366,905	1.17	314,672.5

Golder Associates Ltd. estimated the air space used by measuring the volumetric changes from topographic mapping generated from aerial photography obtained on April 30th 2019 and the previous year on May 1st 2018. The net estimated air space used (ASU) between the last two aerial survey dates was reported to be 235,639 m^3 resulting in air space remaining of 2,124,660 m^3. Records indicate that the ASU during that period of time was consumed by approximately 347,329 tonnes of waste, daily cover material and other materials resulting in a density calculation of 1.47 tonnes/m^3 for a 5 year average of 1.42 tonnes/m^3. The variance between the assumed density calculations could be attributed to many factors including optimization of cell excavation, settlement of the underlying soft clay soils and surcharge loading of the waste pile which influence the year over year volume calculations.

Active landfilling of waste materials and daily cover throughout 2019 was carried out from January to October in the area outlined as Phase 4 and from October to the end of December in the area outlined as Phase 6 (refer to Figure 2.4). Of the 188,654 tonnes of impacted soils received in 2019, a total 67,248 tonnes were treated and re-used in the east buffer or re-used on site. A total of 136,254 tonnes of impacted soils were re-used as daily and interim cover and as cover over asbestos waste in accordance with O. Reg. 347 (17), 121,406 tonnes of which was received in 2019 and 14,848 tonnes was obtained from soil stockpiled on site during previous years. Soil available on site for re-use as cover material is stockpiled and located in the southeast corner of Phase 3 as shown on Figure 4.1.

The remaining air space volume of the landfill (as of the latest Aerial Survey dated April 30th, 2019) was estimated by Golder Associates Limited to be 2,124,660 m^3. Golder Associates Limited estimated the remaining life of the landfill as of January 1st, 2020 to be 7.9 years based on the remaining air space calculated, the estimated airspace of 220,084 m^3 consumed between the last survey date and December 31st, 2019, a 5 year average density of 1.42 tonnes/m^3 and projected future annual waste receipts of 344,750 tonnes/yr.

The actual tonnage landfilled and re-used within the air space between May 1st and December 31st, 2019 was 270,056 tonnes as shown in Table 5.2 consuming an estimated volume of 227,938 m^3 based on assumed waste type densities shown yielding an estimated overall density of 1.18 tonnes/m^3 and remaining air space of 1,896,722 m^3 as of January 1st, 2020. Allowing for future waste receipts and cover soils of 344,750 tonnes/year consuming 292,161 m^3/year at a density of 1.18 tonnes/m^3, the estimated life remaining would be 6.5 years.

Table 5.2: **ESTIMATED AIR SPACE USED (ASU),** May 1 – Dec. 31, 2019

Material	Tonnage	Average Assumed Density, (tonnes/m^3)	Estimated Volume (m^3)
Waste Materials Landfilled	136,409	0.9	152,680
Special Waste Material	11,681	1.5	7,787
Asbestos Waste	2,947	0.4	7,366
Daily Cover Soils	103,079	2.0	51,540
Re-use materials (aggregates, asphalt)	14,153	2.0	7,076
Shingles used for sub base on road/turn areas	1,787	1.2	1,489
Estimated Air Space Used	270,056	1.18	227,938

As of January 1st, 2020 the life expectancy remaining for the Navan Waste Recycling and Disposal Facility under the present Environmental Compliance Approval is estimated to be 6.5 years (2026) to 7.9 years (2027) based on future projected annual waste receipts and cover soils of 344,750 tonnes/yr and a waste density varying from 1.18 to 1.42 tonnes/m^3 as discussed above. As indicated, the actual life of the landfill will vary significantly based on in-place waste densities and waste mix, but also on annual waste tonnage receipts, the amount of waste diversion and recycling initiatives at the landfill and settlement of the underlying soft clays.

5.2 *Financial Assurance*

In compliance with Condition 15 of the Environmental Compliance Approval #A460702, Financial Assurance for the site is currently in place with the MECP in the form of a Surety Bond in the amount of $13,566,246.00. Amendment Notice 11 to the ECA A460702 dated June 19th, 2018 requires that Financial Assurance be reviewed at intervals of three (3) years commencing on March 31, 2021 (Condition 15(b)); that commencing on March 31st, 2019 the owner shall prepare and maintain at the Site an updated re-evaluation of the amount of Financial Assurance required to implement the actions required under Condition 15(a) for each of the intervening years in which a re-evaluation is not required to be submitted to the Director under Condition 15(b). Such a re-evaluation was carried out by Golder Associates dated April, 2019 which concluded that the Financial Assurance already in place was adequate.

6. ENVIRONMENTAL CONTROLS

6.1 *Overview*

The key components of the environmental controls at the site are as follows:

a) Surface Water Controls:

- Ditches have been constructed to divert external flows around the landfill. These consist of north, west, and east diversion ditches, including a 237 m large diameter drainage culvert at the northwest corner of the site;
- Drainage water generated within the landfill that does not come into contact with waste is diverted to the perimeter ditches. Surface runoff water is directed from the top of the landfill down drainage chutes lined with erosion protection;
- The east diversion ditch was constructed as a fish habitat and was commissioned in late 2009 following the South Nation Conservation Authority approval;
- A pond exists in the southeast corner of the site which serves as a storm water retention pond. The north and east parts of the site drain to this pond prior to discharge to the east diversion ditch;
- A pond exists in the northwest corner of the site which serves as a storm water retention pond. The northwest and west parts of the site drain to this pond prior to discharge to the north diversion ditch.

b) Leachate Controls:

- The landfill is underlain with native low permeability clay soil (i.e. a natural liner);
- A perimeter leachate collection system has been constructed along the west and south perimeter of the waste pile;
- A leachate underdrain and collection system has been constructed below the waste in the north 1/3 of Phase 3; below the waste in the east part of Phase 8; below the waste in Phase 4; below the waste in the east half of Phase 5; below the waste in Phase 1; and below the waste in Phase 6;
- The landfill will be covered with low permeability final cover material to reduce water infiltration. Final cover has been completed in parts of the landfill as shown on Figure 3.2.

c) Landfill Gas Controls:

- Riser pipes for the leachate collection system along the north, east and west perimeters of the waste pile have been capped and the interim landfill gas odour control system consisting of a landfill gas collection and flaring system was approved by the TSSA and commissioned in April of 2012. This system has since been in operation on a continuous basis;

- The landfill gas collection system was extended to the top of Phase 3 below the final clay cover in late 2014 as well as a connection to the central MH to control odours generated from these areas. Additional horizontal gas collectors were added to this system in 2016 and 2017. In 2017, 5 vertical wells were added in the Phase 3 area and 2 vertical wells were added in the south east corner of the Phase 1 area. In 2019, 4 vertical wells were added in the Phase 4 area of the waste footprint.

- The leachate collection system and maintenance holes along the west and south waste boundaries serve as a passive venting system.

- In 2017, a misting system comprising of a 300 m perforated HDPE line and blower powered by a diesel generator was constructed on the west side of the main access road that runs along Grid Line 14 as an added odour control system.

Environmental control systems for surface water, groundwater, leachate control, and erosion control systems are discussed in greater detail in the Design & Operations Report (Golder 2008). For the purpose of this report, a summary of the systems presently in use and/or proposed is provided in the following sub-sections. Surface water, groundwater, leachate and landfill gas monitoring undertaken by Golder Associates Ltd. are discussed in Sections 7 and 8 of this report.

6.2 *Surface Water Management*

The overall objectives for surface water management at the site are as follows:

- Divert surface run-off and shallow ground water flows originating upstream of the site around the outside perimeter of the waste footprint;

- Maintain the pre-development drainage conditions and water balance to each watershed;

- Minimize the amount of surface water that comes into contact with waste (which must then be managed as leachate); and

- Maximize the removal of suspended sediment from surface water generated on site prior to its release to the downstream drainage systems.

The regional surface water setting of the landfill is discussed in Section 2.7 and existing surface water control features are shown on Figure 6.1. Existing controls can be summarized as follows:

a) Upstream flows originate from the north and northwest of the site. These flows are diverted around the landfill via ditches located along the perimeters of the site buffer zones.

b) A diversion ditch has been constructed in the north buffer of the landfill flowing east from the office/maintenance facility. A large diameter culvert was added in 2019 at the northwest corner of the waste footprint. This northern diversion ditch and culvert discharges into the east perimeter ditch. The east perimeter ditch conveys water southward into a storm water retention pond located at the southeast corner of the site. This pond discharges into an existing ditch along the landfill's south property line. The southern ditch drains under the VIA ROW near Grid Lines R-16 and flows onto WCC property and to the Mer Bleue drainage basin.

c) A diversion ditch has been constructed in the north buffer area flowing west from the office/maintenance facility. This ditch discharges into a natural drainage channel, referred to as the west perimeter ditch, flowing southward along the west perimeter of the property east of Grid Line -2. This ditch discharges at a location near the intersection of Grid Lines R and -2 and conveys flows westward to the Mud Creek drainage basin.

d) Clay cover has been placed on the north, west and south facing slopes of the waste pile as well as the top of Phase 3, the north edge of Phase 4 and the south half of Phase 1 where final waste grades have been reached as shown on Figure 3.2. Finished slopes are covered with clay soil, a thin layer of topsoil, graded and seeded. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control.

e) Landfill operations are carried out such that surface water is directed away from the waste to minimize water infiltration.

Surface water monitoring is discussed in Section 7.

6.3 *Leachate Management*

Leachate is generated from a combination of infiltration of precipitation into the waste pile as well as surface water and groundwater discharge into the landfill despite efforts to divert water around the waste footprint. Generation of leachate is minimized by grading the waste surface and placing low permeability cover materials over areas of the landfill filled with waste to reduce infiltration from precipitation and promote surface runoff.

Leachate generated by the landfill is collected by a collection system consisting of four separate components that all drain to a leachate pumping station in the southeast corner of the site. Figure 6.2 presents the leachate collection system in plan.

1. A perimeter leachate collection system has been constructed along the southern limit of the waste footprint extending from Grid line 15 to Grid Line 1 and then approximately 330 m north along the west perimeter of the waste footprint along Grid Line 1 to just north of Grid Line K. The perimeter leachate collection system was designed with a slope varying between

0.4% and 0.6% to provide gravity drainage to a collection point at the southeast corner of the site. The waste in the north 1/3 area of Phase 3 (Northwest Cell) was placed on a drainage blanket that connects to the west perimeter leachate collection system. This system consists of a granular trench with a 250 mm diameter perforated HDPE (Boss 2000) drainage pipe. Along the southern perimeter, the leachate collection system has been constructed with lateral granular filled hydraulic connector trenches into the waste pile. Access to the western and southern leachate collection system is provided by a series of manholes spaced at approximately 100 m intervals for monitoring and maintenance purposes.

2. The north area of the site below Phase 4 was constructed with a grid-type drainage network within a stone drainage layer underlying the waste. The leachate collection system in this excavated cell consists of 200 mm diameter perforated HDPE (Boss 2000) drainage pipe surrounded by 50 mm clear stone and non-woven geotextile laid out in a grid pattern spaced no more than 45 m apart. A network of French drains, consisting of clear stone wrapped in non-woven geotextile, placed between the drainage pipes reduces the drainage path along the floor of the cell to approximately 15 m.

3. An underdrain leachate collection system has been constructed beneath the waste located between Grid Lines 14 and 16 and south of Grid Line N and just north of the pump station consisting of a stone drainage layer and perforated drainage piping similar to the system constructed in the Phase 4 area to the north. A clay berm was constructed along Grid Line N to separate the two leachate collection systems located on each side of Grid Line N.

4. A fourth component to the leachate collection system consists of the east lateral expansion cell (Phases 1 and 6) designed by Golder Associates Ltd. and approved by the MECP as an amendment to the ECA No. A460702 Notice 1 dated October 9th 2009. This system in Phase 1 was completed in 2015 with Phase 6 completed in 2019. QA/QC was carried out by Golder Associates Ltd. and as-built reports were prepared by Golder Associates for each of the completed cells and submitted to the MECP. A leachate sump and pump is located at the northwest corner of Phase 1 to drain leachate from both the Phase 1 and Phase 6 areas.

Presently, the disposal method of choice for leachate generated by the WCC Facility is pre-treatment using air stripping followed by direct discharge to the City sewer system via a WCC forcemain. The leachate pumping station located at the southeast corner of the landfill site and leachate forcemain connection to the municipal sewer system on Renaud Road were completed in 2007 and commissioned in early 2008. Pre-treatment of leachate to reduce the concentration of H_2S and Volatile Organic Carbons (VOCs) is carried out prior to pumping leachate to the municipal system. In 2008, cleanouts were added along the leachate forcemain to provide easier access for cleaning and maintenance. In 2011, the leachate pre-treatment and pumping station was expanded with the addition of higher capacity treatment chambers and higher capacity pumps to maintain discharge flows at the approved 17L/sec. The forcemain discharging to the City of Ottawa sewer system was pressure washed on two separate occasions in 2019 to clean the line and maintain unobstructed flows.

In 2019, a total of 148,817 m^3 of pre-treated leachate was discharged to the City of Ottawa wastewater system, a 46.1 % increase over 2018. The increase is attributed to increased precipitation in 2019 and collection of leachate from the new cell in Phase 1. The monthly leachate volumes discharged are

summarized in Table 6.1. The monthly and cumulative volumes of leachate pumped are shown graphically on Figures 6.3 and 6.4 respectively. The peak month was April with a volume of 24,424m^3. The daily average for the period of operation was 407.7 m^3.

Table 6.1: Summary of Leachate Volumes Discharged Off-Site in 2019

Month	Leachate Volumes (m^3) Discharged to City Sewer	Cumulative Leachate Volumes (m^3)
January	4,594	4,594
February	5,400	9,994
March	18,491	28,485
April	24,424	52,909
May	20,475	73,384
June	12,572	85,956
July	14,648	100,604
August	10,220	110,824
September	5,726	116,550
October	4,852	121,402
November	12,466	133,868
December	14,949	148,817
Total:	148,817	

Leachate monitoring is discussed in Section 7.

6.4 *Landfill Gas Management*

Landfill gas generation at the site is limited although its presence can be identified in the waste pile area by signs of dying vegetation and/or localized snow melt during the winter. Landfill gas is produced when organic waste decomposes. It consists primarily of methane (50%) and carbon dioxide (50%) as well as water vapour, nitrogen, and trace amounts of other non-methane organic compounds (NMOC). Non-putrescible waste received at the landfill does not generate landfill gas and methane at the same rate as municipal solid waste (MSW). Methane, which is explosive at concentrations greater than 5%, presents a health and safety risk both on-site and off-site. As a result, monitoring of landfill gas is carried out at the property boundary and within facilities located on site. In addition, passive gas ventilation systems and an active gas collection system at the site prevent the off-site migration of landfill gas.

The perimeter leachate collection system extends below the water table and prevents off-site migration of gas. Figure 6.2 provides details of the perimeter leachate collection system along the southern limit of the landfill.

As part of a commitment to control potential odorous emissions from the site, WCC has installed an interim landfill gas odour control system which will operate until the full-scale landfill gas collection system is installed at the site. This interim odour control system, constructed within the existing landfill footprint, includes connections to leachate collection cleanouts, existing vertical landfill gas extraction wells, and to horizontal wells. This system also includes the installation of lateral and header piping, condensate management facilities, an outdoor skid-mounted abstraction plant, and a candlestick flare. During construction, leachate collection system cleanouts were excavated and the perforated pipe replaced with solid pipe and air tight connections. Tees were installed in the header pipe to allow for expansion of the system as required.

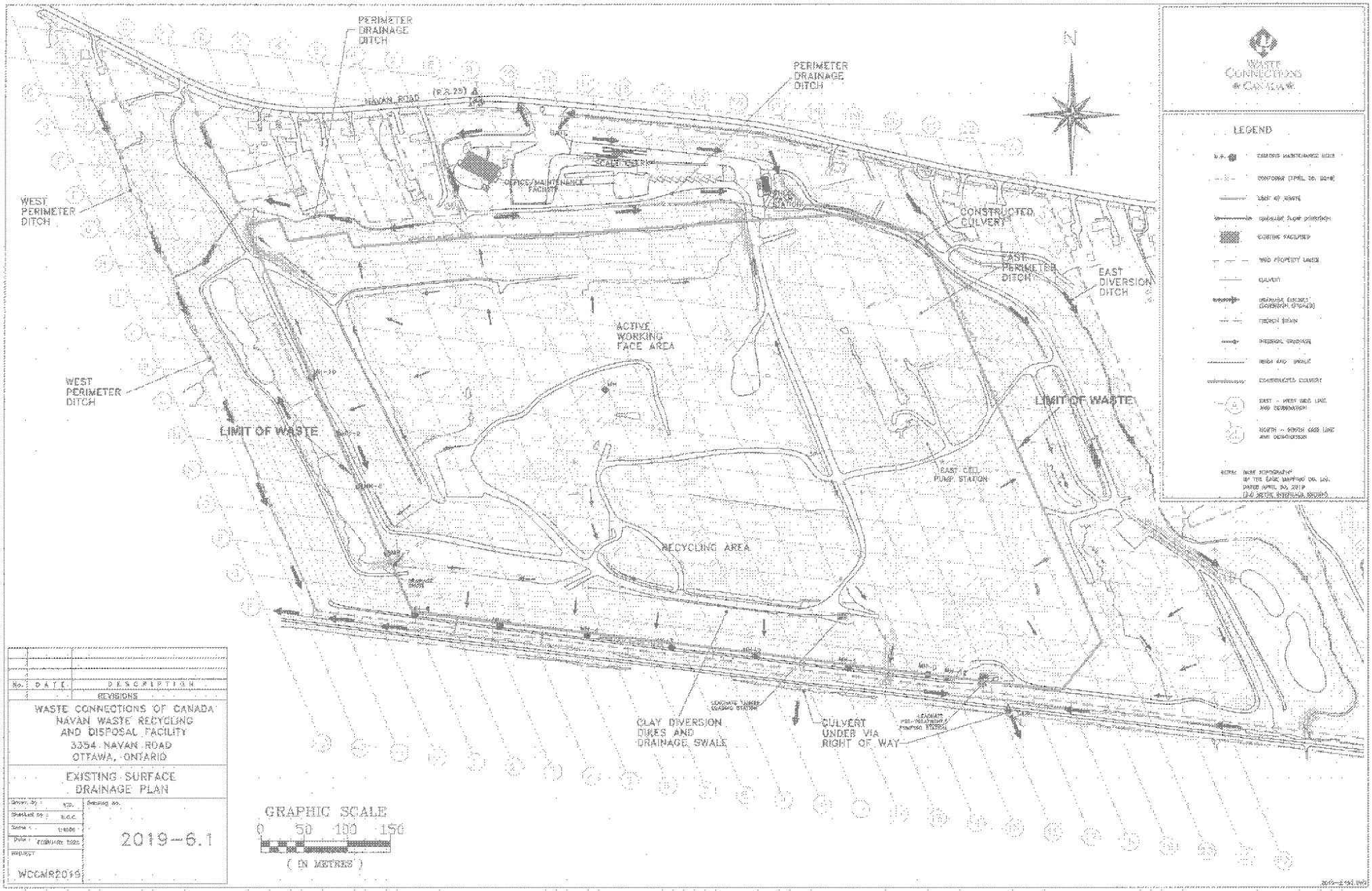
The interim landfill gas odour control system was installed in 2011 and commissioned in April of 2012. Additions to the LFG collection system which included horizontal and vertical wells were constructed in the fall of 2016, in late 2017 and in 2019. In 2019 the LFG system operated for 8,059 hrs at an average of 368 scfm with a methane (CH4) concentration of approximately 48.8%, yielding a total of 2,653,399 m^3 of methane which was flared using the landfill gas flaring system. A 6.8% decrease in methane recovery was recorded from 2018 to 2019.

A monitoring program associated with the odour control system has also been implemented. Design of the full-scale landfill gas collection and flaring system has been completed by Golder Associates Ltd.

Landfill Gas monitoring is discussed in Section 8.

6.5 *Buffer Zone*

The perimeter of the site is surrounded by a buffer zone which occupies an area of about 6.2 ha. In accordance with the ECA, a minimum buffer width of 30 m is maintained between the northern, eastern and western limits of the landfill area and the property boundary. A minimum buffer width of 10 m is maintained between the southern limit of the landfill area and a VIA Right-of-Way. WCC owns additional lands to the north, west and east of the landfill site as well as a 100m wide track of land south of the VIA ROW providing additional buffer space. No waste is deposited within the designated buffer zone. The limits of waste are illustrated in plan on Figure 2.4.



No.	DATE	DESCRIPTION
		REVISIONS

WASTE CONNECTIONS OF CANADA
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD
OTTAWA, ONTARIO

EXISTING SURFACE DRAINAGE PLAN

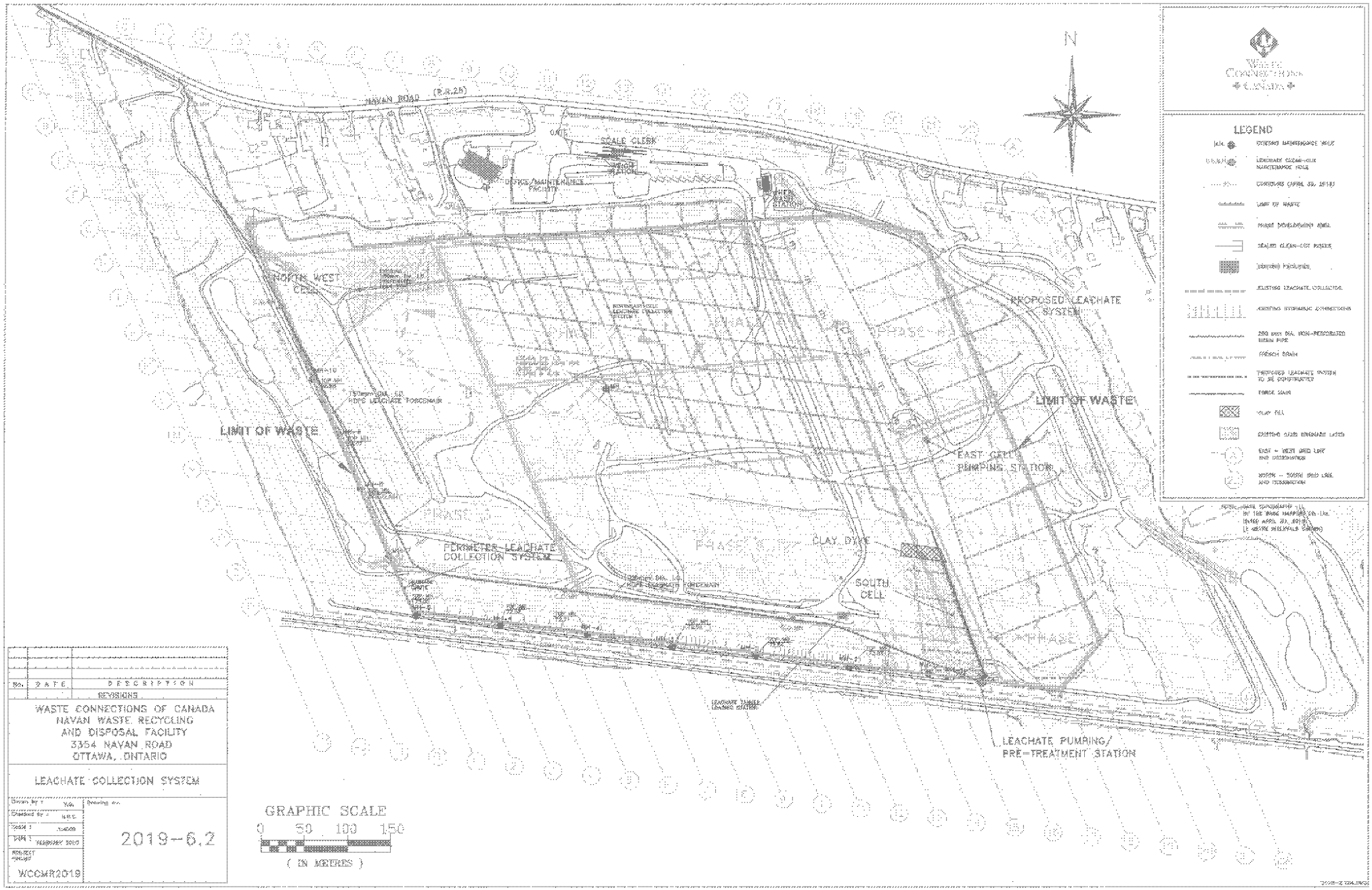
Drawn By :	KB
Checked By :	M.D.C.
Scale :	1:1000
Date :	DECEMBER 2020
Project	WCCNAR2019

Drawing No.

2019-6.1

GRAPHIC SCALE
0 50 100 150
(IN METRES)

000361



No.	DATE	DESCRIPTION
		REVISIONS

WASTE CONNECTIONS OF CANADA
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD
OTTAWA, ONTARIO

LEACHATE COLLECTION SYSTEM

Drawn by : YGA
Checked by : S.P.C.
Scale : 1:4000
Date : FEBRUARY 2019
Project Number : WCOMR2019

Drawing no. 2019-6.2

000362

Figure 6.3: Total Monthly Volume of Pre-treated Leachate Discharged to City of Ottawa Sewer

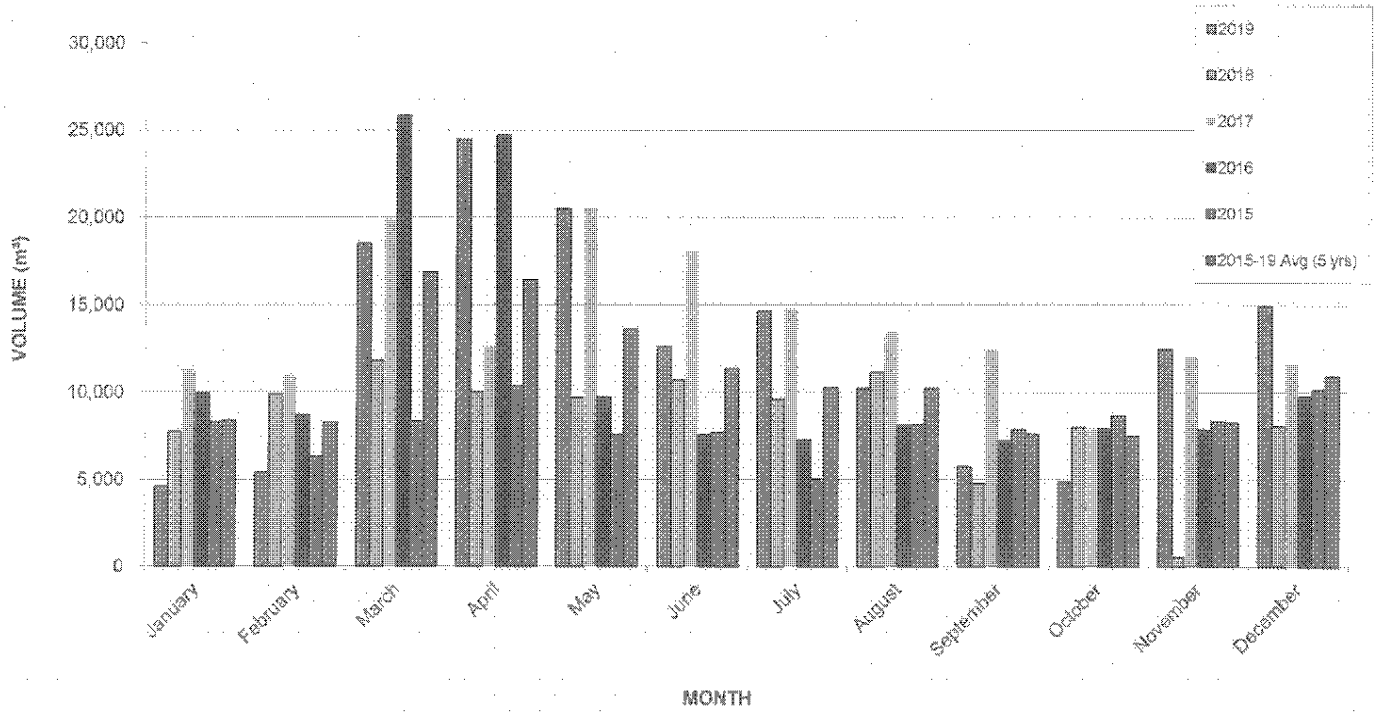
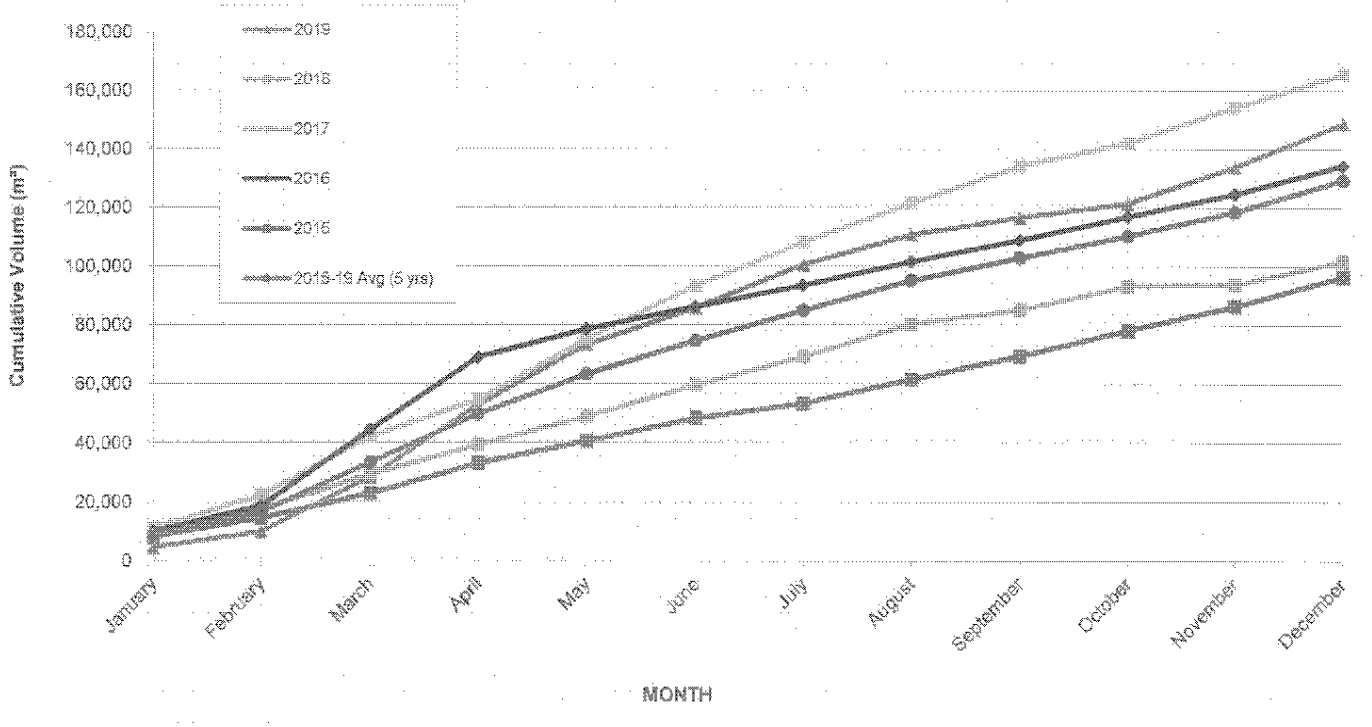


Figure 6.4: Cumulative Monthly Volume of Pre-treated Leachate Discharged to City of Ottawa Sewer



7. WATER QUALITY MONITORING

Water quality monitoring undertaken to date at the Navan Waste Recycling and Disposal Facility consists of water quality analysis of surface water, groundwater, leachate and sediment. The location of water monitoring stations is shown on Figure 7.1. In 2019, Golder Associates Ltd. (GAL) was retained to carry out the annual water quality monitoring program and reporting requirements for the Navan Waste Recycling and Disposal Facility and prepare a report to fulfill the reporting requirements outlined in Conditions 135 and 136 of the Environmental Compliance Approval (ECA) No. A460702. The 2019 GAL report is attached in Appendix 1 and summarized below.

The following summary highlights key points only; for complete information and findings it is necessary for the reader to examine the GAL report provided in Appendix 1.

The monitoring program undertaken was a continuation of the monitoring program already in place for this site and followed the program outlined in Conditions 109 and 112 of the ECA and Condition 10.1 of the Conditions of Environmental Assessment Approval. As per Condition 109, the monitoring program includes sampling of the monitoring wells located in BH09-1 in order to assess the groundwater quality in the Mer Bleue Bog. The original monitoring program indicated that the wells would be sampled during the winter, when the Mer Bleue Bog is frozen and the wells are accessible. However, the groundwater in the monitoring wells has frequently been frozen during these events. In the 2013 monitoring report (Golder, 2014), it was proposed to sample them during the summer, rather than the winter, in 2014 and future years. Due to dry conditions in the summer groundwater samples were successfully collected at monitoring wells BH09-1B, BH09-1C and BH09-1D during the fall session on November 21, 2019 (monitoring well BH09-1A was frozen at the time of sampling, therefore no sample was obtained).

Groundwater monitoring sessions in 2019 were carried out by GAL on June 19 and November 20-21, and surface water monitoring sessions were carried out by GAL on June 20, August 28 and November 21. Leachate quality analysis was undertaken on samples obtained by GAL from the pump station (L5) on June 20, August 28 and November 21. The following is a summary of the results of the monitoring sessions undertaken in 2019 presented in the GAL report provided in Appendix '1'. Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected in November 2018 and will therefore be sampled again in the spring of 2020 and no samples were obtained from these monitoring wells in 2019.

In addition, sediment quality is also monitored at three locations within the Mer Bleue Bog. This program was initiated in 2000 at the request of the National Capital Commission (NCC). In 2019, sediment samples were obtained by GAL on June 20, August 28 and November 21.

A Monitoring and Screening Checklist prepared and signed by a Competent Environmental Practitioner (CEP) is included with the Golder 2019 Landfill Monitoring Report attached as Appendix '1'.

The objectives of the 2019 environmental monitoring program were:

- To comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of Environmental Compliance Approval No. A460702;
- To assess any potential impacts on water quality at the site resulting from landfill operations;
- To continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill;
- To document the chemical composition of groundwater and surface water in the vicinity of the landfill;
- To assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate; and
- To document the chemical composition of sediment at three locations in the Mer Bleue Bog.

7.1 *Groundwater Quality Assessment*

Based on the groundwater levels obtained during the 2019 monitoring program, no significant change in groundwater flow patterns have been observed.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (un-weathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present up-gradient, at the down-gradient edge (used to assess compliance) and further down-gradient of the landfill in each of these units.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2019 background range.

Trigger concentrations exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

In 2019, only one trigger exceedance of the background range was reported: it was for magnesium at MW92-10, in the weathered clay stratigraphic unit. No other continued increase in concentration for other parameters beyond the background range was reported in 2019 in the sand stratigraphic unit or the weathered clay stratigraphic unit, due to stabilizing or decreasing concentrations following WCC actions.

In a continuing effort to achieve a drained state in the leachate collection system, WCC intends to proactively maintain the forcemain in good working condition and acquired a spare leachate pump to reduce down time when a pump requires servicing. Discharge pumps were already upgraded in the fall of 2011 from 20 horsepower to 35 horsepower in an effort to achieve and maintain a discharge of 17 litres per second. Treatment modifications were commissioned in 2012, increasing pumping capability, which resulted in the ability to maintain the leachate collection system in as much a drained state as possible and to better manage the peak discharge periods. A similar course of action is proposed to be followed in 2020.

Results from the upcoming spring 2020 monitoring session will be analyzed to determine if the effect of these actions are detected in groundwater quality with a decrease in concentrations of Leachate Indicator Parameters at trigger locations, including in the intact clay and glacial till/upper bedrock units. At that point, the need for a formal contingency plan will be assessed in collaboration with the MECP.

7.2 *Leachate Water Quality Assessment*

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. The intrinsic biodegradability of municipal landfill leachate can be measured by a BOD:COD ratio. During the first several years of production, the BOD:COD ratio generally is in the 0.5 range. As the landfill ages, the ratio decreases to levels less than 0.1 suggesting a more or less biologically recalcitrant organic composition (Andreottola et al., 1989). Also, the concentration of ammonia tends to increase with landfill age since ammonia is a by-product of the stabilization of organic matter (Elefiniotis et al., 1989), although at a dry waste facility such as the WCC Facility, ammonia concentrations can be expected to remain relatively low.

Leachate quality monitoring results for 2019 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Monitoring of treated leachate is also carried out on a more frequent basis in compliance with the City of Ottawa discharge requirements at the WPCP (ROPEC).

7.3 *Surface Water Quality Assessment*

The WCC Navan Facility is located on a watershed divide resulting in drainage of surface water to both the east and west of the site. The east side of the site drains to the Bear Brook or Mer Bleue drainage basin and the west side into the Mud Creek drainage basin which drains into Green's Creek. The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Surface water quality monitoring will continue at the site, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Groundwater and Surface Water Trigger Mechanism report (Golder, 2007a). The MECP has agreed that this is the preferred approach for the WCC Navan Facility.

7.4 *Sediment Quality Assessment*

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Results are compared to the MECP Table 1 sediment criteria, and Table 2 and Table 4 Recreation/Parkland soil criteria (MOE, 2011) and the CCME freshwater sediment and Recreation/ Parkland soil criteria (CCME, 1999). Given that the material sampled is peat found in the saline Mer Bleue Bog environment, it could be debated that sediment criteria for freshwater deposits should not be used.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

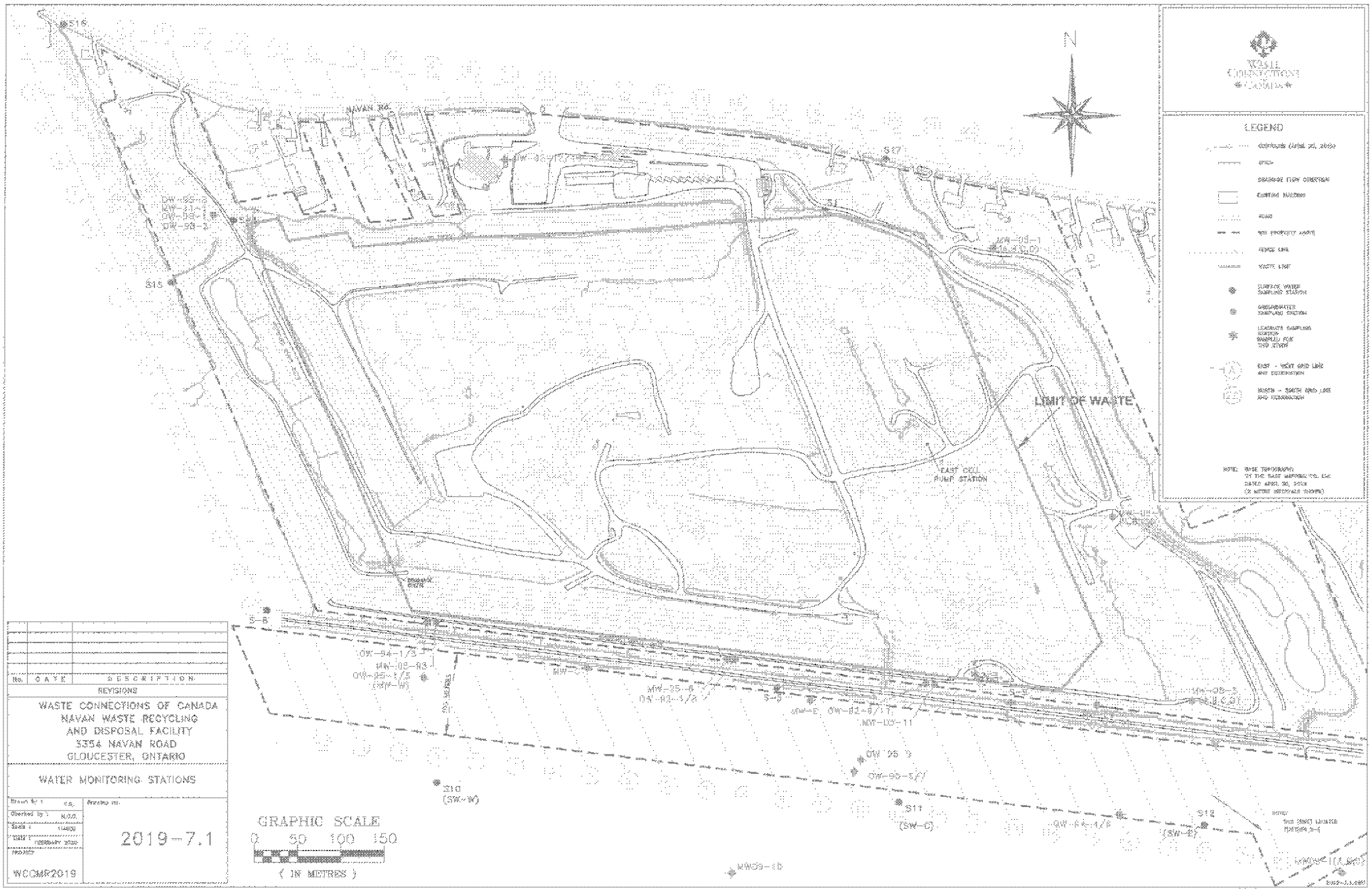
In 2002/2003, an assessment of the WCC Navan Facility operations was undertaken in support of a WCC-NCC (WSI-NCC) exchange of land parcels located south of the WCC Navan Facility along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

7.5 Proposed 2019 Monitoring Program

The proposed 2020 Environmental Monitoring Program is the same as was conducted in 2019, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program (see Golder Report Section 9.0 in Appendix 1). As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as has been done between 2014 and 2018 (due to dry conditions in the summer of 2019, they were sampled in the fall where possible).

As explained in Section 7.3, the MECP agreed that an excursion of landfill leachate would be apparent in the underlying stratigraphic units prior to a surface water impact and a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. Therefore, Golder has proposed to discontinue sediment monitoring and rely on the groundwater and surface water monitoring programs to assess off-site leachate impacts. With MECP concurrence, sediment monitoring could resume temporarily if leachate impacts and trigger exceedances are reported at the site.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the November 2018 monitoring session and will be monitored again in the spring of 2020.


NAVAN RD.
LIMIT OF WASTE
EAST CELL PUMP STATION
GRAPHIC SCALE
0 50 100 150
(IN METRES)
LEGEND
WASTE CONNECTIONS OF CANADA
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD
GLOUCESTER, ONTARIO
WATER MONITORING STATIONS
2019-7.1
WCCNAR2019

000369

8. LANDFILL GAS (LFG)

Golder Associates Ltd. (GAL) was retained to carry out the landfill gas monitoring program in 2019. The monitoring program undertaken was a continuation of the monitoring program already in place for this site and the results of the monitoring events undertaken are summarized below and presented in more details in the GAL report provided in Appendix '2'.

8.1 *LFG Monitoring Results*

The report has been prepared to fulfill the reporting requirements outlined in Condition 110 of Environmental Compliance Approval No. A460702 dated April 16th, 2009.

LFG monitoring was carried out on June 12th 2019, on August 29th 2019 and on December 17th 2019. At most locations monitored, methane gas was less than 5 percent (%) of the Lower Explosive Limit (LEL). Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system that also serves as a passive ventilation system, with methane concentrations measured in excess of 25% LEL (or 1.25% by volume for the spring session) at the following locations (refer to Fig 2, Appendix "2"):

- Monitoring well OW-92-8 (G15) in December 2019.
- MH-10 (G-2a) in August and December 2019.
- MH-9 (G-3a), MH-7 (G-5a), MH-6 (G6-a), MH-4 (G12-a), MH-3 (G13-a) and the tank truck loading station MH (G84-a) in December 2019.

It is noted that no location during the spring 2019 monitoring session reported a methane concentration in excess of 25% LEL, nor in excess of 1.25% by volume.

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5 percent by volume; and,
- The concentration of methane gas must be less than 1.0 percent by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the Navan Facility based on the 2019 monitoring results.

The Navan Facility is designed with a buffer area and natural barriers. The site has a favourable hydrogeological setting whereby the site is underlain and surrounded by a thick clay deposit of low

permeability. The depth below grade to the water table at the perimeter of the site is shallow. The depth of the landfill between the ground surface and the water table is less than 2.5 metres. It is generally considered that methane gas migration of any significance may extend for a distance of ten times the depth of the landfill between the ground surface and the water table. Based on site conditions, this 10:1 general rule would suggest that methane migration could extend for a distance of 25 metres. The north, west, south and east sides of the landfill footprint are surrounded by buffer zones of 30 to 70 metres, 100 metres, 10 metres and 140 metres, respectively. Note that on the south side of the landfill a 10-metre buffer zone exists between the south limits of the waste mound and the VIA Rail right-of-way (ROW) and an additional buffer strip with a width of 100 metres exists to the south of the VIA Rail ROW. These buffers would therefore provide adequate natural venting. The natural barriers and the provision of adequate buffer area present at the Navan Facility are the preferred method of dealing with potential LFG migration. Although no monitoring locations are available below surface at the property boundary, based on the presence of a buffer area and natural barrier system, it is anticipated that the Navan Facility met the property boundary requirements in 2019.

Hydrogen sulfide was not detected at any location during the 2019 monitoring events with the exception of the following locations, which reported relatively low detections:

- Monitoring Wells OW-94-2 (G-8), 05-R3 (G-9) and MH-4 (G-12a) in June 2019
- Collector MH (G-26i) in August 2019

During the 2019 monitoring events, no odours were detected by Golder technician at the WCC Navan Facility during the spring and summer monitoring sessions. During the 2019 winter monitoring session, moderate, but not offensive odours were noted at the site. Strong odours were specifically noted at gas extraction well GW-1. Historically, odours have been detected in some areas (near the active face); however, they were transient and dissipated at a short distance from the source. As previously mentioned, gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2019, WCC personnel responded to twenty-one odour related complaints. The Public Advisory Committee subsequently mailed out four thousand notices to inform stakeholders of a public meeting organized by the Committee. A total of twelve people attended the public meeting and none of the people in attendance had submitted a complaint.

It is noted that an interim LFG odour control system (refer to Section 6.4) was installed in 2011 and commissioned in April 2012. An extension to the LFG odour control system was installed in the fall of 2016 and again in late 2017 and in 2019. The additional vertical wells installed in 2017 and in 2019 are intended to be part of the future permanent LFG collection system. The purpose of this system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells (refer to Fig. 8.1).

8.2 *2018 Regulatory Reporting (NPRI, O.Reg. 127/01, O.Reg. 347, O.Reg 452/09 and Federal GHG)*

In 2019, Dillon Consulting Limited (Dillon) was retained by Waste Connections of Canada Inc. (WCC) to complete the following for the WCC Navan Facility:

- An assessment to determine the reporting requirements under the *National Pollutant Release Inventory* (NPRI) for the 2018 calendar year;
- An assessment to determine the reporting requirements under *Ontario Regulation 127/01 – Airborne Contaminant Discharge Monitoring and Reporting* (O.Reg. 127/01) for the 2018 calendar year;
- Greenhouse Gas Reduction Reporting as required under *Ontario Regulation 347*;
- An assessment to determine the reporting requirements under *Ontario Regulation 452/09 – Greenhouse Gas Emissions Reporting* (O.Reg. 452/09) and the Federal Government Greenhouse Gas Reporting Program for the 2018 calendar year; and
- Assist with data input and submission for Environment Canada's online Single Window Information Manager (SWIM) module, if required.

The Navan Landfill reported to the NPRI in 2019 under NPRI identification number 10967 and has not been required to report to the Federal GHG or Ontario GHG programs in the past. Site operations are identified by NAICS code number 562210 "Waste Treatment and Disposal".

Dillon conducted an assessment of facility operations and material usage in order to determine which substances must be reported to each of the programs mentioned above for the year 2018.

Based on Dillon's assessment, the Navan Landfill was required to report to NPRI in 2019 for the year 2018. The total annual on-site releases and off-site transfers of the reportable NPRI Part 1, Part 2, and Part 3 substances are summarized in Table I. Annual air releases for the NPRI Part 4 and Part 5 substances are also provided in Table I.

Table 8.1: 2018 NPRI Reporting

NPRI Substance	On-site Releases (tonnes)			Off-site Transfers (tonnes)	
	Air	Land	Water	Disposal	Recycle
Part 1 Substances					
Asbestos	-	-	-	211.8 (on-site)	-
Mercury				25.1 kg	
Part 2 Substances					
None	-	-	-	-	-
Part 3 Substances					
None	-	-	-	-	-
Part 4 Substances					
CO	74.19				
PM_{10}	3.487	-	-	-	-
$PM_{2.5}$	1.867	-	-	-	-
Part 5 Substances					
None	-	-	-	-	-

The reports were made based on estimates and not measured values. Many of the parameters that are reportable are the result of handling high volumes of materials on site which are above the manufactured, processed or otherwise used reporting threshold, e.g. leachate and asbestos, but do not result in airborne emissions from the facility. The reporting of mercury was triggered by shipments of contaminated soils received at the site for disposal that contained elevated levels of mercury. The reporting of the emissions of particulate matter (PM10) was triggered by fugitive dust emissions from roads and is generally also reported by all industrial operations in Ontario due to very low thresholds.

Ontario Regulation 347 requires landfill sites larger than 1.5 million cubic meters to report annually on the greenhouse gas reductions being achieved at the site. The Navan Landfill meets the regulation requirements and submitted the required Landfill Data Collection Form electronically for 2018 to the Ministry of the Environment, Conservation and Parks.

It is noted that an interim landfill gas odour control system (refer to Section 6.4) was installed in 2011 and commissioned in April 2012. The purpose of this system is to control potential odorous emissions from the site until the full-scale landfill gas collection system is installed. The interim landfill gas odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical landfill gas extraction wells as shown on Figure 8.1.

Based on this assessment, the Navan Landfill does not meet the reporting requirements for O.Reg. 127/01, or the Ontario GHG reporting programs and was therefore not required to report in 2019 for the 2018 calendar year but was required to report the direct greenhouse gas emissions for this facility for the period identified to Environment and Climate Change Canada (ECCC).

The total GHG emissions for the facility in 2018 were reported as follows:

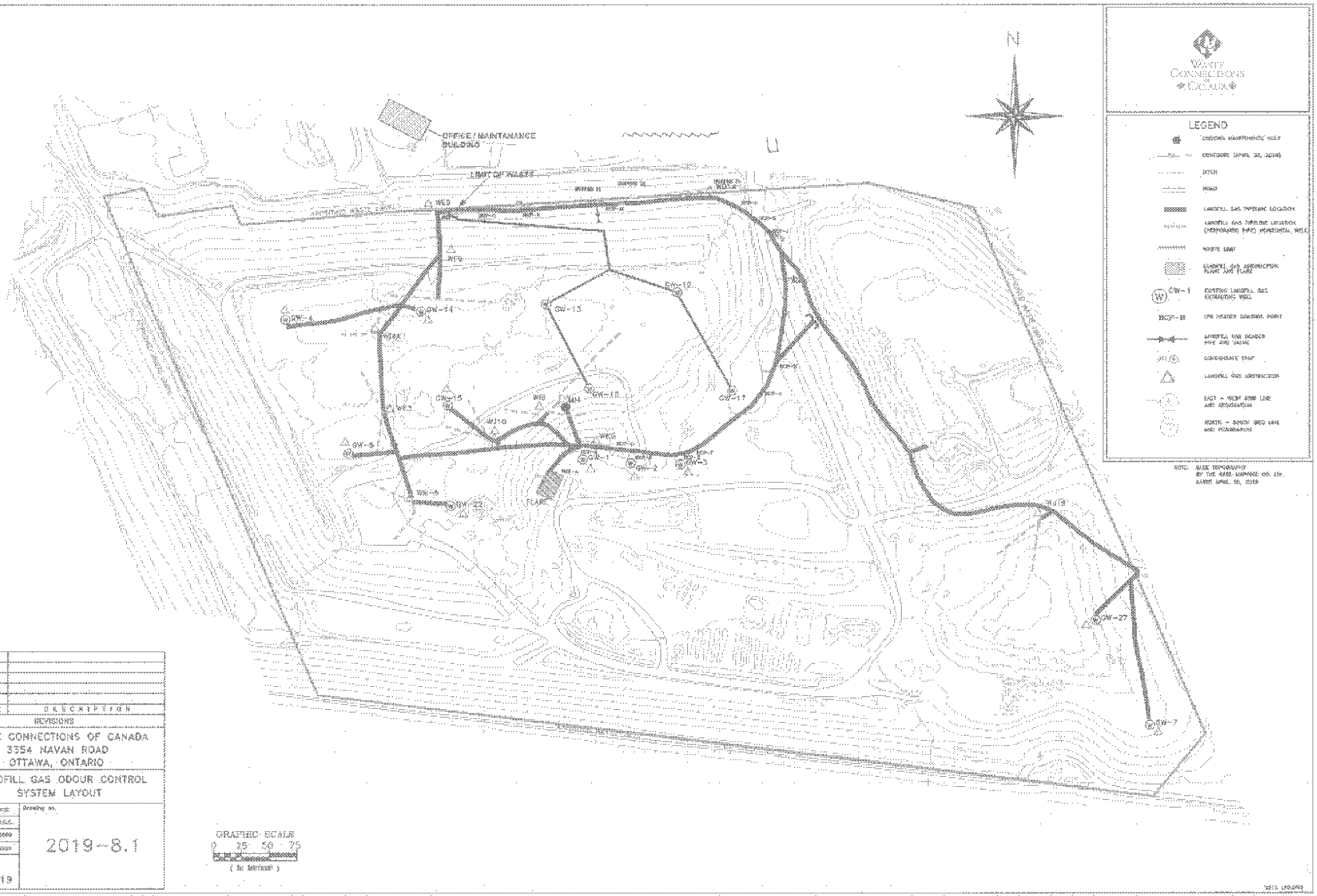
	Emissions (t)	Emissions (t CO2e)
Carbon Dioxide (CO2)	1248.172	1248.172
Methane (CH4)	1029.635129	25740.878225
Nitrous Oxide (N2O)	0.053829	16.041042
Hydrofluorocarbons (HFCs)		
Perfluorocarbons (PFCs)		
Sulphur hexafluoride (SF6)		
Facility Total reported to Environment and Climate Change Canada:		27005.091267
Carbon dioxide (CO2) from biomass combustion:		9342.706

Release Estimate Comparison: 2017 vs. 2018

Table 8.2 provides a comparison between 2017 and 2018 releases for reportable substances. Reasons for changes in release quantities for the two reporting years are provided for those substances/contaminants shown with a ±10% change in release quantity.

Table 8.2 – 2017 vs. 2018 Release Values

Substance	2017 Reported Value	2018 Reported Value	% Change	Reason/Comments
Asbestos	Air = 0 tonnes Disposal = 230.3 tonnes Recycle = 0 tonnes	Air = 0 tonnes Disposal = 211.8 tonnes Recycle = 0 tonnes	(-) 8%	No significant changes in disposal on-site
Mercury	Did not trigger reporting	Air = 0 tonnes Disposal = 25,01 kg Recycle = 0 tonnes	N/A	Shipments of contaminated soils received at the site contained elevated levels of mercury
CO	Air = 73.48 tonnes	Air = 74.19 tonnes	(+) 1%	No significant change in air releases
PM10	Air = 3.540 tonnes	Air = 3.487 tonnes	(-) 1%	No significant change in air releases
PM2.5	Air = 1.856 tonnes	Air = 1.867 tonnes	(+) 1%	No significant change in air releases
CO2e(Federal)	Air = 11,004 tonnes	Air = 27,005 tonnes	>(+)100%	Revised k & Lo resulted in increased GHG emissions from waste decomposition



WASTE CONNECTIONS OF CANADA

No.	DATE	DESCRIPTION
		REVISIONS

WASTE CONNECTIONS OF CANADA
3554 NAVAN ROAD
OTTAWA, ONTARIO

LANDFILL GAS ODOUR CONTROL SYSTEM LAYOUT

Drawn By : YSE
Checked By : RGC
Scale : 1:2000
Date : FEBRUARY 2019
Project : WCOMR2019
Drawing no. 2019-8.1

000375

9. PROCESSING/RECYCLING

9.1 *Diversion of Waste and Other Materials from Disposal*

Diversion through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the WCC Navan Waste Recycling and Disposal Facility. For example, all daily and intermediate cover needs are met by substitution of virgin soils with the re-use of significant quantities of impacted soils. Brick, concrete, asphalt and rubble are also recovered for re-use each year in the construction of access roads and container storage pads. Roofing shingles free of paper and other debris are also re-used on site as a sub-base for roads and pads over which is placed a layer of aggregate or recycled asphalt. In addition, steel, aluminum, wood and white goods are recovered daily from the active face of the landfill and recycled. The site also currently assists local landscape and tree removal contractors by receiving wood waste that is put through a grinding process and sent to markets off site for use as bio-mass or bulking agent for organic composting. Other waste materials removed from the site for recycling include cardboard, tires, glass, drywall and E-waste.

Materials received by the Navan Waste Recycling and Disposal Facility are those which IC&I generators have generally deemed to be waste and of no further value (i.e., post diversion at the source). Many of the waste generators serviced by waste collection contractors who bring waste to the site also divert materials from the landfill at their place of business prior to collection. Recycling within the IC&I sector is regulated by the Ministry of the Environment, Conservation and Parks under Regulations 101, 103 and 104. While the site receives post-diversion waste materials from the IC&I sector, WCC has procedures in place to screen the incoming waste for recyclable material in what is known as a "last chance harvest" which is a "positive" sort where the recyclable item must be removed from the mixed waste mass. In this case, the majority of the material is not recyclable (i.e., it is waste). This is very different than recycling from "source separated" material, which results in a "negative" sort, where the waste components are removed from what is predominantly recyclable material. WCC also encourages and receives "clean" recyclable materials such as wood, metals, drywall, glass and E-waste. Such materials are shipped to market in bulk in efforts to make the recycling of these materials more economically viable.

Management at the WCC Navan Waste Recycling and Disposal Facility is constantly searching for on-site and off-site diversion opportunities to ensure that approved disposal capacity is preserved and used for the disposal of waste material of least commercial value. Given the provincial policy and regulations concerning waste diversion from landfill, the WCC Facility will continue to support the City and the Province in their efforts to meet diversion targets while at the same time ensuring essential disposal capacity is available locally.

Approval for the treatment of contaminated soils was received from the MECP in June of 2015. The treatment of hydrocarbon contaminated soils was started soon after in the processing area of the site located within the waste footprint (refer to Figure 2.4). Treated soils are re-used on site as final cover material or as structural fill along the waste line within the east buffer. Soils which had not reached the treatment criteria by the end of 2019 remained on the treatment pad until the treatment objectives could be achieved or landfilled as waste.

The amount of waste diversion achieved from "last chance harvest" at the WCC Navan Waste Recycling and Disposal Facility over the past five years is summarized in Table 9.1.

Table 9.1: Diversion at Navan Waste Recycling and Disposal Facility (2015 - 2019)

Material	2015	2016	2017	2018	2019	5-Year Total
Off-Site recycling:						
Materials removed for off-Site recycling	10,867	13,164	10,249	14,712	11,025	60,017
On-Site reuse:						
Aggregate material re-used (rubble; brick; concrete; rock)	13,707	22,651	8,480	11,935	5,949	62,722
Asphalt, clean fill, clean shingles	15,303	13,877	7,262	5,623	11,151	53,216
Treated/re-used soils	40,310	61,048	31,096	31,726	67,249	231,429
Total Diversion (excluding daily cover soils)	**80,187**	**110,740**	**57,087**	**63,996**	**93,374**	**407,384**
Waste to Landfill	234,477	233,867	171,419	233,994	222,976	1,096,733
WCC Recycling and Disposal Facility "last chance harvest" diversion rate (excluding daily cover soils)	**25.5%**	**32.1%**	**25.0%**	**21.5%**	**29.5%**	**27.1%**

NOTE: All quantities are in tonnes

At the Navan Waste Recycling and Disposal Facility, loads of clean rubble, rock, asphalt, clean shingles or concrete that are received for disposal from a construction job site are set aside for re-use in the construction of on-site roads and pads. From 2015 to 2019, approximately 115,938 tonnes of these materials were diverted from disposal, avoiding the use of a more valuable resource such as quarried stone.

Heavy equipment equipped with a large magnet and grappling attachments are used for the recovery of metals from the waste after it is dumped at the landfill. Five people are hired full-time to focus on recycling opportunities and are assisted by landfill personnel. All refrigerant containing appliances have the refrigerant removed by a licensed technician prior to recycling. Metals collected on site are stockpiled and removed in bulk by a local contractor using tractor trailers. Smaller loads of more valued metals such as copper, aluminum and brass are shipped regularly to local scrap metal recyclers such as American Iron and Metal (AIM). In response to market interests in recycled wood products, wood is recovered from waste at the site and a wood grinder is used to reduce the wood to a chip size that is suitable to an end market and then removed in bulk using tractor trailers. Wood chips are shipped off-site to local mills where they are re-used in the production of wood pellets or used directly as an alternate fuel source. Wood chips are also used as a bulking agent at organic composting sites. Glass is also collected and removed in bulk from the site for recycling. From 2015 to 2019, over 60,017 tonnes of materials have been shipped off site for recycling and diverted from disposal at the site.

As indicated in Table 9.1, the Navan Waste Recycling and Disposal Facility diverted over 93,374 tonnes of material from disposal in 2019, and over 407,384 tonnes during the past 5 years. For 2019, this represents a "last chance harvest" diversion rate of 29.50% and excludes the re-use of impacted soils for daily cover material. This is in addition to the 17%-18% diversion rate for IC&I waste that occurs at the source. WCC will continue to improve waste diversion and recycling initiatives at the Navan Facility and pursue economically viable waste diversion opportunities to help the local community and WCC clients achieve a better IC&I recycling rate.

9.2 *Recycling*

For years, an independent contractor has undertaken processing (recycling) of steel and wood at the active face of the landfill. In 2009, the use of heavy equipment and permanent staff were introduced to improve health and safety as well as productivity. Daily records of materials received for processing and materials recycled and/or reused are maintained on site. In 2019, there were no operational problems reported related to the processing (recycling) facility.

A total of 11,025 tonnes of waste materials consisting of aluminium, wood, glass, drywall, e-waste, white goods, tires and ferrous metals were recycled and removed from the site in 2019. At the end of the year some materials remained stockpiled for removal in bulk at a later date such as white goods and metals. Wood waste also remained stockpiled in the material recycling area for further size reduction with the use of a wood grinder prior to shipment to off-site markets.

Brick, aggregate, rock and rubble received at the site and re-used in 2019 as aggregate for road construction totalled 5,949 tonnes. Clean fill, clean shingles and asphalt re-used on site as final grading, road/pad construction and engineered fill totalled 11,151 tonnes.

Drywall material received at the site free of debris was stored in a designated area for recycling and when sufficient volumes were received, drywall was processed through a grinder and re-used in powder form as a soil amendment.

Glass received at the site free of debris was stored in a designated area and when a sufficient volume was received, the glass was shipped in bulk to a recycling facility in Montreal, Quebec or Guelph, Ontario. In 2019, a total of 3,121 tonnes of glass were shipped off site for recycling.

Treatment of hydrocarbon contaminated soils was started at the site in 2015 following the receipt of MECP approval. Treated soils were re-used on site as final cover material and as structural fill along the waste limit within the east buffer. Soils which had not reached the treatment criteria by the end of 2019 remained on the treatment pad until the treatment objectives could be achieved or landfilled as waste. In 2019, 60,983 tonnes of hydrocarbon impacted soils were treated at the recycling facility for re-use in the east buffer and 6,266 tonnes of impacted soils were re-used within the landfill footprint as construction materials.

10. PROPOSED 2020 OPERATIONS

10.1 *Landfill Development*

10.1.1 Phasing of Remaining Operations

In 2020, WCC will continue to develop the landfill in a manner consistent with their past operating practices and proceed with capital projects required for the site operations as presented in the revised D&O (Golder, 2008). Over the past number of years, landfilling has progressed in a counter-clockwise pattern starting in the northwest corner of the site (area indicated as north half of Phase 3 on Figure 10.1). To date waste has been placed over the entire permitted waste footprint of the landfill as shown on Figure 10.1 with Phases 2 and 3 having been completed. In areas where significant settlement has occurred, re-grading will be carried out. In 2020, landfilling will continue in the last completed cell identified as Phase 6. Closure work will continue at the top of Phase 4 and in parts of Phase 5 and a small area in Phase 1 where final waste grades have been reached.

The landfill development strategy for the remaining operating period is presented on Figures 10.1 A & B and 10.2 and described in more detail in Section 10.1.2.

10.1.2 Development Schedule

The schedule for developing the remaining landfill capacity is driven by the on-going rate of waste receipts for disposal, the need for readily available constructed landfill air space and rate of cell development which, given the sensitive nature of the clay soil to be excavated, placed and compacted, is influenced by weather conditions. Under the revised ECA (April 2009), the life expectancy remaining for the WCC Landfill as of January 1st, 2019 is estimated to be 6.5 years (2026) to 7.9 years (2027) based on future projected annual waste receipts of 344,750 tonnes/yr and a waste density varying from 1.18 to 1.42 tonnes/m^3 (refer to Chapter 5). The actual life of the landfill will vary based on the actual annual fill rate, waste densities achieved, waste diversion and recycling initiatives at the landfill and the rate of air space development.

Other site operations will evolve together with the on-going landfilling operation as follows:

a) Landscaping

- Apply topsoil and provide additional landscaping to completed final cover areas on the south and southeast slopes of Phase 1 as well as planting additional trees in previously completed areas. This will include removing trees previously planted in the Phase 6 area and re-planting them in other areas of the landfill that have been completed.

b) Final Cover Construction

- Complete filling to final grade in Phase 4 and northwest area of Phase 5. Complete final cover construction in completed areas of fill.

c) Surface Water Management

- Re-align surface runoff away from fill areas and cell construction areas.
- Raise grades in the east buffer adjacent to the waste footprint and grade to direct surface runoff away from waste.
- Place cover clay in areas where waste fill final elevations have been reached to direct surface runoff water to collection swales and ditches.

d) Recycling Operations

- "Last Chance Harvest" of recyclable waste will continue in the active face using specialized heavy equipment as per present practice.
- Increase efforts to sort and divert waste from small vehicles at the small vehicle drop-off area and provide incentives to clients to sort materials at source prior to arrival at the site.
- Establish markets for new recyclable materials in efforts to increase the types of materials to be recycled at the site.
- Enhance/research treatment of contaminated soil.
- Construct a working pad in the area of Phase 4 for recycling activities.

e) Landfill Gas Flaring System

- Where required, add additional wells (horizontal and/or vertical) to the landfill gas collection system to control fugitive gas in fill areas and enhance the odour control system.
- Proceed with the acquisition of the permanent abstraction and flaring plant.
- Obtain TSSA approval of the detail engineering design for the permanent flaring system designed by Golder Associates Ltd.

f) East Cell Construction (Phase 6)

- Complete construction of the north and northeast cell slopes in Phase 6 to accommodate additional lifts of waste.
- Construct a clay barrier wall over the culvert at the north and northeast edge of the waste footprint in Phase 6.

10.1.3 Soil Management

The development of the remaining landfill capacity in the area of Phase 6 (east cell expansion) requires filling and compacting approximately 15,300 m^3 of material including side slopes as of the last aerial photo (April 30th, 2019). Soil management practices will include the following:

- Excavation of clay from the Phase 5 area will occur in the second and third quarters of 2020;
- Sediment control measures will be taken so that inactive areas such as soil stockpile side slopes are seeded; silt fences are installed as required around the perimeter of disturbed areas; and surface runoff from the stockpile areas will be channeled to the internal ditch system which will drain to the site's stormwater retention ponds.

10.2 *Proposed Surface Water Control Improvements*

The current surface water management system is described in the "Design and Operations Report - Navan Landfill Site Expansion Approvals" (Golder 2008). The surface water management system operates at the site to maintain the pre-landfill drainage conditions to each watershed; to divert surface water and shallow groundwater flows originating upstream of the site around the landfill; to minimize the amount of surface water that comes into contact with waste; and to maximize the removal of suspended sediment from surface water generated prior to it's release to the downstream watersheds. Water that comes into contact with waste is collected and managed as leachate. For the revision and updating of the D&O plan, the existing surface water system was assessed in regards to the storm flows that can be transmitted and these flows were compared to the requirements of the Landfill Standards. Improvements were proposed where the existing system was deficient relative to the Standards. Further modifications have been proposed in support of the EPA/OWRA application for the landfill expansion. As a result of these assessments, WCC has proceeded with changes to the surface water management system at the site in order to improve the overall system. The proposed changes to the drainage system are described as follows:

- The east diversion ditch has been deemed a fish habitat and its construction included various features to promote and support fish habitat. This work was completed and continues to be maintained.
- A stormwater management pond was constructed in the southeast corner of the site and a ditch discharging surface runoff water to the pond was constructed along the east access road connecting the pond to the north drainage ditch. Ditch and pond maintenance is on-going. In 2019, construction of a HDPE drainage culvert in the existing ditch alignment along the north and northwest edge of the cell was completed. Construction of the clay cut-off wall above the culvert will occur in 2020.
- A stormwater management pond located in the northwest corner of the site was constructed in 2012 to manage runoff water from the west side of the site. Landscaping consisting of the planting of shrubs and trees in this area is on-going. Drainage chutes in the northwest and southwest corners of Phase 3 were constructed in 2015 to control surface runoff water from the

completed surface of Phase 3 and Phase 4. As the access road at the top of Phase 3 and Phase 4 continue to be extended, swales to promote drainage and seeding will also be carried out;

- Efforts will be made on a continuing basis to maximize the diversion of surface runoff from the active working face in order to reduce leachate generation. This will involve the redirection of internal ditching on an as-needed basis to direct runoff water from capped and stabilized areas to the perimeter ditch system.

10.3 *Leachate Management*

All leachate collected in the existing leachate collection system is designed to drain to a collection well and pump station located at the southeast corner of the existing waste footprint near Grids Q & 16. A forcemain connection allowing treated leachate to be pumped directly to the municipal sewage system for conveyance to the city sewage treatment plant has been constructed and an agreement is in place with the City of Ottawa to discharge pre-treated leachate to the City sewer system. The forcemain was commissioned in early 2008 and has since been used successfully. The use of the forcemain to discharge leachate from the site to the City of Ottawa sewer system is anticipated to continue throughout 2020.

Approved modifications to the pre-treatment/pumping system were completed in 2011. These improvements were initiated in advance of the east expansion cell construction to improve the treatment efficiency and capacity of the system and to increase the pump station flow rates as well as reduce maintenance. The system improvements were commissioned in early 2012 and will continue operations throughout 2020. One additional 35 HP pump was purchased in 2019 as backup to the existing pumps to minimize downtime during servicing. No other alterations or modifications are anticipated in 2020.

The "Navan Landfill Leachate Collection and Maintenance System Lateral Expansion Area – Quality Assurance/Quality Control Plan and Specifications" prepared by Golder Associates was submitted and approved by the MECP in 2009. Excavation and construction of the east expansion cell, Phase 1, was completed in 2015 with Phase 6 completed in 2019 and included the construction of the drainage layer and leachate drainage features and the east cell pumping system. This system will continue to be in full operation in 2020 discharging collected leachate from this cell to the leachate treatment system. Completing the upper north and northeast clay slopes of the cell in Phase 6 will occur in 2020.

A vertical manhole, connected to the leachate collection system in the centre of the existing waste footprint (referred to as "the central manhole"), provides an alternative point of access to evacuate leachate from this part of the leachate collection system in the event that the positive drainage to the wet well and pump station cannot be maintained due to sub-grade settlement. This manhole has been raised to an elevation of 101 metres and will require that it be raised with additional MH sections in 2020.

10.4 *Surface Water, Groundwater and Leachate Monitoring*

The proposed 2020 Environmental Monitoring Program is the same as was conducted in 2019, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program. In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in downgradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations or one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in downgradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during November 2018 monitoring session and will be monitored again in the spring of 2020.

The objectives of the 2020 environmental monitoring program are:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

10.5 *Landfill Gas Management*

Construction of an approved landfill gas collection and flaring system to serve as an interim odour control system was completed in 2011. Commissioning of this system was carried out in April 2012. This system captures landfill gas from the existing leachate collection system below the active fill areas of Phases 1, 2, 4 and 5. Vertical wells installed in Phases 1, 3 and 5 along with horizontal wells installed below the final clay cap in Phase 3, the west end of Phases 4 and 5 and in Phase 1 assist with odour control at the site. Expansion of the interim landfill gas system with the construction of four additional wells in the east end of Phase 4 was completed in 2019. In 2020, an odour control misting system will be constructed on the west side of the landfill to mitigate odours from the site.

The landfill gas monitoring program undertaken by Golder Associates in 2019 will be continued in 2020. Monitoring of landfill gas is carried out three times per year at the property boundary and within facilities located on the site. Monitoring of the odour control and flaring system will also be part of this program.

Assessment of air emissions will again be undertaken for the landfill site in accordance with MECP Reg.127/01 and NPRI reporting requirements.

10.6 *Recycling and Small Vehicle Unloading Facility*

Recycling will continue at the WCC Landfill site in 2020. Heavy equipment equipped with a large magnet and grappler is used for the removal of metal and wood from waste received at the active face of the landfill. A small vehicle unloading pad consisting of a raised paved surface with concrete retaining walls has been constructed at the front of the site east of the new site entrance to serve as an area for small vehicles to unload and sort materials. Concrete bunkers for the receipt of small loads of recyclable materials such as clean fill, asphalt, aggregates, and roofing shingles were added just south of the scale house with access from the small vehicle pad to the east. This small vehicle unloading area improves safety at the site by eliminating the need for small vehicles to access the active face. The facility is grade separated such that bins for various types of wastes and recyclables are easily accessible (i.e., with the top of the bins at or near the ground surface in the drop off area). A utility road has been included to provide access to collect or drop off roll-off containers. Small vehicles are required to be weighed on the scales when entering and exiting the site.

Another recycling area is located within the waste footprint along the southern edge of the area identified as Phase 8. This area is used for the storage of processed materials for later removal in bulk and shipment to local markets. White goods containing refrigerants are also stored in this area for refrigerant removal by an on-site technician. Recycling activities in this area consist of tires, drywall, glass, clean shingles, metals and wood. In 2020, it is proposed to construct a pad in the completed Phase 4 area for the grinding of wood, storing of metal and other recyclable materials.

E-waste recycling services are also offered for the benefit of the local community.

The treatment of contaminated soil as part of the recycling initiatives at the site was approved by the MECP in 2015. Contaminated soils will be treated to a level sufficient for an alternative use on-site and/or off-site. The treatment of impacted soils will continue throughout 2020.

These recycling activities will continue throughout 2020 as will efforts to expand on recycling services and finding new markets for recycled materials.

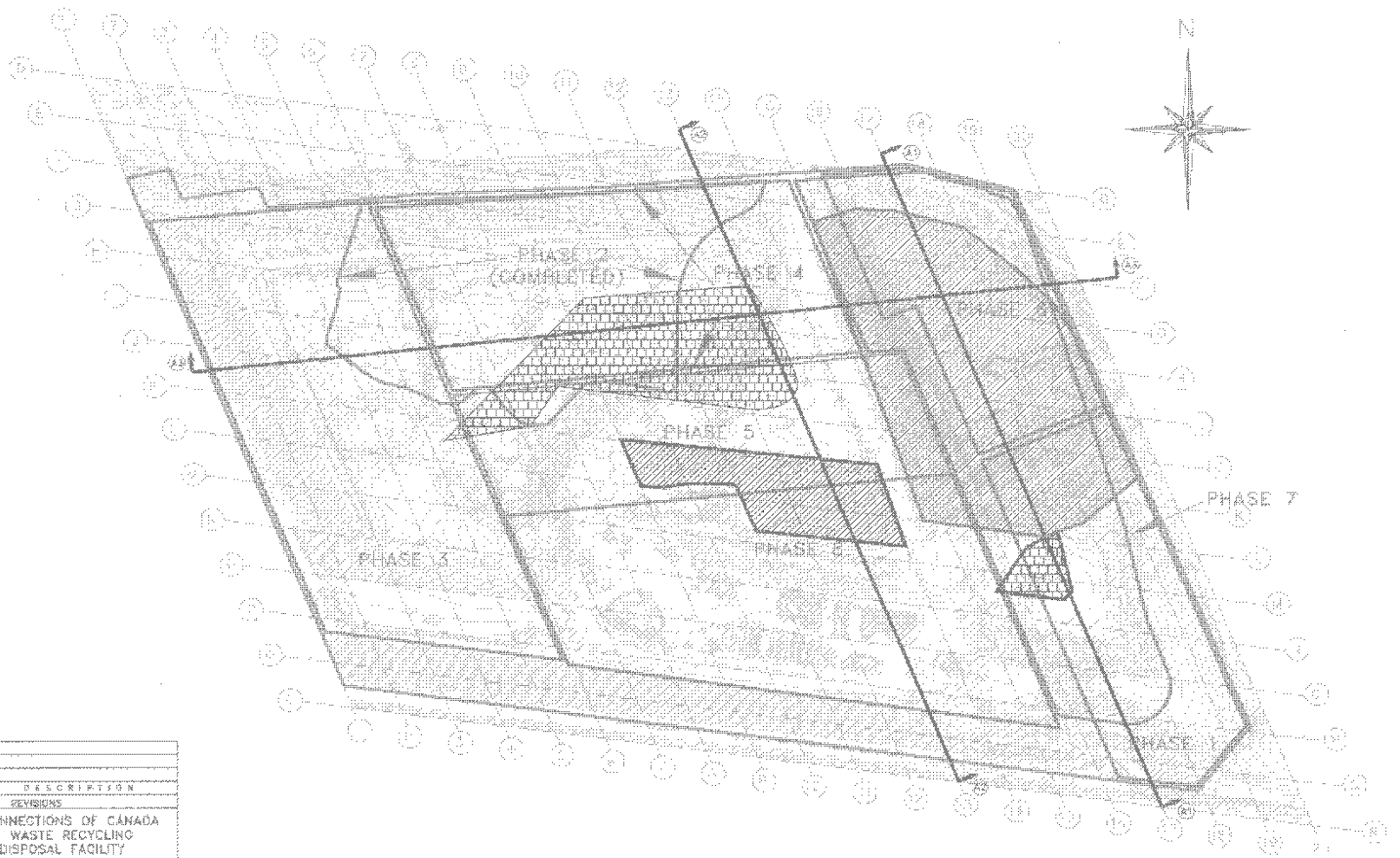
10.7 *Office and Maintenance Facility*

No capital site improvement projects other than adding an odour control misting system on the west side, landscaping and minor site improvements are anticipated for 2020. Landscaping efforts will continue on the north, west, south and southeast facing slopes where cover construction has been completed. Preserving existing vegetation by transplanting trees to the east and north sides of the landfill in addition to adding new trees and shrubs will also continue.

Information presented in this report was provided by Waste Connections of Canada Inc. (WCC) Navan Waste Recycling and Disposal Facility personnel.

This report was prepared for WCC by:

Normand G. Castonguay, M.A.Sc., P. Eng.



WASTE CONNECTIONS CANADA

LEGEND

PROPOSED FILL SEQUENCE (2020)

PROPOSED FILL AREA

PROPOSED CLAY EXCAVATION AREA

PROPOSED CLAY CAPPING AREA

NOTE: [illegible]

GRAPHIC SCALE

0 50 100 150

(IN METRES)

No.	DATE	DESCRIPTION
		REVISIONS

WASTE CONNECTIONS OF CANADA
NAVAN WASTE RECYCLING
AND DISPOSAL FACILITY
3354 NAVAN ROAD
OTTAWA, ONTARIO

PROPOSED FILL SEQUENCE- 2020

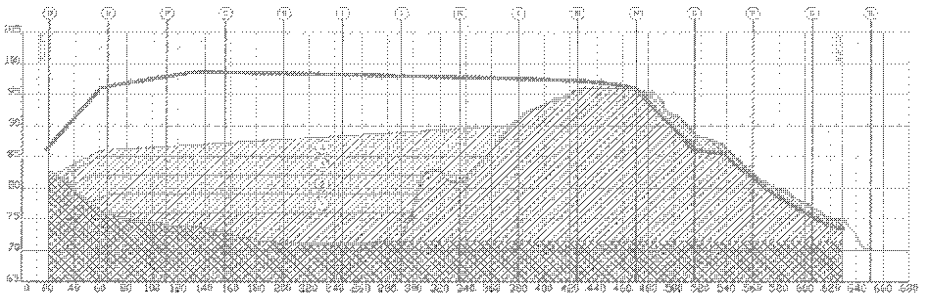
SCALE	AS SHOWN
DRAWN BY	[illegible]
CHECKED BY	[illegible]
DATE	MAY 10 SCALE
FILE NO.	March 2019
DRAWING NO.	WCCNR2019

DRAWING NUMBER

2019-10.1A

000387

SECTION A1–A1



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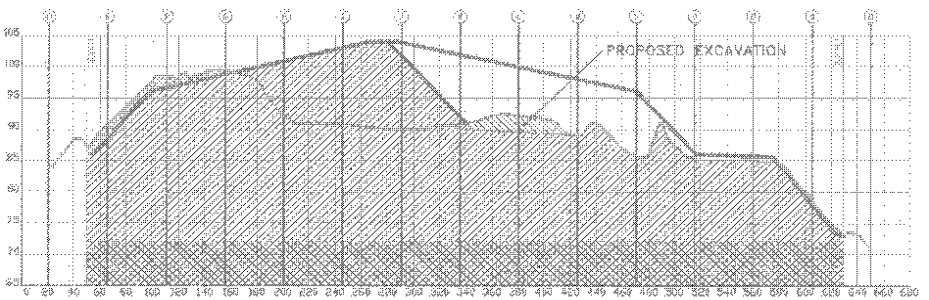
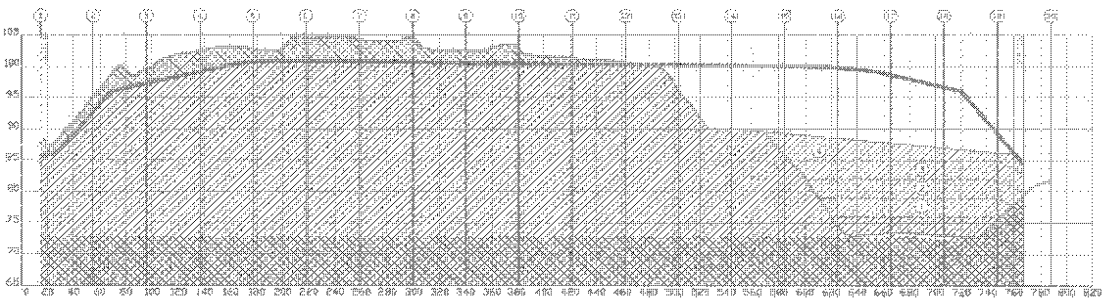


SECTION A3–A3



WASTE CONNECTIONS OF CANADA

LEGEND

PROPOSED FILL SEQUENCE (2019)

- PROPOSED FILL SEQUENCE
- PROPOSED EXCAVATION
- EXISTING WASTE MATERIAL
- CLAY FILL MATERIAL
- NATIVE CLAY MATERIAL
- APPROVED WASTE HEIGHT
- PROPOSED FILL SEQUENCE
- EXISTING GRADE (MAY 1, 2019)

NOTE: GIVE TOPOGRAPHY BY DILLON CONSULTING LTD. DATED APRIL 30, 2019 (3.5 METRE CONTOUR INTERVAL)

GRAPHIC SCALE

0 50 100 150

(IN METRES)

NO.	DATE	DESCRIPTION
		REVISIONS

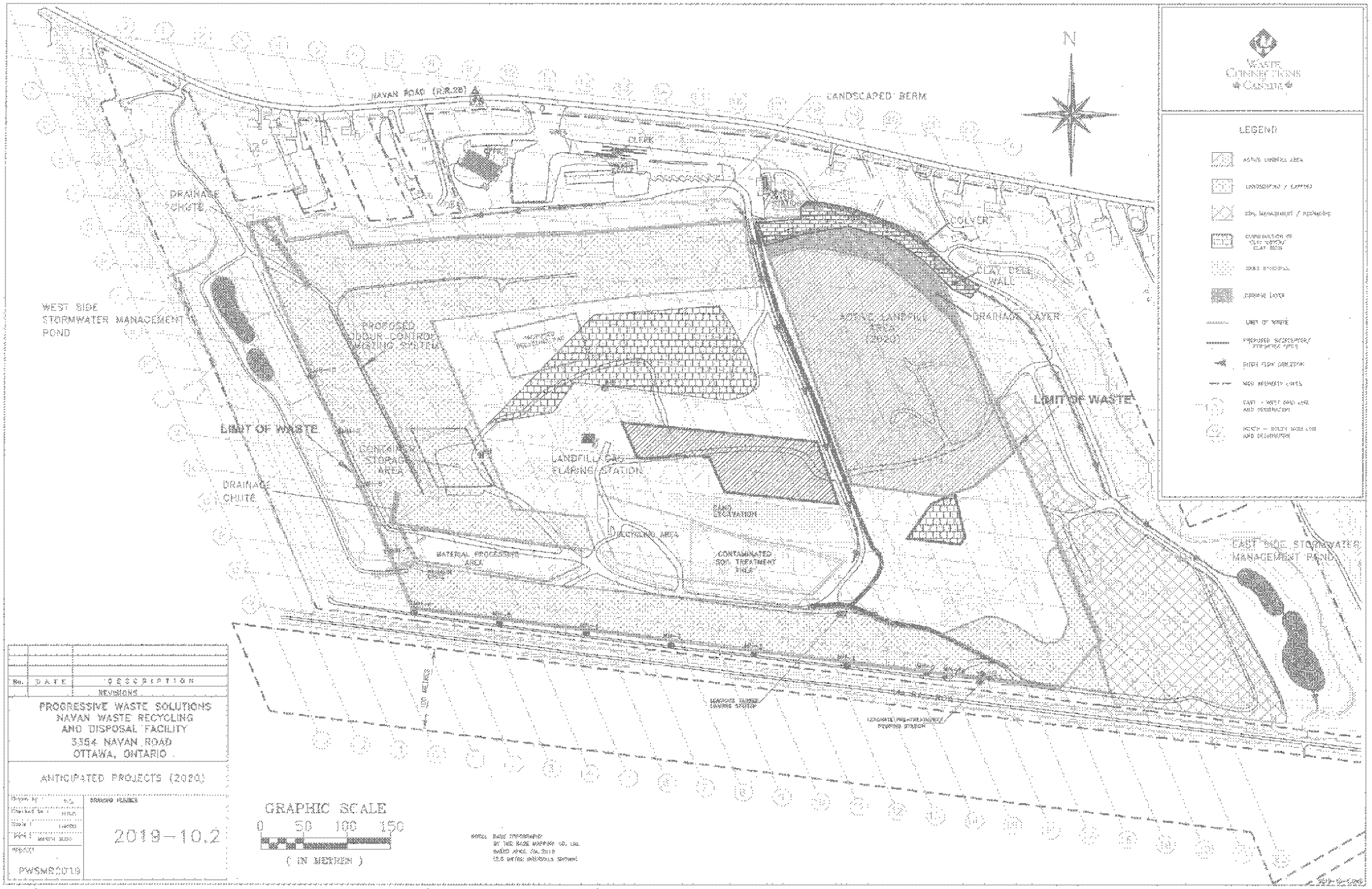
WASTE CONNECTIONS OF CANADA
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD
OTTAWA, ONTARIO

PROPOSED FILL SEQUENCE– 2020
SECTION A1/A2/A3

DRAWN BY: J.C.
CHECKED BY: N.S.C.
SCALE: AS SHOWN
DATE: MAY 2019
PROJECT: WCOCM210-19

DRAWING NUMBER
2019-10.1B

000388


NAVAN ROAD (RR.28)
LANDSCAPED BERM
SITE ENTRANCE
SCALE
DRAINAGE CHUTE
WEST SIDE STORMWATER MANAGEMENT POND
PROPOSED ODOUR CONTROL MISTING SYSTEM
LIMIT OF WASTE
CONTAINER STORAGE AREA
LANDFILL GAS FLARING STATION
DRAINAGE CHUTE
RECYCLING AREA
MATERIAL PROCESSING AREA
CONTAMINATED SOIL TREATMENT AREA
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT FACILITIES STATION
CULVERT
RETAINING WALL
ACTIVE LANDFILL AREA
DRAINAGE LAYER
LIMIT OF WASTE
EAST SIDE STORMWATER MANAGEMENT POND
N
WASTE CONNECTIONS of CANADA
LEGEND
ACTIVE LANDFILL AREA
LANDSCAPED / CAPPED
SOIL MANAGEMENT / RECYCLING
CONSTRUCTION OF FUTURE CAP AREA
ROAD PROFILE
DRAINAGE LAYER
LIMIT OF WASTE
PROPOSED SCREENING (TYPE/HEIGHT VARY)
PITCH FENCE DIRECTION
WIND SPEED/DIRECTION
EAST - WEST GAS LINE AND DESIGNATION
NORTH - SOUTH GAS LINE AND DESIGNATION
No. DATE DESCRIPTION
REVISIONS
PROGRESSIVE WASTE SOLUTIONS
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD
OTTAWA, ONTARIO
ANTICIPATED PROJECTS (2020)
DRAWING NUMBER
2019-10.2
PROJECT
PWSNR2019
GRAPHIC SCALE
0 50 100 150
(IN METRES)
BASE TOPOGRAPHY BY THE BLACK MAPPING CO. LTD. DATED APRIL 5th, 2011 1:2.5 METRE CONTOURS SHOWN
2019-10.2

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Schedule 'A'

Complaints Summary

Schedule 'A'
2019 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	13/01/2019	1 complaint Received an e-mail complaint from a neighbor (AM) about odours @ 11:45 pm	Just got home. Strong smell on all of Wintergreen Drive. Stood outside for 10 mins, odour was consistent, gets stronger as you walk towards landfill. Winds calm, -18 °C, HH with WCC called and visited the complainant the following morning and left him his cell phone number to call at any time. No odours noticed at time of visit.
2	15/05/2019	1 complaint Received an e-mail complaint from a neighbor (VT) about odours @ 7:00 am	Odeur nauséabonde, plus qu'a l'habitude, environ un 7 sur 10 au niveau odeur. Winds from SE, 8 km/hr, 12 °C, HH with WCC stopped by and spoke with the complainant. She mentioned the odour was strong this morning but for the most part no issue. The smell was detected as soon as she opened the door.
3	18/06/2019	1 complaint Received an e-mail complaint from a neighbor (AM) about odours @ 8:45 pm	Absolute horrid smell from landfill on Winterhaven Drive for the last two hours. Backyard and front yard. Had to close all windows upstairs. We have 3 kids. Winds from E, calm km/hr, 8 °C, overcast HH with WCC visited the residence at 4:25 am, no odours with winds still from the east. Spoke with one neighbor who was indoors that evening but did not smell anything that afternoon or evening. Spoke with another neighbor who was out walking his dog the previous evening and did not notice any landfill odours. He has called about odours in the past but lately it has been very good.
4	4/07/2019	1 complaint Received a complaint from a neighbor (CT) about odours @ 6 – 10 pm	Landfill odour 6 – 9 pm Winds from SE/S, 6-8 km/hr, 27 °C, sunny/overcast HH with WCC responded at 10:05 pm and found no odours. Spoke with a neighbor who indicated there were no odours on July 4th and that it has been good the last 1 ½ years. Spoke with another neighbor who indicated there were no odours on July 4th and mentioned sometimes on a hot muggy day there is a slight odour.
5	18/07/2019	1 complaint Received an e-mail complaint from a neighbor (AM) about odours @ 8:20 pm	Strong smell from landfill on Winterhaven Drive for the last 15 minutes. Had to close patio doors and windows. Winds from SE/S, 5 km/hr, 24 °C, rain HH with WCC drove the area at 10:25 pm and following morning and did not notice odours. Spoke with a neighbor who has lived on Winterhaven since 2014 and he has not had any odour issues.. HH responded by e-mail.

6	20/9/2019	1 complaint Received a text complaint from a neighbor (CT) about odours @ 8:11 am	Stinks again this morning – worse. Winds noted from the SW, from the direction of the complainant. JC with WCC responded immediately and visited the area and spoke with the resident and a few other neighbours. Odours usually in early morning. Complainant noticed it more in back yard. House is located adjacent to a storm water discharge ditch which drains a storm water pond to the west. HH drove around area and noticed a slight odour. Spoke with a neighbor who did not have any issues but mentioned that just sometimes she smells odours but not very often.
7	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (TR) about odours @ 1 pm	It been about a week now in the morning and late evening the smell is so bad we cannot open the windows of the house. RM with WCC responded by e-mail.
8	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (KP) about odours @ am	Smell is very strong on Shinleaf. RM with WCC responded by e-mail.
9	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (KL) about odours @ 9:30 am	Odour from the dump. Can't even open windows. RM with WCC responded by e-mail.
10	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (EW) about odours @ 8:00 am	Very strong smell of garbage noted by visitors and all members of household. RM with WCC responded by e-mail
11	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (NP) about odours @ 7:00 am	Very strong odour that I've come to recognize comes from the dump. Winds reported to be from S 6 km/hr, temp 8 °C, overcast HH drove to the location and in the surrounding area around 7:05 pm with same wind direction, no distinct odour found.
12	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (AR) about odours @ 7:00 am	Odor from the dump. RM with WCC responded by e-mail.

13	27/9/2019	1 complaint Received an e-mail complaint from a neighbor (KC) about odours @ 10:00 pm	Could not keep window open smell was awful. HH visited the complainant on the morning of Sept. 28th and responded by e-mail.
14	25/10/2019	1 complaint Received an e-mail complaint from a neighbor (PD) about odours @ 3:00 pm onward	Strong dump smell Request for contact by a WCC representative declined. Winds reported to be from E 12 km/hr, temp 8 °C, sunny HH visited the area on Oct 27th with same wind conditions and did not notice any odours. HH responded with e-mail.
15	27/10/2019	1 complaint Received an e-mail complaint from a neighbor (CL) about odours all day	Terrible odour throughout the area, and all day Winds reported to be from E/SE 20 km/hr, temp 7 °C, HH visited the area that evening at about 8 pm, wind s from the S, no odours. HH responded with e-mail.
16	31/10/2019	1 complaint Received an e-mail complaint from a neighbor (JM) about odours @ 7:00 am	Arounf 7:00 am while going to work, I noticed a bad smell when I stepped out of the door coming from the landfill on Navan Road. Request for contact by a WCC representative declined. Winds reported to be from E 13 km/hr, temp 8 °C, overcast HH drove the neighborhood around 10:30 am, with E winds and noticed no odours.
17	4/11/2019	1 complaint Received an e-mail complaint from a neighbor (DB) about odours @ 8:00 am	and yet again the whole neighborhood smells like a DUMP. Everubody has been complaining for the past few years, and nothing is being done, at least nothing that solves the problem. You ask that they keep filing complaints, but for what? We've been living in the neighborhood for 4 years … it's such a shame. Request for contact by a WCC representative declined. Winds reported to be from SE 7 km/hr, temp -2 °C, rain
18	4/11/2019	1 complaint Received an e-mail complaint from a neighbor (AS) about odours @ 5:40 pm	Request for contact by a WCC representative declined. Winds reported to be from SE 16 km/hr, temp 5 °C, overcast
19	4/11/2019	1 complaint Received an e-mail complaint from a neighbor (JC) about odours @ 7:15 pm	A sewage smell as been noted in the area and it has been frequent. Request for contact by a WCC representative declined. Winds reported to be from SE 7 km/hr, temp -2 °C.
20	4/11/2019	1 complaint Received an e-mail complaint from a neighbor (MO) about odours @ 6:00 pm	Strong odour in the air. Smells from the Waste Connection site have been reaching my property since the spring. I'm disappointed and disgusted. The smell seems to intensify in humid conditions or on day with little wind. Requested contact by a WCC representative. Followed up by e-mail by RM with WCC. Winds reported to be from SE 16 km/hr, temp 4 °C, rain

21	17/11/2019	1 complaint Received an e-mail complaint from a neighbor (LC) about odours @ 11:00 am	Request for contact by a WCC representative declined. R M from WCC drove around the atra at about 4 pm and no odours detected at that time.
	30/10/2019	FOMB Public Meeting	The purpose of the meeting held at le Rendez-vous des ainés francophone d'Ottawa was to hear about any issues and concerns local residents may have regarding the operation and impact of the landfill so that they are being properly understood and effectively communicated The desired outcome was to see if there were any on-going issues affecting a large area of the community that could be addressed. Flyers were sent to over 4,000 homes. Approximately 8 families or 12 people attended. It did not appear that any of those who previously complained attended. A summary of the meeting is attached.
Other			

FOMB Public Meeting
October 30, 2019
Rendez-vous des ainés francophone d'Ottawa
3349 Navan Road, Orleans

Purpose of the public meeting

The FOMB Board welcomed participants and reviewed the purpose of meeting: to hear about any issues and concerns local residents may have regarding the operation and impact of the landfill so that they are being properly understood and effectively communicated.

The desired outcome was to see if there were any ongoing issues affecting a large area of the community that could be addressed.

Public meeting invitations and attendance

Flyers advising people of the meeting were distributed to just over 4,000 homes in the K1W postal code area which covers Bradley Estates, Chapel Hill South and Trails Edge.

Personal invitations were also sent to the e-mail addresses of all those who previously complained via our web site.

Approximately 8 families or 12 people attended the meeting. It doesn't appear that any of those who previously complained attended.

Meeting introduction

The meeting began at 7:00pm with an outlining of the history of the FOMB, some of its past and current activities, and the FOMB's relationship with Waste Connections Canada. This was followed with a presentation of the following information:

Relevant statistics presented at the meeting:
Since 2017 we have received a total of 121 complaints through the FOMB website

- 86 or 71 % of all complaints in 2017
- 20 or 16.53 % of all complaints in 2018
- 15 or 12.4% of all complaints in 2019 (to Oct 28)

Of this total, there were a number of multiple complaints from the same household, but one individual stood out. That person was responsible for 31 or 25.62% of complaints as follows:

- 21 or 24.4% in 2017
- 7 or 35% in 2018
- 3 or 20% in 2019

The majority of the complaints originated in 2017 during the months of November and December with some flowing into Jan 2018. There appears to be a decreasing amount of complaints, at least through the FOMB website.

The majority of the complaints (98.35%) came from the Trails Edge and Bradley Estates areas.

Meeting Discussion

It was emphasized that the FOMB and the community were fortunate to have a conscientious landfill operator willing to communicate and, wherever possible, minimize its impact on the neighborhood. It was pointed out that WCC is an operating landfill and, as well run and managed as any landfill might be, there could be odours and other issues from time to time.

People wishing to talk about attempting to close the landfill were advised that this was not an option. They were informed that the landfill will continue to operate until its current approved capacity is reached, which is estimated to be in 8 to 10 years, at which time it will be closed and caped.

Some meeting attendants said they have noticed occasional odours, but none said there was a daily ongoing issue.

There were two suggestions/observations made at the meeting

1. There is apparently a lot of garbage along the walking trail at the back of the landfill, especially in the spring. A suggestion was to have WCC clean this up as most of the items appear to come from the landfill site.

2. A suggestion about WCC installing a clearly visible sign, perhaps in the Navan/ Blackburn bypass area, providing directions to the landfill. This would serve to warn prospective buyers about the existence of a landfill since the builders apparently do not, as may also be the case for real estate agents. However, concern was expressed that doing so could negatively impact the future sale of homes for current owners.

Conclusions

It is possible that the decreasing number of complaints might be due to people not knowing about the FOMB website. However, our experience indicates residents come to meetings and otherwise participate when there is a serious community problem.

Based on the relatively small attendance or other feedback as a result of the public meeting invitation, it appears residents living in the targeted area and those who previously complained do not presently seem to have major issues with the landfill.

The meeting concluded at 8:00 pm

Schedule 'B'

2019 Tonnage Summary

SCHEDULE "B"

Month	Total Inbound Monthly Tonnage	2019 Outbound and Re-Used Monthly Tonnage													Total Outbound and Re-Used Monthly Tonnage	Total Tonnage Landfilled
		Cardboard	Tires	Glass	Drywall	E-Waste	Shingles	Wood	Metals&WG	Aggregate	Asphalt	Rock/Concrete	Cont Soil (cover/treated)	Clean Fill	Wet Waste	
Jan-19	18,088.40	-	-	(331.08)	-	-	(9.51)	(773.20)	(47.06)	(84.76)	(266.83)	(16.37)	(506.72)	(5.49)	(3.00)	(2,020.02)	16,068.38
Feb-19	18,286.90	-	-	(181.08)	-	-	(5.96)	(308.90)	(39.50)	(111.11)	(48.25)	(60.00)	(4,125.97)	(5.27)	(3.00)	(4,889.04)	13,397.86
Mar-19	24,072.70			(204.62)			(8.21)	(1,564.42)	(42.05)	(120.26)	-	(25.00)	(175.57)	2.28	(3.00)	(2,140.85)	21,931.86
Q1	60,448.00	-	-	(716.78)	-	-	(23.68)	(2,646.52)	(128.61)	(296.13)	(309.08)	(101.37)	(4,810.26)	(8.48)	(9.00)	(9,049.91)	51,398.09
Apr-19	21,723.70	(1.20)	-	(213.89)	-	(1.12)	(137.54)	(86.65)	(40.61)	(162.18)	(20.60)	(1,014.31)	(10,124.94)	(15.04)	(3.00)	(11,821.08)	9,902.62
May-19	38,804.30	(0.91)	-	(398.95)	-	(2.73)	(312.24)	(19.96)	(40.87)	(175.20)	(1,071.71)	(73.88)	(14,299.22)	(149.61)	(3.00)	(16,548.28)	22,256.02
Jun-19	56,260.50	(6.51)	(1.40)	(167.66)	-	-	(304.48)	(290.74)	(43.03)	(200.83)	(3,732.99)	(52.08)	(31,849.67)	(208.93)	(3.00)	(36,861.30)	19,399.20
Q2	116,788.50	(8.62)	(1.40)	(780.50)	-	(3.85)	(754.24)	(397.35)	(124.51)	(538.21)	(4,825.30)	(1,140.27)	(56,273.83)	(373.58)	(9.00)	(65,230.66)	51,557.84
Jul-19	40,287.50	(0.89)	-	(335.50)	-	-	(280.69)	(399.01)	(42.49)	(209.25)	(1,243.74)	(584.89)	(17,401.51)	(111.39)	(4.07)	(20,613.43)	19,674.07
Aug-19	32,764.00	(0.63)	-	(298.51)	-	-	(225.97)	(381.76)	(46.11)	(286.13)	(42.80)	(428.15)	(13,803.13)	(88.66)	(3.00)	(15,584.84)	17,179.16
Sep-19	58,856.00	(0.63)	-	(269.44)	-	-	(293.84)	(2,091.00)	(38.99)	(212.96)	(548.64)	(129.87)	(29,481.08)	(157.11)	(3.00)	(33,226.56)	25,629.44
Q3	131,927.50	(2.15)	-	(903.45)	-	-	(800.50)	(2,871.76)	(127.59)	(688.34)	(1,835.18)	(1,142.91)	(60,685.72)	(357.16)	(10.07)	(69,424.83)	62,502.67
Oct-19	49,194.00	(0.55)	(2.83)	(274.24)	-	(1.62)	(244.42)	(553.65)	(54.63)	(198.48)	(516.45)	(676.00)	(28,804.46)	(97.34)	(3.03)	(31,424.70)	17,769.30
Nov-19	48,102.70	-	-	(311.74)	-	(2.02)	(108.03)	(182.14)	(49.60)	(331.94)	(694.47)	(611.87)	(24,513.33)	(44.67)	(3.00)	(26,852.81)	22,249.89
Dec-19	20,925.10	(0.92)	-	(133.97)	-	-	(17.20)	(715.65)	(28.07)	(221.64)	(137.36)	(4.62)	(2,160.91)	(3.98)	(3.00)	(3,427.32)	17,497.78
Q4	119,221.80	(1.47)	(2.83)	(719.95)	-	(3.64)	(369.65)	(1,451.44)	(132.30)	(750.06)	(1,348.28)	(1,291.49)	(55,478.70)	(145.99)	(9.03)	(61,704.83)	57,516.97
Total:	428,385.80	(12.24)	(4.23)	(3,120.68)	-	(7.49)	(1,948.07)	(7,367.07)	(513.01)	(2,272.74)	(8,317.84)	(3,676.04)	(177,248.51)	(885.21)	(37.10)	(205,410.23)	222,975.57

Schedule 'C'

Brief Site History

Schedule 'C'
BRIEF SITE HISTORY

Landfilling at the Site started in the early 1960s and served, at the time, as a rural dump operation for local residents. In 1971, the Ministry of Environment and Climate Change (MOECC), formerly the MOE, issued a Provisional Certificate of Approval (CofA No. 460702) to Mr. D. J. Huneault for disposal of industrial waste including construction and demolition waste. Currently the site receives all types of solid, non-hazardous waste for disposal excluding putrescible waste. In 1995, the CofA was amended for the operation of waste processing and composting facilities at the site. Composting operations were suspended with the issuance of the CofA amendments in April 2009. In 2016, the CofA, now an Environmental Compliance Approval (ECA) was amended to permit the treatment of contaminated soils.

Annual monitoring of groundwater and surface water was initiated in 1987 and has evolved into a comprehensive monitoring program that is reported to the MOECC on an annual basis. In 1992, a leachate collection system was constructed along the down-gradient toe of the landfill and surface water diversion ditches were constructed up-gradient within the north buffer zone. Leachate was initially collected in retention ponds and re-circulated onto and into the landfill following treatment through a peat filter and constructed wetland system. Transport of leachate by tanker truck to the municipal wastewater treatment plant was initiated in 1997 and used for 11 years. Construction of the existing leachate pre-treatment/pumping station and forcemain connection to the City of Ottawa sanitary sewer system was completed in 2007 and commissioned in early 2008.

In 2001, a landfill gas collection and flaring system was constructed as an interim odour control system. This system was commissioned in April of 2012 and has remained operational since then.

Construction for the last landfill cell was completed in 2019.

A detailed record of milestones in the site's history is presented as follows:

1960s The site was established to serve the local resident population, operating as a rural dump operation.

1971 The first Ministry of Environment (MOE) Provisional Certificate of Approval (CofA No. A460702) was issued to D.J. Huneault and revised in 1980.

1981 Detailed inspections, surveys and water samplings were undertaken. Monitoring wells were installed. Ownership of the site was transferred to Huneault Waste Management (474299 Ontario Ltd.). An application was submitted to update the CofA.

1983 The CofA was re-issued to 474299 Ontario Ltd. for a 100-acre landfill site limited to construction rubble and inert materials.

1984 Following an Ontario Municipal Board hearing, the site was re-zoned to permit landfilling.

1987 An annual monitoring program for groundwater and surface water was initiated.

1989 Four groundwater-monitoring stations were installed along the south property boundary.

1991 A land use agreement was entered into between the City of Gloucester (now City of Ottawa) and 474299 Ontario Ltd. Monitoring of surface water, groundwater and leachate was increased from annual to semi-annual monitoring events.

1992 A leachate collection system was constructed along the down-gradient toe of the landfill. Surface water diversion ditches were constructed up gradient within the north buffer zone. A leachate retention pond was constructed in the southeast corner of the landfill area. The first of two large cells was excavated in the northwest quadrant.

1993 A second leachate retention pond was constructed in the southeast corner of the landfill area. The CofA was re-issued. Waste types were limited to construction and demolition debris, asbestos; non-hazardous solid industrial waste including impacted soil. The second of two large cells was excavated in the northwest quadrant.

1994 The company changed its name from 474299 Ontario Ltd. to Huneault Waste Management Ltd.

1995 Landfilling continued in the west half of the landfill. Landfill gas monitoring was carried out and passive ventilation trenches were constructed. A large peat filter for leachate treatment was constructed east of the leachate retention ponds. The CofA was amended to permit the processing (recycling) and composting of waste materials (leaf and yard waste).

1996 The CofA was amended to allow for the receipt and composting of wet waste. Constructed wetlands were used for on-site treatment of leachate. A compost pad was constructed within the landfill area with recycled asphalt. In the fall, composting of leaf and yard waste as well as composting of mixed organics began.

1997 Due to complaints from neighbouring residents related to odour issues at the Site during the spring and summer, the use of leachate retention ponds and the composting of wet waste were suspended. Leachate was trucked by tanker to the municipal wastewater treatment plant (ROPEC) in compliance with a field order issued by the MOE. Updates to the 1994 Water Management Systems Report were submitted to the MOE for approval and included a design for a long-term leachate pumping station.

1998 Leachate continued to be trucked by tanker to the municipal wastewater treatment plant (ROPEC). The CofA was amended to insure the company submit a revised compost management plan for approval by the MOE prior to receiving mixed organics at the composting site.

1999 In July of 1999, ownership of the landfill changed. Leachate continued to be trucked by tanker to the municipal wastewater treatment plant (ROPEC). The 1994 Water Management Systems Report (1998 Revisions – Leachate Management) and the Huneault Landfill Leachate/Effluent Pumping Station Design prepared by Totten Sims Hubicki Associates Ltd., both dated December 1998, were approved by the MOE and the CofA was amended.

2000 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Construction of a new leachate wet well and pump station was completed. The leachate loading station was relocated to the top of the waste pile near Grid Line P-13 following the construction of the pump station. In September 2000 the corporation changed its name from Huneault Waste Management Ltd. to Waste Services Inc. (WSI).

2001 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). A second scale house was added at the entrance to the site to better serve WSI clients and to improve inbound and outbound traffic control. Active landfilling was being carried out in the southeast quadrant of the Site.

2002 Waste Services Inc. (WSI) was acquired by Capital Environmental Services Inc. (CERI), a publicly traded company. An amendment to the CofA was approved to allow foundry sand, wood chips and contaminated soil to be used as alternative daily cover, to allow recycled asphalt and inert granular materials to be used as road base, and to increase the service area to include the Province of Ontario. A CofA (Air) No. 6141-XKF9 was approved to permit the use of a tub grinder on site. A new scale and scale house were constructed at the entrance to the landfill to ease traffic congestion on Navan Road. Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Active landfilling was being carried out in the southeast quadrant of the Site.

2003 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Ainley Graham and Associates, a municipal engineering firm, completed a preliminary design for a leachate forcemain connection to the City of Ottawa sanitary sewer system. A small parcel of land referred to as the Larivière property and running the length of the Site's east property line was acquired in late 2003.

2004 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). A land exchange agreement was completed with the National Capital Commission giving WSI ownership of a 6.91 hectare parcel of land being a 100 metre strip south of the VIA right of way (ROW) in exchange for an 8.43 hectare parcel south of land owned by WSI (Plan 4R-19707) bringing its total land mass in and around the landfill Site to 69.05 hectares.

2005 Leachate continued to be trucked by tanker to ROPEC. A compliance order was received from the City of Ottawa to pre-treat the leachate and reduce the concentrations of hydrogen sulphide discharged at the wastewater treatment plant. The engineering firm Ainley Graham and Associates completed a Stage 1 Detailed Design for the Leachate Pre-Treatment/Pump Station and Forcemain with connection to the City of Ottawa sanitary sewer system. A small parcel of land referred to as the Robert property, running along the landfill Site's east property line, and a residential property located at 3516 Navan Road were acquired. Golder Associates Ltd. was retained to undertake geotechnical and slope stability analysis for the Site as well as monitoring for landfill gas, groundwater, surface water, leachate and sediment. Golder was also retained to undertake a leachate pre-treatment study. In November, WSI announced to the public that it was undertaking a project to expand the capacity of the landfill and extend its operational life by at least 10 years beyond 2011. The first public Open House was held on December 8, 2005.

2006 In May 2006 the MOE issued an amended CofA No. A460702 consolidating previous Certificates of Approval and associated notices and updating the CofA to the current standards. An updated Design and Operations Report prepared by Gartner Lee Ltd. was adopted. Also in May, a proposed Terms of Reference for the expansion of the landfill in accordance with the Environmental Assessment Act was submitted to the MOE and these were approved in October 2006. Leachate continued to be trucked by tanker to ROPEC. Chemical treatment of leachate to reduce H_2S concentrations began in the spring. An approval for the Leachate Pre-Treatment/Pumping Station and another to install a leachate forcemain within the Navan and Renaud Road allowances were obtained from city council with construction commencing in early December. Additional property to the east of the landfill located at 3326, 3548, 3560 and 3578 Navan Road were acquired by WSI bringing its total land mass in and around the landfill site to 90 ha.

2007 WSI considered and used the results of an environmental assessment (EA) to identify a preferred landfill expansion alternative for the Site thereby extending its operational life. The expansion of the WSI Navan Waste Recycling and Disposal Facility received approval under the Ontario Environmental Assessment Act (EAA) on August 3, 2007. Construction of the leachate forcemain and associated site modifications were completed in August. At the request of the City of Ottawa, modifications to the leachate pre-treatment and sampling system were undertaken with design and construction completed during the later part of 2007.

2008 A revised D&O Report was prepared by Golder Associates Ltd. (January, 2008) to meet the regulatory requirements described in the Landfill Standards (MOE, 1998) and the associated Ontario Regulation 232/98 to address the related Conditions of Approval for the proposed landfill expansion under the EAA. The proposed expansion of the Navan Waste Recycling and Disposal Facility required approval under the Ontario *Environmental Protection Act* (EPA) as well as other legislation. In early 2008, WSI presented submissions to the MOE to satisfy both the conditions of the approved EA and the requirements of the EPA and OWRA. Commissioning of the leachate pre-treatment/pump station was completed in February with leachate being pumped via forcemain to the City of Ottawa sewer system. Construction of new weigh scales, scale house and access roads began in the fall.

2009 Expansion of the Navan Landfill under the Ontario Environmental Protection Act (EPA) received approval with the issuance of the revised CofA No. A460702 (Waste Disposal Site) on April 16, 2009 along with CofA No. 4816-7C7M6C (Industrial Sewage Works) and CofA No. 6733-7BYS9A (Air). CofA No. A460702 was subsequently amended by Notice 1 on October 9th 2009. Significant facility improvements were completed at the entrance to the Site consisting of new scales and scale house, new Site entrance, new office/maintenance facilities, a new small vehicle unloading area and a new wheel wash station. An east diversion ditch c/w fish habitat features was constructed along the east edge of the property and commissioned in the fall following South Nation Conservation Authority approval. A 963 m^2 segment of property bordering Navan Road and west of the new site entrance was severed and transferred to the City of Ottawa for the future widening of Navan Road. Leachate continued to be pre-treated and discharged via forcemain to the City of Ottawa sewer system.

2010 In July, Waste Services Inc (WSI) merged with BFI Canada Inc., a Progressive Waste Solutions company, to become the third largest provider of waste services in North America. This merger had no impacts on the operations of the Navan Waste Recycling and Disposal Facility. Facility improvements continued to be made throughout 2010 and included completing the pavement structure for the main entrance and access to the site, the small vehicle unloading area and office/maintenance facility parking area and fire route. Berm construction and landscaping east of the wheel wash station and west of the site entrance were also completed. The design for modifications to the leachate pre-treatment/pumping station was approved by the MOE and the Certificate of Approval (Industrial Sewage Works) was amended (CofA # 5616-86NKNW). The design for an interim odour control system at the site was approved by the MOE and the Certificate of Approval (Air) was amended (CofA # 3536-8APNZD). Construction of the landfill gas forcemain and flaring system was started in November. Cell development continued in the Phase 2 area of the site with active landfilling being carried out in Phases 3 and 4.

2011 Construction of the landfill gas forcemain and flaring system was completed and awaiting approval by the Technical Standards and Safety Authority (TSSA). Construction of the leachate pre-treatment and pumping station improvements were completed. Monitoring well MW11-1 was installed to replace monitoring well OW92-8. E-waste recycling services were introduced for the benefit of the local community. The east stormwater management pond was completed in the fall. Cell development was completed in the area of Phase 2. Landfill was carried out in Phases 2, 3, and 4.

2012 An interim odour control system comprising of a landfill gas collection and flaring system was commissioned and approval by the Technical Standards and Safety Authority (TSSA) was received in April. The west stormwater management pond and east diversion ditch were completed in the fall. A new access road to the recycling facility and active landfill areas was constructed along the top of the existing waste mound just west of the East Cell expansion area. Landfilling was carried out in the area of Phases 3 and 4.

2013 An interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation. Leachate collection and pre-treatment was continued throughout 2013. A forcemain obstruction causing a cleanout flange failure resulting in a spill along Navan Road was experienced in December. The event was reported to the MOE and the City, the spill was cleaned up and the system repaired and returned to regular operations. Efforts were concentrated in completing the north facing waste slope west of the site access and the west facing waste slope. Landfilling was carried out in the area of Phases 3 and 4. In 2013 BFI partnered with a third party to develop a market for recycled drywall. Other materials recycled and re-used consist of glass, tires, cardboard, e-waste, shingles, wood, metals and white goods, aggregate, asphalt, rock and concrete, clean fill and impacted soils for re-use as cover material.

2014 An interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells. Leachate collection and pre-treatment was continued throughout 2014. Construction of the east expansion cell (Phase 1) drainage system was started in 2014 with completion anticipated in early 2015. Waste placement efforts were concentrated in completing the west facing slope (Phase 3). In 2014 BFI continued to recycle and re-use materials such as glass, tires, cardboard, e-waste, shingles,

wood, metals and white goods, aggregate, asphalt, rock and concrete, clean fill as well as impacted soils re-used as cover material.

2015 In 2015, the company changed its operating name from BFI Canada Inc. to Progressive Waste Solutions Canada Inc. Leachate collection and pre-treatment was continued throughout 2015. Construction of the east expansion cell (Phase 1) and drainage system which was started in 2014 was completed in 2015 and landfilling within the cell began in mid December. Waste placement efforts focused on completing the Phase 3 fill area and the west end of Phases 4 and 5 prior to starting waste placement in the new east cell. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells. In addition to recycling various waste materials, PWS in 2015 received MOECC approval for the treatment of contaminated soils.

2016 Leachate collection and pre-treatment was continued throughout 2016. Waste placement efforts continued in the new east cell (Phase 1). Contaminated soil placement to raise the grades to final elevations continued in the Phase 3 fill area and the west end of Phases 4 and 5. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells at the west end of Phase 5. Recycling and treatment of hydrocarbon impacted soils were on-going operations throughout 2016. Treated soils were used as final cover and to raise the grades in the east buffer adjacent the waste column. Cell construction continued in the north half of the east cell (Phase 6) and consisted of excavation work. A screening plant was added to the processing operations for the screening of oversize materials and rock. Amended Environmental Compliance Approval number 2427-AETKQ5 issued by the MOECC dated November 2016 was received for the construction and operation of an enclosed flare.

2017 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2017. In 2017, two Notices of Violation were issued by the City. One for over strength parameters in the leachate that were later addressed and the second for elevated volatile organic readings in a sampling manhole that was also addressed. Waste placement efforts continued in the east cell (Phase 1). The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of a horizontal collection well in the active fill area and seven permanent vertical wells. Recycling and treatment of hydrocarbon impacted soils were on-going operations throughout 2017. Treated soils were used as final cover and to raise the grades in the east buffer adjacent the waste column. Cell construction continued in the north half of the east cell (Phase 6) and consisted of excavation work. Design of the final and permanent landfill gas flaring system was completed and submitted in December by Golder Associates Ltd. to the Technical Standards and Safety Authority (TSSA) for review and approval. In the spring of 2017, the company changed it's name to Waste Connections of Canada Inc.

2018 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2018. In 2018, one Notice of Violation was issued by the City for a leachate spill along Renaud Road. An obstruction to the discharge pipe inside the sampling manhole located on Renaud Road caused the manhole to fill and overflow onto Renaud Road. The event was reported to the MOE and the City, the spill was cleaned up and the system cleaned out and returned

to regular operations. Waste placement efforts continued in the east cell (Phase 1) and in October resumed in the Phase 4 area of the landfill. Excavation of the north east cell in Phase 6 was continued and construction of the leachate collection and drainage system was substantially completed. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the connection of three vertical wells installed in late 2017. Recycling and treatment of hydrocarbon impacted soils were on-going operations throughout 2018. Treated soils were used as fill to raise the grades in the east buffer adjacent the waste column in the Phase 6 area..

2019 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2019. Construction of a new cell in Phase 6 was completed and an as-built report prepared by Golder Associates Ltd. was submitted to the Ministry of the Environment, Conservation and Parks. Waste placement efforts continued in Phase 1, in the area of Phase 4 and then in the new cell (Phase 6) for the last quarter of the year. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of four permanent vertical wells in the area of Phase 4. Recycling and treatment of hydrocarbon impacted soils were on-going operations throughout 2019. Treated soils were used to raise the grades in the east buffer adjacent the waste column. An existing stormwater ditch along the north edge and the northwest edge of the new cell in Phase 6 was replaced by a large diameter culvert complete with concrete headwalls.

APPENDIX 5

EACMR

1.0 INTRODUCTION

1.1 Background

In August 2007, Waste Services (Canada) Inc. (WSI) now Waste Connections of Canada Inc. (WCC) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Condition 4 of that approval required that WSI (WCC) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WSI's (WCC's) compliance monitoring program. In accordance with Condition 3 of the EA approval, WSI previously submitted a separate document proposing an EA Compliance Monitoring Program.

In October 2008 WSI (WCC) submitted the first Environmental Assessment Compliance Monitoring Report (EACMR), which was intended to fulfill condition 4 of the EA approval conditions. The report addressed the period August 3, 2007 to August 2, 2008. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of the EACMR with submission of the Annual Operations and Monitoring Report which is submitted annually by March 31st. Accordingly, this EACMR is submitted as an Appendix to the Annual Report and covers the period January 1st to Dec. 31st, 2019.

The Ministry's EAAB File # is EA 02 08 02.

1.2 Report Organization

- The EACMR comprises six sections as follows:
- Introduction – provides an overview of the purpose, context of submission and structure of the report as well as the proponent's contact information and an overview of significant activities at the Navan Landfill during the reporting period;
- Physical Works/Mitigation Measures – are presented in Table A, which lists WCC's commitments to make physical improvements to the site and in-design mitigation measures made during the EA and subsequent review, and provides a discussion on WCC's progress in meeting the commitments;
- Studies and Other Commitments – during the EA and review of the EA, WCC made commitments to other studies or activities, such as developing an end use plan and property value protection plan. These and other commitments are listed in Table B and WCC's progress in meeting these requirements is assessed;

- Public Consultation – is presented in Table C, which lists commitments and conditions of approval involving public consultation. A discussion is provided summarizing consultation activities during the reporting period and assessing WCC's fulfillment of these requirements;
- EA Conditions of Approval – the conditions of EA approval contained in the Minister's letter are listed in Table D and WCC's progress in meeting these conditions is described.
- Compliance Status – the final section of the report summarizes the findings in Tables A – D and provides concluding remarks on the overall status of compliance with the EA. Potential non-compliance issues, if any, are discussed in this section.

1.3 Proponent Contact Information

Waste Connections of Canada Inc. (WCC) is a multi-regional, integrated solid waste services company providing collection, transfer, recycling, composting, and disposal services to its customers. WCC is committed to excellence in environmental management and to conducting its business in a manner which protects the environment, health and safety of its employees, customers and communities in which it operates. Waste Connections of Canada Inc. is the owner and operator of the Navan Waste Recycling and Disposal Facility. WCC's contact information is as follows:

Waste Connections of Canada Inc.

3354 Navan Road

Ottawa, ON

K4B 1M9

Attn: Mr. Henri Huneault, Landfill Manager

2.0 PHYSICAL WORKS/MITIGATION MEASURES

There were thirteen (13) commitments made by WSI during the EA and subsequent review process. These commitments relate to installation of physical works and/or implementation of mitigation measures. WSI (WCC) made the majority of the commitments during the EA as documented in the EA Study Report (EASR). Table A provides a listing of the outstanding commitments during the current reporting period. For each commitment a reference is provided regarding the documented source of the commitment, the time frame in which it is expected to be implemented and comments on WCC's progress in fulfilling the commitment such as 'completed', 'in progress', 'ongoing' etc.

WCC has now completed nine (9) of the original thirteen (13) commitments in Table A and the remaining four (4) are ongoing. There are no non-compliance issues.

Table A: EA Compliance Status for Physical Works and Mitigation Measures

Commitments	Where Commitment Made	Implementation Schedule	Status
A-5: WCC will install an active gas management system consistent with the requirements of Ontario Regulation 232/98.	▪ Section 8.3 of the EASR.	Landfill gas/odour control system will begin construction in 2010 and the remainder phased in as the landfill is developed.	**Ongoing** Studies for landfill gas completed in 2009. Approved interim LFG odour control system header pipe and connections abstraction plant and candlestick flare equipment was completed in 2011 and commissioned in early 2012. The operation and expansion of the system as required is on-going. Final Design of permanent enclosed flaring system was completed in 2017 and modified in 2019. In 2019 four vertical landfill gas wells were added and connected to the interim odour control system.
A-6: WSI will undertake best management practices (BMP) for dust control.	▪ Section 8.3 of the EASR.	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and ongoing during operations.	**Ongoing** Best management practices for dust control have been implemented in 2009 and will continue over the operating life of the landfill. A wheel wash system was constructed and commissioned in late 2009 and operated from April to November, 2019 to reduce dirt and mud drag out onto paved roads (internal roads and Navan Road). A Best Management Practices Plan for Fugitive Dust Control was completed by Dillon Consulting dated October 2015 and submitted to the MOECC in accordance with the requirement of an amendment for the treatment of contaminated soils.

Table A: EA Compliance Status for Physical Works and Mitigation Measures

Commitments	Where Commitment Made	Implementation Schedule	Status
A-7: WSI will vegetate side slopes and berms in order for the landfill to blend in as much as possible with the environment. Species native to Site area will be used wherever possible.	▪ Section 9.1 of the EASR	Following receipt of all necessary approvals to allow expansion of the Navan Landfill. Vegetation planting will be ongoing during operations. Details of vegetation planting will be refined during the EPA approval process.	**Ongoing** Approvals have been received. In 2019 vegetation was maintained and preserved where possible. The south, north and west facing waste slopes have been covered with final cover and seeded. Additional tree planting at the top of the landfill as closure progresses is on-going.
Commitments	Where Commitment Made	Implementation Schedule	Status
A-12: Best management practices (BMP) will be used to mitigate dust from activities at the Navan landfill application.	▪ Response to MOE GRT Comments, p. 24 ▪ MOE EA Approval Condition # 10.5	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and ongoing during operations.	**Ongoing** Approvals received

3.0 STUDIES AND OTHER COMMITMENTS

WSI (WCC) agreed to undertake a total of thirty one (31) studies and additional tasks/commitments during the course of the EA and subsequent review. Table B lists the outstanding commitments during the reporting period along with a brief description of their status. Of the thirty one (31) original commitments listed in Table B, WCC has completed all but three (3) with one (1) not yet started, one (1) ongoing and one (1) in progress. Most of the completed commitments relate to providing additional information and detail during the EPA approval process.

There are no issues with non-compliance associated with any of the Table B commitments.

Table B: EA Compliance Status for Studies and Other Communication

Commitments	Where Commitment Made	Implementation Schedule	Status
B-1: WSI will undertake an evaluation of end-use alternatives.	▪ EASR Table 8.3-1, p. 120d	Three years prior to the landfill closure.	**Not yet started** The evaluation of end use alternatives will be undertaken and documented as part of a closure plan to the MOECC as required by Regulation 232/98. Status of the development of the end use plan will be reported in the EACMR section of the annual O&M Report to the MOECC starting three years prior to site closure.
B-3: WSI will continue to pursue further waste diversion programs as appropriate.	▪ EASR p.120e	Schedule is based on economic and technical viability and approvals.	**Ongoing** Treatment of hydrocarbon contaminated soils along with the recycling and re-use of other landfill materials such as glass, wood, metals, roofing shingles, aggregates, tires and other materials was on-going throughout 2019.
B-11: WSI will maintain sufficient financial assurance for proper decommissioning of the site in keeping with MOE requirements, community plans and input from the PAC.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**In Progress** Financial assurance plan is in place and will be maintained throughout the life of the landfill site.

4.0 PUBLIC CONSULTATION

WSI agreed to seven (7) commitments regarding public consultation during the EA, including the formation of a Public Advisory Committee (PAC). The status of these commitments is provided in Table C. All four (4) of the commitments remaining are ongoing.

Table C: EA Compliance Status for Public Consultations

Commitments	Where Commitment Made	Implementation Schedule	Status
C-3: WSI will work with the PAC on an ongoing basis to consider enhanced opportunities to improve re-cycling and diversion at the Navan Road Landfill to work towards the diversion goals articulated by the City of Ottawa and the province.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and completion of the City's study.	**Ongoing** Treatment of hydrocarbon contaminated soils along with the recycling and re-use of other landfill materials such as glass, wood, metals, roofing shingles, aggregates, tires and other materials was on-going throughout 2019. WCC continues to add marketable materials to its recycling efforts.
C-4: WSI will work with the PAC on an ongoing basis to consider other opportunities to reduce odour, dust and road dirt.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**Ongoing** A wheel wash station was constructed and commissioned at the end of 2009. Construction of an interim odour control system was completed in 2011 and commissioned in early 2012. Four vertical landfill gas wells were added to the interim odour control system in 2019. Final design of a permanent landfill gas system was completed in 2017 and modified in 2019.
C-5: WSI is prepared to address new issues arising from the EA or detailed EPA assessment work and will work with the PAC on these issues.	▪ WSI – Friends of Mer Bleue Agreement	As these issues become known.	**Ongoing**

Table C: EA Compliance Status for Public Consultations

Commitments	Where Commitment Made	Implementation Schedule	Status
C-7: WSI will work with the City of Ottawa, the Friends of the Mer Bleue and the PAC to identify and develop community projects to enhance and improve the community and its public spaces.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**Ongoing** An agreement for a funding mechanism by WCC for community projects was included in the Terms of Reference for the PAC. A number of community projects were funded in 2019 by the WCC-PAC fund. Again in 2019, $22,000 in scholarships were awarded to 11 high schools for a qualifying local student pursuing post secondary studies in environmental science.

5.0 EA CONDITIONS OF APPROVAL

In the Notice of Approval to Proceed with the Undertaking, the Minister of the Environment listed forty three (43) conditions grouped into ten (10) categories of which sixteen (16) remain, as listed in Table D. Many of these conditions result from commitments made by WSI (WCC) during the EA review and are listed in Tables A, B or C. For convenience to the reader, cross-references have been provided to the corresponding WSI (WCC) commitment listed in Tables A, B or C. Where no cross-reference is available (i.e., this is a new condition), "not applicable" (n/a) is recorded in Table D. It should be noted that many of the conditions are the same as WSI (WCC) commitments contained in Tables A, B and C.

No non-compliance issues have been identified.

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
1. General Requirements			
1.1 The proponent shall comply with the provisions in the EA which are hereby incorporated in this approval by reference except as provided in these conditions and as provided in any other approval or permit that may be issued for the site.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
1.2 The proponent shall implement any additional commitments made by them and recorded in their response and attachments as noted above, except as provided for in these conditions or as provided for under other approvals, authorizations or permits required for the undertaking.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
1.3 These conditions do not prevent more restrictive conditions being imposed under other statutes.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
2. Public Record			
2.1 Where a document is required for the public record, the proponent shall provide two copies of the document to the Director, one copy for filing within the specific public record file maintained for the undertaking and one copy for staff use.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.2 The proponent shall provide additional copies of such documents at the request of the: • Regional Director; • Clerk of the City of Ottawa; and, • PAC.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.3 The proponent shall quote EAAB file number EA 02 08 02 on the documents.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.4 The proponent may also provide these documents through other means as it considers appropriate.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
3. Compliance Monitoring Program			
3.6 The proponent shall carry out the monitoring program as amended by the Director.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing**
3.7 The proponent shall make the documentation available to the ministry or it's designate upon request in a timely manner when so requested by the ministry during an on-site inspection, audit, or response to a pollution incident report or when information concerning compliance is requested by the ministry.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing**
4. Compliance Reporting			
4.1 The proponent shall prepare an annual compliance report which describes compliance with the conditions of approval set out in this notice and which describes the results of the proponent's EA compliance monitoring program.	n/a	The EACMR is required annually, until all conditions have been met. MOE has agreed for EACMR to be submitted annually April 1 with the Annual O & M Report.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
4.2 The proponent shall issue the first compliance report no later than one year following the date of this approval, and in each subsequent year shall issue a compliance report covering the previous year, on the date that is the anniversary of this approval or the proponent can coordinate the timing of its reporting with its annual Design and Operations report required under the EPA.			**Ongoing**
4.3 The proponent shall submit the annual compliance report to the Director for placement on the public record.			**Ongoing**
4.4 The proponent shall submit annual compliance reports until all conditions of this approval are satisfied.	n/a	Beginning in 2008 and annually during the operation of the landfill until all conditions have been satisfied.	**Ongoing** The first annual EACMR was submitted in 2008 and are provided annually attached to the Operations and Monitoring Report
4.5 When all conditions have been satisfied, the proponent shall indicate in the annual compliance report that this is its final submission.	n/a		**Ongoing**
4.6 The proponent shall retain either on site or in another location approved by the Director, copies of the annual compliance reports for each reporting year and any associated documentation of compliance monitoring activities.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing** In 2008, WSI established a library on site where EACMR and associated documentation is available for viewing by the public.

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
4.7 The proponent shall make the documentation available to the ministry or it's designate upon request in a timely manner when so requested by the ministry during an on-site inspection, audit, or in response to a pollution incident report or when information concerning compliance is requested by the ministry.	n/a		**Ongoing**
5. Public Advisory Committee			
5.4 The proponent may dispense with the PAC if, after a period of time and after giving sufficient notice, there is no interest from the public in continuing with it. The proponent shall review the need for such a PAC yearly.	n/a	Ongoing through operational life of landfill expansion	**Ongoing**
6. Planting Plan			
6.3 The proponent shall make best efforts to protect existing mature trees and vegetation on site that could be used to screen the construction of the landfill berms, where appropriate.			**Ongoing** On-going throughout life of the landfill.

6.0 COMPLIANCE STATUS

WSI (WCC) made a total of 51 commitments during the EA and subsequent review as listed in Tables A, B and C. Eleven (11) commitments remain "ongoing" or "in progress". In other words, about 78% of the original commitments have now been fulfilled and some will remain in ongoing throughout the operating life of the Site.

The Minister listed fourty three (43) conditions in her Notice of Approval to Proceed with the undertaking, which are listed in Table D. Several conditions (13) were derived from WSI commitments made during the EA and subsequent review. Eighteen (18) conditions remain at the end of the reporting period and will remain ongoing throughout the operating life of the landfill. WCC continues to make progress in all of the remaining conditions.

No non-compliance issues were identified during the report period.

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LIST OF ABBREVIATIONS

The abbreviations commonly employed on Records of Boreholes, on figures, and in the text of the report are as follows:

I. SAMPLE TYPE

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO or DP	Seamless open-ended, driven or pushed tube samplers
DS	Denison type sample
FS	Foil sample
RC	Rock core
SC	Soil core
SS	Split spoon sampler
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample
DT	Dual tube sample
DD	Diamond drilling

II. PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg. (140 lb.) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split spoon sampler for a distance of 300 mm (12 in.).

Dynamic Cone Penetration Resistance (DCPT); N_d:

The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) to drive an uncased 50 mm (2 in.) diameter, 60^0 cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH:	Sampler advanced by hydraulic pressure
PM:	Sampler advanced by manual pressure
WH:	Sampler advanced by static weight of hammer
WR:	Sampler advanced by weight of sampler and rod

Cone Penetration Test (CPT):

An electronic cone penetrometer with a 60^0 conical tip and a projected end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and friction along a sleeve are recorded electronically at 25 mm penetration intervals.

III. SOIL DESCRIPTION

(a) Cohesionless Soils

Density Index (Relative Density)	**N** Blows/300 mm Or Blows/ft.
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very dense	over 50

(b) Cohesive Soils

C_u or S_u

Consistency	kPa	Psf
Very soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1,000
Stiff	50 to 100	1,000 to 2,000
Very stiff	100 to 200	2,000 to 4,000
Hard	Over 200	Over 4,000

IV. SOIL TESTS

w	Water content
w_p or PL	Plastic limited
w_1 or LL	Liquid limit
C	Consolidaiton (oedometer) test
CHEM	Chemical analysis (refer to text)
CID	Consolidated isotropically drained triaxial test[1]
CIU	Consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	Relative density
DS	Direct shear test
Gs	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	Organic content test
SO_4	Concentration of water-soluble sulphates
UC	Unconfined compression test
UU	Unconsolidated undrained triaxial test
V	Field vane test (LV-laboratory vane test)
γ	Unit weight

Note: [1] Tests which are anisotropically consolidated prior shear are shown as CAD, CAU.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$ x or log x	logarithm of x to base 10
g	acceleration due to gravity
t	time
FOS	factor of safety
V	volume
W	weight

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta \sigma'$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
ν	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial vertical effective overburden stress
$\sigma_1\sigma_2\sigma_3$	principal stresses (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3) / 3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) formerly (G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_1 or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity Index = $(w_1 - w_p)$
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_c	consistency index = $(w_1 - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (overconsolidated range)
C_s	swelling index
C_α	coefficient of secondary consolidation
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	overconsolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p or τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c'	effective cohesion
c_u or s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3) / 2$
p'	mean effective stress $(\sigma'_1 + \sigma'_3) / 2$
q	$(\sigma_1 - \sigma_3) / 2$ or $(\sigma'_1 - \sigma'_3) / 2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes:
[1] $\tau = c' + \sigma' \tan \phi'$
[2] shear strength = (compressive strength) / 2

PROJECT: 11-1125-0017

RECORD OF BOREHOLE: BH11-1

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 30, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp W Wl) (20 40 60 80)	ADDITIONAL LAB TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE											
0	Power Auger 200 mm Diam. (Hollow Stem)	Very loose to loose grey brown silty fine sand and silty clay (FILL)		0.00	1	50 DO	1						Bentonite Seal
1					2	50 DO	WH						Native Backfill
2					3	50 DO	4						
3					4	50 DO	5						
3		Grey brown silty clay, some sand (FILL)		3.51									
4		Loose brown SILTY fine SAND, trace gravel, clay and organic matter		3.66	5	50 DO	7						
5					6	50 DO	7						
5		Stiff red brown SILTY CLAY, trace sand (Weathered Crust)		5.18	7	50 DO	8						Bentonite Seal
6		Very soft grey SILTY CLAY		5.94	8	50 DO	1						
7					9	50 DO	PM						
7					10	50 DO	PM						Silica Sand
8					11	50 DO	PM						
9					12	50 DO	PM						50 mm Diam. PVC #10 Slot Screen
10		End of Borehole		10.67									
11													
12													
13													
14													
15													

DEPTH SCALE

1 : 75

LOGGED: DG

CHECKED: LEB

Golder Associates

000430

MIS-BHS 001 1111250017-01.GPJ GAL-MIS.GDT 12/23/11 P.G

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1A

SHEET 1 OF 2

LOCATION: N ;E

BORING DATE: 02/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		69.76				SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	WATER CONTENT PERCENT Wp ⊢ W ⊣ Wl (20 40 60 80)		
		Black SANDY SILT with organic matter		0.00							Protective casing
				69.23							
1		Loose brown fine SANDY SILT		0.53	1	SS DO	6				Bentonite Seal
				67.77							
		Stiff grey brown SILTY CLAY (Weathered Crust)		1.99	2	SS DO	4				
2					3	SS DO	WH				
				66.17							
		Grey SILTY CLAY		3.59	4	SS DO	WH				
3											
4					5	SS DO	PM				
				60.86							
5		Grey SILTY CLAY, trace of black organic matter		4.89							
6					6	SS DO	PM				
					7	SS DO	PM				
				60.84							
8		Grey SILTY CLAY, occasional rust brown layers, traces black organic matter		7.89							Native Backfill
9					8	SS DO	PM				
10				58.40							
		Grey SILTY CLAY, trace black organic matter		10.38	9	SS DO	PM				
11											
12					10	SS DO	PM				
13											
14					11	SS DO	PM				
15		CONTINUED NEXT PAGE									

Power Auger
203mm Diam. (Hollow Stem)

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.G.
CHECKED: MKF

000431

MIS-BHS 001 09112525G8-2500.GPJ GAL-MIS.GDT 3/8/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1A

SHEET 2 OF 2

LOCATION: N ;E

BORING DATE: 02/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		— CONTINUED FROM PREVIOUS PAGE —						SHEAR STRENGTH Cu, kPa (nat V. + ● rem V. ⊕ U - ○) (20 40 60 80)	WATER CONTENT PERCENT Wp W Wl (20 40 60 80)		
16	Power Auger 200mm Diam. (Hollow Stem)	Grey SILTY CLAY, trace black organic matter			12	SS DO	PM				Notfrez Backfill
17					13	SS DO	PM				
18		Grey SILTY CLAY		50.78 17.98	14	SS DO	WH				
19											Bentonite Seal
20		Very dense grey SANDY SILT, some gravel and clay (GLACIAL TILL)		49.00 19.76	15	SS DO	>50				Silica Sand
21		End of Borehole		47.65 21.11		SS DO	>50				32mm diam. PVC #10 slot screen
22											Well Screen frozen to Elev. 68.67 m on Feb 8, 2010
23											
24											
25											
26											
27											
28											
29											
30											

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.G.
CHECKED: MKF

000432

GS-BHS 001 09112500XX-2009.GPJ GAL-MIS.GDT 9/4/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1B&C

SHEET 1 OF 1

LOCATION: N ;E

BORING DATE: 04/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + Q - ● rem V. ⊕ U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7})	WATER CONTENT PERCENT (20 40 60 80) Wp W Wl	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam. (Nominal Size)	GROUND SURFACE		68.72									
		For subsurface stratigraphy refer to record of borehole 09-B2A		0.00									Protective Casing
1													Bentonite Seal
2													Native Backfill
3													Silica Sand
4													32mm diam. PVC #10 slot screen C
5													Silica Sand Bentonite Seal
6													Native Backfill and Bentonite
7													Bentonite Seal
8													Silica Sand
9													32mm diam. PVC #10 slot screen B
10		End of Borehole		58.61 10.00									W.L. in Screen B at Elev. 67.43 m W.L. in Screen C at Elev. 67.57 m on Feb. 8, 2010
11													
12													
13													
14													
15													

DEPTH SCALE

1 : 75

Golder Associates

LOGGED: D.G.

CHECKED: WKF

000433

M16-2-15 001 GN-1125-0008-2003 GPJ GAL-MIS GDT 3/9/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1D

SHEET 1 OF 1

LOCATION: N ;E

BORING DATE: 08/02/2010

DATUM: Geodetic

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		69.58									
0	Hand Auger Open Hole	PEAT		0.00	1	50 DO	WH						Bentonite Seal
1					2	50 DO	1						Silica Sand Backfill; 32mm Dia. PVC # 10 Slot Screen
2				67.60	3	50 DO	WH						
		End of Borehole		1.98									Well Installed Elev. 68.40 m Feb. 8, 2010
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

DEPTH SCALE

1 : 75

LOGGED: J.D.

CHECKED: MKC

Golder Associates

000434

MIS-BHS 001 09112500S-2000.GPJ GAL-MIS.GDT 3/9/10

PROJECT: 07-1122-0203-200

RECORD OF BOREHOLE: BH07-1

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: August 27, 2007

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q -, U -) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}); WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		32.34							
		TOPSOIL (FILL)		32.19							Protective Casing
		Brown SANDY SILTY some gravel trace brick (FILL)		31.95							Bentonite Seal
		Brown SILTY SAND, trace topsoil (FILL)		31.75	1	50 DO	8				Silica Sand
				0.79							
				30.46	2	50 DO	3				50mm Diam. PVC #10 Slot Screen D
		Dark grey brown SILTY SAND, trace topsoil (FILL)		1.83							
		Stiff grey brown SILTY CLAY (Weathered Crust)		29.84 2.50	3	50 DO	WH				
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter			4	50 DO	WH				Bentonite Seal
					5	50 DO	PH				38mm Diam. PVC #10 Slot Screen C
					6	50 DO	PH				Native Backfill
					7	50 DO	PH				Bentonite Seal
											Silica Sand
		Grey SILTY CLAY, trace black organic matter		23.61 8.57	8	50 DO	PH				38mm Diam. PVC #10 Slot Screen B
					9	50 DO	PH				
		Grey SILTY CLAY, trace to some black organic matter		20.56 11.58	10	50 DO	PH				
					11	50 DO	PH				Native Backfill
					12	50 DO	PH				
					13	50 DO	PH				
					14	50 DO	PH				
					15		PH				

Barrel Hydr. 105mm Diam. (Nuflow 89mm)

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: D.J.S

CHECKED: P.L.E

000435

M:\Jobs\2007\07-1122-0203-200\EPT\BLOGS\GINT\07-1122-0203-200 EPT BLOGS.GPJ 8/19/07

PROJECT: 07-1122-0203-200

RECORD OF BOREHOLE: BH07-1

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: August 27, 2007

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7})	WATER CONTENT PERCENT (Wp — W — Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Power Auger 200mm diam. (Hollow Stem)	— CONTINUED FROM PREVIOUS PAGE —											
		Grey SILTY CLAY, trace to some black organic matter			15	SS DO	PM						Native Backfill
		Grey SILTY CLAY, occasional clayey silt seam		20.70									
22		Compact dark grey SANDY SILT, some gravel and clay, occasional cobbles (GLACIAL TILL)		21.73	16	SS DO	HAM						Bentonite Seal
					17	SS DO	13						Silica Sand
24		End of Borehole Auger Refusal		23.90									38mm Diam. PVC #10 Slot Screen
26													
28													
30													
32													
34													
36													
38													
40													

Note: monitoring well screens A and B are each installed in their own boreholes and monitoring well screens C and D are installed in one borehole.

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: O.J.S.

CHECKED: P.L.E.

000436

GTA-S-GEO 07-1122-0203-200 GPJ GLOB_CAN.GDT 9/19/07

PROJECT: 05-1120-732-303

RECORD OF BOREHOLE: 05-11

SHEET 1 OF 1

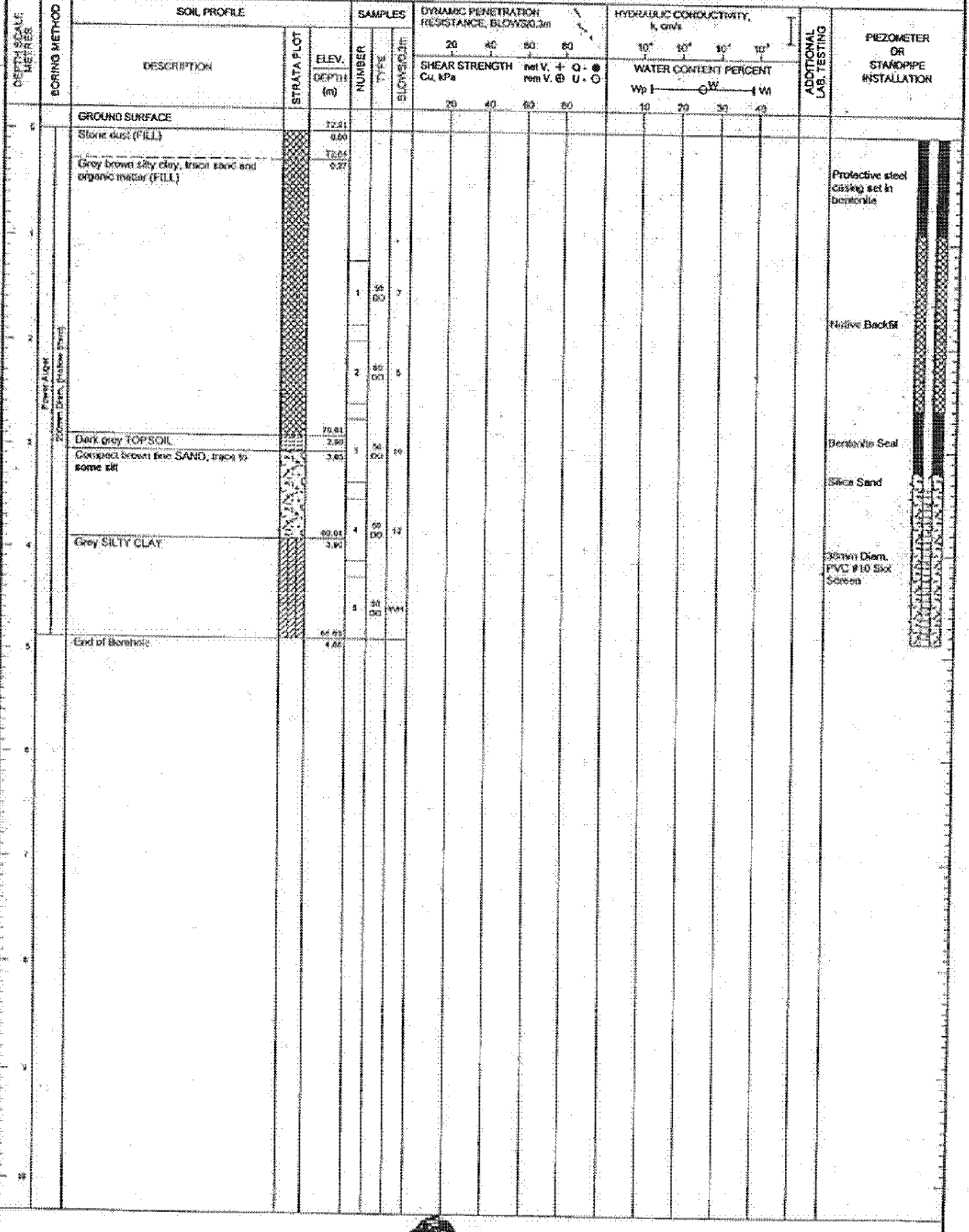
LOCATION: See Site Plan

BORING DATE: Aug. 17, 2005

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm



DEPTH SCALE

1 : 50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

000437

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/2/06

PROJECT: 05-1120-732-303

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-8

BORING DATE: Aug. 17, 2005

SHEET 1 OF 1

DATUM:

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-3} 10^{-2} 10^{-1})	WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		73.16 / 0.00									
		Stone dust (FILL)		72.86 / 0.30									
		Asphalt and gravel (FILL)											Protective steel casing set in bentonite
1		Dark brown and grey brown silty clay and sandy silt, trace organic matter (FILL)		71.94 / 1.22	1	50 DO	7						
2	Power Auger 200mm Diam. (Hollow Stem)	Brown sand with plastic and metal (FILL)		71.00 / 2.07	2	60 DO	27						Native Backfill
		TOPSOIL		69.96 / 3.20	3	50 DO	19						Bentonite Seal
4		Compact brown fine SAND, trace to some silt		3.35	4	50 DO	16						Silica Sand
		Grey SILTY CLAY		68.83 / 4.33	5	50 DO	1						38mm Diam. PVC #10 Slot Screen
5		End of Borehole		68.13 / 5.03									
6													
8													
10													

DEPTH SCALE

1:50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.J.E.

000438

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/2/06

PROJECT: 05-1120-732-303

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-R3

BORING DATE: Aug. 18, 2005

SHEET 1 OF 1

DATUM:

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10⁻⁴ 10⁻⁵ 10⁻⁶ 10⁻⁷) / WATER CONTENT PERCENT Wp — W — Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		72.93							
		Grey stone dust (FILL)		0.00							Protective steel casing set in bentonite
		Brown sandy silt; some gravel (FILL)		72.50 / 0.43							
		Grey brown silty clay, trace sand, organic matter and gravel (FILL)		72.08 / 0.85	1	SS DO	8				Native Backfill
					2	SS DO	9				
		Grey brown and red brown SILTY CLAY (Weathered Crust)		69.88 / 3.05	3	SS DO	6				Bentonite Seal
					4	SS DO	7				Silica Sand
		Grey SILTY CLAY		68.60 / 4.33	5	SS DO	WH				38mm Diam. PVC #10 Slot Screen
		End of Borehole		67.75 / 5.18							

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/5/08

000439

PROJECT: 04-1120-143-3000

RECORD OF BOREHOLE: 05-4

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 16, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		85.00							
0	Power Auger 200mm Diam. (Hollow Stem)	Brown stratified fine SAND, some silt		0.00							
				84.45							
		Grey brown SILTY CLAY (Weathered Crust)		0.55							
1				83.93	1	50 DO	WH	+			
		Soft to stiff grey SILTY CLAY		1.07							
					2	50 DO	WH	+			
2				82.87							
		End of Borehole		2.13							
3	Nilcon Vane							+			
4								+			
5								+			
6								+			
7								+			
8								+			
9								+			
10								+			
11								+			
12								+			
13								+			
14								+			
15		CONTINUED NEXT PAGE									

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 06-1122-273.GPJ GLDR_CAN.GDT 1/17/07

PROJECT: 04-1120-143-3000

RECORD OF BOREHOLE: 05-4

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 16, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + Q - ● rem V. ⊕ U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-5} 10^{-6} 10^{-4} 10^{-3})	WATER CONTENT PERCENT Wp W Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
15		— CONTINUED FROM PREVIOUS PAGE —											
16									+				
17									+				
18	Nilson Vane								+				
19									+				
20									+				
21									+				
22									+				
23													
24													
25													
26													
27													
28													
29													
30													

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 06-1122-273.GPJ GLDR_CAN.GDT 1/17/07

000441

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-3

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 8, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		69.85							
0	Power Auger 200mm Diam. (Hollow Stem)	Grey and grey brown silty clay (FILL)		0.00							
		Firm to stiff grey brown SILTY CLAY (Weathered Crust)		69.39 0.46							
		Grey SILTY CLAY, occasional red brown layer, trace organic matter		68.78 1.07	1	50 DO	2				Bentonite Seal
2					2	50 DO	WH				Silica Sand
					3	50 DO	PH				38mm Diam. PVC #10 Slot Screen D
					4	50 DO	WH				Bentonite Seal
4					5	50 DO	WH				Silica Sand
											38mm Diam. PVC #10 Slot Screen C
6					6	50 DO	PH				Native Backfill
8					7	50 DO	PM				Bentonite Seal
					8	50 DO	PM				Silica Sand
10					9	50 DO	PM				38mm Diam. PVC #10 Slot Screen B
											Silica Sand
		Grey SILTY CLAY, trace black organic matter		58.27 11.58							
12					10	50 DO	PH				
14					11	50 DO	PM				Native Backfill
					12	50 DO	PM				
16					13	50 DO	PM				
18		Grey SILTY CLAY		51.87 17.98							
					14	50 DO	PM				
		Grey layered SILTY CLAY and CLAYEY SILT		50.65 19.20							Bentonite Seal
20					15		26				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-3

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 8, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		— CONTINUED FROM PREVIOUS PAGE —						SHEAR STRENGTH Cu, kPa: nat V. + Q- ● rem V. ⊕ U- ○ (20 40 60 80)	WATER CONTENT PERCENT: Wp W Wl (10 20 30 40)		
20	Power Auger 200mm Diam. (Hollow Stem)	Very loose to compact grey to dark grey SANDY SILT, some gravel, trace clay (GLACIAL TILL)		48.78 20.12	15	50 DO	26				Silica Sand
22					16	50 DO	3				38mm Diam. PVC #10 Slot Screen A
		End of Borehole Auger Refusal		47.39 22.46							
24											
26											
28											
30											
32											
34											
36											
38											
40											

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-2

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 10, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam. (Hollow Stem)	GROUND SURFACE		80.08							
		Brown fine SAND, some silt		0.00							Protective casing set in bentonite Bentonite Seal
				79.50							
		Very stiff to stiff grey brown SILTY CLAY, occasional red brown layer, fine sand and silt seam (Weathered Crust)		0.58	1	50 DO	12				
2					2	50 DO	6				Native Backfill
					3	50 DO	6				Bentonite Seal
					4	50 DO	5				Silica Sand
4					5	50 DO	5				38mm Diam. PVC #10 Slot Screen D
					6	50 DO	2				
				74.84							
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter		5.24	7	50 DO	WH				Bentonite Seal
6					8	50 DO	PH				
											Native Backfill
8					9	50 DO	WH				
											Bentonite Seal
					10	50 DO	PH				Silica Sand
10											38mm Diam. PVC #10 Slot Screen C
					11	50 DO	PM				
12					12	50 DO	PM				
14					13	50 DO	PM				Native Backfill
					14	50 DO	WR				
16					15	50 DO	WR				
											Bentonite Seal
18											Silica Sand
					16	50 DO	PH				
											38mm Diam. PVC #10 Slot Screen B
20					17		WR				

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-2

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 10, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20		*--- CONTINUED FROM PREVIOUS PAGE ---*									
	Power Auger 200mm Diam. (Hollow Stem)	Grey SILTY CLAY, occasional red brown layer, trace black organic matter			17	50 DO	WR				
22					18	50 DO	WR				
		Grey SILTY CLAY, slight trace black organic matter		57.52 22.56	19	50 DO	WR				Native Backfill
24					20	50 DO	WR				
26					21	50 DO	WR				Bentonite Seal
		Grey layered SILTY CLAY and CLAYEY SILT		52.60 27.58	22	50 DO	WR				Silica Sand
28		Compact to dense grey to dark grey SANDY SILT, some gravel and clay with cobbles (GLACIAL TILL)		27.89							
				50.58	23	50 DO	41				38mm Diam. PVC #10 Slot Screen A
		Probably weathered SHALE BEDROCK		29.50							
30		End of Borehole Auger Refusal		29.72							
32											
34											
36											
38											
40											

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-1

BORING DATE: Aug. 2, 2005

SHEET 1 OF 2

DATUM: Geodetic

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam. (Hollow Stem)	GROUND SURFACE		85.53							
		Grey crushed stone (FILL)		0.12							Protective casing
		Compact brown stratified fine SAND, trace silt			1	50 DO	15				Silica Sand
				84.01							38mm Diam. PVC #10 Slot Screen D
2		Grey SILTY CLAY, occasional red brown layer with depth		1.52	2	50 DO	WH				Native Backfill
											Bentonite Seal
					3	50 DO	PM				Silica Sand
4											38mm Diam. PVC #10 Slot Screen C
					4	50 DO	PH				
6					5	50 DO	PM				Native Backfill
8					6	50 DO	PM				Bentonite Seal
					7	50 DO	PM				Silica Sand
10											38mm Diam. PVC #10 Slot Screen B
					8	50 DO	PH				
12		Grey SILTY CLAY, occasional red brown layer, scattered trace black organic matter		73.95 11.58	9	50 DO	PM				Native Backfill
14					10	50 DO	PM				
16					11	50 DO	PM				Bentonite Seal
					12	50 DO	WR				
18					13	50 DO	PM				Native Backfill
20		CONTINUED NEXT PAGE			14		WR				

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MiS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 10/19/06

000446

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-1

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 2, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20		— CONTINUED FROM PREVIOUS PAGE —									
	Power Auger 200mm Diam. (Hollow Stem)	Grey SILTY CLAY, occasional red brown layer, scattered trace black organic matter			14	50 DO	WR				
22					15	50 DO	WR				
		Grey SILTY CLAY, occasional red brown layer, trace to some black organic matter		62.97 22.56							
					16	50 DO	WR				
24					17	50 DO	PM				
26					18	50 DO	WR				Native Backfill
					19	50 DO	WR				
28					20	50 DO	WR				
30					21	50 DO	WR				
32					22	50 DO	WR				
		Layered SILTY CLAY and CLAYEY SILT		52.29 33.24							Bentonite Seal
											Silica Sand
34		Grey CLAYEY SILT, some gravel		51.53 34.14	23	50 DO	WR				
		Compact to dense dark grey SANDY SILT, some gravel and clay (GLACIAL TILL)									38mm Diam. PVC #10 Slot Screen A
				50.33 35.20	24	50 DO	>100				
		End of Borehole Auger Refusal									
36											
38											
40											

DEPTH SCALE

1 : 100

Golder Associates

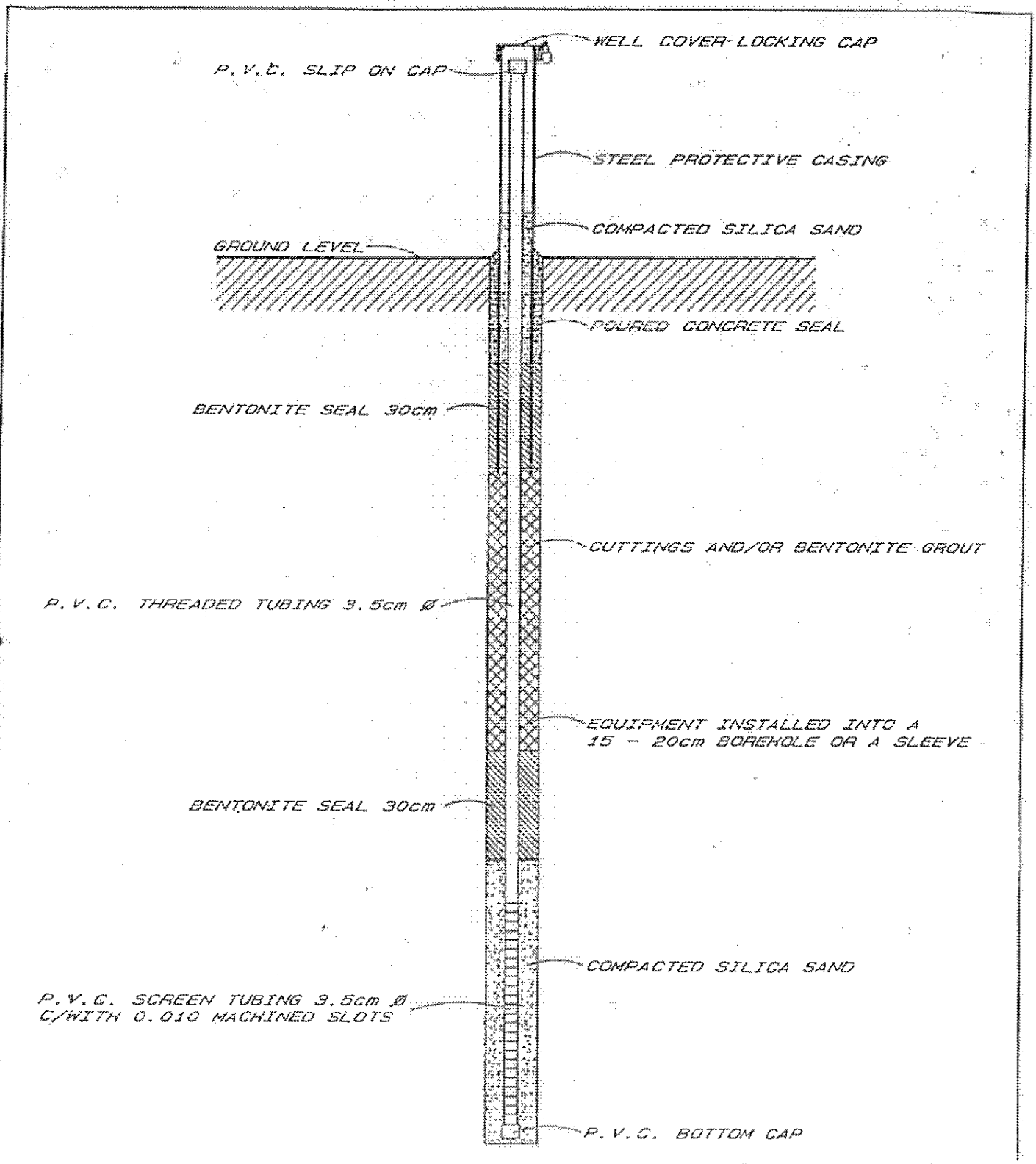
LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 10/19/06

TYPICAL MONITORING WELL INSTALLATION

INSTALLATION TYPIQUE D'UN PUIT D'OBSERVATION



000448

PROJECT NO. WSI006

BOREHOLE NO. MW-4 (MW-4)

PROJECT HUNEAULT LANDFILL

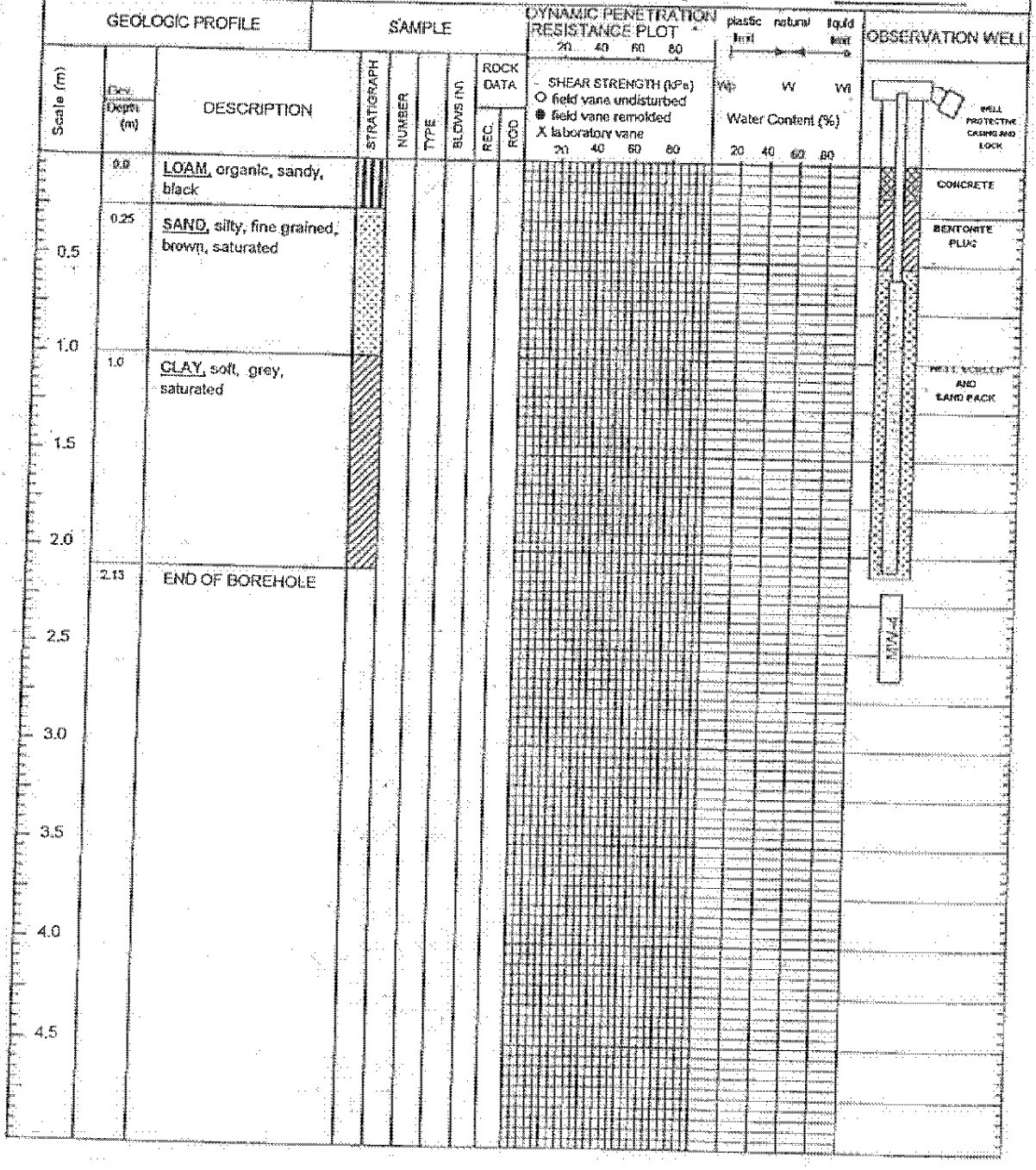
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM Arbitrary BOREHOLE TYPE HAND AUGER

DRILLING DATE 19-May-00

REPORT DATE Sep-00

COMPILED BY N.C.



PROJECT NO. WSI006

BOREHOLE NO. MW-5 (MW-E)

PROJECT HUNEAULT LANDFILL

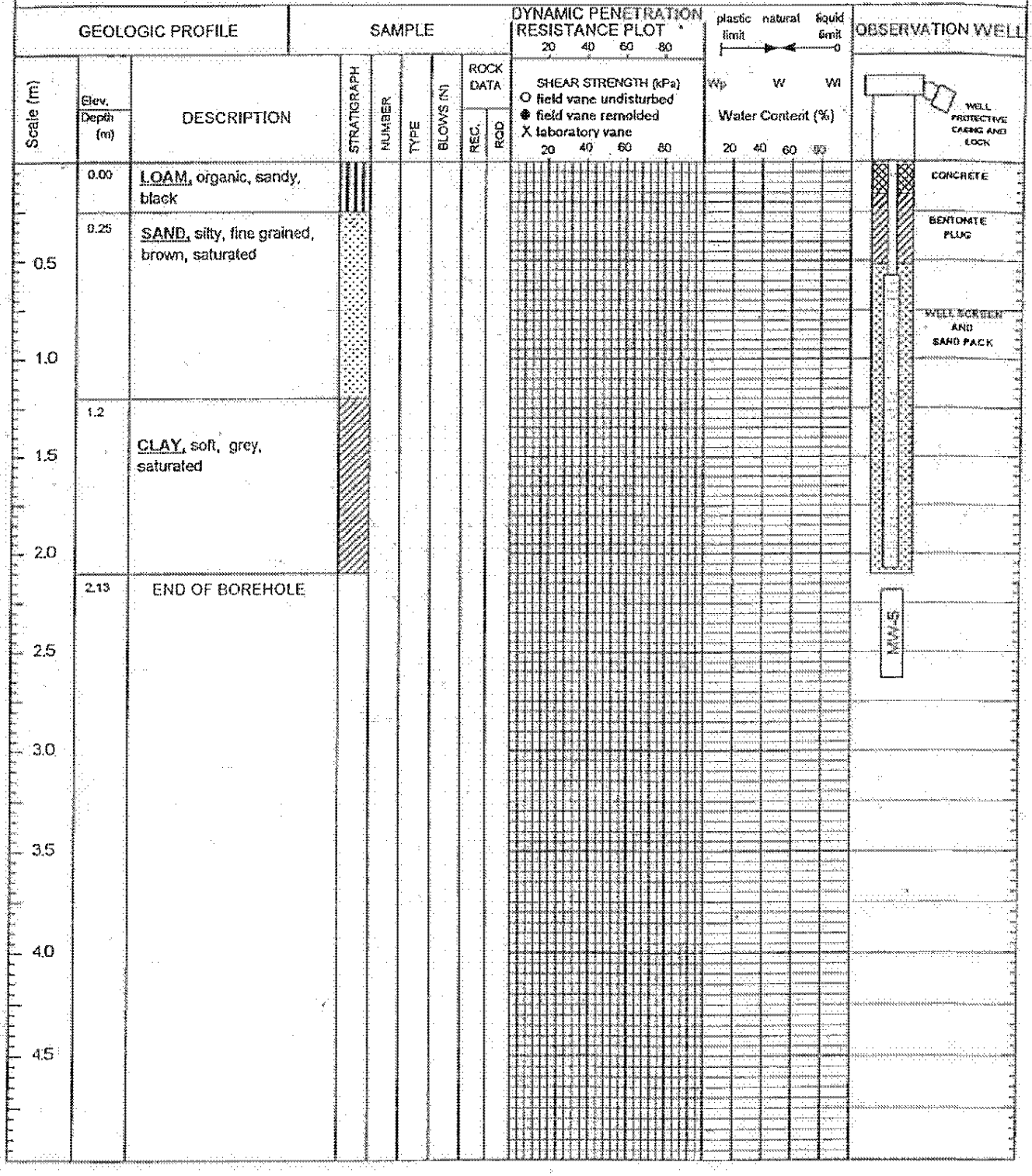
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM Arbitrary BOREHOLE TYPE HAND AUGER

DRILLING DATE 19-May-00

REPORT DATE Sep-00

COMPILED BY N.C.



PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

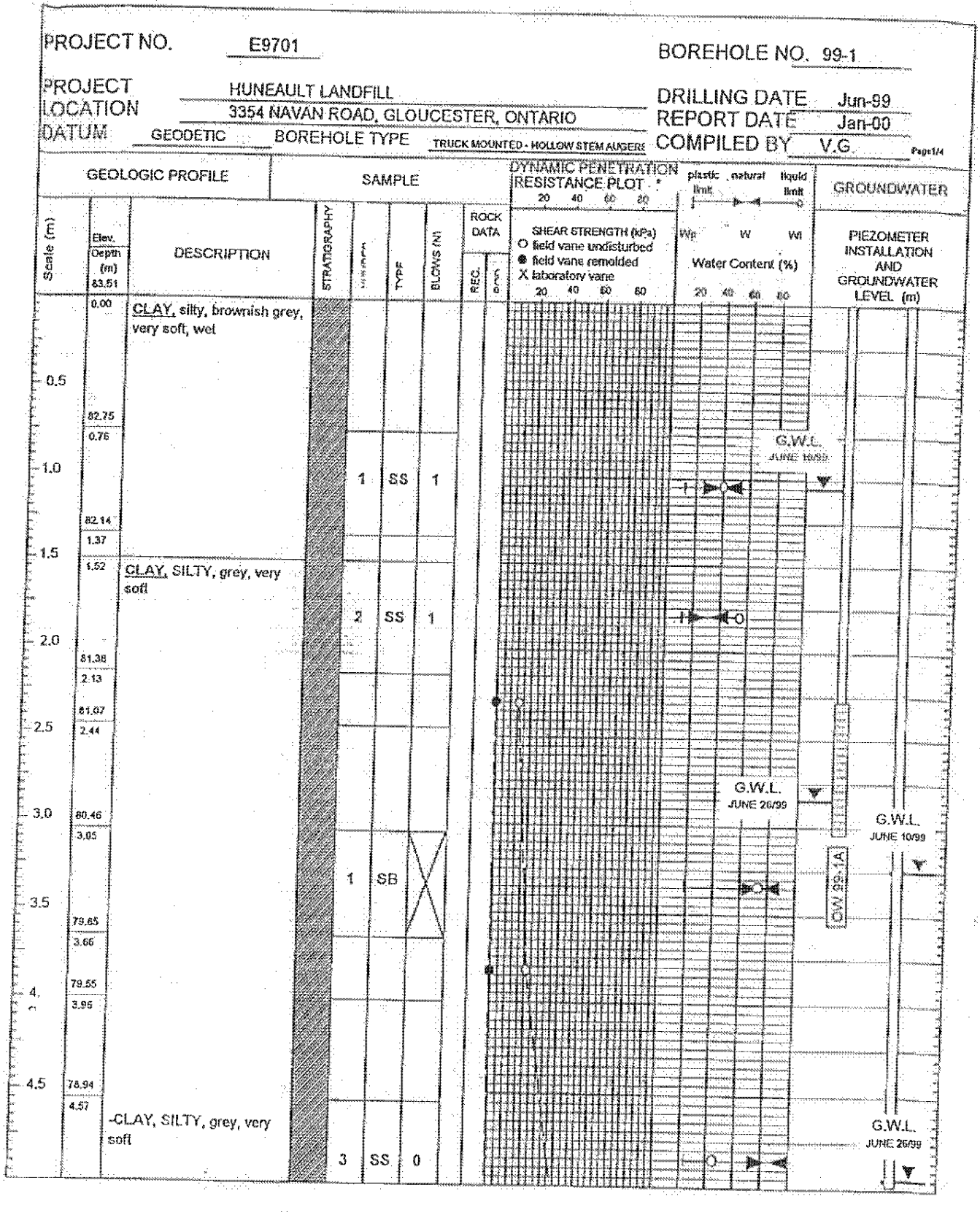
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.

Page1/4



PROJECT NO. E9701 BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL DRILLING DATE Jun-99
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Jan-00
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS COMPILED BY V.G.

GEOLOGIC PROFILE | SAMPLE | DYNAMIC PENETRATION RESISTANCE PLOT | plastic limit | natural | liquid limit | GROUNDWATER

Scale (m)	Elev. / Depth (m) 78.51	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	TYPE	BLOWS (N)	ROCK DATA REC.	ROCK DATA	SHEAR STRENGTH (kPa) O field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	5.00										
	5.18 / 78.02										
5.5	5.49 / 77.41										
6.0	6.10 / 76.8	-CLAY, SILTY, grey, very soft, wet		4	SS	0					
6.5	6.71 / 76.50										
7.0	7.01 / 75.89										
7.5	7.62 / 75.28	-CLAY, SILTY, grey, very soft, wet		5	SS	0					
8.0	8.23 / 74.98										
8.5	8.53 / 74.37										
9.0	9.14 / 73.76			2	SB	X					
9.5	9.75										

PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

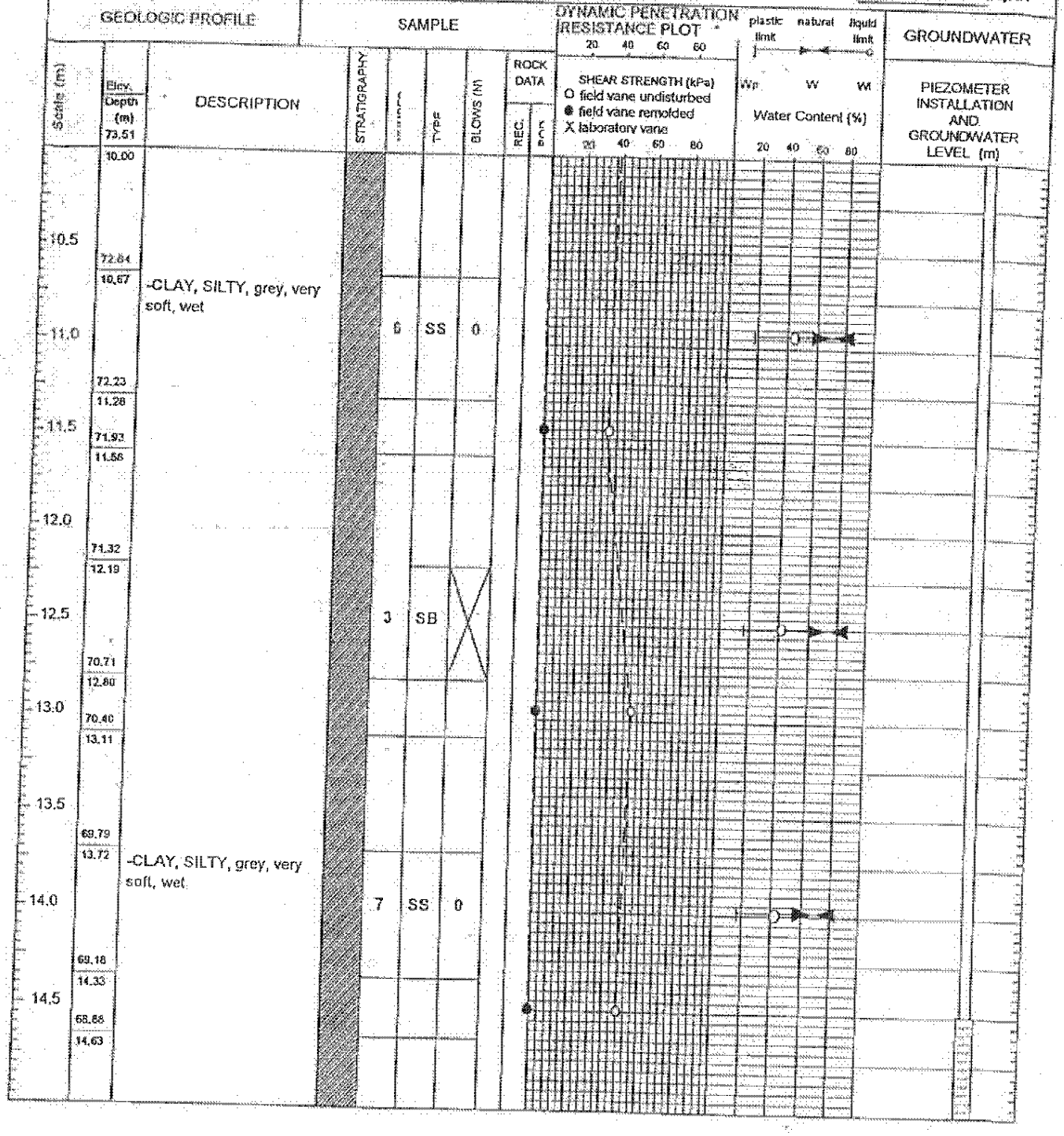
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.



PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

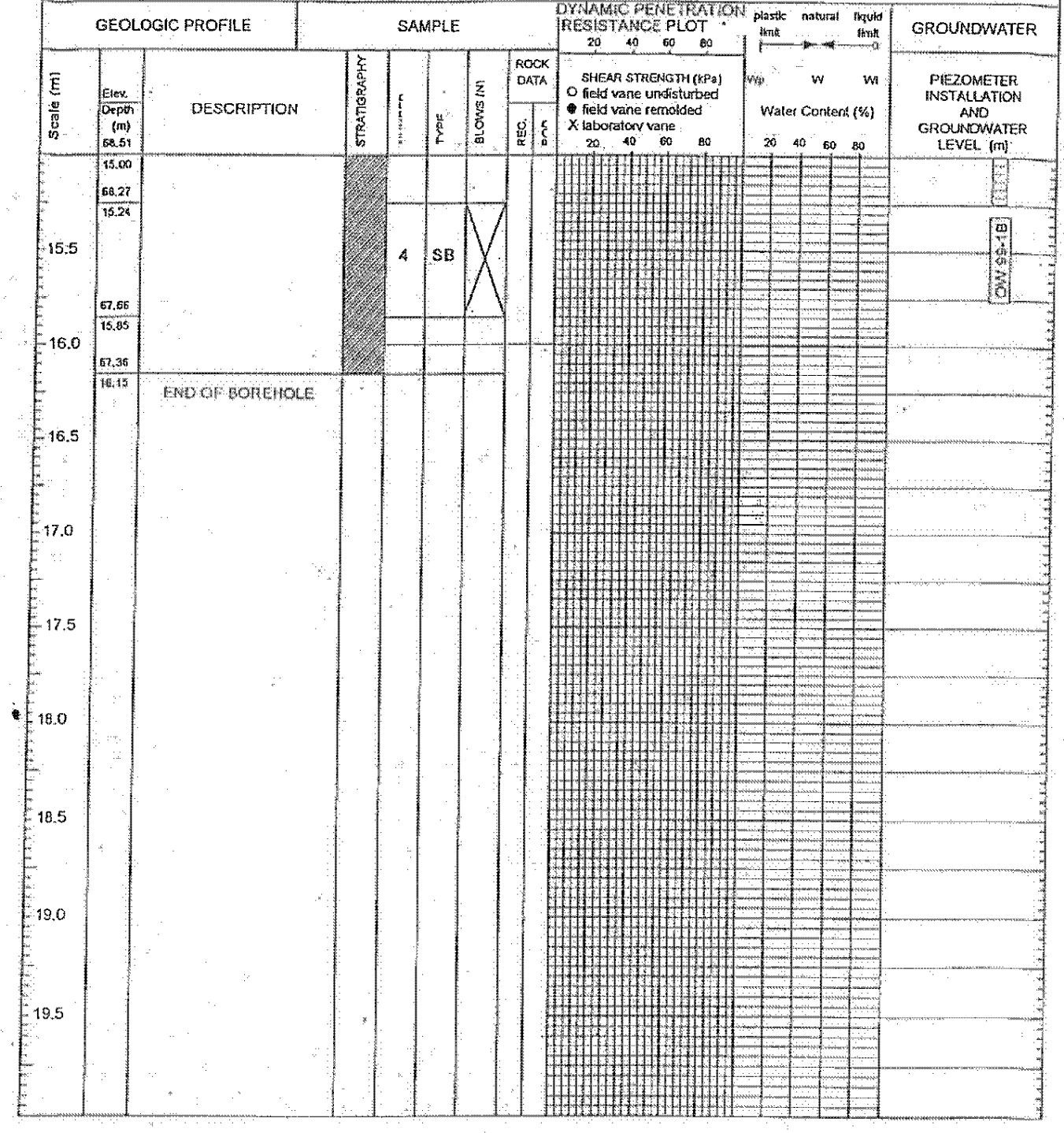
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.

Page 4/4



PROJECT NO. E8401

BOREHOLE NO. 98-1

PROJECT HUNEAULT LANDFILL

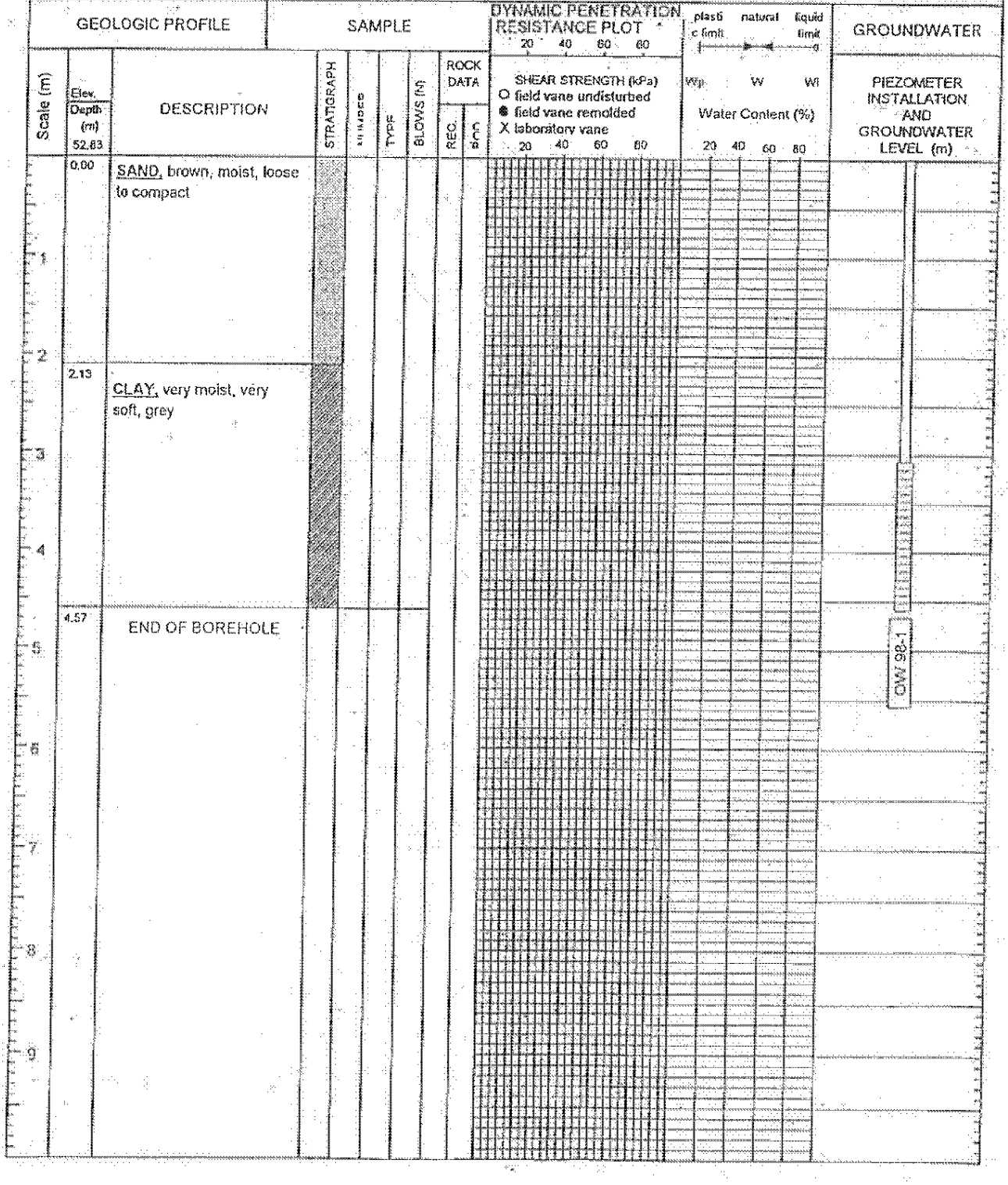
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Oct-98

REPORT DATE Oct-98

COMPILED BY V.G.



PROJECT NO. E8401

BOREHOLE NO. 98-2

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DRILLING DATE Oct-98

REPORT DATE Oct-98

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - 108MM LOW STEM AUGERS

COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE				ROCK DATA		DYNAMIC PENETRATION RESISTANCE PLOT		GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPH	Sequence	TYPE	BLOWS (N)	REC.	RQD	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	plasti c limit / natural / liquid limit; Wp W Wl; Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
1	0.00	SAND, brown, moist, loose to compact		1	S	1					
	1.37			2	S	0					
2	2.13	CLAY, very moist, very soft, grey		3	S	0					
3	2.90			4	S	0					
	3.66			5	S	0					
4	4.42										
5											
6				6	S	0					
	6.71										
7	7.62			7	S	0					
8	8.23	END OF BOREHOLE									OW 98-2
9											

PROJECT NO. E8401

BOREHOLE NO. 98-3

PROJECT HUNEAULT LANDFILL

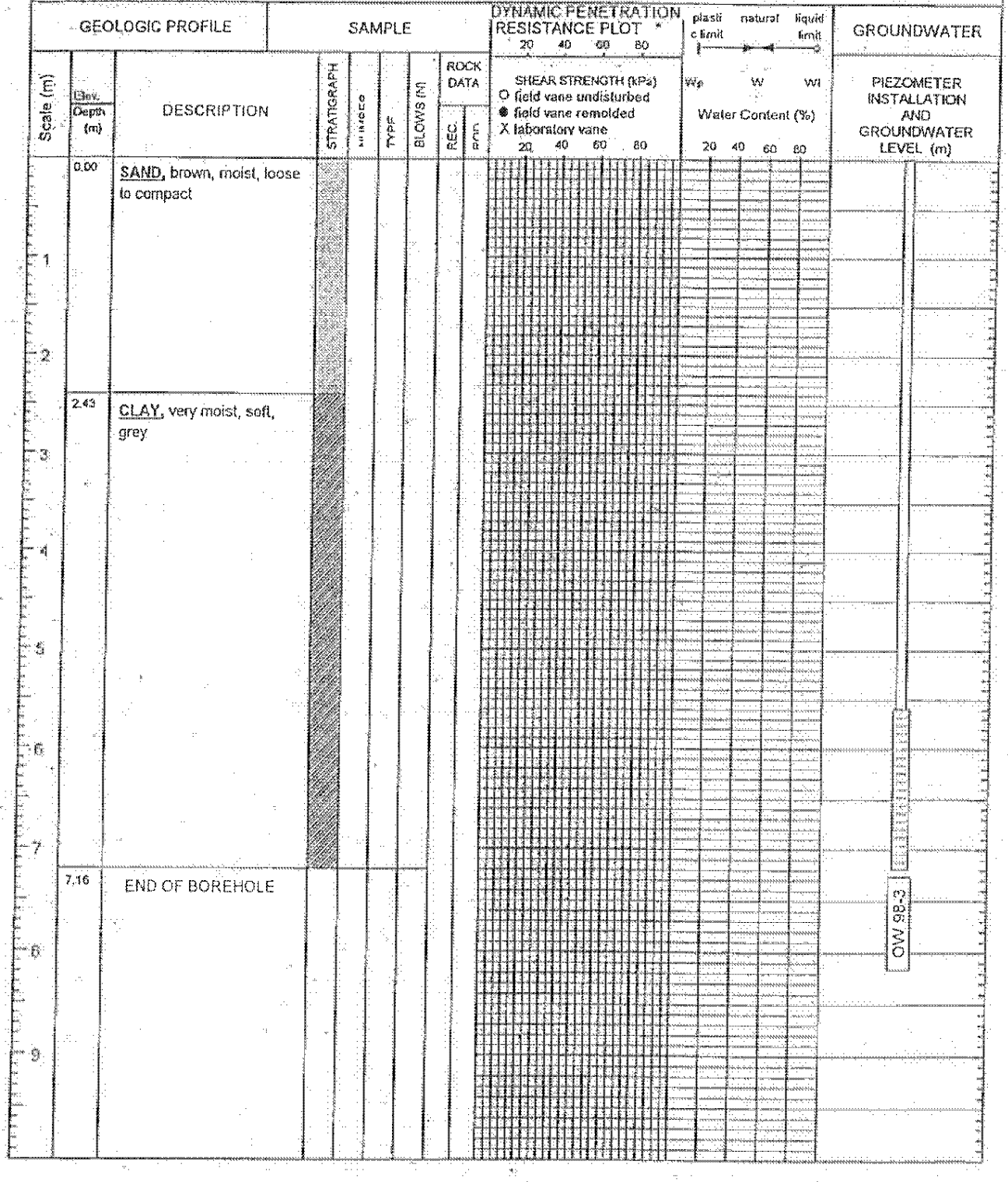
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Oct-98

REPORT DATE Oct-98

COMPILED BY V.G.



PROJECT NO. E8401

BOREHOLE NO. 98-4

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Oct-98

REPORT DATE Oct-98

COMPILED BY V.G.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPH	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS/0.3m	ROCK DATA: REC.	ROCK DATA: RQD
	0.00	SAND, brown, dry, loose to compact						
	2.13	CLAY, very moist, soft, grey						
	4.57	END OF BOREHOLE						

DYNAMIC PENETRATION RESISTANCE PLOT
20 40 60 80

SHEAR STRENGTH (kPa)
O field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plasti c limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

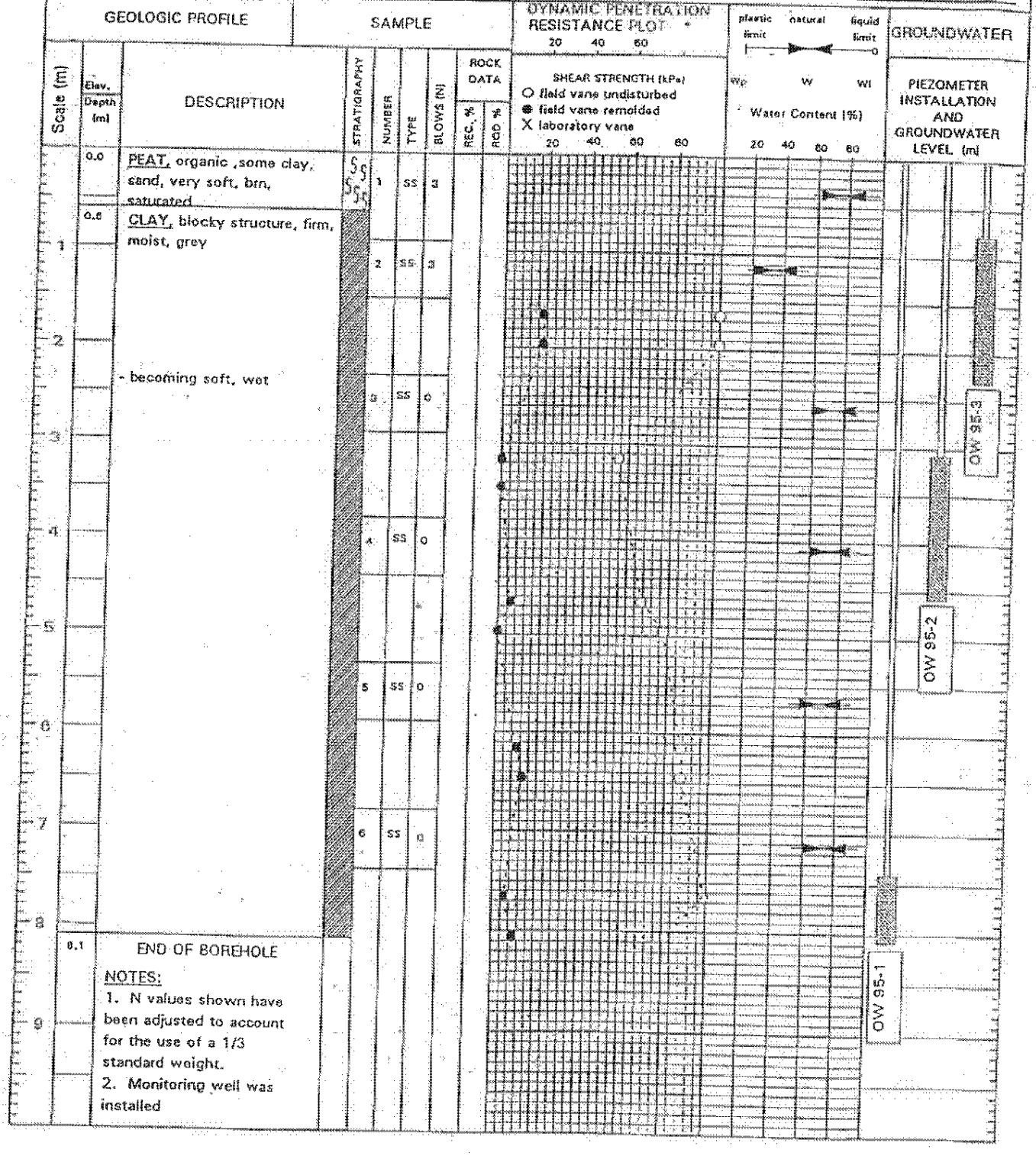
GROUNDWATER

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 98-4

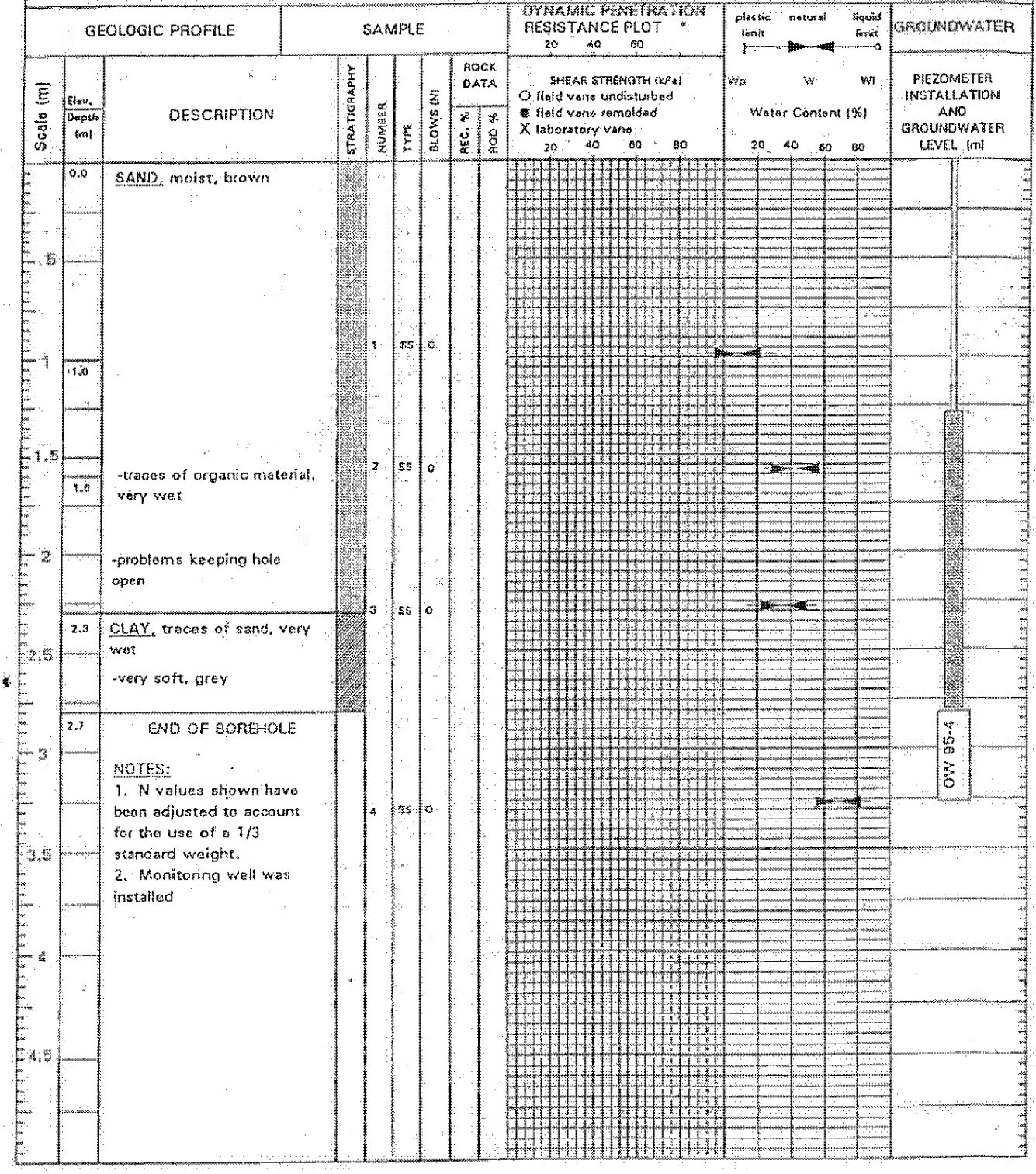
PROJECT NO. E0100 BOREHOLE NO. 95-1

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



PROJECT NO. E0100 BOREHOLE NO. 95-4

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



PROJECT NO. E0100 BOREHOLE NO. 95-5

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.

Soils (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	ROCK DATA: REC. %	ROCK DATA: RQD %
	0.0	PEAT, organic, soft, wet, brn		1	SS	0		
	0.3			2	SS	0		
	0.6	SAND, moist, brown						
1		CLAY, moist, brown		3	SS	7		
		-grey, moist						
2				4	SS	5		
3		-soft, moist		5	SS	0		
4								
5		-becoming stiff, grey, traces of brown and black color		6	SS	0		
6				7	SS	0		
		-stiff, grey, traces of brown and black color						
7								
8				8	SS	0		
	8.25	END OF BOREHOLE						

NOTES:
1. N values shown have been adjusted to account for the use of a 1/3 standard weight.
2. Monitoring well was installed

DYNAMIC PENETRATION RESISTANCE PLOT * (20 40 60)

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER
PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 95-7
OW 95-8
OW 95-9

PROJECT NO. E0100

BOREHOLE NO. 95-8

PROJECT HUNEAULT WASTE MANAGEMENT

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATU GEODETIC

BOREHOLE TYP PORTABLE DRILLING

DRILLING DATE Jun-95

REPORT DATE Aug-95

COMPILED BY V.G.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA RQD %
0	0.0	SAND, moist, brown		1	SS	0		
.5				2	SS	0		
1	1.0			3	SS	0		
1.5				4	SS	0		
	1.55	- CLAY, very soft, very moist, grey						
2								
2.5	2.3			5	SS	0		
	2.7	END OF BOREHOLE						
3		NOTES: 1. N values shown have been adjusted to account for the use of a 1/3 standard weight. 2. Monitoring well was installed						
3.5								
4								
4.5								

DYNAMIC PENETRATION RESISTANCE PLOT 20 40 60

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER

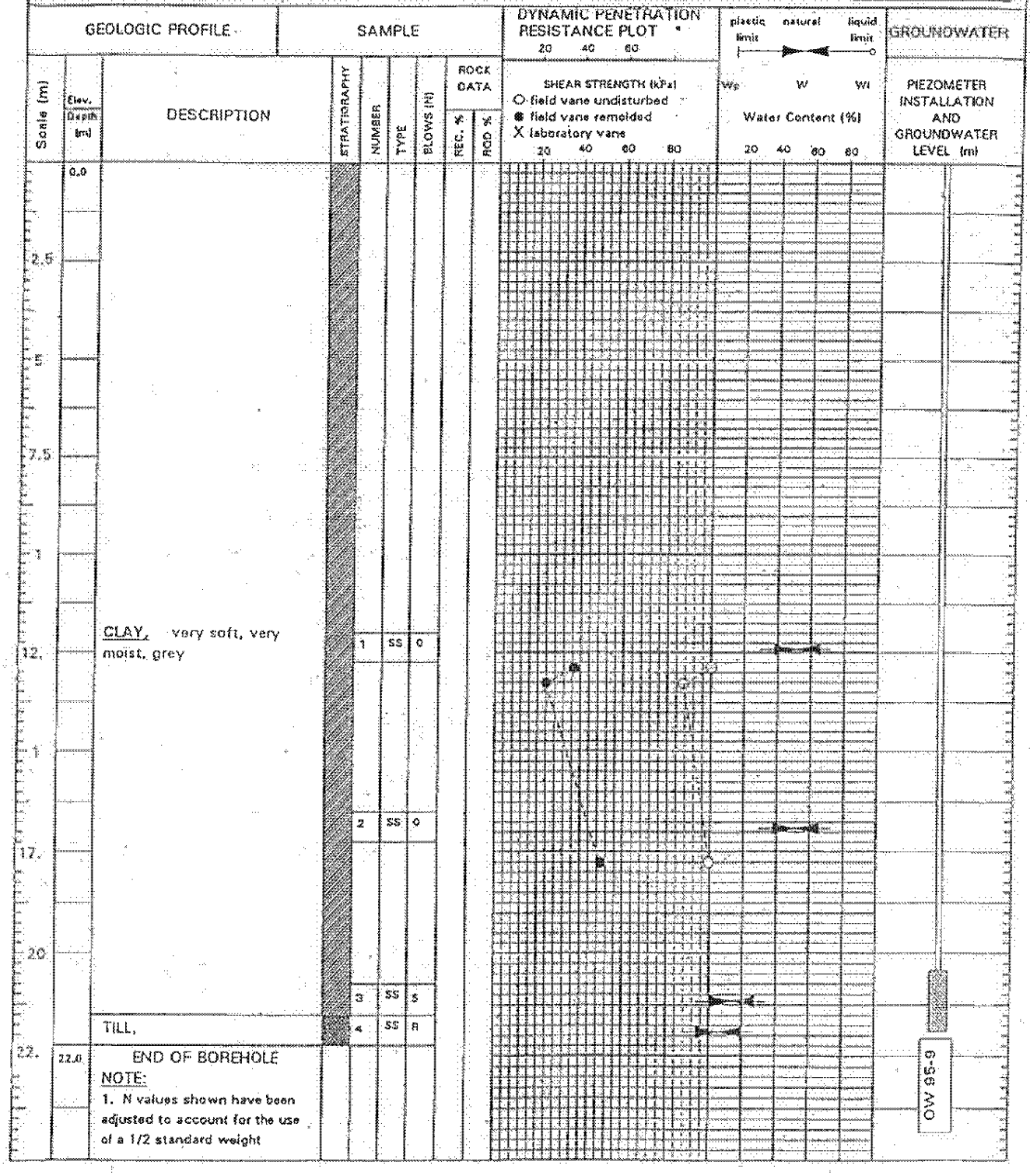
PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 95-8

000462

PROJECT NO. E0100 BOREHOLE NO. 95-9

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



PROJECT NO. E0100 BOREHOLE NO. OW-1A-D

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jul-95

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE

DATU GEODETIC BOREHOLE TYP AUGER TYPE COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE					DYNAMIC PENETRATION RESISTANCE PLOT * 20 40 60	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	ROCK DATA REC. %	ROD %	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	0.0	PEAT, organic, very soft, brn, moist									
1	1.7	SAND, med. grained, brn, very moist									
2		END OF BOREHOLE NOTES: 1. Monitoring well was installed									OW 1A OW 1B OW 1C OW 1D

PROJECT NO. E0100 BOREHOLE NO. OW-2A-D

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jul-95

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE

DATU GEODETIC BOREHOLE TYP AUGER TYPE COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE					DYNAMIC PENETRATION RESISTANCE PLOT * 20 40 60	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS/0.3m	ROCK DATA REC. %	ROCK DATA ROD %	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
0	0.0	PEAT, organic, very soft, brn, moist	SS								
0.5			SS								
1			SS								
1.5			SS								
	1.7	SAND, med. grained, brn, very moist									
2		END OF BOREHOLE NOTES: 1. Monitoring well was installed									OW 2A OW 2B OW 2C OW 2D

CASTONGUAY Technologies Inc.

Environmental and Geotechnical Engineering

PROJECT NO. E0100 BOREHOLE NO. 94-1

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE May 19/94

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-94

DATU GEODETIC BOREHOLE TYP BOA DRILL - HOLLOW STEM COMPILED BY N.G.C.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA RQD %
1	0.0	FILL, mixture: sand, gravel, silt, clay, loose to compact, moist, med. brn						
	0.8	SAND, med. grained, tr. silt, very moist, reddish brn, loose, wet @ 1.1m		1	SS	14		
2	1.5	CLAY, blocky structure, firm, moist, brown to 1.8m becoming grey		2	SS	3		
3		- becoming soft, grey, saturated		3	SS	1		
4				4	SS	1		
5								
6				5	SS	0		
7								
8				6	SS	0		
9	8.5	END OF BOREHOLE						

DYNAMIC PENETRATION RESISTANCE PLOT * (20, 40, 60)

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 94-3
OW 94-2
OW 94-1

000466

CASTONGUAY Technologies Inc.
Environmental and Geotechnical Engineering

PROJECT NO. E0100 BOREHOLE NO. 94-4

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE May 19/94
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-94
DATU GEODETIC BOREHOLE TYP BOA DRILL - HOLLOW STEM COMPILED BY N.G.C.

Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS (N)	ROCK DATA REC. %	ROCK DATA RQD %
0	0.0	PEAT, non-fibrous, v. soft						
	0.3	SAND, silty, very loose, saturated, brn, loose		1	AS			
1				2	SS	11		
	1.1	CLAY, blocky structure, occasional sand seam, v. stiff, moist, brown with oxidation stains		3	SS	7		
2								
3		- becoming soft, grey,		4	SS	0		
4								
		- occasional black staining		5	SS	0		
5								
6				6	SS	0		
7								
8				7	SS	0		
	8.5	END OF BOREHOLE						
9								

DYNAMIC PENETRATION RESISTANCE PLOT * 20 40 60 80

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 94-6
OW 94-5
OW 94-4

000467

O-8550E

FONDEX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Dynamic Cone Penetration Resistance Plot 20 40 60 80 / Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	plastic limit / natural / liquid limit Wp W Wl / Water Content (%) 20 40 60 80	GROUNDWATER PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	71.10										
	0.00	SILTY CLAY (FILL) : SOFT, BLACK, MOIST, ORGANIC ODOUR, PIECES OF ASPHALT.									OW-92-1
1	69.70										
	1.40	SAND : LOOSE, BROWN CHANGING TO GREY AND MOIST.									
2											
	68.10										
3	3.00	CLAY : SOFT, GREY, MOIST, BLOCKY STRUCTURE.									
				1	ST						
4											
		- BECOMING LAYERED.									
5											
				2	ST						
6											
				3	ST						
7											
		- WITH ALTERNATING BROWN LAYERS.									
8		- SEA SHELLS VISIBLE AT A DEPTH OF 8.80m.									
		- ALTERNATING GREY AND BLACK LAYERS.									

000468

O-8550E

FOND DX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Shear Strength (kPa) • field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	61.10 / 10.00	CLAY: SOFT, WITH ALTERNATING GREY AND BROWN LAYERS.		4	ST						OW-92-1
11											
12											
13											
14		- BECOMING WET.									
15		- BECOMING DARK GREY, VARVED STRUCTURE.									
16											
17											
18											

000469

O-8550E

FONDEX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	51.10 20.00	CLAY : DARK GREY, WET, VARVED STRUCTURE.									OW-92-1
21	49.90 21.20	- BECOMING VERY SOFT, TRACE OF SILT AND GRAVEL AT A DEPTH OF 21.80m.									
22											
23		- BECOMING TILL-LIKE ACCORDING TO SOUND AND DIFFICULTY OF DRILLING.									
	47.15										
24	23.95	SAND AND GRAVEL TILL : ACCORDING TO SOUND AND DIFFICULTY OF DRILLING.									
25	45.80	PRACTICAL AUGER REFUSAL									
	25.30	END OF BOREHOLE									

NOTE :
THE SOIL PROFILE PRESENTED IS REPRESENTATIVE OF THE PIEZOMETER NEST. CONTINUOUS SAMPLING WAS CARRIED OUT AT OW-92-01 TO A DEPTH OF APPROXIMATELY 21.0m. SHELBY TUBE SAMPLES WERE OBTAINED AT VARIOUS ELEVATIONS AT OTHER BOREHOLES WITHIN THE PIEZOMETER NEST.

O-8550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Dynamic Cone Penetration Resistance Plot 20 40 60 80 / Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	plastic limit / natural / liquid limit Wp W Wl / Water Content (%) 20 40 60 80	GROUNDWATER PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	76.03										
	10.00	CLAY : TRACE OF SILT, SOFT, GREY, WET.		4	ST						OW-92-12
	75.03										
11	1.00	SILTY CLAY : SOFT, GREY, WET.									
12											
13											
14											
15											
16											
17											
18		- BECOMING SATURATED, ORGANIC ODOUR DETECTED.									

000471

O-B550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot	plastic limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Shear Strength (kPa): * field vane undisturbed, × field vane remolded, • laboratory vane	Wp W Wl; Water Content (%)	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	0.00	200mm OF GRAVEL OVER SAND : FINE GRAINED, LOOSE, BROWN, WET.							20 40 60 80	20 40 60 80	OW-92-12
1											
2											
3		- BECOMING GREY.									
4				1	ST						
	1.43										
	4.60	CLAY : TRACE OF SILT, SOFT, GREY, WET.									
5				2	ST						
6											
7				3	ST						
8											

000472

O-B530E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM — DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO — REPORT DATE APRIL 92

DATUM GEODETIC — BOREHOLE TYPE CME — COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Shear Strength (kPa) • field vane undisturbed × field vane remolded ◦ laboratory vane 20 40 60 80	Wp W Wl — Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	20.00	SILTY CLAY : SOFT, GREY, SATURATED.									OW 92-12
21											
22											
23											
24		- ASSUMED SILTY CLAY BASED ON SOUND AND EASE OF DRILLING									
25											
26											
27											
28											
9											

000473

O-8550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot	plastic limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane	Water Content (%) Wp W Wl	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	56.03								20 40 60 80	20 40 60 80	
	30.00	SILTY CLAY : (ASSUMED)									OW-92-12
31											
32											
33	52.53										
	33.50	SAND AND GRAVEL TILL :									
34		- ENCOUNTERED COBBLES AND BOULDERS.									
35											
36											
37	48.83										
	37.20	PRACTICAL TRICONE REFUSAL									
		END OF BOREHOLE									

NOTE :
THE SOIL PROFILE PRESENTED IS REPRESENTATIVE OF THE PIEZOMETER NEST. CONTINUOUS SAMPLING WAS CARRIED OUT AT OW-92-12 TO A DEPTH OF APPROXIMATELY 22,0m. SHELBY TUBE SAMPLES WERE OBTAINED AT VARIOUS ELEVATIONS AT OTHER BOREHOLES WITHIN THE PIEZOMETER NEST.

morrison beatty limited
consulting engineers and hydrogeologists
4806 dixie road, R.R.4, mississauga, ontario l4w 2k4 - 625-0044

OW2-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 15, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing.
TOPSOIL fine to medium grained, dark brown, wet, come organic material (FILL).							stick-up 0.90m.
	1	5					bentonite grout.
SAND fine to medium grained, reddish brown, wet, compact, some red and black staining.	2						50mm Ø sch 40 threaded PVC riser pipe.
CLAY grey, wet, cohesive, plastic, laminated compact, weathered	3	10					bentonite seal.
CLAY grey, wet, very cohesive, plastic, soft, laminated. Frequent black vertical staining (0.5cm thick) from 5m to depth. Red banding (1cm thick) 10-15cm apart from 3.6m to depth.	4	15					silica sand filter pack.
	5						50mm Ø continuously wound PVC #8 slot well screen.
END OF HOLE 5.26m bgl.	6	20					end cap.
	7	25					
	8						
	9						

000475

morrison beatty limited
consulting engineers and hydrogeologists
4606 dixie road, ltd., mississauga, ontario (416) 624-9700

OW2-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED Noverber 15, 1989

DESCRIPTION	DEPTH metres / feet	SAMPLE no. / type / "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
				lockable steel protective casing. stick-up 0.91m
TOPSOIL fine to medium grained sand, dark brown, wet, some organic material (FILL).	1 / 5			50mm Ø sch 40 threaded PVC riser pipe.
SAND fine to medium grained, reddish brown, wet, compact, some red and black staining.	2			
CLAY grey, wet, cohesive plastic, laminated, compact, weathered.	3 / 10			bentonite grout.
CLAY grey, wet, very cohesive, plastic, soft, laminated. Frequent black vertical staining (0.5cm thick) from 5m to depth. Red banding (1cm thick) 10-15cm apart from 3.6m to depth.	4 / 15			
	5			bentonite seal.
	6 / 20			silica sand filter pack.
	7			50mm Ø continuously wound PVC #8 slot well screen.
	25			
END OF HOLE 7.92m bgl.	8			end cap.
	9 / 30			

WL-040181

000476

morrison beatty limited
consulting engineers and hydrogeologists
4800 dixie road, suite 202, mississauga, ontario (416) 624-9100

OW3-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 16, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing.
							stick-up 1.08m
TOPSOIL fine to medium sand with some very fine gravel, brown to dark brown with some organic material wet, compact, becoming black (FILL).	1	5					50mmØ sch 40 threaded PVC riser pipe.
SAND fine to medium grained, orangish brown becoming dark brown, saturated, loose	2						bentonite grout.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, weathered.	3	10					bentonite seal.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, some black vertical staining (1cm thick) from 3.5m. Red banding (1-2cm thick) from 5.0m.	4	15					silica sand filter pack.
	5						50mm Ø continuously wound PVC #8 slot well screen.
END OF HOLE 5.15m bgl.	6	20					end cap.
	7						
	8	25					
	9						

WL-040181

000477

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consulting engineers and hydrogeologists

OW3-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 16, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT
							10 20 30 40 50 60 70 80 90
							lockable steel protective casing, stick-up 0.75m
TOPSOIL fine to medium sand with some very fine gravel, brown to dark brown with some organic material, wet, compact, becoming black (FILL).							
	1						
		5					50mm Ø sch 40 threaded PVC riser pipe.
SAND fine to medium grained, orangish brown becoming dark brown, saturated, loose.	2						
		10					
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, weathered.	3						bentonite grout.
	4						
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, some black vertical staining (1cm thick) from 3.5m. Red banding (1-2cm thick) from 5.0m.		15					
	5						bentonite seal.
	6	20					silica sand filter pack.
	7						50mm Ø continuously wound PVC #8 slot well screen.
		25					
END OF HOLE 7.92m bgl.	8						end cap.
	9						

000478

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4600 dixie road, unit 1, mississauga, ontario (416) 624-9200

OW4-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 17, 1989

DESCRIPTION	DEPTH metres / feet	SAMPLE no. / type / "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
				lockable steel protective casing.
TOPSOIL fine to medium grained sand, brown, moist, loose (FILL).	1 / 5			50mmØ sch40 threaded PVC riser pipe.
SAND fine to medium grained, orangish to greenish brown, wet, loose.	2			bentonite grout.
CLAY grey, moist, compact, cohesive, plastic, laminated, weathered.	3 / 10			bentonite seal.
	4 / 15			50mmØ continuously wound PVC #8 slot well screen.
CLAY grey, moist, very cohesive, soft (moldable) Black vertical staining (1cm thick) every 4 to 5cm from 5m. Red banding (1cm thick) every 4 to 5cm from 5m.	5			silica sand filter pack.
	6 / 20			end cap.
END OF HOLE 5.27m bgl.	7 / 25			
	8			
	9			

000479

OW4-8

morrison beatty limited
consulting engineers and hydrogeologists
4800 dixie road, Mississauga, ontario (416) 624-8500

CLIENT HUNEAULT LANDFILL FILE NO. 245-891
PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO
GEOLOGIST/ENGINEER KEW DATE COMPLETED November 17, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing. stick-up 0.82m.
TOPSOIL fine to medium grained sand, brown, moist, loose (FILL).			1		5		
SAND fine to medium grained, orangish to greenish brown, wet, loose.			2				50mm Ø sch 40 threaded PVC riser pipe.
CLAY grey, moist, compact, cohesive, plastic, laminated, weathered.			3		10		bentointe grout.
			4				
CLAY grey, moist, very cohesive, soft, (moldable) Black vertical staining (1cm thick) every 4 to 5 cm from 5m. Red banding (1cm thick) every 4 to 5cm from 5m.					15		bentonite seal.
			5				
			6		20		silica sand filter pack.
			7				50mm Ø continuously wound PVC #8 slot well screen.
					25		
END OF HOLE 7.92m bgl.			8				end cap.
			9		30		

000480

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 18113613
Custody:

Report Date: 27-Jun-2019
Order Date: 21-Jun-2019

Order #: 1925628

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1925628-01	L-5

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 27-Jun-2019
Order Date: 21-Jun-2019
Project Description: 18113613

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	25-Jun-19	25-Jun-19
Ammonia, as N	EPA 351.2 - Auto Colour	24-Jun-19	26-Jun-19
Anions	EPA 300.1 - IC	25-Jun-19	25-Jun-19
Biochemical Oxygen Demand	SM 5210B - DO Probe	21-Jun-19	26-Jun-19
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	25-Jun-19	25-Jun-19
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	24-Jun-19	24-Jun-19
Golder General Chemistry-Leachate	Hardness as CaCO3	24-Jun-19	24-Jun-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	24-Jun-19	24-Jun-19
Phenolics	EPA 420.2 - Auto Colour, 4AAP	25-Jun-19	25-Jun-19
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	24-Jun-19	25-Jun-19
Total Dissolved Carbon	MOE 3247B - Combustion IR	24-Jun-19	24-Jun-19
Total Dissolved Solids	SM 2540C - gravimetric, filtration	24-Jun-19	25-Jun-19
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	24-Jun-19	25-Jun-19
Total Suspended Solids	SM 2540D - Gravimetric	24-Jun-19	25-Jun-19
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	27-Jun-19	27-Jun-19

Certificate of Analysis

Report Date: 27-Jun-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Jun-2019

Client PO:

Project Description: 18113613

	Client ID:	L-5	-	-	-
	Sample Date:	20-Jun-19 03:10	-	-	-
	Sample ID:	1925628-01	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	2250	-	-	-
Ammonia as N	0.01 mg/L	112	-	-	-
BOD	2 mg/L	178	-	-	-
Chemical Oxygen Demand	10 mg/L	497	-	-	-
Dissolved Inorganic Carbon	0.500 mg/L	2.80	-	-	-
Dissolved Organic Carbon	0.5 mg/L	125	-	-	-
Total Dissolved Carbon	0.5 mg/L	128	-	-	-
Hardness	mg/L	1200	-	-	-
Phenolics	0.001 mg/L	0.008	-	-	-
Phosphorus, total	0.01 mg/L	0.36	-	-	-
Total Dissolved Solids	10 mg/L	3120	-	-	-
Total Suspended Solids	2 mg/L	5	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	115	-	-	-
Anions					
Chloride	1 mg/L	619	-	-	-
Nitrate as N	0.1 mg/L	<0.1	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-
Sulphate	1 mg/L	87	-	-	-
Metals					
Arsenic	1 ug/L	7	-	-	-
Boron	10 ug/L	25600	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	208000	-	-	-
Chromium	1 ug/L	15	-	-	-
Cobalt	0.5 ug/L	5.5	-	-	-
Copper	0.5 ug/L	0.6	-	-	-
Iron	100 ug/L	1330	-	-	-
Lead	0.1 ug/L	<0.1	-	-	-
Magnesium	200 ug/L	166000	-	-	-
Manganese	5 ug/L	315	-	-	-
Potassium	100 ug/L	123000	-	-	-
Sodium	200 ug/L	666000	-	-	-
Zinc	5 ug/L	15	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 27-Jun-2019

Order Date: 21-Jun-2019

Project Description: 18113613

	Client ID:	L-5	-	-	-
	Sample Date:	20-Jun-19 03:10	-	-	-
	Sample ID:	1925628-01	-	-	-
	MDL/Units	Water	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 27-Jun-2019
Order Date: 21-Jun-2019
Project Description: 18113613

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Total Dissolved Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 27-Jun-2019
Order Date: 21-Jun-2019
Project Description: 18113613

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	140	1	mg/L	ND			0.0	10	
Nitrate as N	0.14	0.1	mg/L	0.15			6.7	10	
Nitrite as N	ND	0.05	mg/L	ND				10	
Sulphate	137	1	mg/L	138			1.0	10	
General Inorganics									
Alkalinity, total	283	5	mg/L	268			5.3	14	
Ammonia as N	0.029	0.01	mg/L	0.038			24.7	18	QR-01
BOD	77	2	mg/L	70			9.5	20	
Chemical Oxygen Demand	93	10	mg/L	83			11.4	12	
Dissolved Organic Carbon	0.8	0.5	mg/L	1.2			34.2	37	
Phenolics	ND	0.001	mg/L	ND				10	
Phosphorus, total	ND	0.01	mg/L	ND				15	
Total Dissolved Solids	368	10	mg/L	406			9.8	10	
Total Suspended Solids	33.0	2	mg/L	31.0			6.3	10	
Total Kjeldahl Nitrogen	2.01	0.1	mg/L	2.21			9.1	16	
Metals									
Aluminum	3.8	1	ug/L	3.3			13.9	20	
Arsenic	3.8	1	ug/L	3.4			11.8	20	
Boron	189	10	ug/L	190			0.3	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Calcium	269000	100	ug/L	249000			7.6	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	2.91	0.5	ug/L	2.56			12.7	20	
Copper	1.34	0.5	ug/L	1.18			12.2	20	
Iron	1460	100	ug/L	1310			10.5	20	
Lead	0.25	0.1	ug/L	0.18			33.5	20	QR-01
Magnesium	175000	200	ug/L	163000			7.5	20	
Manganese	2080	5	ug/L	1850			11.5	20	
Potassium	14400	100	ug/L	13600			5.7	20	
Sodium	310000	2000	ug/L	354000			13.2	20	
Zinc	10	5	ug/L	6			43.0	20	QR-01
Volatiles									
Benzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 27-Jun-2019
Order Date: 21-Jun-2019
Project Description: 18113613

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	18.4	1	mg/L	9.10	93.5	77-123			
Nitrate as N	1.20	0.1	mg/L	ND	120	79-120			
Nitrite as N	0.975	0.05	mg/L	ND	97.5	84-117			
Sulphate	27.0	1	mg/L	15.8	112	74-126			
General Inorganics									
Ammonia as N	0.268	0.01	mg/L	0.038	92.0	81-124			
BOD	194		mg/L		96.9	71-121			
Chemical Oxygen Demand	301	10	mg/L	83	109	85-111			
Dissolved Organic Carbon	9.9	0.5	mg/L	1.2	87.6	60-133			
Phenolics	0.023	0.001	mg/L	ND	91.0	69-132			
Phosphorus, total	0.493	0.01	mg/L	ND	98.6	80-120			
Total Dissolved Solids	94.0	10	mg/L		94.0	75-125			
Total Suspended Solids	19.0	2	mg/L		95.0	75-125			
Total Kjeldahl Nitrogen	1.71	0.1	mg/L		85.3	81-126			
Metals									
Aluminum	51.7		ug/L	3.3	96.8	80-120			
Arsenic	54.9		ug/L	3.4	103	80-120			
Boron	77		ug/L	33	87.3	80-120			
Cadmium	43.4		ug/L	0.02	86.7	80-120			
Calcium	106000		ug/L	97800	81.3	80-120			
Chromium	59.0		ug/L	0.5	117	80-120			
Cobalt	54.5		ug/L	2.56	104	80-120			
Copper	50.5		ug/L	1.18	98.6	80-120			
Iron	3760		ug/L	1310	97.8	80-120			
Lead	42.6		ug/L	0.48	84.2	80-120			
Magnesium	48500		ug/L	39300	91.9	80-120			
Manganese	74.6		ug/L	24.7	99.8	80-120			
Potassium	24900		ug/L	13600	113	80-120			
Sodium	29800		ug/L	21100	87.4	80-120			
Zinc	47		ug/L	6	80.8	80-120			
Volatiles									
Benzene	34.6	0.5	ug/L		86.4	60-130			
1,1-Dichloroethane	32.3	0.5	ug/L		80.7	60-130			
Ethylbenzene	39.0	0.5	ug/L		97.6	60-130			
Methylene Chloride	33.2	5.0	ug/L		83.1	60-130			
Toluene	30.3	0.5	ug/L		75.8	60-130			
Vinyl chloride	37.7	0.5	ug/L		94.2	50-140			
m,p-Xylenes	81.8	0.5	ug/L		102	60-130			
o-Xylene	38.6	0.5	ug/L		96.4	60-130			

Qualifier Notes:

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

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PARACEL WO: 1925628

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Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 1651383	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marcenau	Quote #: 19-351 Leachate	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd Ottawa, Ontario K2H 5B7	PO #:	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marcenau@golder.com, emily_secor@golder.com henri.hunsa@paracelconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ ☐ REC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1925628

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	L-3	W		4	06/28/19	3:10pm	☑
2							
3							
4							
5							
6							
7							
8							
9							
10							

Comments: Invoice to Henri Hunsaut. 2 Sample Submitted on the water. The water in Golder box.

Method of Delivery: SWIFT

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Sweetpotm Dalhousie	Verified By:
Relinquished By (Print):	Date/Time:	Date/Time: 06 28 2019 02:29	Date/Time:
Date/Time: 06/28/19	Temperature: °C	Temperature: 19.4	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 18113613
Custody:

Report Date: 28-Jun-2019
Order Date: 21-Jun-2019

Order #: 1925630

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1925630-01	SED-W
1925630-02	SED-C
1925630-03	SED-E

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 28-Jun-2019
Order Date: 21-Jun-2019
Project Description: 18113613

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	25-Jun-19	25-Jun-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	26-Jun-19	27-Jun-19
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	26-Jun-19	27-Jun-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	26-Jun-19	27-Jun-19
Solids, %	Gravimetric, calculation	26-Jun-19	26-Jun-19

Certificate of Analysis

Report Date: 28-Jun-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Jun-2019

Client PO:

Project Description: 18113613

	Client ID:	SED-W	SED-C	SED-E	-
	Sample Date:	20-Jun-19 09:55	20-Jun-19 10:20	20-Jun-19 10:20	-
	Sample ID:	1925630-01	1925630-02	1925630-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	8.9	46.9	9.4	-
Metals					
Arsenic	1.0 ug/g dry	2.4	1.3	3.3	-
Boron, available	0.5 ug/g dry	17.5	3.0	11.1	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	12.6	16.7	23.9	-
Cobalt	1.0 ug/g dry	2.7	2.5	4.5	-
Copper	5.0 ug/g dry	14.2	5.0	16.2	-
Iron	200 ug/g dry	12800	7320	13400	-
Lead	1.0 ug/g dry	6.5	5.1	8.3	-
Manganese	5 ug/g dry	504	101	230	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	2.6	<1.0	1.8	-
Nickel	5.0 ug/g dry	10.0	7.8	17.8	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Zinc	20.0 ug/g dry	63.7	26.7	65.3	-

Certificate of Analysis

Report Date: 28-Jun-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Jun-2019

Client PO:

Project Description: 18113613

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	ND	1.0	ug/g						
Boron, available	ND	0.5	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Iron	ND	200	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Manganese	ND	5	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Zinc	ND	20.0	ug/g						

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 28-Jun-2019

Order Date: 21-Jun-2019

Project Description: 18113613

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Boron, available	0.62	0.5	ug/g dry	0.62			0.7	35	
Cadmium	0.6	0.5	ug/g dry	ND			0.0	30	
Lead	498	1.0	ug/g dry	370			29.4	30	
Mercury	2.93	0.1	ug/g dry	2.88			1.6	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	16.1	5.0	ug/g dry	12.3			27.2	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Physical Characteristics									
% Solids	75.4	0.1	% by Wt.	76.1			0.9	25	

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 28-Jun-2019
Order Date: 21-Jun-2019
Project Description: 18113613

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	50.5		ug/L	2.1	96.7	70-130			
Boron, available	4.12	0.5	ug/g	0.62	70.1	70-122			
Cadmium	45.7		ug/L	ND	91.1	70-130			
Chromium	56.6		ug/L	6.6	100	70-130			
Cobalt	49.6		ug/L	2.0	95.1	70-130			
Copper	79.4		ug/L	35.0	88.8	70-130			
Iron	8560		ug/L	6260	92.3	70-130			
Lead	175		ug/L	148	53.7	70-130			QM-07
Mercury	1.65	0.1	ug/g		110	80-120			
Manganese	278		ug/L	225	104	70-130			
Molybdenum	45.0		ug/L	ND	89.5	70-130			
Nickel	52.9		ug/L	ND	96.0	70-130			
Selenium	48.5		ug/L	ND	96.5	70-130			
Zinc	106		ug/L	59.3	93.8	70-130			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 28-Jun-2019
Order Date: 21-Jun-2019
Project Description: 18113613

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.
Applies to samples: SED-W, SED-C, SED-E

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Paracel ID: 1925630

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Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 18113613	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marcoux	Quote #: 19359 sediment	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:		
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com; emily_bacon@golder.com; jean.lamoureux@waterlooconnections.com	Date Required:	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary/ Municipality) ☐ Other: ODWQS ☐ PSC Filing ☐ O. Reg. 558/00

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1925630

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote										
1	SED-W ✓	SED		1	06/19/19	9:55am	☑										1x PCMI
2	SED-C ✓	SED		1	06/19/19	10:20am	☑										
3	SED-E ✓	SED		1	06/19/19	11:20am	☑										
4							☐										
5							☐										
6							☐										
7							☐										
8							☐										
9							☐										
10							☐										

Comments: Invoice to Maria Nunnikhoven - Sample submitted on the right of the right on Golder ice. Sub. 1,2,3 Sample date on 3 bottles and June 20, 2019. Received on ice

Method of Delivery: Swift

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print):	Date/Time:	Date/Time: JUN 21, 2019 12:30	Date/Time: 21 June 19 12:30
Date/Time: 06/20/19	Temperature: °C	Temperature: 14.4°C	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-17-00370
Project: 18113613
Custody:

Report Date: 8-Jul-2019
Order Date: 21-Jun-2019

Order #: 1925629

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1925629-01	S-20
1925629-02	S-21
1925629-03	S-1
1925629-04	S-3
1925629-05	S-15
1925629-06	S-16
1925629-07	S-17
1925629-08	S-8
1925629-09	S-9
1925629-10	S-10
1925629-11	S-11
1925629-12	S-12
1925629-13	Dupe-1

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 08-Jul-2019
Order Date: 21-Jun-2019
Project Description: 18113613

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	25-Jun-19	25-Jun-19
Ammonia, as N	EPA 351.2 - Auto Colour	24-Jun-19	26-Jun-19
Anions	EPA 300.1 - IC	25-Jun-19	26-Jun-19
Biochemical Oxygen Demand	SM 5210B - DO Probe	22-Jun-19	27-Jun-19
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	25-Jun-19	25-Jun-19
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	25-Jun-19	26-Jun-19
Golder General Chemistry- SW	Hardness as CaCO3	24-Jun-19	24-Jun-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	24-Jun-19	24-Jun-19
Phenolics	EPA 420.2 - Auto Colour, 4AAP	25-Jun-19	25-Jun-19
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	26-Jun-19	26-Jun-19
Total Dissolved Carbon	MOE 3247B - Combustion IR	25-Jun-19	26-Jun-19
Total Dissolved Solids	SM 2540C - gravimetric, filtration	24-Jun-19	25-Jun-19
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	26-Jun-19	26-Jun-19
Total Suspended Solids	SM 2540D - Gravimetric	24-Jun-19	25-Jun-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 08-Jul-2019

Order Date: 21-Jun-2019

Project Description: 18113613

	Client ID:	S-20	S-21	S-1	S-3
	Sample Date:	20-Jun-19 11:50	20-Jun-19 13:00	20-Jun-19 13:20	20-Jun-19 14:05
	Sample ID:	1925629-01	1925629-02	1925629-03	1925629-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	268	258	398	318
Ammonia as N	0.01 mg/L	0.24	0.15	0.12	0.17
BOD	2 mg/L	2	3	<2	<2
Chemical Oxygen Demand	10 mg/L	83	38	36	28
Dissolved Inorganic Carbon	0.500 mg/L	59.1	54.7	79.3	67.2
Dissolved Organic Carbon	0.5 mg/L	13.0	11.0	10.2	7.4
Total Dissolved Carbon	0.5 mg/L	72.1	65.7	89.5	74.6
Hardness	mg/L	298	299	556	315
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.20	0.03	0.01	0.03
Total Dissolved Solids	10 mg/L	648	674	1140	764
Total Suspended Solids	2 mg/L	<2	<2	<2	4
Total Kjeldahl Nitrogen	0.1 mg/L	1.5	1.3	0.8	0.7
Anions					
Chloride	1 mg/L	196	158	338	160
Nitrate as N	0.1 mg/L	<0.1	0.2	0.2	0.8
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	64	137	168	146
Metals					
Arsenic	1 ug/L	2	<1	<1	<1
Boron	10 ug/L	410	1020	172	100
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	81500	68100	160000	85500
Chromium	1 ug/L	3	<1	<1	2
Cobalt	0.5 ug/L	1.2	<0.5	<0.5	0.6
Copper	0.5 ug/L	2.7	2.3	2.6	3.0
Iron	100 ug/L	1640	<100	201	1870
Lead	0.1 ug/L	0.5	<0.1	0.2	0.2
Magnesium	200 ug/L	23000	31400	37800	24700
Manganese	5 ug/L	1400	57	222	438
Potassium	100 ug/L	7690	12500	13300	9230
Sodium	200 ug/L	131000	136000	197000	128000
Zinc	5 ug/L	10	<5	11	<5

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 08-Jul-2019

Order Date: 21-Jun-2019

Project Description: 18113613

	Client ID:	S-15	S-16	S-17	S-8
	Sample Date:	20-Jun-19 13:45	20-Jun-19 14:45	20-Jun-19 14:30	20-Jun-19 09:30
	Sample ID:	1925629-05	1925629-06	1925629-07	1925629-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	344	222	211	395
Ammonia as N	0.01 mg/L	0.21	0.13	0.16	0.06
BOD	2 mg/L	<2	<12 [1]	<2	5
Chemical Oxygen Demand	10 mg/L	43	67	65	78
Dissolved Inorganic Carbon	0.500 mg/L	72.3	45.0	44.8	78.6
Dissolved Organic Carbon	0.5 mg/L	10.4	10.7	13.0	11.2
Total Dissolved Carbon	0.5 mg/L	82.7	55.7	57.8	89.8
Hardness	mg/L	345	310	285	347
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.05	0.21	0.07	0.23
Total Dissolved Solids	10 mg/L	712	832	770	560
Total Suspended Solids	2 mg/L	21	41	<2	9
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	1.3	1.4	1.6
Anions					
Chloride	1 mg/L	154	335	300	105
Nitrate as N	0.1 mg/L	0.4	0.2	0.3	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	113	43	31	24
Metals					
Arsenic	1 ug/L	<1	<1	1	<1
Boron	10 ug/L	100	36	32	143
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	90700	99100	86600	88100
Chromium	1 ug/L	1	3	<1	<1
Cobalt	0.5 ug/L	0.7	2.0	0.7	0.8
Copper	0.5 ug/L	2.2	6.1	2.1	2.4
Iron	100 ug/L	1730	2670	821	108
Lead	0.1 ug/L	0.5	4.3	0.2	<0.1
Magnesium	200 ug/L	28700	15200	16600	30700
Manganese	5 ug/L	830	1020	484	3890
Potassium	100 ug/L	11000	3390	5900	9440
Sodium	200 ug/L	119000	147000	165000	122000
Zinc	5 ug/L	<5	22	13	<5

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 08-Jul-2019

Order Date: 21-Jun-2019

Project Description: 18113613

	Client ID:	S-9	S-10	S-11	S-12
	Sample Date:	20-Jun-19 10:40	20-Jun-19 09:55	20-Jun-19 10:20	20-Jun-19 13:20
	Sample ID:	1925629-09	1925629-10	1925629-11	1925629-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	259	218	117	164
Ammonia as N	0.01 mg/L	0.11	0.03	0.05	0.13
BOD	2 mg/L	<2	<12 [1]	12	203
Chemical Oxygen Demand	10 mg/L	32	91	78	807
Dissolved Inorganic Carbon	0.500 mg/L	53.9	47.1	24.7	34.4
Dissolved Organic Carbon	0.5 mg/L	12.0	23.1	19.6	24.8
Total Dissolved Carbon	0.5 mg/L	66.0	70.2	44.3	59.2
Hardness	mg/L	306	217	111	124
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.08	0.11	0.13	8.39
Total Dissolved Solids	10 mg/L	692	352	282	328
Total Suspended Solids	2 mg/L	2	16	38	1110
Total Kjeldahl Nitrogen	0.1 mg/L	1.0	1.6	1.8	10.9
Anions					
Chloride	1 mg/L	208	62	75	54
Nitrate as N	0.1 mg/L	0.2	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	86	1	19	2
Metals					
Arsenic	1 ug/L	1	1	<1	9
Boron	10 ug/L	391	197	111	109
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Calcium	100 ug/L	82100	59400	28400	34200
Chromium	1 ug/L	2	1	1	6
Cobalt	0.5 ug/L	0.7	2.3	<0.5	9.3
Copper	0.5 ug/L	3.2	1.4	0.8	17.8
Iron	100 ug/L	781	13500	706	132000
Lead	0.1 ug/L	0.3	2.3	0.1	5.6
Magnesium	200 ug/L	24400	16600	9840	9310
Manganese	5 ug/L	294	2990	195	3240
Potassium	100 ug/L	8520	4480	2650	2240
Sodium	200 ug/L	133000	65900	61700	51500
Zinc	5 ug/L	7	18	6	40

Certificate of Analysis

Report Date: 08-Jul-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Jun-2019

Client PO: 7145-17-00370

Project Description: 18113613

	Client ID:	Dupe-1	-	-	-
	Sample Date:	20-Jun-19 13:20	-	-	-
	Sample ID:	1925629-13	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	261	-	-	-
Ammonia as N	0.01 mg/L	0.09	-	-	-
BOD	2 mg/L	<2	-	-	-
Chemical Oxygen Demand	10 mg/L	36	-	-	-
Dissolved Inorganic Carbon	0.500 mg/L	54.3	-	-	-
Dissolved Organic Carbon	0.5 mg/L	12.1	-	-	-
Total Dissolved Carbon	0.5 mg/L	66.4	-	-	-
Hardness	mg/L	321	-	-	-
Phenolics	0.001 mg/L	<0.001	-	-	-
Phosphorus, total	0.01 mg/L	0.08	-	-	-
Total Dissolved Solids	10 mg/L	652	-	-	-
Total Suspended Solids	2 mg/L	4	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	1.0	-	-	-
Anions					
Chloride	1 mg/L	208	-	-	-
Nitrate as N	0.1 mg/L	0.2	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-
Sulphate	1 mg/L	85	-	-	-
Metals					
Arsenic	1 ug/L	1	-	-	-
Boron	10 ug/L	433	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	85900	-	-	-
Chromium	1 ug/L	4	-	-	-
Cobalt	0.5 ug/L	0.8	-	-	-
Copper	0.5 ug/L	3.5	-	-	-
Iron	100 ug/L	936	-	-	-
Lead	0.1 ug/L	2.9	-	-	-
Magnesium	200 ug/L	25900	-	-	-
Manganese	5 ug/L	315	-	-	-
Potassium	100 ug/L	9050	-	-	-
Sodium	200 ug/L	143000	-	-	-
Zinc	5 ug/L	7	-	-	-

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 08-Jul-2019
Order Date: 21-Jun-2019
Project Description: 18113613

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Total Dissolved Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 08-Jul-2019
Order Date: 21-Jun-2019
Project Description: 18113613

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	140	1	mg/L	ND			0.0	10	
Nitrate as N	0.14	0.1	mg/L	0.15			6.7	10	
Nitrite as N	ND	0.05	mg/L	ND				10	
Sulphate	137	1	mg/L	138			1.0	10	
General Inorganics									
Alkalinity, total	283	5	mg/L	268			5.3	14	
Ammonia as N	0.029	0.01	mg/L	0.038			24.7	18	QR-01
BOD	ND	2	mg/L	203			0.0	20	BOD01
Chemical Oxygen Demand	93	10	mg/L	83			11.4	12	
Dissolved Organic Carbon	5.8	0.5	mg/L	5.9			1.6	37	
Phenolics	ND	0.001	mg/L	ND				10	
Phosphorus, total	0.195	0.01	mg/L	0.197			1.0	15	
Total Dissolved Solids	368	10	mg/L	406			9.8	10	
Total Suspended Solids	33.0	2	mg/L	31.0			6.3	10	
Total Kjeldahl Nitrogen	1.57	0.1	mg/L	1.50			4.4	16	
Metals									
Arsenic	3.8	1	ug/L	3.4			11.8	20	
Boron	189	10	ug/L	190			0.3	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Calcium	269000	100	ug/L	249000			7.6	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	2.91	0.5	ug/L	2.56			12.7	20	
Copper	1.34	0.5	ug/L	1.18			12.2	20	
Iron	1460	100	ug/L	1310			10.5	20	
Lead	0.25	0.1	ug/L	0.18			33.5	20	QR-01
Magnesium	175000	200	ug/L	163000			7.5	20	
Manganese	2080	5	ug/L	1850			11.5	20	
Potassium	14400	100	ug/L	13600			5.7	20	
Sodium	310000	2000	ug/L	354000			13.2	20	
Zinc	10	5	ug/L	6			43.0	20	QR-01

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 08-Jul-2019
Order Date: 21-Jun-2019
Project Description: 18113613

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	18.4	1	mg/L	9.10	93.5	77-123			
Nitrate as N	1.20	0.1	mg/L	ND	120	79-120			
Nitrite as N	0.975	0.05	mg/L	ND	97.5	84-117			
Sulphate	27.0	1	mg/L	15.8	112	74-126			
General Inorganics									
Ammonia as N	0.268	0.01	mg/L	0.038	92.0	81-124			
BOD	188		mg/L		94.2	71-121			
Chemical Oxygen Demand	301	10	mg/L	83	109	85-111			
Dissolved Organic Carbon	15.6	0.5	mg/L	5.9	97.3	60-133			
Phenolics	0.023	0.001	mg/L	ND	91.0	69-132			
Phosphorus, total	0.678	0.01	mg/L	0.197	96.2	80-120			
Total Dissolved Solids	94.0	10	mg/L		94.0	75-125			
Total Suspended Solids	19.0	2	mg/L		95.0	75-125			
Total Kjeldahl Nitrogen	4.00	0.1	mg/L	1.50	125	81-126			
Metals									
Arsenic	54.9		ug/L	3.4	103	80-120			
Boron	77		ug/L	33	87.3	80-120			
Cadmium	43.4		ug/L	ND	86.7	80-120			
Calcium	106000		ug/L	97800	81.3	80-120			
Chromium	59.0		ug/L	ND	117	80-120			
Cobalt	54.5		ug/L	2.56	104	80-120			
Copper	50.5		ug/L	1.18	98.6	80-120			
Iron	3760		ug/L	1310	97.8	80-120			
Lead	42.6		ug/L	0.48	84.2	80-120			
Magnesium	48500		ug/L	39300	91.9	80-120			
Manganese	74.6		ug/L	24.7	99.8	80-120			
Potassium	24900		ug/L	13600	113	80-120			
Sodium	29800		ug/L	21100	87.4	80-120			
Zinc	47		ug/L	6	80.8	80-120			

Qualifier Notes:

Sample Qualifiers :

1 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

QC Qualifiers :

BOD01 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

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PARACEL WO: 1925629

Chain of Custody
(Lab Use Only)

Page 1 of 2

Client Name: Golder Associates	Project Reference: 18113813	TAT: ☑ Regular ☐ 3 Day
Contact Name: Yannick Marcotte	Quote #: 19-361 SW	☐ 2 Day ☐ 1 Day
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	Date Required:
Telephone: 613-592-9600	Email Address: yannick_marcotte@golder.com, emily_jason@golder.com, henri.hunsa@wsscconnections.com	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary Municipality:) ☐ Other: OBWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1925629

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	S-20	SW		1	06/20/19	11:50 AM	✓
2	S-21	SW			06/20/19	1:20 PM	✓
3	S-1	SW			06/20/19	1:20 PM	✓
4	S-3	SW			06/20/19	2:05 PM	✓
5	S-16	SW			06/20/19	1:45 PM	✓
6	S-18	SW			06/20/19	2:45 PM	✓
7	S-17	SW			06/20/19	2:30 PM	✓
8	~~S-6~~	~~SW~~			~~06/20/19~~	~~Duplicate~~	✓
9	S-5	SW			06/20/19	9 AM	✓
10	S-9	SW		↓	06/20/19	12:40 PM	✓

Comments: Inside to Hand Hunsa ; Sample submerged on the notes, The Water in Cooler Tub

Method of Delivery: Quiff

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Christopher Quiroz	Verified By:
Relinquished By (Print):	Date/Time:	Date/Time: Nov 21 2019 02:20	Date/Time:
Date/Time: 06/20/19	Temperature: °C	Temperature: 10.4 °C	pH Verified By:

Chain of Custody (Blank) - Rev 8.3 Oct. 2014

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PARACEL WO: 1925629

Chain of Custody
(Lab Use Only)

Page 2 of 2

Client Name: Golder Associates	Project Reference: 18113613	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marceau	Quote #: 19-341 SW	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_bacon@golder.com, henri.huneault@wastecorrections.com		

Criteria: ☐ O.Reg. 153/04 (As Amended) Table ☐ REC Filing ☐ O.Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☐ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

	Paracel Order Number: / Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	S-10	SW		4	06/20/19	2:55pm	☑
2	S-11	SW		4	06/20/19	12:24pm	☑
3	S-12	SW		4	06/20/19	12:24pm	☑
4	Dupe-1	SW		4	06/20/19	/	☑
5							☐
6							☐
7							☐
8							☐
9							☐
10							☐

Comments: Invoice to Henri Huneault

Method of Delivery: SWIFT

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print):	Date/Time:	Date/Time: 20 Jun 19 02:2	Date/Time:
Date/Time: 20 Jun 19	Temperature: °C	Temperature: 14.4 °C	pH Verified: ☐ By:

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-17-00370
Project: 18113613
Custody:

Report Date: 11-Jul-2019
Order Date: 20-Jun-2019

Order #: 1925592

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1925592-01	92-19
1925592-02	05-1D
1925592-03	95-8
1925592-04	92-18
1925592-05	98-1
1925592-06	05-1C
1925592-07	05-R3
1925592-08	05-8
1925592-09	05-11
1925592-10	05-3D
1925592-11	07-1D
1925592-12	MW-C
1925592-13	MW-E
1925592-14	92-7
1925592-15	92-10
1925592-16	94-3
1925592-17	94-6
1925592-18	95-3
1925592-19	95-7
1925592-20	05-3C
1925592-21	07-1C
1925592-22	94-4
1925592-23	95-2
1925592-24	95-6
1925592-25	Dupe-2
1925592-26	Dupe-3

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 11-Jul-2019
Order Date: 20-Jun-2019
Project Description: 18113613

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, bicarbonate	calculated from EPA 310.1 - Titration to pH 4.5	22-Jun-19	22-Jun-19
Alkalinity, carbonate	calculated from EPA 310.1 - Titration to pH 4.5	21-Jun-19	22-Jun-19
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	21-Jun-19	22-Jun-19
Ammonia, as N	EPA 351.2 - Auto Colour	24-Jun-19	26-Jun-19
Anions	EPA 300.1 - IC	24-Jun-19	25-Jun-19
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	24-Jun-19	24-Jun-19
Golder General Chemistry- GW	Hardness as CaCO3	24-Jun-19	24-Jun-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	24-Jun-19	24-Jun-19
Phenolics	EPA 420.2 - Auto Colour, 4AAP	24-Jun-19	24-Jun-19
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	25-Jun-19	26-Jun-19
Total Dissolved Solids	SM 2540C - gravimetric, filtration	24-Jun-19	25-Jun-19
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	25-Jun-19	26-Jun-19
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	25-Jun-19	25-Jun-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	92-19	05-1D	95-8	92-18
	Sample Date:	19-Jun-19 08:55	19-Jun-19 09:35	19-Jun-19 13:05	19-Jun-19 08:45
	Sample ID:	1925592-01	1925592-02	1925592-03	1925592-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	191	248	944	198
Alkalinity, bicarbonate	5 mg/L	191	247	943	197
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<5
Ammonia as N	0.01 mg/L	0.10	0.09	2.25	0.03
Chemical Oxygen Demand	10 mg/L	14	<10	124	72
Hardness	mg/L	213	617	864	511
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.17	0.08	0.02	0.09
Total Dissolved Solids	10 mg/L	406	1400	1260	1040
Total Kjeldahl Nitrogen	0.1 mg/L	0.2	0.4	3.4	0.1
Anions					
Chloride	1 mg/L	76	528	161	356
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.3	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	0.07	<0.05
Sulphate	1 mg/L	39	99	14	38
Metals					
Arsenic	1 ug/L	<1	<1	<1	4
Boron	10 ug/L	47	40	73	26
Cadmium	0.1 ug/L	<0.1	<0.1	0.3	<0.1
Calcium	100 ug/L	67700	175000	213000	132000
Chromium	1 ug/L	<1	<1	9	<1
Cobalt	0.5 ug/L	<0.5	<0.5	2.7	<0.5
Copper	0.5 ug/L	2.7	6.9	94.8	2.2
Iron	100 ug/L	<100	<100	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	0.1	<0.1
Magnesium	200 ug/L	10700	43400	80600	43800
Manganese	5 ug/L	23	<5	11300	<5
Potassium	100 ug/L	3120	15000	22600	7890
Sodium	200 ug/L	42300	240000	124000	96000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	92-19	05-1D	95-8	92-18
	Sample Date:	19-Jun-19 08:55	19-Jun-19 09:35	19-Jun-19 13:05	19-Jun-19 08:45
	Sample ID:	1925592-01	1925592-02	1925592-03	1925592-04
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	86.9%	86.8%	88.1%	86.4%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	98-1	05-1C	05-R3	05-8
	Sample Date:	19-Jun-19 12:55	19-Jun-19 09:15	19-Jun-19 11:25	19-Jun-19 11:05
	Sample ID:	1925592-05	1925592-06	1925592-07	1925592-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	526	183	902	1260
Alkalinity, bicarbonate	5 mg/L	523	181	899	1250
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<25 [1]
Ammonia as N	0.01 mg/L	2.15	0.29	0.05	0.79
Chemical Oxygen Demand	10 mg/L	42	19	18	110
Hardness	mg/L	414	172	814	942
Phenolics	0.001 mg/L	<0.001	<0.001	0.001	0.003
Phosphorus, total	0.01 mg/L	0.39	0.91	0.03	0.13
Total Dissolved Solids	10 mg/L	1170	330	1020	1400
Total Kjeldahl Nitrogen	0.1 mg/L	3.1	0.5	0.3	2.5
Anions					
Chloride	1 mg/L	433	55	21	113
Nitrate as N	0.1 mg/L	0.2	0.2	<0.1	<0.1
Nitrite as N	0.05 mg/L	0.33	<0.05	<0.05	<0.05
Sulphate	1 mg/L	3	52	123	1
Metals					
Arsenic	1 ug/L	<1	2	<1	<1
Boron	10 ug/L	163	71	507	2480
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	93700	41600	183000	195000
Chromium	1 ug/L	<1	<1	<1	1
Cobalt	0.5 ug/L	0.9	<0.5	<0.5	0.9
Copper	0.5 ug/L	1.1	2.5	1.9	4.6
Iron	100 ug/L	6580	188	<100	210
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Magnesium	200 ug/L	43800	16600	86400	110000
Manganese	5 ug/L	1390	46	417	13700
Potassium	100 ug/L	18600	5530	9850	6520
Sodium	200 ug/L	327000	53000	128000	136000
Zinc	5 ug/L	6	5	<5	8
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 11-Jul-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 20-Jun-2019

Client PO: 7145-17-00370

Project Description: 18113613

	Client ID:	98-1	05-1C	05-R3	05-8
	Sample Date:	19-Jun-19 12:55	19-Jun-19 09:15	19-Jun-19 11:25	19-Jun-19 11:05
	Sample ID:	1925592-05	1925592-06	1925592-07	1925592-08
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	87.1%	87.5%	87.8%	88.0%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	05-11	05-3D	07-1D	MW-C
	Sample Date:	19-Jun-19 10:40	19-Jun-19 10:10	19-Jun-19 10:30	19-Jun-19 14:25
	Sample ID:	1925592-09	1925592-10	1925592-11	1925592-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	1330	701	428	460
Alkalinity, bicarbonate	5 mg/L	1330	694	426	457
Alkalinity, carbonate	5 mg/L	<25 [1]	6	<5	<5
Ammonia as N	0.01 mg/L	2.27	0.04	0.26	0.16
Chemical Oxygen Demand	10 mg/L	124	11	68	140
Hardness	mg/L	1160	380	485	427
Phenolics	0.001 mg/L	0.003	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.12	0.16	1.42	1.39
Total Dissolved Solids	10 mg/L	1660	970	686	986
Total Kjeldahl Nitrogen	0.1 mg/L	4.1	0.2	2.2	1.2
Anions					
Chloride	1 mg/L	173	113	17	68
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.8	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	44	111	197	317
Metals					
Arsenic	1 ug/L	<1	<1	<1	1
Boron	10 ug/L	5730	444	247	392
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	266000	67200	119000	86800
Chromium	1 ug/L	1	<1	<1	4
Cobalt	0.5 ug/L	2.9	<0.5	<0.5	1.2
Copper	0.5 ug/L	1.3	5.1	3.2	5.0
Iron	100 ug/L	<100	122	<100	1560
Lead	0.1 ug/L	<0.1	0.3	<0.1	1.0
Magnesium	200 ug/L	121000	51500	45600	51100
Manganese	5 ug/L	6680	52	670	168
Potassium	100 ug/L	14500	14800	7070	6440
Sodium	200 ug/L	189000	258000	63800	141000
Zinc	5 ug/L	<5	6	8	9
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	05-11	05-3D	07-1D	MW-C
	Sample Date:	19-Jun-19 10:40	19-Jun-19 10:10	19-Jun-19 10:30	19-Jun-19 14:25
	Sample ID:	1925592-09	1925592-10	1925592-11	1925592-12
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	87.6%	86.4%	88.5%	87.6%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	MW-E	92-7	92-10	94-3
	Sample Date:	19-Jun-19 14:35	19-Jun-19 11:10	19-Jun-19 10:55	19-Jun-19 13:45
	Sample ID:	1925592-13	1925592-14	1925592-15	1925592-16
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	368	649	832	934
Alkalinity, bicarbonate	5 mg/L	366	640	827	930
Alkalinity, carbonate	5 mg/L	<5	9	6	<5
Ammonia as N	0.01 mg/L	0.26	0.38	0.24	0.31
Chemical Oxygen Demand	10 mg/L	103	39	84	81
Hardness	mg/L	388	394	589	708
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.93	0.20	0.15	0.11
Total Dissolved Solids	10 mg/L	662	1350	1240	1020
Total Kjeldahl Nitrogen	0.1 mg/L	1.6	0.7	0.9	0.8
Anions					
Chloride	1 mg/L	70	428	227	49
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	138	4	60	64
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	235	765	1090	590
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	0.1
Calcium	100 ug/L	100000	58800	103000	145000
Chromium	1 ug/L	<1	1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	0.6
Copper	0.5 ug/L	3.4	4.6	5.3	2.0
Iron	100 ug/L	<100	<100	<100	424
Lead	0.1 ug/L	<0.1	0.2	<0.1	<0.1
Magnesium	200 ug/L	33500	60000	80700	83800
Manganese	5 ug/L	342	<5	876	3430
Potassium	100 ug/L	4770	26700	19600	11000
Sodium	200 ug/L	76400	444000	272000	116000
Zinc	5 ug/L	<5	6	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	MW-E	92-7	92-10	94-3
	Sample Date:	19-Jun-19 14:35	19-Jun-19 11:10	19-Jun-19 10:55	19-Jun-19 13:45
	Sample ID:	1925592-13	1925592-14	1925592-15	1925592-16
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	86.6%	88.0%	89.3%	86.7%

PARACEL LABORATORIES LTD.

Order #: 1925592

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	94-6	95-3	95-7	05-3C
	Sample Date:	19-Jun-19 15:25	19-Jun-19 14:05	19-Jun-19 14:55	19-Jun-19 10:00
	Sample ID:	1925592-17	1925592-18	1925592-19	1925592-20
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	463	757	618	982
Alkalinity, bicarbonate	5 mg/L	461	750	610	957
Alkalinity, carbonate	5 mg/L	<5	7	8	25
Ammonia as N	0.01 mg/L	0.32	0.29	0.75	0.62
Chemical Oxygen Demand	10 mg/L	86	105	73	84
Hardness	mg/L	411	232	268	90.4
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.66	2.92	0.86	0.83
Total Dissolved Solids	10 mg/L	1070	1150	1410	1580
Total Kjeldahl Nitrogen	0.1 mg/L	1.8	1.2	1.3	2.1
Anions					
Chloride	1 mg/L	263	189	458	316
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.1	0.9
Nitrite as N	0.05 mg/L	<0.05	<0.05	0.07	0.10
Sulphate	1 mg/L	149	85	10	23
Metals					
Arsenic	1 ug/L	<1	<1	2	4
Boron	10 ug/L	147	831	303	1490
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	96600	36300	41500	10700
Chromium	1 ug/L	<1	<1	<1	1
Cobalt	0.5 ug/L	0.8	0.6	0.8	0.6
Copper	0.5 ug/L	5.2	1.4	2.3	10.6
Iron	100 ug/L	<100	<100	321	502
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	41200	34300	39900	15400
Manganese	5 ug/L	1110	599	4250	29
Potassium	100 ug/L	7680	8900	9460	16200
Sodium	200 ug/L	218000	375000	457000	557000
Zinc	5 ug/L	7	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	94-6	95-3	95-7	05-3C
	Sample Date:	19-Jun-19 15:25	19-Jun-19 14:05	19-Jun-19 14:55	19-Jun-19 10:00
	Sample ID:	1925592-17	1925592-18	1925592-19	1925592-20
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	88.5%	87.6%	86.2%	85.5%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	07-1C	94-4	95-2	95-6
	Sample Date:	19-Jun-19 10:20	19-Jun-19 15:35	19-Jun-19 13:55	19-Jun-19 15:05
	Sample ID:	1925592-21	1925592-22	1925592-23	1925592-24
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	665	1080	1070	943
Alkalinity, bicarbonate	5 mg/L	661	1070	1060	931
Alkalinity, carbonate	5 mg/L	<5	<25 [1]	<25 [1]	11
Ammonia as N	0.01 mg/L	0.61	4.36	2.07	1.48
Chemical Oxygen Demand	10 mg/L	28	84	97	75
Hardness	mg/L	229	443	245	299
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.66	1.41	2.57	0.52
Total Dissolved Solids	10 mg/L	1440	3690	2090	2370
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	5.0	2.8	2.0
Anions					
Chloride	1 mg/L	418	1640	587	902
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	0.05	<0.50 [1]	0.36	0.07
Sulphate	1 mg/L	117	<1	3	1
Metals					
Arsenic	1 ug/L	3	3	1	1
Boron	10 ug/L	452	140	842	686
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	34000	48200	32500	40600
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	0.7	0.6	<0.5	0.6
Copper	0.5 ug/L	1.0	1.2	2.5	2.3
Iron	100 ug/L	917	210	<100	108
Lead	0.1 ug/L	0.6	<0.1	0.1	<0.1
Magnesium	200 ug/L	35000	78400	39700	47900
Manganese	5 ug/L	389	112	48	111
Potassium	100 ug/L	14100	32500	17700	17000
Sodium	200 ug/L	442000	1060000	720000	591000
Zinc	5 ug/L	5	7	6	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	07-1C	94-4	95-2	95-6
	Sample Date:	19-Jun-19 10:20	19-Jun-19 15:35	19-Jun-19 13:55	19-Jun-19 15:05
	Sample ID:	1925592-21	1925592-22	1925592-23	1925592-24
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	86.2%	85.1%	86.9%	87.6%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	Dupe-2	Dupe-3	-	-
	Sample Date:	19-Jun-19 00:00	19-Jun-19 00:00	-	-
	Sample ID:	1925592-25	1925592-26	-	-
	MDL/Units	Water	Water	-	-
General Inorganics					
Alkalinity, total	5 mg/L	246	505	-	-
Alkalinity, bicarbonate	5 mg/L	245	502	-	-
Alkalinity, carbonate	5 mg/L	<5	<5	-	-
Ammonia as N	0.01 mg/L	0.05	2.27	-	-
Chemical Oxygen Demand	10 mg/L	13	42	-	-
Hardness	mg/L	478	457	-	-
Phenolics	0.001 mg/L	<0.001	<0.001	-	-
Phosphorus, total	0.01 mg/L	0.03	0.33	-	-
Total Dissolved Solids	10 mg/L	1330	1200	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.3	2.9	-	-
Anions					
Chloride	1 mg/L	502	434	-	-
Nitrate as N	0.1 mg/L	<0.1	0.2	-	-
Nitrite as N	0.05 mg/L	<0.05	0.34	-	-
Sulphate	1 mg/L	99	3	-	-
Metals					
Arsenic	1 ug/L	<1	<1	-	-
Boron	10 ug/L	26	253	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Calcium	100 ug/L	137000	104000	-	-
Chromium	1 ug/L	<1	<1	-	-
Cobalt	0.5 ug/L	<0.5	1.1	-	-
Copper	0.5 ug/L	4.7	<0.5	-	-
Iron	100 ug/L	<100	8260	-	-
Lead	0.1 ug/L	<0.1	<0.1	-	-
Magnesium	200 ug/L	33300	48000	-	-
Manganese	5 ug/L	<5	1290	-	-
Potassium	100 ug/L	10900	19600	-	-
Sodium	200 ug/L	199000	290000	-	-
Zinc	5 ug/L	<5	<5	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 11-Jul-2019

Order Date: 20-Jun-2019

Project Description: 18113613

	Client ID:	Dupe-2	Dupe-3	-	-
	Sample Date:	19-Jun-19 00:00	19-Jun-19 00:00	-	-
	Sample ID:	1925592-25	1925592-26	-	-
	MDL/Units	Water	Water	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	88.6%	86.3%	-	-

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 11-Jul-2019
Order Date: 20-Jun-2019
Project Description: 18113613

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Alkalinity, bicarbonate	ND	5	mg/L						
Alkalinity, carbonate	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Surrogate: Toluene-d8	*70.4*		*ug/L*		*88.0*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 11-Jul-2019
Order Date: 20-Jun-2019
Project Description: 18113613

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	76.8	1	mg/L	76.2			0.7	10	
Nitrate as N	ND	0.1	mg/L	ND				10	
Nitrite as N	ND	0.05	mg/L	ND				10	
Sulphate	39.4	1	mg/L	39.2			0.4	10	
General Inorganics									
Alkalinity, total	260	5	mg/L	257			1.0	14	
Alkalinity, bicarbonate	188	5	mg/L	191			1.8	14	
Alkalinity, carbonate	ND	5	mg/L	ND			0.0	14	
Ammonia as N	0.029	0.01	mg/L	0.038			24.7	18	QR-01
Chemical Oxygen Demand	22	10	mg/L	24			8.7	12	
Phenolics	ND	0.001	mg/L	ND				10	
Phosphorus, total	0.193	0.01	mg/L	0.174			10.0	15	
Total Dissolved Solids	368	10	mg/L	406			9.8	10	
Total Kjeldahl Nitrogen	0.25	0.1	mg/L	0.23			9.5	16	
Metals									
Arsenic	3.8	1	ug/L	3.4			11.8	20	
Boron	189	10	ug/L	190			0.3	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Calcium	269000	100	ug/L	249000			7.6	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	2.91	0.5	ug/L	2.56			12.7	20	
Copper	1.34	0.5	ug/L	1.18			12.2	20	
Iron	1460	100	ug/L	1310			10.5	20	
Lead	0.25	0.1	ug/L	0.18			33.5	20	QR-01
Magnesium	175000	200	ug/L	163000			7.5	20	
Manganese	2080	5	ug/L	1850			11.5	20	
Potassium	14400	100	ug/L	13600			5.7	20	
Sodium	310000	2000	ug/L	354000			13.2	20	
Zinc	10	5	ug/L	6			43.0	20	QR-01
Volatiles									
Benzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: Toluene-d8	*69.6*		*ug/L*		*87.0*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 11-Jul-2019
Order Date: 20-Jun-2019
Project Description: 18113613

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	84.4	1	mg/L	76.2	81.9	77-123			
Nitrate as N	1.07	0.1	mg/L	ND	107	79-120			
Nitrite as N	0.901	0.05	mg/L	ND	90.1	84-117			
Sulphate	49.2	1	mg/L	39.2	99.7	74-126			
General Inorganics									
Ammonia as N	0.268	0.01	mg/L	0.038	92.0	81-124			
Chemical Oxygen Demand	212	10	mg/L	24	94.0	85-111			
Phenolics	0.025	0.001	mg/L	ND	98.1	69-132			
Phosphorus, total	0.694	0.01	mg/L	0.174	104	80-120			
Total Dissolved Solids	94.0	10	mg/L		94.0	75-125			
Total Kjeldahl Nitrogen	2.54	0.1	mg/L	0.23	116	81-126			
Metals									
Arsenic	54.9		ug/L	3.4	103	80-120			
Boron	77		ug/L	33	87.3	80-120			
Cadmium	43.4		ug/L	ND	86.7	80-120			
Calcium	106000		ug/L	97800	81.3	80-120			
Chromium	59.0		ug/L	ND	117	80-120			
Cobalt	54.5		ug/L	2.56	104	80-120			
Copper	50.5		ug/L	1.18	98.6	80-120			
Iron	3760		ug/L	1310	97.8	80-120			
Lead	42.6		ug/L	0.48	84.2	80-120			
Magnesium	48500		ug/L	39300	91.9	80-120			
Manganese	74.6		ug/L	24.7	99.8	80-120			
Potassium	24900		ug/L	13600	113	80-120			
Sodium	29800		ug/L	21100	87.4	80-120			
Zinc	47		ug/L	6	80.8	80-120			
Volatiles									
Benzene	34.6	0.5	ug/L		86.4	60-130			
1,1-Dichloroethane	32.3	0.5	ug/L		80.7	60-130			
Ethylbenzene	39.0	0.5	ug/L		97.6	60-130			
Methylene Chloride	33.2	5.0	ug/L		83.1	60-130			
Toluene	30.3	0.5	ug/L		75.8	60-130			
Vinyl chloride	37.7	0.5	ug/L		94.2	50-140			
m,p-Xylenes	81.8	0.5	ug/L		102	60-130			
o-Xylene	38.6	0.5	ug/L		96.4	60-130			
Surrogate: Toluene-d8	*59.1*		*ug/L*		*73.9*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

PARACEL

PARACEL WO: 1925592

Chain of Custody
(Lab Use Only)

Page 1 of 3

Client Name: Golder Associates	Project Reference: 18113613	TAT: ☑ Regular ☐ 3 Day
Contact Name: Yannick Marcenac	Quote #: 95-360 GW	☐ 2 Day ☐ 1 Day
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #	Date Required:
Telephone: 613-592-9600	Email Address: yannick_marcenac@golder.com, emily_bacon@golder.com, henri.hunault@wastecorrectors.com	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1925592

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	92-19	GW		1	06/19/19	8:55am	☑
2	85-1D	GW			06/19/19	9:35am	☑
3	95-8	GW			06/19/19	1:25pm	☑
4	92-18	GW			06/19/19	8:45am	☑
5	93-1	GW			06/19/19	12:55pm	☑
6	05-1C	GW			06/19/19	9:15am	☑
7	05-03	GW			06/19/19	11:25am	☑
8	05-8	GW			06/19/19	11:05am	☑
9	05-11	GW			06/19/19	10:40am	☑
10	05-3D	GW		V	06/19/19	10:10am	☑

Comments: Invoice to Henri Hunault. 9: Strip Submerged in the water, the water in Coolers too.

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): PATRICK ARMITAGE	Date/Time: 20/06/19 11:00	Date/Time: JUN 20 2019 05:47	Date/Time:
Date/Time: 20/6/19	Temperature: °C	Temperature: 4.6 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

000530

PARACEL

PARACEL WO: 1925592

Chain of Custody
(Lab Use Only)

Page 2 of 3

Client Name: Golder Associates	Project Reference: 18113613	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marcerou	Quote #: 19-368 GW	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd Ottawa, Ontario K2H 5B7	PO #:	Email Address: yannick_marcerou@golder.com emily_bacon@golder.com henri.mussaut@wasteconnections.com	Date Required:
Telephone: 613-592-9600			

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1925592

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Per quote										
1	07-1D	GW		4	06/19/19	12:30 pm	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2	MW-C	GW			06/19/19	2:25 PM	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3	MW-E	GW			06/19/19	2:35 PM	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4	92-7	GW			06/19/19	11:10 am	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5	92-10	GW			06/19/19	12:55 pm	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6	~~94-2~~ 94-3	GW			06/19/19	1:45 PM	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7	94-6	GW			06/19/19	2:25 PM	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8	95-3	GW			06/19/19	2:05 PM	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9	95-7	GW			06/19/19	2:55 PM	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10	05-3C	GW			06/19/19	12:30 pm	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Comments: Invoice to Henri Mussaut

Method of Delivery: Parcel

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Shreedevi Odhrmoj	Verified By:
Relinquished By (Print): Laurie Armitage	Date/Time: 20/06/19 11:00 AM	Date/Time: June 20/19 05:03	Date/Time: Oct 21-19 12
Date/Time:	Temperature: °C	Temperature: 8.2 °C	pH Verified By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

PARACEL

PARACEL WO: 1925592

Client Name: Golder Associates	Project Reference: 1811503
Contact Name: Yannick Mercerou	Quote #: 19360 GW
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:
Telephone: 613-592-9600	Email Address: yannick_mercerou@golder.com, emily_bacon@golder.com, brent.hunnault@wasteconnections.com

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary)

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Ground Water/Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1925592		Matrix	Air Volume	# of Containers	Sample Taken		Per quote	VOCs	
	Sample ID/Location Name				Date	Time			
1	07-1C	GW		3	06/19/19	10:22AM	✓	☐	☐
2	~~94-5~~ 94-4	GW			06/19/19	3:35 PM	✓	☐	☐
3	96-2	GW			06/19/19	1:55 PM	✓	☐	☐
4	95-6	GW			06/19/19	3:05 PM	✓	☐	☐
5	Dupe-2	GW			06/19/19	/	✓	☐	☐
6	Dupe-3	GW		√	06/19/19	/	✓	☐	☐
7							☐	☐	☐
8							☐	☐	☐
9							☐	☐	☐
10							☐	☐	☐

Comments: Invoice to Waste Connections

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Sonapreet Bhinai 05.07
Relinquished By (Print): Brent Hunnault	Date/Time: 20/06/19 11:00	Date/Time: JUN 20, 2019
Date/Time: 06/19/19	Temperature: °C	Temperature: 9.8 °C

JG-21-19124

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-17-00370
Project: 18113613
Custody:

Report Date: 4-Sep-2019
Order Date: 28-Aug-2019

Order #: 1935456

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1935456-01	S-21
1935456-02	S-1
1935456-03	S-3
1935456-04	S-15
1935456-05	S-16
1935456-06	S-17
1935456-07	S-12
1935456-08	Dupe-1

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 04-Sep-2019
Order Date: 28-Aug-2019
Project Description: 18113613

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	30-Aug-19	30-Aug-19
Ammonia, as N	EPA 351.2 - Auto Colour	3-Sep-19	3-Sep-19
Anions	EPA 300.1 - IC	30-Aug-19	30-Aug-19
Biochemical Oxygen Demand	SM 5210B - DO Probe	30-Aug-19	4-Sep-19
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	30-Aug-19	30-Aug-19
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	29-Aug-19	30-Aug-19
Golder General Chemistry- SW	Hardness as CaCO3	3-Sep-19	4-Sep-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	3-Sep-19	4-Sep-19
Phenolics	EPA 420.2 - Auto Colour, 4AAP	30-Aug-19	3-Sep-19
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	30-Aug-19	30-Aug-19
Total Dissolved Carbon	MOE 3247B - Combustion IR	30-Aug-19	30-Aug-19
Total Dissolved Solids	SM 2540C - gravimetric, filtration	3-Sep-19	4-Sep-19
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	30-Aug-19	30-Aug-19
Total Suspended Solids	SM 2540D - Gravimetric	30-Aug-19	30-Aug-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 04-Sep-2019

Order Date: 28-Aug-2019

Project Description: 18113613

	Client ID:	S-21	S-1	S-3	S-15
	Sample Date:	28-Aug-19 12:50	28-Aug-19 13:45	28-Aug-19 14:35	28-Aug-19 14:15
	Sample ID:	1935456-01	1935456-02	1935456-03	1935456-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	272	167	208	371
Ammonia as N	0.01 mg/L	0.06	0.04	0.25	0.15
BOD	2 mg/L	4	2	<2	<2
Chemical Oxygen Demand	10 mg/L	75	53	52	54
Dissolved Inorganic Carbon	0.500 mg/L	-	52.8	70.9	-
Dissolved Inorganic Carbon	1.00 mg/L	92.4	-	-	-
Dissolved Inorganic Carbon	2.00 mg/L	-	-	-	125
Dissolved Organic Carbon	0.5 mg/L	22.2	14.8	18.6	27.4
Total Dissolved Carbon	0.5 mg/L	115	67.6	89.5	152
Hardness	mg/L	274	325	322	385
Phenolics	0.001 mg/L	0.006	0.005	0.005	0.006
Phosphorus, total	0.01 mg/L	0.09	0.11	0.07	0.06
Total Dissolved Solids	10 mg/L	840	794	762	724
Total Suspended Solids	2 mg/L	8	68	10	4
Total Kjeldahl Nitrogen	0.1 mg/L	1.6	0.7	1.0	1.0
Anions					
Chloride	1 mg/L	199	251	234	168
Nitrate as N	0.1 mg/L	0.1	0.1	0.2	0.2
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	150	151	117	59
Metals					
Arsenic	1 ug/L	1	<1	<1	<1
Boron	10 ug/L	1360	130	76	64
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	58100	104000	98300	101000
Chromium	1 ug/L	1	8	1	1
Cobalt	0.5 ug/L	<0.5	1.8	0.6	0.8
Copper	0.5 ug/L	0.8	6.8	3.5	2.1
Iron	100 ug/L	210	2690	2020	1070
Lead	0.1 ug/L	0.2	3.2	0.3	0.3
Magnesium	200 ug/L	31400	16200	18600	31900
Manganese	5 ug/L	135	202	738	1240
Potassium	100 ug/L	16300	10100	9830	12900
Sodium	200 ug/L	156000	142000	126000	96300
Zinc	5 ug/L	<5	25	10	5

PARACEL LABORATORIES LTD.

Order #: 1935456

Certificate of Analysis

Report Date: 04-Sep-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 28-Aug-2019

Client PO: 7145-17-00370

Project Description: 18113613

	Client ID:	S-16	S-17	S-12	Dupe-1
	Sample Date:	28-Aug-19 15:15	28-Aug-19 14:55	28-Aug-19 10:30	28-Aug-19 10:30
	Sample ID:	1935456-05	1935456-06	1935456-07	1935456-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	227	86	10	273
Ammonia as N	0.01 mg/L	0.30	0.08	0.03	0.06
BOD	2 mg/L	4	4	6	9
Chemical Oxygen Demand	10 mg/L	46	44	73	60
Dissolved Inorganic Carbon	0.500 mg/L	75.7	27.3	<0.500	-
Dissolved Inorganic Carbon	1.00 mg/L	-	-	-	89.6
Dissolved Organic Carbon	0.5 mg/L	14.8	12.9	9.3	23.1
Total Dissolved Carbon	0.5 mg/L	90.6	40.2	9.7	113
Hardness	mg/L	284	153	30.6	283
Phenolics	0.001 mg/L	0.005	0.004	0.003	0.006
Phosphorus, total	0.01 mg/L	0.14	0.15	0.30	0.11
Total Dissolved Solids	10 mg/L	1130	548	50	782
Total Suspended Solids	2 mg/L	62	43	113	7
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	0.9	1.1	1.9
Anions					
Chloride	1 mg/L	505	192	3	198
Nitrate as N	0.1 mg/L	<0.1	0.5	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	36	101	17	143
Metals					
Arsenic	1 ug/L	<1	<1	<1	1
Boron	10 ug/L	24	34	63	1390
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	92900	51700	8860	59300
Chromium	1 ug/L	5	4	12	2
Cobalt	0.5 ug/L	1.4	1.0	1.2	0.6
Copper	0.5 ug/L	4.8	6.8	4.4	1.6
Iron	100 ug/L	3640	1550	3630	645
Lead	0.1 ug/L	2.9	2.5	4.0	0.4
Magnesium	200 ug/L	12700	5720	2070	32900
Manganese	5 ug/L	843	140	55	355
Potassium	100 ug/L	3750	6120	1620	16300
Sodium	200 ug/L	268000	101000	8130	156000
Zinc	5 ug/L	22	27	22	8

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-17-00370

Report Date: 04-Sep-2019

Order Date: 28-Aug-2019

Project Description: 18113613

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Total Dissolved Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 04-Sep-2019
Order Date: 28-Aug-2019
Project Description: 18113613

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	530	5	mg/L	536			1.1	10	
Nitrate as N	0.19	0.1	mg/L	0.19			0.9	10	
Nitrite as N	0.085	0.05	mg/L	0.090			5.6	10	
Sulphate	138	1	mg/L	135			2.0	10	
General Inorganics									
Alkalinity, total	271	5	mg/L	272			0.2	14	
Ammonia as N	0.056	0.01	mg/L	0.036			42.7	18	QR-01
BOD	9780	2	mg/L	9570			2.2	20	
Chemical Oxygen Demand	60	10	mg/L	75			22.2	12	QR-01
Dissolved Organic Carbon	5.2	0.5	mg/L	5.2			0.4	37	
Phenolics	ND	0.001	mg/L	ND				10	
Phosphorus, total	0.094	0.01	mg/L	0.090			3.7	15	
Total Dissolved Solids	802	10	mg/L	840			4.6	10	
Total Suspended Solids	ND	2	mg/L	ND				10	
Total Kjeldahl Nitrogen	1.63	0.1	mg/L	1.60			2.0	16	
Metals									
Arsenic	ND	1	ug/L	ND			0.0	20	
Boron	24	10	ug/L	29			18.9	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Calcium	127000	100	ug/L	131000			2.6	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	9.33	0.5	ug/L	9.65			3.4	20	
Iron	114	100	ug/L	153			29.3	20	QR-05
Lead	3.40	0.1	ug/L	3.51			3.2	20	
Magnesium	32100	200	ug/L	33300			3.4	20	
Manganese	ND	5	ug/L	ND			0.0	20	
Potassium	8320	100	ug/L	8620			3.5	20	
Sodium	23600	200	ug/L	24600			4.2	20	
Zinc	29	5	ug/L	28			0.9	20	

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 04-Sep-2019
Order Date: 28-Aug-2019
Project Description: 18113613

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.29	1	mg/L		92.9	85-115			
Nitrate as N	1.31	0.1	mg/L	0.19	112	79-120			
Nitrite as N	1.06	0.05	mg/L	0.090	96.8	84-117			
Sulphate	146	1	mg/L	135	101	74-126			
General Inorganics									
Ammonia as N	0.316	0.01	mg/L	0.036	112	81-124			
BOD	179		mg/L		89.6	71-121			
Chemical Oxygen Demand	245	10	mg/L	75	85.0	85-111			
Dissolved Organic Carbon	12.2	0.5	mg/L	4.6	75.5	60-133			
Phenolics	0.025	0.001	mg/L	ND	102	69-132			
Phosphorus, total	0.577	0.01	mg/L	0.090	97.3	80-120			
Total Dissolved Solids	110	10	mg/L		110	75-125			
Total Suspended Solids	23.0	2	mg/L		115	75-125			
Total Kjeldahl Nitrogen	3.75	0.1	mg/L	1.60	107	81-126			
Metals									
Arsenic	43.8		ug/L	ND	87.4	80-120			
Boron	43		ug/L		87.0	80-120			
Cadmium	49.0		ug/L		98.1	80-120			
Calcium	9720		ug/L		97.2	80-120			
Chromium	54.8		ug/L	ND	109	80-120			
Cobalt	50.8		ug/L	ND	101	80-120			
Copper	56.3		ug/L	9.65	93.2	80-120			
Iron	2390		ug/L	153	89.5	80-120			
Lead	44.8		ug/L	3.51	82.6	80-120			
Magnesium	9010		ug/L		90.1	80-120			
Manganese	55.2		ug/L	ND	107	80-120			
Potassium	17900		ug/L	8620	92.4	80-120			
Sodium	8840		ug/L		88.4	80-120			
Zinc	51		ug/L		102	80-120			

Qualifier Notes:

Login Qualifiers :

Container(s) - Labeled improperly/insufficient information -
Applies to samples: S-21

QC Qualifiers :

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

QR-05 : Duplicate RPDs higher than normally accepted. Remaining batch QA\QC was acceptable. May be sample effect.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Paracel ID: 1935456

PARACEL

Chain of Custody (Lab Use Only)

Page 1 of 2

Client Name: Golder Associates	Project Reference: 18103613	TAT: ☑ Regular ☐ 3 Day
Contact Name: Yannick Mansoreau	Quote #: 19-361 SW	☐ 2 Day ☐ 1 Day
Address: 1931 Robertson Rd Ottawa, Ontario K2H 5B7	PO #:	Date Required:
Telephone: 613-592-9600	Email Address: yannick_mansoreau@golder.com, emily_lucier@golder.com ltrow.hawaldi@wsiteconnections.com	

Criteria: ☐ O.Reg 153/04 (As Amended) Table ☐ REC Filing ☐ O.Reg 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1935456

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	~~Dup~~	~~SW~~					☑
2	S-21 ✓	SW		7	08/29/19	12:50 PM	☑
3	S-1	SW				1:45 PM	☑
4	S-3	SW				2:35 PM	☑
5	S-15	SW				2:15 PM	☑
6	S-16	SW				3:15 PM	☑
7	S-17	SW		↓	↓	2:55 PM	☑
8	~~Dup~~	~~SW~~					☑
9	~~Dup~~	~~SW~~					☑
10	~~Dup~~	~~SW~~					☑

Comments: Invoice to Golder Associates Ltd. ON45 Factory 1253 : No 1 sample date/time will sets result AUG 27, 2019.

Method of Delivery: [illegible]

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Jyoti Saini Dokania	Verified By:
Relinquished By (Print): [illegible]	Date/Time: [illegible]	Date/Time: AUG 29 2019 11:45	Date/Time: [illegible]
Date/Time: [illegible]	Temperature: [illegible] °C	Temperature: 10.1 °C	pH Verified ☐ By: [illegible]

Chain of Custody (Blank) - Rev 0.3 Oct 2014

Paracel ID: 1935456

PARACEL | TRL RES REL

Chain of Custody (Lab Use Only)

Page 2 of 2

Client Name: Golder Associates	Project Reference: 18115653
Contact Name: Yannick Marcenau	Quote #: 59-361-SW
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:
Telephone: 613-592-9600	Email Address: yannick_marcenau@golder.com, emily_bates@golder.com, karen.hynes@wastecontrolcorp.com

TAT: ☑ Regular ☐ 1 Day ☐ 2 Day ☐ 3 Day

Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other: DDWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1935456

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	~~S-11~~	~~SW~~					☑
2	~~S-??~~	~~SW~~					☑
3	S-12	SW		2	08/28/19	12:30 pm	☑
4	Dupe-1 ✓	SW		↓	↓	↓	☑
5							☐
6							☐
7							☐
8							☐
9							☐
10							☐

Required Analyses

Comments: Invoice to Neptune Customer no.: NO. 8 Sample date on The All Jets read : AUG 27, 2019

Method of Delivery:

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print):	Date/Time: 08/28/19 4:35p	Date/Time: AUG 29 2019 11:49	Date/Time:
Date/Time: 08/28/19	Temperature: 12.0 °C	Temperature: °C	pH Verified (N) By:

Chain of Custody (Blank) - Rev 6.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-17-00370
Project: 18113613
Custody:

Report Date: 4-Sep-2019
Order Date: 28-Aug-2019

Order #: 1935458

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1935458-01	L-5

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 04-Sep-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 28-Aug-2019

Client PO: 7145-17-00370

Project Description: 18113613

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	30-Aug-19	30-Aug-19
Ammonia, as N	EPA 351.2 - Auto Colour	3-Sep-19	3-Sep-19
Anions	EPA 300.1 - IC	30-Aug-19	30-Aug-19
Biochemical Oxygen Demand	SM 5210B - DO Probe	30-Aug-19	4-Sep-19
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	30-Aug-19	30-Aug-19
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	29-Aug-19	30-Aug-19
Golder General Chemistry-Leachate	Hardness as CaCO3	3-Sep-19	4-Sep-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	3-Sep-19	4-Sep-19
Phenolics	EPA 420.2 - Auto Colour, 4AAP	3-Sep-19	4-Sep-19
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	30-Aug-19	30-Aug-19
Total Dissolved Carbon	MOE 3247B - Combustion IR	30-Aug-19	30-Aug-19
Total Dissolved Solids	SM 2540C - gravimetric, filtration	3-Sep-19	4-Sep-19
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	30-Aug-19	30-Aug-19
Total Suspended Solids	SM 2540D - Gravimetric	30-Aug-19	30-Aug-19
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	2-Sep-19	2-Sep-19

Certificate of Analysis

Report Date: 04-Sep-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 28-Aug-2019

Client PO: 7145-17-00370

Project Description: 18113613

	Client ID:	L-5	-	-	-
	Sample Date:	28-Aug-19 13:20	-	-	-
	Sample ID:	1935458-01	-	-	-
	MDL/Units	Leachate	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	2080	-	-	-
Ammonia as N	0.01 mg/L	69.1 [1]	-	-	-
BOD	2 mg/L	86	-	-	-
Chemical Oxygen Demand	10 mg/L	414	-	-	-
Dissolved Inorganic Carbon	20.0 mg/L	818	-	-	-
Dissolved Organic Carbon	0.5 mg/L	129	-	-	-
Total Dissolved Carbon	0.5 mg/L	948	-	-	-
Hardness	mg/L	1420	-	-	-
Phenolics	0.001 mg/L	0.033	-	-	-
Phosphorus, total	0.01 mg/L	0.34	-	-	-
Total Dissolved Solids	10 mg/L	3020	-	-	-
Total Suspended Solids	2 mg/L	48	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	68.0	-	-	-
Anions					
Chloride	1 mg/L	536	-	-	-
Nitrate as N	0.1 mg/L	0.2	-	-	-
Nitrite as N	0.05 mg/L	0.09	-	-	-
Sulphate	1 mg/L	135	-	-	-
Metals					
Arsenic	1 ug/L	19	-	-	-
Boron	10 ug/L	13200	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	287000	-	-	-
Chromium	1 ug/L	21	-	-	-
Cobalt	0.5 ug/L	3.3	-	-	-
Copper	0.5 ug/L	1.3	-	-	-
Iron	100 ug/L	11200	-	-	-
Lead	0.1 ug/L	0.5	-	-	-
Magnesium	200 ug/L	171000	-	-	-
Manganese	5 ug/L	13200	-	-	-
Potassium	100 ug/L	102000	-	-	-
Sodium	200 ug/L	503000	-	-	-
Zinc	5 ug/L	10	-	-	-
Volatiles					
Benzene	0.5 ug/L	0.6	-	-	-

Certificate of Analysis

Report Date: 04-Sep-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 28-Aug-2019

Client PO: 7145-17-00370

Project Description: 18113613

	Client ID:	L-5	-	-	-
	Sample Date:	28-Aug-19 13:20	-	-	-
	Sample ID:	1935458-01	-	-	-
	MDL/Units	Leachate	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	0.5	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Toluene	0.5 ug/L	3.2	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	1.4	-	-	-
o-Xylene	0.5 ug/L	0.8	-	-	-

Certificate of Analysis

Report Date: 04-Sep-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 28-Aug-2019

Client PO: 7145-17-00370

Project Description: 18113613

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Total Dissolved Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						

Certificate of Analysis

Report Date: 04-Sep-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 28-Aug-2019

Client PO: 7145-17-00370

Project Description: 18113613

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	530	5	mg/L	536			1.1	10	
Nitrate as N	0.19	0.1	mg/L	0.19			0.9	10	
Nitrite as N	0.085	0.05	mg/L	0.090			5.6	10	
Sulphate	138	1	mg/L	135			2.0	10	
General Inorganics									
Alkalinity, total	271	5	mg/L	272			0.2	14	
Ammonia as N	0.056	0.01	mg/L	0.036			42.7	18	QR-01
BOD	9780	2	mg/L	9570			2.2	20	
Chemical Oxygen Demand	60	10	mg/L	75			22.2	12	QR-01
Dissolved Organic Carbon	5.2	0.5	mg/L	5.2			0.4	37	
Phenolics	ND	0.001	mg/L	ND				10	
Phosphorus, total	0.094	0.01	mg/L	0.090			3.7	15	
Total Dissolved Solids	802	10	mg/L	840			4.6	10	
Total Suspended Solids	ND	2	mg/L	ND				10	
Total Kjeldahl Nitrogen	1.63	0.1	mg/L	1.60			2.0	16	
Metals									
Aluminum	19.0	1	ug/L	17.1			10.2	20	
Arsenic	ND	1	ug/L	ND			0.0	20	
Boron	24	10	ug/L	29			18.9	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Calcium	127000	100	ug/L	131000			2.6	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	9.33	0.5	ug/L	9.65			3.4	20	
Iron	114	100	ug/L	153			29.3	20	QR-05
Lead	3.40	0.1	ug/L	3.51			3.2	20	
Magnesium	32100	200	ug/L	33300			3.4	20	
Manganese	ND	5	ug/L	ND			0.0	20	
Potassium	8320	100	ug/L	8620			3.5	20	
Sodium	23600	200	ug/L	24600			4.2	20	
Zinc	29	5	ug/L	28			0.9	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	

Certificate of Analysis

Report Date: 04-Sep-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 28-Aug-2019

Client PO: 7145-17-00370

Project Description: 18113613

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.29	1	mg/L		92.9	85-115			
Nitrate as N	1.31	0.1	mg/L	0.19	112	79-120			
Nitrite as N	1.06	0.05	mg/L	0.090	96.8	84-117			
Sulphate	146	1	mg/L	135	101	74-126			
General Inorganics									
Ammonia as N	0.316	0.01	mg/L	0.036	112	81-124			
BOD	179		mg/L		89.6	71-121			
Chemical Oxygen Demand	245	10	mg/L	75	85.0	85-111			
Dissolved Organic Carbon	12.2	0.5	mg/L	4.6	75.5	60-133			
Phenolics	0.028	0.001	mg/L	ND	113	69-132			
Phosphorus, total	0.577	0.01	mg/L	0.090	97.3	80-120			
Total Dissolved Solids	110	10	mg/L		110	75-125			
Total Suspended Solids	23.0	2	mg/L		115	75-125			
Total Kjeldahl Nitrogen	3.75	0.1	mg/L	1.60	107	81-126			
Metals									
Aluminum	57.2		ug/L	17.1	80.1	80-120			
Arsenic	43.8		ug/L	ND	87.4	80-120			
Boron	43		ug/L		87.0	80-120			
Cadmium	49.0		ug/L		98.1	80-120			
Calcium	9720		ug/L		97.2	80-120			
Chromium	54.8		ug/L	ND	109	80-120			
Cobalt	50.8		ug/L	ND	101	80-120			
Copper	56.3		ug/L	9.65	93.2	80-120			
Iron	2390		ug/L	153	89.5	80-120			
Lead	44.8		ug/L	3.51	82.6	80-120			
Magnesium	9010		ug/L		90.1	80-120			
Manganese	55.2		ug/L	ND	107	80-120			
Potassium	17900		ug/L	8620	92.4	80-120			
Sodium	8840		ug/L		88.4	80-120			
Zinc	51		ug/L		102	80-120			
Volatiles									
Benzene	33.2	0.5	ug/L		82.9	60-130			
1,1-Dichloroethane	30.1	0.5	ug/L		75.3	60-130			
Ethylbenzene	36.2	0.5	ug/L		90.6	60-130			
Methylene Chloride	28.4	5.0	ug/L		71.0	60-130			
Toluene	38.2	0.5	ug/L		95.5	60-130			
Vinyl chloride	25.2	0.5	ug/L		62.9	50-140			
m,p-Xylenes	77.2	0.5	ug/L		96.6	60-130			
o-Xylene	36.2	0.5	ug/L		90.5	60-130			

Qualifier Notes:

Sample Qualifiers :

1 : Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions.

QC Qualifiers :

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

QR-05 : Duplicate RPDs higher than normally accepted. Remaining batch QA\QC was acceptable. May be sample effect.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Paracel ID: 1935458

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Head Office
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Ottawa Ontario K2B 5G8
[illegible]

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 1813843	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marceau	Quote #: 19-357 Leachate	☐ 2 Day ☐ Day	
Address: 1931 Robertson Rd. Ottawa Ontario K2H 5B7	P.O.#:	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_bacon@golder.com hpeschuneault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ ISC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ PCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1935458

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	L-5	WL		9	08/28/19	1:20 PM	☑
2							
3							
4							
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada
EQuIS Facility: 4233

Method of Delivery: WALKIN

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): P. Arbuckle	Date/Time: 08/29/19 9:30	Date/Time: AUG 29 2019 11:44	Date/Time: 8-29-19 12:10
Date/Time: 08/28/19	Temperature: 12.0 °C	Temperature: 10.1 °C	pH Verified ☐ By: [illegible]

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

Review Items

Lab Number	Analysis	Analyte	Exception
			Default Report (not modified) Error in Query(0): 3010 - Table 'OutRepSampleAnalyte' already exists. create_OutRepSampleA CREATE TABLE OutRepSampleAnalyte(Wrk CHAR,Sample CHAR,Analysis CHAR,Analyte CHAR,Laboratory CHAR, nMDL Numeric,nMRL Numeric,tMDL CHAR,tMRL CHAR); VERSION 6.20:2003
	Carbon- Dissolved Inorganic	(Water)	Result calculations based on MDL
1925535-DUP1	Chemical Oxygen Demand	Chemical Oxygen Demand	Exceeds RPD control limit
1925535-DUP1	Chemical Oxygen Demand	Chemical Oxygen Demand	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1925760-DUP1	Ammonia, as N	Ammonia as N	Exceeds RPD control limit
1925760-DUP1	Ammonia, as N	Ammonia as N	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1925760-DUP2	Ammonia, as N	Ammonia as N	Exceeds RPD control limit
1925760-DUP2	Ammonia, as N	Ammonia as N	QR-01: Duplicate RPD is high, however, the sample result is less than 10x the MDL.
1925811-DUP1	Iron - (low level) ICPMS	Iron	Exceeds RPD control limit
1925811-DUP1	Iron - (low level) ICPMS	Iron	QR-05: Duplicate RPDs higher than normally accepted. Remaining batch QA\QC was acceptable. May be sample effect.
1935458-01	Ammonia, as N	Ammonia as N	INOG6: Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions.
1935458-01	Solids, total dissolved	Total Dissolved Solids	Exceeds FlagLevel 1

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-17-00370
Project: 18113613
Custody:

Report Date: 3-Sep-2019
Order Date: 28-Aug-2019

Order #: 1935499

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1935499-01	Trip Blank
1935499-02	Field Blank

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 03-Sep-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 28-Aug-2019

Client PO: 7145-17-00370

Project Description: 18113613

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	2-Sep-19	2-Sep-19

Certificate of Analysis

Report Date: 03-Sep-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 28-Aug-2019

Client PO: 7145-17-00370

Project Description: 18113613

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	20-Aug-19 09:00	28-Aug-19 13:20	-	-
	Sample ID:	1935499-01	1935499-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	96.0%	96.1%	-	-

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 03-Sep-2019
Order Date: 28-Aug-2019
Project Description: 18113613

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Surrogate: Toluene-d8	*74.8*		*ug/L*		*93.4*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 03-Sep-2019
Order Date: 28-Aug-2019
Project Description: 18113613

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Benzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: Toluene-d8	*79.8*		*ug/L*		*99.8*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 03-Sep-2019
Order Date: 28-Aug-2019
Project Description: 18113613

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Benzene	33.2	0.5	ug/L		82.9	60-130			
1,1-Dichloroethane	30.1	0.5	ug/L		75.3	60-130			
Ethylbenzene	36.2	0.5	ug/L		90.6	60-130			
Methylene Chloride	28.4	5.0	ug/L		71.0	60-130			
Toluene	38.2	0.5	ug/L		95.5	60-130			
Vinyl chloride	25.2	0.5	ug/L		62.9	50-140			
m,p-Xylenes	77.2	0.5	ug/L		96.6	60-130			
o-Xylene	36.2	0.5	ug/L		90.5	60-130			
Surrogate: Toluene-d8	*65.8*		*ug/L*		*82.3*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-17-00370

Report Date: 03-Sep-2019
Order Date: 28-Aug-2019
Project Description: 18113613

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Paracel ID: 1935499

PARACEL | T R

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 1811613	TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day
Contact Name: Yannick Marcoux	Quote #: 19-358 ONQC	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	Date Required:
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bacon@golder.com, trent.hunter@wasteconnections.com	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☐ Other: ONQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1935499

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Per quote	VOCs									
1	Trip Blank			1	08/28/19		☑										
2	Field Blank			4	"	12:30	☑										
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Comments: Invoice to Waste Connections of Canada
BOutS Facility #253

Method of Delivery: Walk-in

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. Marcoux	Date/Time: 08/28/19 3:10pm	Date/Time: AUG 29, 2019 11:44	Date/Time:
Date/Time: 08/28/19	Temperature: 14.0 °C	Temperature: 10.1 °C	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 18113613/2000
Project: 18113613
Custody:

Report Date: 25-Nov-2019
Order Date: 21-Nov-2019

Order #: 1947519

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1947519-01	Trip Blank
1947519-02	Field Blank

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 18113613/2000

Report Date: 25-Nov-2019
Order Date: 21-Nov-2019
Project Description: 18113613

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	23-Nov-19	23-Nov-19

Certificate of Analysis

Report Date: 25-Nov-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO: 18113613/2000

Project Description: 18113613

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	13-Nov-19 09:00	20-Nov-19 09:00	-	-
	Sample ID:	1947519-01	1947519-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	92.7%	92.6%	-	-

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 18113613/2000

Report Date: 25-Nov-2019
Order Date: 21-Nov-2019
Project Description: 18113613

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Surrogate: Toluene-d8	*74.7*		*ug/L*		*93.4*	*50-140*			

Certificate of Analysis

Report Date: 25-Nov-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO: 18113613/2000

Project Description: 18113613

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Benzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
Vinyl chloride	3360	0.5	ug/L	3320			1.2	30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: Toluene-d8	*74.7*		*ug/L*		*93.4*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 18113613/2000

Report Date: 25-Nov-2019
Order Date: 21-Nov-2019
Project Description: 18113613

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Benzene	24.0	0.5	ug/L		60.0	60-130			
1,1-Dichloroethane	39.3	0.5	ug/L		98.3	60-130			
Ethylbenzene	32.7	0.5	ug/L		81.8	60-130			
Methylene Chloride	38.0	5.0	ug/L		95.1	60-130			
Toluene	32.0	0.5	ug/L		79.9	60-130			
Vinyl chloride	41.1	0.5	ug/L		103	50-140			
m,p-Xylenes	68.3	0.5	ug/L		85.4	60-130			
o-Xylene	34.0	0.5	ug/L		85.1	60-130			
Surrogate: Toluene-d8	*72.6*		*ug/L*		*90.7*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Paracel ID: 1947519

PARACEL | T R R

Chain of Custody (Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 18113613	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marcoux	Quote #: 19-358 OAQC	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd Ottawa, Ontario K2H 5B7	PO #: 18113613/2000	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com ferni.huneault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table _ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1947519

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote	VOCs									
1	Trip Blank			2	Nov 20		☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2	Field Blank			4	Nov 20		☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Comments: Invoice to Waste Connections of Canada

Method of Delivery: Fedex

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print):	Date/Time: 21/11/19 10 35	Date/Time:	Date/Time:
Date/Time:	Temperature: °C	Temperature: °F	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 18113613/2000
Custody:

Report Date: 27-Nov-2019
Order Date: 22-Nov-2019

Order #: 1947626

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1947626-01	SED-W
1947626-02	SED-C
1947626-03	SED-E

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 27-Nov-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-Nov-2019

Client PO:

Project Description: 18113613/2000

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	26-Nov-19	26-Nov-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	26-Nov-19	26-Nov-19
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	26-Nov-19	26-Nov-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	26-Nov-19	26-Nov-19
Solids, %	Gravimetric, calculation	25-Nov-19	25-Nov-19

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 27-Nov-2019

Order Date: 22-Nov-2019

Project Description: 18113613/2000

	Client ID:	SED-W	SED-C	SED-E	-
	Sample Date:	21-Nov-19 09:15	21-Nov-19 09:40	21-Nov-19 11:00	-
	Sample ID:	1947626-01	1947626-02	1947626-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	7.6	29.8	7.5	-
Metals					
Arsenic	1.0 ug/g dry	2.4	1.3	2.4	-
Boron, available	0.5 ug/g dry	18.6	7.7	8.4	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	23.9	17.5	14.8	-
Cobalt	1.0 ug/g dry	4.6	3.0	2.8	-
Copper	5.0 ug/g dry	18.5	6.8	9.7	-
Iron	200 ug/g dry	12400	6910	13200	-
Lead	1.0 ug/g dry	7.8	5.5	5.4	-
Manganese	5 ug/g dry	279	121	311	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.2	-
Molybdenum	1.0 ug/g dry	3.4	<1.0	<1.0	-
Nickel	5.0 ug/g dry	14.8	8.1	9.3	-
Selenium	1.0 ug/g dry	1.1	1.4	<1.0	-
Zinc	20.0 ug/g dry	72.6	27.0	31.8	-

Certificate of Analysis

Report Date: 27-Nov-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-Nov-2019

Client PO:

Project Description: 18113613/2000

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	ND	1.0	ug/g						
Boron, available	ND	0.5	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Iron	ND	200	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Manganese	ND	5	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Zinc	ND	20.0	ug/g						

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 27-Nov-2019
Order Date: 22-Nov-2019
Project Description: 18113613/2000

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	1.3	1.0	ug/g dry	1.3			5.8	30	
Boron, available	ND	0.5	ug/g dry	ND			0.0	35	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium	15.2	5.0	ug/g dry	17.5			14.0	30	
Cobalt	2.6	1.0	ug/g dry	3.0			14.3	30	
Copper	5.9	5.0	ug/g dry	6.8			14.1	30	
Iron	6070	200	ug/g dry	6910			12.9	30	
Lead	4.7	1.0	ug/g dry	5.5			15.8	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Manganese	107	5	ug/g dry	121			12.7	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	7.0	5.0	ug/g dry	8.1			14.8	30	
Selenium	ND	1.0	ug/g dry	1.4			0.0	30	
Zinc	23.6	20.0	ug/g dry	27.0			13.2	30	
Physical Characteristics									
% Solids	80.1	0.1	% by Wt.	80.5			0.5	25	

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 27-Nov-2019

Order Date: 22-Nov-2019

Project Description: 18113613/2000

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	49.9		ug/L	ND	98.7	70-130			
Boron, available	4.93	0.5	ug/g	ND	98.5	70-122			
Cadmium	51.0		ug/L	ND	102	70-130			
Chromium	62.5		ug/L	7.0	111	70-130			
Cobalt	53.9		ug/L	1.2	105	70-130			
Copper	55.8		ug/L	ND	106	70-130			
Lead	49.0		ug/L	2.2	93.6	70-130			
Mercury	1.35	0.1	ug/g	ND	90.3	70-130			
Manganese	91.4		ug/L	48.4	85.9	70-130			
Molybdenum	53.9		ug/L	ND	107	70-130			
Nickel	56.3		ug/L	ND	106	70-130			
Selenium	45.3		ug/L	ND	89.5	70-130			
Zinc	61.3		ug/L	ND	101	70-130			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

PARACEL LABORATORIES LTD.

Paracel ID: 1947626

Chain of Custody (Lab Use Only)

Page 1 of 1

Client Name: Golder Associates		Project Reference: 1811361/3/2009	TAT: ☑ Regular ☐ 1 Day
Contact Name: Yannick Marcoux		Quote #: 19-368	☐ 2 Day ☐ 3 Day
Address: 1931 Robertson Rd Ottawa, Ontario K2H 5B7		PO #:	Date Required:
Telephone: 613-592-9600		Email Address: yannick_marcoux@golder.com, hemi.bureau.lt@wasteconnections.com	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1947626

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote										
1	SED-W	SED		1	11/2/19	2:15pm	☑										
2	SED-C	SED		1	"	2:40pm	☑										
3	SED-E	SED		1	"	11:20am	☑										
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Comments: Invoice to Waste Connections of Canada

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Anneliese Dohmen	Verified By:
Relinquished By (Print): M. MARTINEAU	Date/Time: 2019/11/2 11:15	Date/Time: Nov 2/19 01:38	Date/Time: 11/2/19 16:44
Date/Time: 11/2/19	Temperature: °C	Temperature: 4.5 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 18113613/2000
Custody:

Report Date: 3-Dec-2019
Order Date: 22-Nov-2019

Order #: 1947623

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1947623-01	L-5

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 03-Dec-2019
Order Date: 22-Nov-2019
Project Description: 18113613/2000

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	25-Nov-19	25-Nov-19
Ammonia, as N	EPA 351.2 - Auto Colour	25-Nov-19	25-Nov-19
Anions	EPA 300.1 - IC	27-Nov-19	27-Nov-19
Biochemical Oxygen Demand	SM 5210B - DO Probe	22-Nov-19	27-Nov-19
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	25-Nov-19	25-Nov-19
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	26-Nov-19	26-Nov-19
Golder General Chemistry-Leachate	Hardness as CaCO3	28-Nov-19	28-Nov-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	28-Nov-19	28-Nov-19
Phenolics	EPA 420.2 - Auto Colour, 4AAP	25-Nov-19	26-Nov-19
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	27-Nov-19	27-Nov-19
Total Dissolved Carbon	MOE 3247B - Combustion IR	26-Nov-19	26-Nov-19
Total Dissolved Solids	SM 2540C - gravimetric, filtration	25-Nov-19	26-Nov-19
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	27-Nov-19	27-Nov-19
Total Suspended Solids	SM 2540D - Gravimetric	25-Nov-19	25-Nov-19
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	26-Nov-19	26-Nov-19

Certificate of Analysis

Report Date: 03-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-Nov-2019

Client PO:

Project Description: 18113613/2000

	Client ID:	L-5	-	-	-
	Sample Date:	21-Nov-19 14:05	-	-	-
	Sample ID:	1947623-01	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	1940	-	-	-
Ammonia as N	0.01 mg/L	89.4	-	-	-
BOD	2 mg/L	35	-	-	-
Chemical Oxygen Demand	10 mg/L	428	-	-	-
Dissolved Inorganic Carbon	0.500 mg/L	10.1	-	-	-
Dissolved Organic Carbon	0.5 mg/L	122	-	-	-
Total Dissolved Carbon	0.5 mg/L	132	-	-	-
Hardness	mg/L	1510	-	-	-
Phenolics	0.001 mg/L	0.008	-	-	-
Phosphorus, total	0.01 mg/L	0.25	-	-	-
Total Dissolved Solids	10 mg/L	3320	-	-	-
Total Suspended Solids	2 mg/L	47	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	92.6	-	-	-
Anions					
Chloride	1 mg/L	658	-	-	-
Nitrate as N	0.1 mg/L	<0.1	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-
Sulphate	1 mg/L	143	-	-	-
Metals					
Arsenic	1 ug/L	6	-	-	-
Boron	10 ug/L	24600	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	320000	-	-	-
Chromium	1 ug/L	19	-	-	-
Cobalt	0.5 ug/L	6.3	-	-	-
Copper	0.5 ug/L	0.5	-	-	-
Iron	100 ug/L	5730	-	-	-
Lead	0.1 ug/L	0.3	-	-	-
Magnesium	200 ug/L	172000	-	-	-
Manganese	5 ug/L	776	-	-	-
Potassium	100 ug/L	132000	-	-	-
Sodium	200 ug/L	714000	-	-	-
Zinc	5 ug/L	6	-	-	-
Volatiles					
Benzene	0.5 ug/L	0.9	-	-	-

Certificate of Analysis

Report Date: 03-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-Nov-2019

Client PO:

Project Description: 18113613/2000

	Client ID:	L-5	-	-	-
	Sample Date:	21-Nov-19 14:05	-	-	-
	Sample ID:	1947623-01	-	-	-
	MDL/Units	Water	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 03-Dec-2019
Order Date: 22-Nov-2019
Project Description: 18113613/2000

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Total Dissolved Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 03-Dec-2019

Order Date: 22-Nov-2019

Project Description: 18113613/2000

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	1420	10	mg/L	1570			9.6	10	
Nitrate as N	ND	0.1	mg/L	ND				10	
Nitrite as N	ND	0.05	mg/L	ND				10	
Sulphate	2.01	1	mg/L	1.72			15.5	10	QR-01
General Inorganics									
Alkalinity, total	185	5	mg/L	190			2.5	14	
Ammonia as N	3.80	0.10	mg/L	3.97			4.2	18	
BOD	69	2	mg/L	74			6.9	20	
Chemical Oxygen Demand	429	10	mg/L	428			0.2	12	
Dissolved Organic Carbon	ND	0.5	mg/L	ND			0.0	37	
Phenolics	ND	0.001	mg/L	ND				10	
Phosphorus, total	0.218	0.01	mg/L	0.246			11.9	15	
Total Dissolved Solids	3030	10	mg/L	3320			9.0	10	
Total Suspended Solids	44.0	2	mg/L	47.0			6.6	10	
Total Kjeldahl Nitrogen	82.7	4.0	mg/L	92.6			11.4	16	
Metals									
Aluminum	ND	1	ug/L	ND			0.0	20	
Arsenic	ND	1	ug/L	ND			0.0	20	
Boron	ND	10	ug/L	ND			0.0	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Calcium	ND	100	ug/L	ND			0.0	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	ND	0.5	ug/L	ND			0.0	20	
Iron	ND	100	ug/L	ND			0.0	20	
Lead	ND	0.1	ug/L	ND			0.0	20	
Magnesium	ND	200	ug/L	ND			0.0	20	
Manganese	ND	5	ug/L	ND			0.0	20	
Potassium	ND	100	ug/L	ND			0.0	20	
Sodium	ND	200	ug/L	ND			0.0	20	
Zinc	ND	5	ug/L	ND			0.0	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 03-Dec-2019
Order Date: 22-Nov-2019
Project Description: 18113613/2000

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.99	1	mg/L		99.9	85-115			
Nitrate as N	1.02	0.1	mg/L		102	86-114			
Nitrite as N	0.938	0.05	mg/L		93.8	85-115			
Sulphate	10.5	1	mg/L		105	86-114			
General Inorganics									
Ammonia as N	0.348	0.01	mg/L	0.095	101	81-124			
BOD	179		mg/L		89.5	71-121			
Chemical Oxygen Demand	613	10	mg/L	428	92.5	85-111			
Dissolved Organic Carbon	10.8	0.5	mg/L	ND	108	60-133			
Phenolics	0.023	0.001	mg/L	ND	91.4	69-132			
Phosphorus, total	0.673	0.01	mg/L	0.246	85.4	80-120			
Total Dissolved Solids	112	10	mg/L		112	75-125			
Total Suspended Solids	20.0	2	mg/L		100	75-125			
Total Kjeldahl Nitrogen	2.02	0.1	mg/L	ND	101	81-126			
Metals									
Aluminum	46.2		ug/L	ND	91.0	80-120			
Arsenic	53.6		ug/L	ND	107	80-120			
Boron	50		ug/L	ND	95.4	80-120			
Cadmium	51.5		ug/L	ND	103	80-120			
Calcium	11000		ug/L	ND	109	80-120			
Chromium	54.4		ug/L	ND	109	80-120			
Cobalt	50.4		ug/L	ND	101	80-120			
Copper	51.5		ug/L	ND	103	80-120			
Iron	2190		ug/L	ND	87.5	80-120			
Lead	44.1		ug/L	ND	88.2	80-120			
Magnesium	8930		ug/L	ND	89.2	80-120			
Manganese	52.4		ug/L	ND	105	80-120			
Potassium	8910		ug/L	ND	88.8	80-120			
Sodium	8870		ug/L	ND	88.1	80-120			
Zinc	52		ug/L	ND	103	80-120			
Volatiles									
Benzene	47.7	0.5	ug/L		119	60-130			
1,1-Dichloroethane	42.6	0.5	ug/L		107	60-130			
Ethylbenzene	28.6	0.5	ug/L		71.5	60-130			
Methylene Chloride	37.6	5.0	ug/L		94.0	60-130			
Toluene	29.0	0.5	ug/L		72.6	60-130			
Vinyl chloride	39.8	0.5	ug/L		99.5	50-140			
m,p-Xylenes	61.5	0.5	ug/L		76.9	60-130			
o-Xylene	29.6	0.5	ug/L		74.0	60-130			

Qualifier Notes:

QC Qualifiers :

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

PARACEL LABORATORIES LTD.

Paracel ID: 1947623

Lab Office
[illegible]

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 1811361/2000	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marceau	Quote #: 19-357 Leachate	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, herm.huneault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ REC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1947623

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	L-5	W		9	11/11/19	2:05pm	☑
2	09-10	GW		7	"	12 PM	☑
3	Spare 1 500 bottles only						
4	Blank Field						
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada: 09-10 is GW and was added to 1947610

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Jennifer Dorman	Verified By:
Relinquished By (Print): H. Huneault	Date/Time: 22/11/19 11:15	Date/Time: Nov 22, 2019 11:25	Date/Time:
Date/Time: 11/21/19	Temperature: °C	Temperature: 5.0 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 18113613/2000
Custody:

Report Date: 3-Dec-2019
Order Date: 22-Nov-2019

Order #: 1947627

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1947627-01	S-20
1947627-02	S-21
1947627-03	S-1
1947627-04	S-3
1947627-05	S-15
1947627-06	S-16
1947627-07	S-17
1947627-08	S-8
1947627-09	S-9
1947627-10	S-10
1947627-11	S-11
1947627-12	S-12
1947627-13	Dupe-1

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 03-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-Nov-2019

Client PO:

Project Description: 18113613/2000

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	25-Nov-19	25-Nov-19
Ammonia, as N	EPA 351.2 - Auto Colour	25-Nov-19	25-Nov-19
Anions	EPA 300.1 - IC	27-Nov-19	27-Nov-19
Biochemical Oxygen Demand	SM 5210B - DO Probe	22-Nov-19	27-Nov-19
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	25-Nov-19	25-Nov-19
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	26-Nov-19	26-Nov-19
Golder General Chemistry- SW	Hardness as CaCO3	28-Nov-19	28-Nov-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	28-Nov-19	28-Nov-19
Phenolics	EPA 420.2 - Auto Colour, 4AAP	27-Nov-19	27-Nov-19
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	26-Nov-19	26-Nov-19
Total Dissolved Carbon	MOE 3247B - Combustion IR	26-Nov-19	26-Nov-19
Total Dissolved Solids	SM 2540C - gravimetric, filtration	25-Nov-19	26-Nov-19
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	26-Nov-19	26-Nov-19
Total Suspended Solids	SM 2540D - Gravimetric	25-Nov-19	25-Nov-19

Certificate of Analysis

Report Date: 03-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-Nov-2019

Client PO:

Project Description: 18113613/2000

	Client ID:	S-20	S-21	S-1	S-3
	Sample Date:	21-Nov-19 11:25	21-Nov-19 13:45	21-Nov-19 14:25	21-Nov-19 15:05
	Sample ID:	1947627-01	1947627-02	1947627-03	1947627-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	197	251	409	311
Ammonia as N	0.01 mg/L	0.05	0.02	0.13	0.17
BOD	2 mg/L	<20 [1]	9	<2	<2
Chemical Oxygen Demand	10 mg/L	56	72	34	24
Dissolved Inorganic Carbon	0.500 mg/L	1.81	0.887	<0.500	0.655
Dissolved Organic Carbon	0.5 mg/L	12.0	9.1	10.1	8.4
Total Dissolved Carbon	0.5 mg/L	13.8	10.0	10.2	9.0
Hardness	mg/L	335	340	660	528
Phenolics	0.001 mg/L	0.008	0.011	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.27	0.11	0.03	0.02
Total Dissolved Solids	10 mg/L	664	630	1180	926
Total Suspended Solids	2 mg/L	271	71	<2	2
Total Kjeldahl Nitrogen	0.1 mg/L	1.5	1.5	0.7	0.6
Anions					
Chloride	1 mg/L	161	157	383	322
Nitrate as N	0.1 mg/L	0.3	<0.1	0.2	0.5
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	184	132	220	120
Metals					
Arsenic	1 ug/L	1	<1	<1	<1
Boron	10 ug/L	221	357	124	74
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	84500	89100	189000	155000
Chromium	1 ug/L	11	2	1	<1
Cobalt	0.5 ug/L	2.9	0.5	0.6	0.7
Copper	0.5 ug/L	7.1	2.6	4.0	1.9
Iron	100 ug/L	3850	555	295	2270
Lead	0.1 ug/L	2.1	0.4	0.3	0.1
Magnesium	200 ug/L	30000	28400	45600	34300
Manganese	5 ug/L	434	130	409	885
Potassium	100 ug/L	7690	13000	14100	12400
Sodium	200 ug/L	128000	117000	261000	171000
Zinc	5 ug/L	26	7	11	8

Certificate of Analysis

Report Date: 03-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-Nov-2019

Client PO:

Project Description: 18113613/2000

	Client ID:	S-15	S-16	S-17	S-8
	Sample Date:	21-Nov-19 14:45	21-Nov-19 15:40	21-Nov-19 15:30	21-Nov-19 08:55
	Sample ID:	1947627-05	1947627-06	1947627-07	1947627-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	377	352	200	229
Ammonia as N	0.01 mg/L	0.35	0.30	0.05	0.05
BOD	2 mg/L	<2	<30 [1]	28	<30 [1]
Chemical Oxygen Demand	10 mg/L	32	70	76	122
Dissolved Inorganic Carbon	0.500 mg/L	<0.500	<0.500	1.38	<0.500
Dissolved Organic Carbon	0.5 mg/L	11.0	11.3	17.6	10.5
Total Dissolved Carbon	0.5 mg/L	11.4	11.1	18.9	9.9
Hardness	mg/L	544	673	352	351
Phenolics	0.001 mg/L	0.010	0.012	0.009	<0.001
Phosphorus, total	0.01 mg/L	0.02	3.66	0.04	0.24
Total Dissolved Solids	10 mg/L	976	2080	772	650
Total Suspended Solids	2 mg/L	5	208	<2	245
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	6.6	0.8	1.4
Anions					
Chloride	1 mg/L	308	1030	275	176
Nitrate as N	0.1 mg/L	0.3	<0.1	0.6	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	92	114	104	139
Metals					
Arsenic	1 ug/L	<1	4	<1	<1
Boron	10 ug/L	69	30	37	93
Cadmium	0.1 ug/L	<0.1	0.2	<0.1	<0.1
Calcium	100 ug/L	150000	198000	104000	83800
Chromium	1 ug/L	1	28	1	10
Cobalt	0.5 ug/L	1.0	6.2	0.6	4.0
Copper	0.5 ug/L	1.5	18.3	2.9	10.5
Iron	100 ug/L	1260	31700	391	3790
Lead	0.1 ug/L	0.1	12.8	0.3	1.9
Magnesium	200 ug/L	41000	43200	22400	34400
Manganese	5 ug/L	1670	2450	169	3180
Potassium	100 ug/L	15800	10300	8110	9730
Sodium	200 ug/L	164000	544000	152000	120000
Zinc	5 ug/L	5	82	29	25

PARACEL LABORATORIES LTD.

Order #: 1947627

Certificate of Analysis

Report Date: 03-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-Nov-2019

Client PO:

Project Description: 18113613/2000

	Client ID:	S-9	S-10	S-11	S-12
	Sample Date:	21-Nov-19 10:30	21-Nov-19 09:15	21-Nov-19 09:40	21-Nov-19 11:00
	Sample ID:	1947627-09	1947627-10	1947627-11	1947627-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	252	89	66	85
Ammonia as N	0.01 mg/L	0.04	0.03	0.18	0.03
BOD	2 mg/L	4	<20 [1]	<60 [1]	<20 [1]
Chemical Oxygen Demand	10 mg/L	41	178	137	101
Dissolved Inorganic Carbon	0.500 mg/L	<0.500	<0.500	<0.500	<0.500
Dissolved Organic Carbon	0.5 mg/L	9.1	21.8	22.5	15.4
Total Dissolved Carbon	0.5 mg/L	9.5	22.0	22.7	15.2
Hardness	mg/L	386	328	404	215
Phenolics	0.001 mg/L	<0.001	0.005	0.005	0.004
Phosphorus, total	0.01 mg/L	0.06	0.43	1.27	0.37
Total Dissolved Solids	10 mg/L	690	612	720	384
Total Suspended Solids	2 mg/L	12	106	394	189
Total Kjeldahl Nitrogen	0.1 mg/L	0.8	3.2	6.5	1.5
Anions					
Chloride	1 mg/L	185	113	121	92
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	159	243	371	127
Metals					
Arsenic	1 ug/L	<1	1	2	1
Boron	10 ug/L	200	246	238	127
Cadmium	0.1 ug/L	<0.1	<0.1	0.1	<0.1
Calcium	100 ug/L	103000	85000	108000	56600
Chromium	1 ug/L	2	2	13	3
Cobalt	0.5 ug/L	0.5	2.1	7.7	0.8
Copper	0.5 ug/L	3.3	2.9	6.4	2.4
Iron	100 ug/L	511	8400	11800	5020
Lead	0.1 ug/L	0.2	1.3	4.5	0.8
Magnesium	200 ug/L	31100	28200	32600	17900
Manganese	5 ug/L	88	1600	2650	313
Potassium	100 ug/L	10900	10700	10900	5410
Sodium	200 ug/L	129000	90200	89900	75500
Zinc	5 ug/L	8	20	37	13

Certificate of Analysis

Report Date: 03-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-Nov-2019

Client PO:

Project Description: 18113613/2000

	Client ID:	Dupe-1	-	-	-
	Sample Date:	21-Nov-19 00:00	-	-	-
	Sample ID:	1947627-13	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	255	-	-	-
Ammonia as N	0.01 mg/L	0.02	-	-	-
BOD	2 mg/L	4	-	-	-
Chemical Oxygen Demand	10 mg/L	30	-	-	-
Dissolved Inorganic Carbon	0.500 mg/L	<0.500	-	-	-
Dissolved Organic Carbon	0.5 mg/L	9.7	-	-	-
Total Dissolved Carbon	0.5 mg/L	9.3	-	-	-
Hardness	mg/L	417	-	-	-
Phenolics	0.001 mg/L	0.003	-	-	-
Phosphorus, total	0.01 mg/L	0.06	-	-	-
Total Dissolved Solids	10 mg/L	732	-	-	-
Total Suspended Solids	2 mg/L	23	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.8	-	-	-
Anions					
Chloride	1 mg/L	183	-	-	-
Nitrate as N	0.1 mg/L	<0.1	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-
Sulphate	1 mg/L	161	-	-	-
Metals					
Arsenic	1 ug/L	<1	-	-	-
Boron	10 ug/L	213	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	111000	-	-	-
Chromium	1 ug/L	2	-	-	-
Cobalt	0.5 ug/L	0.5	-	-	-
Copper	0.5 ug/L	3.2	-	-	-
Iron	100 ug/L	508	-	-	-
Lead	0.1 ug/L	0.4	-	-	-
Magnesium	200 ug/L	34000	-	-	-
Manganese	5 ug/L	93	-	-	-
Potassium	100 ug/L	11900	-	-	-
Sodium	200 ug/L	140000	-	-	-
Zinc	5 ug/L	8	-	-	-

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 03-Dec-2019
Order Date: 22-Nov-2019
Project Description: 18113613/2000

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Total Dissolved Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 03-Dec-2019

Order Date: 22-Nov-2019

Project Description: 18113613/2000

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	1420	10	mg/L	1570			9.6	10	
Nitrate as N	ND	0.1	mg/L	ND				10	
Nitrite as N	ND	0.05	mg/L	ND				10	
Sulphate	2.01	1	mg/L	1.72			15.5	10	QR-01
General Inorganics									
Alkalinity, total	185	5	mg/L	190			2.5	14	
Ammonia as N	3.80	0.10	mg/L	3.97			4.2	18	
BOD	69	2	mg/L	74			6.9	20	
Chemical Oxygen Demand	429	10	mg/L	428			0.2	12	
Dissolved Organic Carbon	ND	0.5	mg/L	ND			0.0	37	
Phenolics	ND	0.001	mg/L	ND				10	
Phosphorus, total	0.260	0.01	mg/L	0.271			4.2	15	
Total Dissolved Solids	3030	10	mg/L	3320			9.0	10	
Total Suspended Solids	44.0	2	mg/L	47.0			6.6	10	
Total Kjeldahl Nitrogen	1.37	0.1	mg/L	1.45			5.4	16	
Metals									
Arsenic	ND	1	ug/L	ND			0.0	20	
Boron	ND	10	ug/L	ND			0.0	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Calcium	ND	100	ug/L	ND			0.0	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	ND	0.5	ug/L	ND			0.0	20	
Iron	ND	100	ug/L	ND			0.0	20	
Lead	ND	0.1	ug/L	ND			0.0	20	
Magnesium	ND	200	ug/L	ND			0.0	20	
Manganese	ND	5	ug/L	ND			0.0	20	
Potassium	ND	100	ug/L	ND			0.0	20	
Sodium	ND	200	ug/L	ND			0.0	20	
Zinc	ND	5	ug/L	ND			0.0	20	

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 03-Dec-2019

Order Date: 22-Nov-2019

Project Description: 18113613/2000

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.99	1	mg/L		99.9	85-115			
Nitrate as N	1.02	0.1	mg/L		102	86-114			
Nitrite as N	0.938	0.05	mg/L		93.8	85-115			
Sulphate	10.5	1	mg/L		105	86-114			
General Inorganics									
Ammonia as N	0.348	0.01	mg/L	0.095	101	81-124			
BOD	179		mg/L		89.5	71-121			
Chemical Oxygen Demand	613	10	mg/L	428	92.5	85-111			
Dissolved Organic Carbon	10.8	0.5	mg/L	ND	108	60-133			
Phenolics	0.024	0.001	mg/L	ND	95.7	69-132			
Phosphorus, total	0.725	0.01	mg/L	0.271	90.8	80-120			
Total Dissolved Solids	112	10	mg/L		112	75-125			
Total Suspended Solids	20.0	2	mg/L		100	75-125			
Total Kjeldahl Nitrogen	3.32	0.1	mg/L	1.45	93.5	81-126			
Metals									
Arsenic	53.6		ug/L	ND	107	80-120			
Boron	50		ug/L	ND	95.4	80-120			
Cadmium	51.5		ug/L	ND	103	80-120			
Calcium	11000		ug/L	ND	109	80-120			
Chromium	54.4		ug/L	ND	109	80-120			
Cobalt	50.4		ug/L	ND	101	80-120			
Copper	51.5		ug/L	ND	103	80-120			
Iron	2190		ug/L	ND	87.5	80-120			
Lead	44.1		ug/L	ND	88.2	80-120			
Magnesium	8930		ug/L	ND	89.2	80-120			
Manganese	52.4		ug/L	ND	105	80-120			
Potassium	8910		ug/L	ND	88.8	80-120			
Sodium	8870		ug/L	ND	88.1	80-120			
Zinc	52		ug/L	ND	103	80-120			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 03-Dec-2019
Order Date: 22-Nov-2019
Project Description: 18113613/2000

Qualifier Notes:

Sample Qualifiers :

1 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

QC Qualifiers :

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Paracel ID: 1947627

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Head Office
[illegible]

Chain of Custody
(Lab Use Only)

Page 1 of 2

Client Name: Golder Associates	Project Reference: 191-3613/2800	TAT: ✓ Regular ☐ 3 Day
Contact Name: Yannick Marcotte	Quote #: 16-381 SW	☐ 2 Day ☐ 1 Day
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	Date Required:
Telephone: 613-592-9600	Email Address: yannick_marcotte@golder.com heidi.hurea.ill@wasteconnections.com	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1947627

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	S-20	SW			12/11/19	11:25 am	✓
2	S-21	SW				1:45 PM	✓
3	S-1	SW				2:25 PM	✓
4	S-3	SW				3:05 PM	✓
5	S-15	SW				2:45 PM	✓
6	S-16	SW				3:40 PM	✓
7	S-17	SW				3:30 PM	✓
8	~~S-6~~	~~SW~~					~~✓~~
9	S-8	SW				8:55 AM	✓
10	S-9	SW			↓	10:30 AM	✓

Comments: Invoice to Waste Connections of Canada

Method of Delivery: [illegible]

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): [illegible]	Date/Time: 12/11/19 11:15 AM	Date/Time: 11-12-19 [illegible]	Date/Time:
Date/Time: 12/11/19	Temperature: °C	Temperature: 4.5 °C	pH Verified: ☐ By:

Chain of Custody (Black) - Rev 0.3 Oct. 2014

PARACEL LABORATORIES LTD.

Paracel ID: 1947627

Head Office
(Ottawa, Ontario K2G 5J8)
Tel: 613-526-0123
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paracel@paracellabs.com
www.paracellabs.com

Chain of Custody
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Page 1 of 2

Client Name: Golder Associates	Project Reference: 1611361/2/8800	TAT: ☑ Regular ☐ 3 Day
Contact Name: Yannick Mancerou	Quote #: 19-361	☐ 2 Day ☐ 1 Day
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	Date Required:
Telephone: 613-592-9600	Email Address: yannick_mancerou@golder.com, henri.luneau@wasteconnections.com	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1947627

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	S-10	SW			11/21/19	9:15 am	✓
2	S-11	SW				9:40 am	✓
3	S-12	SW				11:00 am	✓
4	Dupe-1	SW					✓
5							
6							
7							
8							
9							
10							

Comments: Invoice to Norman Custompany

Method of Delivery: Walk in

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:
Relinquished By (Print): H. MANCEROU	Date/Time: 22/11/19 11:15 AM	Date/Time: 11-22-19 13:55
Date/Time: 11/21/19	Temperature: °C	Temperature: 4.3 °C
		Verified By:
		Date/Time: 11-22-19 14:00
		pH Verified ☐ By:

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 18113613/200
Custody:

Report Date: 4-Dec-2019
Order Date: 21-Nov-2019

Order #: 1947520

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1947520-01	09-1B
1947520-02	09-1C
1947520-03	92-19
1947520-04	95-8
1947520-05	05-1D
1947520-06	92-18
1947520-07	98-1
1947520-08	07-1D
1947520-09	MW-C
1947520-10	MW-E
1947520-11	92-7
1947520-12	92-10
1947520-13	94-2
1947520-14	94-6
1947520-15	95-3
1947520-16	95-7
1947520-17	05-3C
1947520-18	07-1C
1947520-19	94-5
1947520-20	95-2
1947520-21	95-6
1947520-22	Dupe-3
1947520-23	05-1C
1947520-24	05-R3
1947520-25	05-8
1947520-26	05-11
1947520-27	05-3D
1947520-28	09-1D

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, bicarbonate	calculated from EPA 310.1 - Titration to pH 4.5	22-Nov-19	22-Nov-19
Alkalinity, carbonate	calculated from EPA 310.1 - Titration to pH 4.5	22-Nov-19	23-Nov-19
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	22-Nov-19	22-Nov-19
Ammonia, as N	EPA 351.2 - Auto Colour	25-Nov-19	25-Nov-19
Anions	EPA 300.1 - IC	27-Nov-19	27-Nov-19
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	22-Nov-19	25-Nov-19
Golder General Chemistry- GW	Hardness as CaCO3	26-Nov-19	3-Dec-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	26-Nov-19	27-Nov-19
Phenolics	EPA 420.2 - Auto Colour, 4AAP	25-Nov-19	26-Nov-19
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	26-Nov-19	27-Nov-19
Total Dissolved Solids	SM 2540C - gravimetric, filtration	25-Nov-19	26-Nov-19
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	26-Nov-19	27-Nov-19
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	24-Nov-19	24-Nov-19

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	09-1B	09-1C	92-19	95-8
	Sample Date:	20-Nov-19 15:00	20-Nov-19 15:15	20-Nov-19 08:55	20-Nov-19 12:00
	Sample ID:	1947520-01	1947520-02	1947520-03	1947520-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	1270	947	332	916
Alkalinity, bicarbonate	5 mg/L	1260	937	332	916
Alkalinity, carbonate	5 mg/L	<25	10	<5	<5
Ammonia as N	0.01 mg/L	3.97	1.49	0.04	2.66
Chemical Oxygen Demand	10 mg/L	88	80	30	121
Hardness	mg/L	363	375	428	911
Phenolics	0.001 mg/L	<0.004 [1]	0.004	<0.001	<0.010 [1]
Phosphorus, total	0.01 mg/L	2.19	1.64	0.16	0.02
Total Dissolved Solids	10 mg/L	3690	2250	662	1250
Total Kjeldahl Nitrogen	0.1 mg/L	4.6	2.5	0.2	3.3
Anions					
Chloride	1 mg/L	1570	788	93	165
Nitrate as N	0.1 mg/L	<0.1	0.6	0.3	<0.1
Nitrite as N	0.05 mg/L	<0.05	0.25	<0.05	<0.05
Sulphate	1 mg/L	2	2	123	14
Metals					
Arsenic	1 ug/L	4	3	<1	1
Boron	10 ug/L	1780	672	78	67
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	0.4
Calcium	100 ug/L	41000	52300	137000	225000
Chromium	1 ug/L	<1	<1	<1	13
Cobalt	0.5 ug/L	1.1	1.0	1.9	4.3
Copper	0.5 ug/L	1.1	6.1	2.1	9.4
Iron	100 ug/L	486	<100	<100	4020
Lead	0.1 ug/L	<0.1	0.2	<0.1	0.2
Magnesium	200 ug/L	63200	59300	21100	84900
Manganese	5 ug/L	90	837	1040	10600
Potassium	100 ug/L	36800	20100	10800	24200
Sodium	200 ug/L	1220000	717000	69800	131000
Zinc	5 ug/L	<5	<5	<5	8
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	09-1B	09-1C	92-19	95-8
	Sample Date:	20-Nov-19 15:00	20-Nov-19 15:15	20-Nov-19 08:55	20-Nov-19 12:00
	Sample ID:	1947520-01	1947520-02	1947520-03	1947520-04
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.3%	92.8%	93.8%	93.6%

PARACEL LABORATORIES LTD.

Order #: 1947520

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	05-1D	92-18	98-1	07-1D
	Sample Date:	20-Nov-19 09:20	20-Nov-19 08:45	20-Nov-19 11:50	20-Nov-19 10:10
	Sample ID:	1947520-05	1947520-06	1947520-07	1947520-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	270	189	505	361
Alkalinity, bicarbonate	5 mg/L	269	187	501	361
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<5
Ammonia as N	0.01 mg/L	0.02	0.03	1.23	0.10
Chemical Oxygen Demand	10 mg/L	11	14	51	52
Hardness	mg/L	474	539	412	539
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.10	0.10	0.40	0.61
Total Dissolved Solids	10 mg/L	970	976	1080	752
Total Kjeldahl Nitrogen	0.1 mg/L	0.2	<0.1	1.7	1.2
Anions					
Chloride	1 mg/L	323	393	413	28
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.5	1.7
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	85	<1	2	215
Metals					
Arsenic	1 ug/L	<1	4	<1	<1
Boron	10 ug/L	28	31	157	286
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	128000	140000	87000	134000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	0.5	<0.5
Copper	0.5 ug/L	5.4	2.8	1.6	3.1
Iron	100 ug/L	<100	<100	770	662
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	37300	46400	47200	49700
Manganese	5 ug/L	5	182	288	344
Potassium	100 ug/L	11100	8730	19200	7560
Sodium	200 ug/L	173000	97600	322000	63300
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	05-1D	92-18	98-1	07-1D
	Sample Date:	20-Nov-19 09:20	20-Nov-19 08:45	20-Nov-19 11:50	20-Nov-19 10:10
	Sample ID:	1947520-05	1947520-06	1947520-07	1947520-08
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	92.6%	93.1%	93.0%	93.1%

PARACEL LABORATORIES LTD.

Order #: 1947520

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	MW-C	MW-E	92-7	92-10
	Sample Date:	20-Nov-19 15:20	20-Nov-19 13:50	20-Nov-19 10:55	20-Nov-19 10:35
	Sample ID:	1947520-09	1947520-10	1947520-11	1947520-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	570	476	627	779
Alkalinity, bicarbonate	5 mg/L	565	472	621	774
Alkalinity, carbonate	5 mg/L	<5	<5	6	<5
Ammonia as N	0.01 mg/L	0.31	0.05	1.03	0.58
Chemical Oxygen Demand	10 mg/L	127	102	41	86
Hardness	mg/L	298	627	288	588
Phenolics	0.001 mg/L	0.002	<0.001	0.005	0.004
Phosphorus, total	0.01 mg/L	1.78	1.32	0.38	0.66
Total Dissolved Solids	10 mg/L	1220	1360	1290	1160
Total Kjeldahl Nitrogen	0.1 mg/L	1.7	1.5	1.3	1.2
Anions					
Chloride	1 mg/L	283	124	457	226
Nitrate as N	0.1 mg/L	0.4	<0.1	0.3	0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	165	60	8	57
Metals					
Arsenic	1 ug/L	2	<1	<1	<1
Boron	10 ug/L	633	854	453	903
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	48700	150000	42500	101000
Chromium	1 ug/L	<1	1	<1	<1
Cobalt	0.5 ug/L	0.5	<0.5	<0.5	0.5
Copper	0.5 ug/L	2.8	3.5	1.5	2.3
Iron	100 ug/L	223	151	<100	660
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	42900	61200	44200	81500
Manganese	5 ug/L	426	<5	47	1200
Potassium	100 ug/L	10500	10400	20300	21600
Sodium	200 ug/L	376000	152000	448000	290000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	MW-C	MW-E	92-7	92-10
	Sample Date:	20-Nov-19 15:20	20-Nov-19 13:50	20-Nov-19 10:55	20-Nov-19 10:35
	Sample ID:	1947520-09	1947520-10	1947520-11	1947520-12
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	94.3%	92.5%	93.8%	91.9%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 04-Dec-2019

Order Date: 21-Nov-2019

Project Description: 18113613/200

	Client ID:	94-2	94-6	95-3	95-7
	Sample Date:	20-Nov-19 13:15	20-Nov-19 14:35	20-Nov-19 13:30	20-Nov-19 14:20
	Sample ID:	1947520-13	1947520-14	1947520-15	1947520-16
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	889	518	703	597
Alkalinity, bicarbonate	5 mg/L	873	516	698	588
Alkalinity, carbonate	5 mg/L	16	<5	<5	9
Ammonia as N	0.01 mg/L	0.35	0.19	0.11	0.05
Chemical Oxygen Demand	10 mg/L	54	80	111	85
Hardness	mg/L	295	390	237	292
Phenolics	0.001 mg/L	0.003	<0.001	0.002	0.002
Phosphorus, total	0.01 mg/L	0.68	0.88	2.97	1.59
Total Dissolved Solids	10 mg/L	1780	1400	1090	1340
Total Kjeldahl Nitrogen	0.1 mg/L	0.8	1.1	1.6	1.0
Anions					
Chloride	1 mg/L	588	460	164	483
Nitrate as N	0.1 mg/L	<0.1	0.1	<0.1	0.5
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	5	112	88	13
Metals					
Arsenic	1 ug/L	3	<1	<1	2
Boron	10 ug/L	433	262	904	432
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	40700	66300	36500	44700
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	0.6	0.7	<0.5	0.6
Copper	0.5 ug/L	1.4	7.6	1.6	7.5
Iron	100 ug/L	462	640	<100	383
Lead	0.1 ug/L	0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	47000	54400	35500	43800
Manganese	5 ug/L	354	1450	444	626
Potassium	100 ug/L	20400	9810	11100	13000
Sodium	200 ug/L	636000	411000	374000	455000
Zinc	5 ug/L	5	6	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	94-2	94-6	95-3	95-7
	Sample Date:	20-Nov-19 13:15	20-Nov-19 14:35	20-Nov-19 13:30	20-Nov-19 14:20
	Sample ID:	1947520-13	1947520-14	1947520-15	1947520-16
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.3%	93.7%	93.2%	93.4%

PARACEL LABORATORIES LTD.

Order #: 1947520

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	05-3C	07-1C	94-5	95-2
	Sample Date:	20-Nov-19 09:14	20-Nov-19 10:00	20-Nov-19 14:45	20-Nov-19 13:40
	Sample ID:	1947520-17	1947520-18	1947520-19	1947520-20
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	1040	690	860	1150
Alkalinity, bicarbonate	5 mg/L	1030	682	848	1130
Alkalinity, carbonate	5 mg/L	<25	9	12	<25
Ammonia as N	0.01 mg/L	1.71	0.36	0.94	1.59
Chemical Oxygen Demand	10 mg/L	80	42	159	132
Hardness	mg/L	121	276	471	290
Phenolics	0.001 mg/L	0.004	<0.001	0.002	<0.004 [1]
Phosphorus, total	0.01 mg/L	2.31	0.54	4.76	2.86
Total Dissolved Solids	10 mg/L	1710	1470	2220	2470
Total Kjeldahl Nitrogen	0.1 mg/L	2.9	0.7	3.1	3.0
Anions					
Chloride	1 mg/L	385	448	995	720
Nitrate as N	0.1 mg/L	0.2	0.1	0.8	0.7
Nitrite as N	0.05 mg/L	0.40	<0.05	<0.05	0.07
Sulphate	1 mg/L	2	115	10	6
Metals					
Arsenic	1 ug/L	5	4	1	1
Boron	10 ug/L	1420	421	387	864
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	14400	39600	63800	38400
Chromium	1 ug/L	2	<1	<1	<1
Cobalt	0.5 ug/L	0.6	0.6	0.8	<0.5
Copper	0.5 ug/L	3.1	1.6	1.4	1.6
Iron	100 ug/L	429	411	297	261
Lead	0.1 ug/L	0.4	0.2	<0.1	0.1
Magnesium	200 ug/L	20700	43100	75600	47100
Manganese	5 ug/L	52	401	1810	62
Potassium	100 ug/L	21200	19500	19000	25200
Sodium	200 ug/L	640000	518000	745000	851000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	05-3C	07-1C	94-5	95-2
	Sample Date:	20-Nov-19 09:14	20-Nov-19 10:00	20-Nov-19 14:45	20-Nov-19 13:40
	Sample ID:	1947520-17	1947520-18	1947520-19	1947520-20
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.3%	92.6%	93.0%	93.1%

PARACEL LABORATORIES LTD.

Order #: 1947520

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	95-6	Dupe-3	05-1C	05-R3
	Sample Date:	20-Nov-19 14:10	20-Nov-19 14:10	20-Nov-19 09:15	20-Nov-19 11:15
	Sample ID:	1947520-21	1947520-22	1947520-23	1947520-24
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	932	843	167	760
Alkalinity, bicarbonate	5 mg/L	924	842	166	756
Alkalinity, carbonate	5 mg/L	<25	<5	<5	<5
Ammonia as N	0.01 mg/L	2.13	2.61	0.17	0.02
Chemical Oxygen Demand	10 mg/L	179	126	21	23
Hardness	mg/L	409	865	192	613
Phenolics	0.001 mg/L	<0.002 [1]	<0.004 [1]	<0.001	<0.001
Phosphorus, total	0.01 mg/L	5.46	0.03	0.33	0.04
Total Dissolved Solids	10 mg/L	2620	1270	356	1100
Total Kjeldahl Nitrogen	0.1 mg/L	3.9	3.5	0.4	0.2
Anions					
Chloride	1 mg/L	994	196	53	18
Nitrate as N	0.1 mg/L	0.4	<0.1	0.2	0.2
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	15	50	162
Metals					
Arsenic	1 ug/L	2	1	2	<1
Boron	10 ug/L	614	64	77	446
Cadmium	0.1 ug/L	<0.1	0.4	<0.1	<0.1
Calcium	100 ug/L	54500	212000	46200	118000
Chromium	1 ug/L	<1	14	<1	3
Cobalt	0.5 ug/L	0.7	4.5	<0.5	<0.5
Copper	0.5 ug/L	1.1	5.3	1.6	2.5
Iron	100 ug/L	124	4100	311	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	66200	81400	18600	77100
Manganese	5 ug/L	201	11000	74	83
Potassium	100 ug/L	28800	24000	6800	10200
Sodium	200 ug/L	882000	133000	57300	125000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	95-6	Dupe-3	05-1C	05-R3
	Sample Date:	20-Nov-19 14:10	20-Nov-19 14:10	20-Nov-19 09:15	20-Nov-19 11:15
	Sample ID:	1947520-21	1947520-22	1947520-23	1947520-24
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.5%	93.2%	92.7%	92.8%

Certificate of Analysis

Report Date: 04-Dec-2019

Client: Golder Associates Ltd. (Ottawa)

Order Date: 21-Nov-2019

Client PO:

Project Description: 18113613/200

	Client ID:	05-8	05-11	05-3D	09-1D
	Sample Date:	20-Nov-19 10:45	20-Nov-19 10:25	20-Nov-19 09:50	21-Nov-19 12:00
	Sample ID:	1947520-25	1947520-26	1947520-27	1947520-28
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	1310	1170	671	72
Alkalinity, bicarbonate	5 mg/L	1310	1170	666	72
Alkalinity, carbonate	5 mg/L	<25	<25	5	<5
Ammonia as N	0.01 mg/L	0.42	0.76	0.22	1.19
Chemical Oxygen Demand	10 mg/L	141	129	25	1400
Hardness	mg/L	1200	939	378	35.4
Phenolics	0.001 mg/L	0.006	<0.004 [1]	0.003	0.008
Phosphorus, total	0.01 mg/L	0.11	0.16	0.16	0.62
Total Dissolved Solids	10 mg/L	1550	1480	1060	238
Total Kjeldahl Nitrogen	0.1 mg/L	2.2	2.8	0.4	12.5
Anions					
Chloride	1 mg/L	94	128	116	74
Nitrate as N	0.1 mg/L	<0.1	0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	9	77	110	2
Metals					
Arsenic	1 ug/L	<1	2	<1	<1
Boron	10 ug/L	4670	6130	435	44
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	254000	185000	60000	5970
Chromium	1 ug/L	2	2	<1	<1
Cobalt	0.5 ug/L	2.7	2.6	0.7	<0.5
Copper	0.5 ug/L	1.5	0.7	3.0	1.4
Iron	100 ug/L	10300	10200	<100	679
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Magnesium	200 ug/L	137000	116000	55400	4970
Manganese	5 ug/L	13200	4340	623	98
Potassium	100 ug/L	11700	16300	18300	2860
Sodium	200 ug/L	190000	189000	276000	63200
Zinc	5 ug/L	<5	<5	8	<5
Volatiles					
Benzene	0.5 ug/L	0.6	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 04-Dec-2019

Order Date: 21-Nov-2019

Project Description: 18113613/200

	Client ID:	05-8	05-11	05-3D	09-1D
	Sample Date:	20-Nov-19 10:45	20-Nov-19 10:25	20-Nov-19 09:50	21-Nov-19 12:00
	Sample ID:	1947520-25	1947520-26	1947520-27	1947520-28
	MDL/Units	Water	Water	Water	Water
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.2%	92.8%	93.1%	102%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 04-Dec-2019

Order Date: 21-Nov-2019

Project Description: 18113613/200

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Alkalinity, bicarbonate	ND	5	mg/L						
Alkalinity, carbonate	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Surrogate: Toluene-d8	*74.7*		*ug/L*		*93.4*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 04-Dec-2019
Order Date: 21-Nov-2019
Project Description: 18113613/200

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	1420	10	mg/L	1570			9.6	10	
Nitrate as N	ND	0.1	mg/L	ND				10	
Nitrite as N	ND	0.05	mg/L	ND				10	
Sulphate	2.01	1	mg/L	1.72			15.5	10	QR-01
General Inorganics									
Alkalinity, total	493	5	mg/L	499			1.2	14	
Alkalinity, bicarbonate	493	5	mg/L	499			1.2	14	
Alkalinity, carbonate	ND	5	mg/L	ND			0.0	14	
Ammonia as N	3.80	0.10	mg/L	3.97			4.2	18	
Chemical Oxygen Demand	29	10	mg/L	27			7.1	12	
Phenolics	ND	0.001	mg/L	ND				10	
Phosphorus, total	2.17	0.04	mg/L	2.19			0.9	15	
Total Dissolved Solids	3030	10	mg/L	3320			9.0	10	
Total Kjeldahl Nitrogen	4.46	0.2	mg/L	4.63			3.6	16	
Metals									
Arsenic	ND	1	ug/L	ND			0.0	20	
Boron	23	10	ug/L	24			4.6	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Calcium	32200	100	ug/L	29800			7.6	20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	ND	0.5	ug/L	ND			0.0	20	
Copper	1.02	0.5	ug/L	0.87			16.0	20	
Iron	ND	100	ug/L	ND			0.0	20	
Lead	ND	0.1	ug/L	ND			0.0	20	
Magnesium	8030	200	ug/L	7110			12.2	20	
Manganese	ND	5	ug/L	ND			0.0	20	
Potassium	1900	100	ug/L	1690			11.3	20	
Sodium	15300	200	ug/L	13300			14.4	20	
Zinc	8	5	ug/L	14			51.8	20	QR-01
Volatiles									
Benzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
Vinyl chloride	3360	0.5	ug/L	3320			1.2	30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: Toluene-d8	*74.7*		*ug/L*		*93.4*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 04-Dec-2019
Order Date: 21-Nov-2019
Project Description: 18113613/200

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.99	1	mg/L		99.9	85-115			
Nitrate as N	1.02	0.1	mg/L		102	86-114			
Nitrite as N	0.938	0.05	mg/L		93.8	85-115			
Sulphate	10.5	1	mg/L		105	86-114			
General Inorganics									
Ammonia as N	0.348	0.01	mg/L	0.095	101	81-124			
Chemical Oxygen Demand	217	10	mg/L	27	95.0	85-111			
Phenolics	0.023	0.001	mg/L	ND	91.4	69-132			
Phosphorus, total	0.499	0.01	mg/L		99.8	80-120			
Total Dissolved Solids	112	10	mg/L		112	75-125			
Total Kjeldahl Nitrogen	2.15	0.1	mg/L		107	81-126			
Metals									
Arsenic	50.2		ug/L	ND	99.8	80-120			
Boron	72		ug/L	24	95.8	80-120			
Cadmium	49.1		ug/L	ND	98.1	80-120			
Calcium	40000		ug/L	29800	101	80-120			
Chromium	56.6		ug/L	ND	113	80-120			
Cobalt	51.5		ug/L	ND	103	80-120			
Copper	51.6		ug/L	0.87	101	80-120			
Iron	2250		ug/L	ND	89.2	80-120			
Lead	45.2		ug/L	ND	90.4	80-120			
Magnesium	16200		ug/L	7110	91.3	80-120			
Manganese	55.5		ug/L	ND	108	80-120			
Potassium	10600		ug/L	1690	89.1	80-120			
Sodium	22900		ug/L	13300	95.9	80-120			
Zinc	58		ug/L	14	89.0	80-120			
Volatiles									
Benzene	24.0	0.5	ug/L		60.0	60-130			
1,1-Dichloroethane	39.3	0.5	ug/L		98.3	60-130			
Ethylbenzene	32.7	0.5	ug/L		81.8	60-130			
Methylene Chloride	38.0	5.0	ug/L		95.1	60-130			
Toluene	32.0	0.5	ug/L		79.9	60-130			
Vinyl chloride	41.1	0.5	ug/L		103	50-140			
m,p-Xylenes	68.3	0.5	ug/L		85.4	60-130			
o-Xylene	34.0	0.5	ug/L		85.1	60-130			
Surrogate: Toluene-d8	*72.6*		*ug/L*		*90.7*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.
Applies to samples: MW-C

Sample Qualifiers :

1 : Elevated Reporting Limit due to matrix interference.

QC Qualifiers :

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Paracel ID: 1947520

PARACEL LABORATORIES LTD. | RELIABLE

Lab Office
[illegible]
Ottawa, Ontario K2G 4J8
[illegible]
[illegible]
www.paracellabs.com

Chain of Custody
(Lab Use Only)

Page 1 of 2

Client Name: Golder Associates	Project Reference: 1911356132020	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marceau	Quote #: 19-560 GW	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com henri.hunsinger@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

	Paracel Order Number: 1947520 / Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	~~09-14~~	~~GW~~		~~3~~	11-20-19		✓
2	09-18	GW		3		3 PM	✓
3	09-1C	GW		3		3:15 PM	✓
4	~~09-1D~~	~~GW~~					✓
5	Dupe-2 [illegible]	GW				/	✓
6	92-19			3		8:55 AM	
7	95-8			3		12 PM	
8	05-10			3		9:20 AM	
9	92-18			3		8:45 AM	
10	98-1	✓		3		11:30 AM	

Comments: Invoice to Waste Connections of Canada

Method of Delivery: Paracel

Relinquished By (Sign): [signature]	Received by Driver/Depot: [signature]	Received at Lab: [signature]	Verified By: [signature]
Relinquished By (Print): [illegible]	Date/Time: 21/11/19 10:35	Date/Time: 11/21/19 14:06	Date/Time: 11/21/19 17:53
Date/Time: 11-21-19	Temperature: °C AM	Temperature: 2.6 °C	pH Verified ☐ By: BJ

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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PARACEL LABORATORIES LTD.

Paracel ID: 1947520

Chain of Custody (Lab Use Only)

Page 2 of 6

Client Name: Golder Associates	Project Reference: 181139613	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marceau	Quote #: 19-350	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 1811361320000	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com henri.bureau@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1947520

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Per quote										
1	07-1D	GW		2	11/6/19	12:10 pm	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2	MW-C	GW		2		3:20 pm	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3	MW-E	GW		2		1:50 pm	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4	92-7	GW		2		10:55 am	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5	92-10	GW		2		10:35 am	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6	94-2	GW		2		1:15 pm	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7	94-6	GW		2		2:35 pm	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8	95-3	GW		2		1:30 pm	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9	95-7	GW		2		2:20 pm	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10	05-3C	GW		2	↓	9:20 am	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Comments: Invoice to Waste Connections of Canada

#2 "Identified in notes"

Method of Delivery: Courier

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): N. ARMITAGE	Date/Time: 21/11/19 10:35 AM	Date/Time: 11/21/19 10:06	Date/Time: 11/21/19 13:52
Date/Time: 11/21/19	Temperature: °C	Temperature: 2.6 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

PARACEL LABORATORIES LTD.

Paracel ID: 1947520

Chain of Custody
(Lab Use Only)

Page 1 of 2

Client Name: Golder Associates	Project Reference: 18113813		
Contact Name: Yannick Marceau	Quote #: 19-360		
Address: 1931 Robertson Rd Ottawa, Ontario K2H 5B7	PO #: 18113813/2000		
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com hsmithsmead@wasteconnections.com		

T.A.T.: ☑ Regular ☐ 1 Day ☐ 2 Day ☐ 3 Day

Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table _____ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality _____ ☐ Other ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1947520

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote	VOCs									
1	07-1C	GW		7	14/20/19	10 AM	☑	☐									
2	94-5	GW		3		2:45PM	☑	☐									
3	95-2	GW		3		1:40 PM	☑	☐									
4	95-6	GW		3		2:10 PM	☑	☐									
5	Dupe-3	GW		3		/	☑	☐									
6	05-1C	GW		3		9:15 AM	☑	☐									
7	05-R3	GW		3		11:15AM	☑	☐									
8	05-8	GW		3		10:45AM	☑	☐									
9	05-11	GW				12:25PM	☑	☐									
10	05-3D	GW			↓	9:50AM	☑	☐									

Comments: Invoice to Waste Connections of Canada

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print):	Date/Time: 21/11/19 10:35	Date/Time: 11/21/19 11:06	Date/Time: 11/21/19 12:30
Date/Time: 11/20/19	Temperature: °C AM	Temperature: 6.6 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-12 09-Jun-1992	92-12 01-Nov-1992	92-12 15-Jun-1994	92-12 02-Nov-1994	92-12 22-Nov-1995	92-12 12-Oct-1996
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	756	822	--	771	787	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	13	--
Alkalinity (Total as CaCO3)	mg/l	--	--	684	674	680	642	672	676
Ammonia Nitrogen	mg/l	--	--	--	--	--	0.72	0.69	0.97
Chemical Oxygen Demand	mg/l	--	--	--	--	386	113	50	38
Chloride	mg/l	--	250	121	122.8	170	125	109	133
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1528	1516	1620	1564	1610	1570
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	6.42	--	--
Hardness, Calcium Carbonate	mg/l	--	--	37.65	34	78	34	36	32.9
Nitrate as N	mg/l	10.0	--	--	--	0.01	0.34	0.4	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	5.75	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	5.06	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.47	8.21	8.57	8.8	8.72	8.39
Phosphate	mg/l	--	--	--	--	--	--	2.6	--
Phosphorus	mg/l	--	--	--	--	3.2	2.288	--	--
Sulphate	mg/l	--	500 [4]	4.1	1	6.7	2.5	2	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	820	785	800	790
Total Organic Carbon	mg/l	--	--	--	--	19	19.6	15.4	14.5
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	480
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	**0.1**	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.202	--	--
Boron, dissolved	mg/l	5	--	--	--	1.04	0.89	0.87	0.84
Cadmium, dissolved	mg/l	0.005	--	--	--	--	**0.01**	0.0001	--
Calcium, dissolved	mg/l	--	--	3.7	5.42	10.3	2.698	3.97	3.62
Chromium, dissolved	mg/l	0.05	--	--	--	0.037	0.01	0.02	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0215	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	11.42	0.1	1.39	0.39
Lead, dissolved	mg/l	0.01	--	--	--	0.0032	**0.1**	0.0021	0.0002
Magnesium, dissolved	mg/l	--	--	6.9	5.04	12.7	1.778	6.2	5.27
Manganese, dissolved	mg/l	--	0.05	--	--	0.179	0.012	0.03	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.039	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.2	12.2	25.3	7.441	13.4	11.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	358.9	387	313	333.9	373	314
Zinc, dissolved	mg/l	--	5	--	--	0.034	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.074	0.001	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-12 06-Nov-1997	92-12 05-Jun-1998	92-12 06-May-1999	92-12 24-Oct-2000	92-12 14-Jun-2001	92-12 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	821	887	765	794
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	7	1
Alkalinity (Total as CaCO3)	mg/l	--	--	332	654	673	727	639	651
Ammonia Nitrogen	mg/l	--	--	0.62	0.6	0.94	0.47	0.88	0.99
Chemical Oxygen Demand	mg/l	--	--	36	46	45	--	35	54
Chloride	mg/l	--	250	300	118	117	133	132	128
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1460	1566	1500	1570	1300	1410
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	29	32	28	27	28	28
Nitrate as N	mg/l	10.0	--	0.1	1.1	--	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	2.18	1.62	2.75	1.83
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.21	--	8.4	8.33	8.6	8.4
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	2.25	3.37	2.43
Sulphate	mg/l	--	500 [4]	69	37	1	1	1	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	730	790	750	928	900	876
Total Organic Carbon	mg/l	--	--	15.6	16.5	18.8	--	14.8	15.9
Total Suspended Solids	mg/l	--	--	--	--	--	22	239	33
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.91	0.99	1	0.93	0.99	0.98
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	2.67	2.62	1.1	2.85	2.43	2.44
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.38	0.84	0.16	0.15	0.1	0.06
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0006	0.0022	0.0002	0.0011
Magnesium, dissolved	mg/l	--	--	5.45	6.03	6	4.92	5.27	5.29
Manganese, dissolved	mg/l	--	0.05	0.01	0.02	0.01	0.01	0.01	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	13.1	15.4	5.4	10.5	6.2	8.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	316	416	370	430	353	368
Zinc, dissolved	mg/l	--	5	0.01	0.02	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.022	0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-12 30-May-2003	92-12 19-Nov-2004	92-12 16-Nov-2005	92-12 15-May-2007	92-12 10-Nov-2008	92-12 26-Nov-2009 M-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	811	856	171	690	699	648
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	26
Alkalinity (Total as CaCO3)	mg/l	--	--	645	702	700	690	699	674
Ammonia Nitrogen	mg/l	--	--	0.73	0.87	1.02	0.89	0.98	0.94
Chemical Oxygen Demand	mg/l	--	--	108	52	42	54	28	45
Chloride	mg/l	--	250	127	110	129	131	129	129
Conductivity	uS/cm	--	--	--	--	--	--	--	1610
Conductivity (Field)	uS/cm	--	--	1370	1690	1600	1100	1300	1442
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	27	26	31	27	26	28
Nitrate as N	mg/l	10.0	--	0.1	<1	0.1	<0.1	<0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.61	1.73	1.78	1.8	1.72	1.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	8.63
pH (Field)	-	--	--	7.4	8.4	--	8.8	8.5	8.48
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.42	2.3	2.12	--	--	2.32
Sulphate	mg/l	--	500 [4]	1	10	<1	6	<1	2
Temperature (Field)	deg c	--	15	--	--	10.9	8.3	7	9.3
Total Dissolved Solids	mg/l	--	500	685	845	981	941	945	1050
Total Organic Carbon	mg/l	--	--	17.8	15.9	19.5	--	--	--
Total Suspended Solids	mg/l	--	--	12	6	13	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	0.0008	0.0006	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.94	0.992	1	0.919	0.919	1.0
Cadmium, dissolved	mg/l	0.005	--	--	--	0.0005	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	2.76	2.19	3.08	2.39	2.14	3
Chromium, dissolved	mg/l	0.05	--	0.01	0.002	<0.002	<0.002	<0.002	0.006
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	0.006	<0.005	<0.0002
Copper, dissolved	mg/l	--	1	0.01	0.002	<0.002	<0.002	<0.002	0.001
Iron, dissolved	mg/l	--	0.3	0.19	0.093	0.09	0.06	0.054	0.07
Lead, dissolved	mg/l	0.01	--	0.0004	0.0004	0.0004	0.00007	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	3	5.03	5.57	5.06	4.95	5
Manganese, dissolved	mg/l	--	0.05	0.01	0.003	0.002	0.013	0.002	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	10.8	11.1	13	11.7	11.5	11
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	363	374	420	370	377	397
Zinc, dissolved	mg/l	--	5	0.01	0.005	0.006	0.008	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	--	--	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	--	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	<0.0005	0.0006	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	<0.0002	<0.0002	<0.0002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-12 24-May-2011 G-10	92-12 28-Nov-2012 92-12	92-12 29-May-2014 [3] 92-12	92-12 26-Nov-2015 92-12	92-12 24-May-2017 92-12	92-12 29-Nov-2018 92-12
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	637	630	630	661	680	729
Alkalinity, Carbonate as CaCO3	mg/l	--	--	33	22	28	19	17	18
Alkalinity (Total as CaCO3)	mg/l	--	--	670	650	660	680	697	747
Ammonia Nitrogen	mg/l	--	--	0.94	1.1	1.1	1.04	1.04	0.93
Chemical Oxygen Demand	mg/l	--	--	45	49	49	54	38	46
Chloride	mg/l	--	250	128	130	140	138	108	139
Conductivity	uS/cm	--	--	1640	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1472	1484	1383	1512	1595	1393
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	28	28	30	24.6	29	43
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.50	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.050	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.60	2.9	1.9	1.7	2.0	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.50	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	8.74	--	8.67	--	--	--
pH (Field)	-	--	--	8.79	8.72	8.14	8.86	8.30	8.36
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.39	2.5	2.2	2.11	2.06	2.09
Sulphate	mg/l	--	500 [4]	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	12.8	6.9	11.2	9.3	10.5	7.3
Total Dissolved Solids	mg/l	--	500	1070	946	916	936	956	974
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.96	1.1	1.1	0.106	1.07	1.06
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3	2.5	2.9	2.57	2.7	7.63
Chromium, dissolved	mg/l	0.05	--	0.005	<0.005	<0.0050	0.001	0.008	<0.001
Cobalt, dissolved	mg/l	--	--	0.0003	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0012	<0.0005	0.0011	<0.0005
Iron, dissolved	mg/l	--	0.3	0.07	<0.1	<0.1	<0.1	<0.1	0.106
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	5	5.2	5.5	4.41	5.32	5.86
Manganese, dissolved	mg/l	--	0.05	<0.01	0.002	0.0028	<0.005	5.32	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	11	11	9.57	10.9	12.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	344	370	390	393	383	408
Zinc, dissolved	mg/l	--	5	0.02	<0.005	0.0051	0.01	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.002 [7]	<0.002 [8]	0.003
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.00050	0.00016	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0025	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0010	0.00031	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0010	<0.00020	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-16 09-Jun-1992	92-16 01-Nov-1992	92-16 08-Jun-1993	92-16 04-Nov-1993	92-16 15-Jun-1994	92-16 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	224	226	201	195	--	190
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	184	185	165	160	164	156
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	0.95
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	42	194
Chloride	mg/l	--	250	31	12	4	6	4	2
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	556	398	358	446	400	391
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	7
Hardness, Calcium Carbonate	mg/l	--	--	95.53	68	58	76	63	70
Nitrate as N	mg/l	10.0	--	--	--	0.42	0.48	0.24	0.54
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.87	7.52	7.74	8.33	8.14	8.95
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	1.86	0.282
Sulphate	mg/l	--	500 [4]	43	21.2	19.2	28.3	27.7	24.8
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	280	212	200	197
Total Organic Carbon	mg/l	--	--	--	--	--	--	8.3	4.8
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	1.827	0.42	--	1.039
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.022
Boron, dissolved	mg/l	5	--	--	--	--	--	0.12	0.129
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**
Calcium, dissolved	mg/l	--	--	20.1	14	12.4	14.9	12.4	13.67
Chromium, dissolved	mg/l	0.05	--	--	--	0.014	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.1	0.01	0.007	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.109	0.1	1.25	1.293
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	0.0033	0.0004	**0.1**
Magnesium, dissolved	mg/l	--	--	11	7.99	6.6	9.3	7.8	2.614
Manganese, dissolved	mg/l	--	0.05	--	--	0.04	0.022	0.046	0.058
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.7	6.81	7.4	7.7	7.8	6.645
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	88.5	73.5	57.9	119	55	56.14
Zinc, dissolved	mg/l	--	5	--	--	0.048	0.01	0.01	0.03
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.002	0.053	0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
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Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-16 28-Jun-1995	92-16 22-Nov-1995	92-16 12-Oct-1996	92-16 06-Nov-1997	92-16 05-Jun-1998	92-16 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	205	218	--	--	--	217
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	168	179	174	186	190	178
Ammonia Nitrogen	mg/l	--	--	0.62	0.27	0.74	0.27	0.2	0.04
Chemical Oxygen Demand	mg/l	--	--	350	23	5	3	22	3
Chloride	mg/l	--	250	7.7	2.5	2.4	3	2.8	2.3
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	460	380	370	380	370	350
Dissolved Oxygen (Field)	mg/l	--	--	9.65	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	59	56	50	59	68	56
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.1	0.2	1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	11.5	3.1	--	--	--	1.39
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	10.88	2.83	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.35	8.38	7.93	7.4	--	7.9
Phosphate	mg/l	--	--	--	0.8	--	--	--	--
Phosphorus	mg/l	--	--	14.5	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	22	22	19	18	49	15
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	190	180	180	190	184	180
Total Organic Carbon	mg/l	--	--	5.5	3.9	4.1	4.5	5	4.6
Total Suspended Solids	mg/l	--	--	--	--	1900	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.11	0.07	0.12	0.11	0.21	0.13
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	13.5	11.4	10	12.9	12.7	11.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.02	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.03	0.76	0.61	1.17	6.26	0.02
Lead, dissolved	mg/l	0.01	--	0.0001	0.0009	0.0002	0.0002	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	5.95	6.7	5.87	6.5	8.72	6.36
Manganese, dissolved	mg/l	--	0.05	0.02	0.04	0.03	0.06	0.12	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	11.9	4.3	8.6	9.4	1.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	58.1	65.2	57.3	56.7	77.6	66.3
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.07	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
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Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-16 24-Oct-2000	92-16 14-Jun-2001	92-16 16-Dec-2002	92-16 30-May-2003	92-16 19-Nov-2004	92-16 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	226	210	187	205	220	233
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	185	172	153	168	180	191
Ammonia Nitrogen	mg/l	--	--	0.03	0.48	0.38	0.13	0.07	0.23
Chemical Oxygen Demand	mg/l	--	--	--	18	23	9	14	21
Chloride	mg/l	--	250	2.8	2.8	16.4	4.2	4.3	5.4
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	346	340	374	300	440	350
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	46	52	47	47	44	48
Nitrate as N	mg/l	10.0	--	0.2	0.2	1.4	0.3	0.2	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.46	1.88	0.08	0.64	0.61	0.79
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.79	8.2	8.2	7.2	8.2	8.93
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.67	6.07	3	1.49	0.68	1.41
Sulphate	mg/l	--	500 [4]	15	15	30	13	19	16
Temperature (Field)	deg c	--	15	--	--	--	--	--	11.6
Total Dissolved Solids	mg/l	--	500	214	250	236	150	220	229
Total Organic Carbon	mg/l	--	--	--	4.2	4	4.1	4.1	5.5
Total Suspended Solids	mg/l	--	--	256	2760	2120	516	910	1800
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.003	0.003	0.003	0.002	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.12	0.14	0.12	0.12	0.118	0.12
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	10.5	12	9.48	10.5	9.89	10.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	0.004
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.02	0.04	0.01	0.012
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0006	0.0002	0.0002	<0.0002
Magnesium, dissolved	mg/l	--	--	4.81	5.45	5.58	5.07	4.8	5.17
Manganese, dissolved	mg/l	--	0.05	0.02	0.03	0.01	0.02	0.017	0.018
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	5.9	2.3	1.5	5.2	5.1	6.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [5]	61.5	63	72.9	64.9	68.4	75.5
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.024	0.001	0.001	0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-16	92-16	92-16	92-16	92-16	92-16
				15-May-2007	10-Nov-2008	26-Nov-2009	24-May-2011 [12]	28-Nov-2012	29-May-2014
						M-7	G-2	92-16	92-16
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	186	183	179	178	180	180
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [13]	4	2.7	2.6
Alkalinity (Total as CaCO3)	mg/l	--	--	186	180	179	182	180	180
Ammonia Nitrogen	mg/l	--	--	0.1	0.2	0.14	0.10	0.33	0.16
Chemical Oxygen Demand	mg/l	--	--	86	<5	15	25	14	7.3
Chloride	mg/l	--	250	7.1	6.4	11	13	21	25
Conductivity	uS/cm	--	--	--	--	390	404	--	--
Conductivity (Field)	uS/cm	--	--	280	390	360	379	391	366
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	43	47	41	48	48	52
Nitrate as N	mg/l	10.0	--	0.3	0.1	<0.10	0.17	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.39	0.23	0.12	0.15	0.78	0.95
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.16	8.38	--	8.19
pH (Field)	-	--	--	8.4	8	7.8	8.02	8.16	8.07
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.61	0.87	0.60	0.59
Sulphate	mg/l	--	500 [4]	12	11	11	10	10	10
Temperature (Field)	deg c	--	15	8.7	7	8.5	10.6	7.5	10.7
Total Dissolved Solids	mg/l	--	500	224	218	254	263	340	414
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0045	0.0035	0.003	<0.01	0.002	0.0025
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.107	0.105	0.12	0.11	0.12	0.12
Cadmium, dissolved	mg/l	0.005	--	0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	9.42	10.5	10	11	11	12
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.001	<0.001	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.015	<0.005	<0.0002	0.0002	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.005	0.006	0.003	0.0045
Iron, dissolved	mg/l	--	0.3	0.261	<0.005	<0.03	<0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00034	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	4.62	5	4	5	5.2	5.6
Manganese, dissolved	mg/l	--	0.05	0.044	<0.001	<0.01	<0.01	<0.002	<0.0020
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	5.7	5	5	5.2	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	72.2	68.8	65	64	65	70
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.01	0.01	0.006	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-16 26-Nov-2015	92-16 24-May-2017	92-16 29-Nov-2018
				92-16	92-16	92-16
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	188	200	215
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	6
Alkalinity (Total as CaCO3)	mg/l	--	--	189	202	221
Ammonia Nitrogen	mg/l	--	--	0.24	0.03	0.51
Chemical Oxygen Demand	mg/l	--	--	32	27	122
Chloride	mg/l	--	250	17	19	21
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	417	409	394
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	43.4	56	74
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.7	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.14	7.82	8.21
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.38	6.56
Sulphate	mg/l	--	500 [4]	8	9	6
Temperature (Field)	deg c	--	15	9.7	9.7	7.9
Total Dissolved Solids	mg/l	--	500	256	272	270
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Aluminum, dissolved	mg/l	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003	0.002
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.11	0.145	0.114
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	9.82	12.1	19.3
Chromium, dissolved	mg/l	0.05	--	<0.001	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0037	0.0038
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	4.58	6.3	6.31
Manganese, dissolved	mg/l	--	0.05	0.028	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.34	5.65	5.76
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	79.3	68.3	70.4
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.007
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 09-Jun-1992	92-18 01-Nov-1992	92-18 04-Nov-1993	92-18 15-Jun-1994	92-18 02-Nov-1994	92-18 28-Jun-1995
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	244	198	210	--	190	193
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	200	162	172	140	156	158
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	0.17	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	67	62	170
Chloride	mg/l	--	250	87	35.8	38	26	22	23
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	831	540	539	480	453	460
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	11.65	9.65
Hardness, Calcium Carbonate	mg/l	--	--	276.9	178	150	136	138	144
Nitrate as N	mg/l	10.0	--	--	--	0.44	0.1	0.48	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.1	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	7.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	7.64
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.96	7.78	8.1	7.9	8.25	7.82
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	2.96	0.148	7.62
Sulphate	mg/l	--	500 [4]	88	68.8	40.3	44.9	36.4	36
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	248	250	228	230
Total Organic Carbon	mg/l	--	--	--	--	--	6.8	4.8	6.3
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	**0.1**	--
Barium, dissolved	mg/l	1	--	--	--	--	--	0.022	--
Boron, dissolved	mg/l	5	--	--	--	--	0.03	0.06	0.04
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	**0.01**	0.0001
Calcium, dissolved	mg/l	--	--	69.62	45.4	38.3	35.3	32.09	38.7
Chromium, dissolved	mg/l	0.05	--	--	--	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.01	0.003	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.124	0.336	0.103	0.02
Lead, dissolved	mg/l	0.01	--	--	--	0.0062	0.0002	**0.1**	0.0002
Magnesium, dissolved	mg/l	--	--	25	15.7	13.3	11.7	4.599	11.3
Manganese, dissolved	mg/l	--	0.05	--	--	0.032	0.086	0.028	0.04
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	3.9	4.54	5.3	4.9	1.864	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	77.76	53.6	72	33	37.41	40.3
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.111	0.001	0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 22-Nov-1995	92-18 12-Jun-1996	92-18 12-Oct-1996	92-18 18-Jun-1997	92-18 06-Nov-1997	92-18 05-Jun-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	195	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	168	273	273	297	842	304
Ammonia Nitrogen	mg/l	--	--	0.01	0.04	0.14	0.65	0.05	0.1
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	25	18	3	10	25	38
Chloride	mg/l	--	250	23.1	368	470	339	916	685
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	440	1790	1790	1670	2990	3060
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	3.16	--	--
Hardness, Calcium Carbonate	mg/l	--	--	137	587	590	608	829	543
Nitrate as N	mg/l	10.0	--	0.4	0.1	0.8	1	1.5	1.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.87	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.86	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.18	7	6.63	6.85	6.29	--
Phosphate	mg/l	--	--	0.2	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	31	117	107	109	1	147
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	220	900	900	890	1500	1516
Total Organic Carbon	mg/l	--	--	3.1	7.2	7.2	7.7	8.9	11.4
Total Suspended Solids	mg/l	--	--	--	579	1030	665	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.038	0.07	0.05	0.05	0.14
Cadmium, dissolved	mg/l	0.005	--	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.6	169	176	184	249	173
Chromium, dissolved	mg/l	0.05	--	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.04	1.17	0.57	1.52	1.41	0.31
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	11.5	39.9	35.7	35.3	49.5	26.6
Manganese, dissolved	mg/l	--	0.05	0.02	0.97	0.81	1.01	1.8	1.26
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	7.7	8.88	7	7.4	7.7	9.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	42.6	286	232	253	437	343
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.23
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 29-Oct-1998	92-18 06-May-1999	92-18 19-Oct-1999	92-18 05-May-2000	92-18 24-Oct-2000	92-18 14-Jun-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	380	386	427	488	356	315
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	312	632	350	400	292	258
Ammonia Nitrogen	mg/l	--	--	0.11	0.04	0.11	0.01	0.07	0.21
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	5	15	12	45	--	13
Chloride	mg/l	--	250	580	403	627	400	614	468
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3170	1870	2413	2850	2490	1750
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	379	482	593	551	394	379
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.4	0.7	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.48	0.51	--	--	0.52	0.46
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.5	6.5	7.1	6.5	6.6	6.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.28	0.58
Sulphate	mg/l	--	500 [4]	116	111	106	80	85	72
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1590	930	1206	1425	1290	1150
Total Organic Carbon	mg/l	--	--	13.1	9.3	8.9	7.2	--	6.1
Total Suspended Solids	mg/l	--	--	--	--	506	828	348	415
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.05	0.06	0.14	0.14	0.06	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	121	172	180	160	123	124
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.02	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.44	0.02	1.78	0.61	0.59	0.03
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0022	0.0002
Magnesium, dissolved	mg/l	--	--	18.7	34.8	34.3	36.4	21	16.8
Manganese, dissolved	mg/l	--	0.05	1.82	1.14	2.51	1.61	2.38	1.68
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.04	0.02
Potassium, dissolved	mg/l	--	--	12	2.7	10.6	3.9	14.6	6.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	358	387	400	300	411	272
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.11	0.22	0.02	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.042

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 23-Nov-2001	92-18 23-May-2002	92-18 06-Nov-2002	92-18 30-May-2003	92-18 09-Oct-2003	92-18 14-May-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	304	216	198	200	--	194
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	7	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	249	189	162	164	161	159
Ammonia Nitrogen	mg/l	--	--	0.2	0.03	0.02	0.01	0.03	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	1	--
Chemical Oxygen Demand	mg/l	--	--	22	3	9	2	2	11
Chloride	mg/l	--	250	1470	89.1	103	102	100	108
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	454	640	468	540	720	710
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	37	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	866	191	186	199	197	211
Nitrate as N	mg/l	10.0	--	0.9	0.2	0.2	0.2	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.67	0.05	0.21	0.12	0.19	0.28
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.08	7.21	8.2	7.1	7.5	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.13	0.17	0.19	0.24	0.4	1.41
Sulphate	mg/l	--	500 [4]	146	29	29	28	36	25
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2900	436	340	270	365	355
Total Organic Carbon	mg/l	--	--	11	16	2.8	3.5	5	2.4
Total Suspended Solids	mg/l	--	--	117	94	251	100	280	1180
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.003	0.002	0.002	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.07	0.05	0.06	0.04	0.043	0.038
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	282	50.8	49.2	53	51.3	56.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.05	0.02	0.02	0.11	0.792	0.005
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0009	0.0003	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	39.3	15.6	15.4	16.1	16.8	17.2
Manganese, dissolved	mg/l	--	0.05	1.5	0.01	0.01	0.01	0.012	0.003
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	22.7	5.3	5.6	4.3	4.8	4.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	730	56.7	55.8	61.5	58.2	57.4
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.01	0.005	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 19-Nov-2004	92-18 24-May-2005	92-18 16-Nov-2005	92-18 25-May-2006	92-18 21-Nov-2006
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	212	220	220	172	184
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	170	180	180	170	184
Ammonia Nitrogen	mg/l	--	--	0.05	<0.01	<0.01	0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	6	<5	<5	7
Chloride	mg/l	--	250	117	135	132	156	156
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	900	1200	1000	400	725
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	215	258	258	244	265
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.3	0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.31	0.31	0.05	0.13	0.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	6	8	8.3	6.9
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.18	0.8	0.12	--	--
Sulphate	mg/l	--	500 [4]	25	31	29	29	27
Temperature (Field)	deg c	--	15	--	12.6	10.5	5.5	5
Total Dissolved Solids	mg/l	--	500	450	437	429	432	456
Total Organic Carbon	mg/l	--	--	2.5	1.9	3.5	--	--
Total Suspended Solids	mg/l	--	--	468	1560	531	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.001	0.001	0.0035
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.049	0.026	0.049	0.034	0.041
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001
Calcium, dissolved	mg/l	--	--	57.4	67.5	68.6	64.6	69.9
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.004	0.003	0.005	0.01	<0.002
Iron, dissolved	mg/l	--	0.3	0.01	<0.005	<0.005	<0.005	<0.005
Lead, dissolved	mg/l	0.01	--	0.0002	0.0005	<0.0002	<0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	17.3	21.8	21	20.2	22
Manganese, dissolved	mg/l	--	0.05	0.01	<0.001	0.002	0.001	0.178
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	5.3	4.9	6.1	4.5	5.5
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [5]	57	73	68.9	59.3	64.7
Zinc, dissolved	mg/l	--	5	0.005	0.008	0.01	<0.005	0.008
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 19-Nov-2004	92-18 24-May-2005	92-18 16-Nov-2005	92-18 25-May-2006	92-18 21-Nov-2006
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	<0.0006	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 15-May-2007	92-18 30-Nov-2007	92-18 22-May-2008	92-18 10-Nov-2008
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	177	183	150	183
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	177	183	150	180
Ammonia Nitrogen	mg/l	--	--	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	27	47	<5	<5
Chloride	mg/l	--	250	175	176	175	182
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	700	525	850	825
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	297	281	301	296
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.1	0.28	0.18	0.08
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.3	7.5	7.4	7.8
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	30	28	28	27
Temperature (Field)	deg c	--	15	8.8	6	11	9
Total Dissolved Solids	mg/l	--	500	489	481	467	491
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.0041	0.0037	0.0036	0.0032
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.037	0.042	0.037	0.036
Cadmium, dissolved	mg/l	0.005	--	0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	79.2	74.5	81.1	79.8
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	<0.005	<0.005	<0.005	<0.005
Lead, dissolved	mg/l	0.01	--	0.00004	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	24.2	23	23.9	23.4
Manganese, dissolved	mg/l	--	0.05	0.002	0.027	0.002	<0.001
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.2	5.5	4.9	5.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	67.7	63.7	63.7	62.9
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 15-May-2007	92-18 30-Nov-2007	92-18 22-May-2008	92-18 10-Nov-2008
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 19-May-2009 G-1	92-18 26-Nov-2009 M-12	92-18 25-May-2010 [12] M-2	92-18 20-Oct-2010 [12] G-2
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	174	175	168	172
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	<2 [13]	<2 [13]	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	174	175	168	172
Ammonia Nitrogen	mg/l	--	--	0.02	0.02	<0.02	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	5	13	10	15
Chloride	mg/l	--	250	179	197	193	215
Conductivity	uS/cm	--	--	1000	1010	1060	1060
Conductivity (Field)	uS/cm	--	--	800	834	1119	1020
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	315	297	345	365
Nitrate as N	mg/l	10.0	--	0.24	0.13	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.16	<0.10	<0.10	<0.10
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	7.98	8.09	8.11	7.91
pH (Field)	-	--	--	--	7.58	6.95	7.61
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.18	0.15	0.08	0.09
Sulphate	mg/l	--	500 [4]	26	31	28	28
Temperature (Field)	deg c	--	15	7	9.7	14.8	10.1
Total Dissolved Solids	mg/l	--	500	650	657	689	689
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	<0.01	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.05	0.05	0.04	0.04
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	85	81	92	100
Chromium, dissolved	mg/l	0.05	--	0.005	0.004	0.002	0.004
Cobalt, dissolved	mg/l	--	--	<0.0002	<0.0002	<0.0002	0.0005
Copper, dissolved	mg/l	--	1	0.003	0.003	0.003	0.001
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	25	23	28	28
Manganese, dissolved	mg/l	--	0.05	<0.01	<0.01	<0.01	0.40
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5	5	6	5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	63	65	66	68
Zinc, dissolved	mg/l	--	5	<0.01	0.01	0.01	<0.01
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18	92-18	92-18	92-18
				19-May-2009	26-Nov-2009	25-May-2010 [12]	20-Oct-2010 [12]
				G-1	M-12	M-2	G-2
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 24-May-2011 [12] G-5	92-18 29-Nov-2011 [12] 92-18	92-18 31-May-2012 92-18	92-18 28-Nov-2012 92-18
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	174	177	170	190
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	<2 [13]	1.8	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	174	177	180	190
Ammonia Nitrogen	mg/l	--	--	<0.02	0.04	<0.050	0.093
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	25	12	22
Chloride	mg/l	--	250	213	226	210	220
Conductivity	uS/cm	--	--	1090	1120	--	--
Conductivity (Field)	uS/cm	--	--	1021	1028	1076	1084
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	352	358	410	370
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	<0.10	0.14	0.51	0.36
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	8.22	8.15	8.05	--
pH (Field)	-	--	--	7.85	7.71	6.73	7.81
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.11	0.07	0.054	0.13
Sulphate	mg/l	--	500 [4]	28	29	27	28
Temperature (Field)	deg c	--	15	13.6	9.3	10.2	7.5
Total Dissolved Solids	mg/l	--	500	708	728	836	636
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	0.0028	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.04	0.05	0.043	0.04
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	93	97	110	97
Chromium, dissolved	mg/l	0.05	--	0.003	0.003	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0003	<0.0002	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.004	<0.001	0.0036	0.001
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	29	28	33	31
Manganese, dissolved	mg/l	--	0.05	<0.01	0.21	0.079	0.004
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5	5	5.8	5.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	64	67	76	67
Zinc, dissolved	mg/l	--	5	0.01	<0.01	0.011	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 24-May-2011 [12] G-5	92-18 29-Nov-2011 [12] 92-18	92-18 31-May-2012 92-18	92-18 28-Nov-2012 92-18
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00020	<0.00020

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 29-May-2013 92-18	92-18 26-Nov-2013 GW-17	92-18 29-May-2014 92-18	92-18 19-Nov-2014 92-18
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	170	170	180	180
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.7	1.7	2.0	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	170	180	180	180
Ammonia Nitrogen	mg/l	--	--	0.082	<0.050	<0.050	0.051
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	6.8	23	6.3	<4.0
Chloride	mg/l	--	250	230	230	270	260
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1032	1081	1105	1215
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	430	310	460	410
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.31	0.30	0.43	0.22
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	8.04	8.02	8.09	7.97
pH (Field)	-	--	--	6.40	6.42	7.57	7.95
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.20	0.11	0.089	0.26
Sulphate	mg/l	--	500 [4]	28	26	31	30
Temperature (Field)	deg c	--	15	9.6	7.7	11.8	5.4
Total Dissolved Solids	mg/l	--	500	852	836	912	778
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.0030	0.0023	0.0032	0.0028
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.033	0.042	0.04	0.034
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	120	83	120	110
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.0027	0.0012	0.0031	0.0020
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00051	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	34	25	37	34
Manganese, dissolved	mg/l	--	0.05	0.0048	0.0080	<0.0020	<0.0020
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.7	5.4	6.1	5.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	76	57	85	76
Zinc, dissolved	mg/l	--	5	<0.0050	0.0056	0.0051	<0.0050
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 29-May-2013 92-18	92-18 26-Nov-2013 GW-17	92-18 29-May-2014 92-18	92-18 19-Nov-2014 92-18
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 02-Jun-2015 92-18	92-18 26-Nov-2015 92-18	92-18 26-May-2016 92-18	92-18 17-Nov-2016 92-18
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	181	184	195	193
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	182	185	196	193
Ammonia Nitrogen	mg/l	--	--	0.08	0.07	0.03	0.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	21	13	12	12
Chloride	mg/l	--	250	356	340	329	307
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1238	1282	1362	1439
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	395	358	469	462
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.2	0.2	0.2	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.40	8.11	7.42	6.61
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.15	0.11	0.15	0.18
Sulphate	mg/l	--	500 [4]	31	30	35	33
Temperature (Field)	deg c	--	15	9.1	9.5	10.1	10.9
Total Dissolved Solids	mg/l	--	500	884	836	1080	886
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.003	0.003	0.004	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.024	0.033	0.025	0.03
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	92.8	98.2	123	126
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.004
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0013	0.0030
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	39.7	27.2	39	35.9
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.15	4.89	7.06	6.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	86.4	85.3	83.8	82.6
Zinc, dissolved	mg/l	--	5	0.007	0.007	0.006	0.014
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 02-Jun-2015 92-18	92-18 26-Nov-2015 92-18	92-18 26-May-2016 92-18	92-18 17-Nov-2016 92-18
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 24-May-2017	92-18 29-Nov-2017	92-18 24-May-2018	92-18 29-Nov-2018
				92-18	92-18	92-18	92-18
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	204	202	213	213
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	205	203	214	214
Ammonia Nitrogen	mg/l	--	--	0.03	0.11	0.03	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	22	53	30
Chloride	mg/l	--	250	325	361	348	333
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1373	1318	1463	1331
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	495	442	499	455
Nitrate as N	mg/l	10.0	--	<0.1	0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.3	0.3	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.44	6.53	7.34	6.5
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.19	0.49	0.27	0.44
Sulphate	mg/l	--	500 [4]	33	36	36	36
Temperature (Field)	deg c	--	15	9.3	8.9	8.8	8.2
Total Dissolved Solids	mg/l	--	500	1080	882	1280	882
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.029	0.06	0.028	0.048
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	0.0003	<0.0001
Calcium, dissolved	mg/l	--	--	140	117	134	119
Chromium, dissolved	mg/l	0.05	--	0.005	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0019	0.0013	0.0013	0.0023
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	35.4	36.4	40	38.2
Manganese, dissolved	mg/l	--	0.05	0.018	<0.005	0.008	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.87	6.15	6.17	6.83
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	84.6	79.4	89.6	81.5
Zinc, dissolved	mg/l	--	5	<0.005	0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	0.004

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 24-May-2017 92-18	92-18 29-Nov-2017 92-18	92-18 24-May-2018 92-18	92-18 29-Nov-2018 92-18
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 19-Jun-2019 92-18	92-18 20-Nov-2019 92-18
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	197	187
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	198	189
Ammonia Nitrogen	mg/l	--	--	0.03	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	72	14
Chloride	mg/l	--	250	356	393
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1395	1505
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	511	539
Nitrate as N	mg/l	10.0	--	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.1	<0.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	6.24	7.65
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	0.09	0.10
Sulphate	mg/l	--	500 [4]	38	<1
Temperature (Field)	deg c	--	15	12.1	7.6
Total Dissolved Solids	mg/l	--	500	1040	976
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004
Barium, dissolved	mg/l	1	--	--	--
Boron, dissolved	mg/l	5	--	0.026	0.031
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	132	140
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0022	0.0028
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	43.8	46.4
Manganese, dissolved	mg/l	--	0.05	<0.005	0.182
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.89	8.73
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	96	97.6
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-18 19-Jun-2019 92-18	92-18 20-Nov-2019 92-18
VOCs					
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--
Bromoform	mg/l	--	--	--	--
Bromomethane	mg/l	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--
Chloroform	mg/l	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 09-Jun-1992	92-19 01-Nov-1992	92-19 08-Jun-1993	92-19 15-Jun-1994	92-19 02-Nov-1994	92-19 28-Jun-1995
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	390	283	381	--	326	336
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	320	232	312	320	267	276
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	0.1	0.06
Chemical Oxygen Demand	mg/l	--	--	--	--	--	34	77	35
Chloride	mg/l	--	250	254	97.8	315	860	400	250
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1688	934	1750	2490	1950	2120
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	9.69	8.52
Hardness, Calcium Carbonate	mg/l	--	--	687.61	459	719	637	561	605
Nitrate as N	mg/l	10.0	--	--	--	0.6	0.1	0.42	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.1	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	2.24
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.69	7.09	6.35	6.5	6.73	6.64
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.3	0.203	0.62
Sulphate	mg/l	--	500 [4]	165	146.5	154	147	116	107
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	--
Total Organic Carbon	mg/l	--	--	--	--	--	9	9.4	8.8
Total Suspended Solids	mg/l	--	--	--	--	1140	1260	980	1060
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	0.168	--	0.093	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	**0.1**	--
Barium, dissolved	mg/l	1	--	--	--	--	--	0.164	--
Boron, dissolved	mg/l	5	--	--	--	--	0.07	0.078	0.01
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	**0.01**	0.0001
Calcium, dissolved	mg/l	--	--	189.1	138	210	167	154.8	176
Chromium, dissolved	mg/l	0.05	--	--	--	0.015	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.012	0.0113	0.01	0.02
Iron, dissolved	mg/l	--	0.3	--	--	0.47	0.621	0.412	0.02
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	0.0008	**0.1**	0.0002
Magnesium, dissolved	mg/l	--	--	52.18	27.8	47.3	53.4	23.506	39.6
Manganese, dissolved	mg/l	--	0.05	--	--	2.722	1.449	1.056	1.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.03
Potassium, dissolved	mg/l	--	--	5.39	5.33	6.9	11.6	3.634	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	89.81	33.5	112	185	164.6	180
Zinc, dissolved	mg/l	--	5	--	--	0.037	0.01	0.018	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.047	0.001	0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 22-Nov-1995	92-19 12-Jun-1996	92-19 12-Oct-1996	92-19 18-Jun-1997	92-19 06-Nov-1997	92-19 05-Jun-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	327	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	268	242	183	158	188	174
Ammonia Nitrogen	mg/l	--	--	0.01	0.02	0.36	0.41	0.14	0.11
Chemical Oxygen Demand	mg/l	--	--	33	11	15	6	5	20
Chloride	mg/l	--	250	156	25	26.3	28	29	40.5
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1180	470	450	480	450	521
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	3.75	--	--
Hardness, Calcium Carbonate	mg/l	--	--	525	137	134	160	152	153
Nitrate as N	mg/l	10.0	--	0.7	0.6	0.4	0.1	0.1	1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	29	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	28.99	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	7.88	7.62	7.64	6.05	--
Phosphate	mg/l	--	--	0.4	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	118	35	32	33	21	61
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	4900	2580	2740	--	--
Total Organic Carbon	mg/l	--	--	55	4.1	3.6	3.2	3.9	3.1
Total Suspended Solids	mg/l	--	--	590	240	230	240	220	260
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.04	0.05	0.04	0.04	0.21
Cadmium, dissolved	mg/l	0.005	--	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	157	34.9	35.6	43.4	41.1	38.8
Chromium, dissolved	mg/l	0.05	--	0.03	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.02
Iron, dissolved	mg/l	--	0.3	0.36	0.492	0.07	0.56	0.53	2.24
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	31.7	11.9	10.8	12.4	11.9	13.4
Manganese, dissolved	mg/l	--	0.05	0.52	0.054	0.05	0.04	0.05	0.07
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	8.9	4.03	3.8	0.9	6.8	8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	130	45.7	40.7	40.1	39.7	67.8
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.12
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 29-Oct-1998	92-19 06-May-1999	92-19 19-Oct-1999	92-19 05-May-2000	92-19 24-Oct-2000	92-19 14-Jun-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	205	222	244	227	228	216
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	7
Alkalinity (Total as CaCO3)	mg/l	--	--	168	182	200	186	187	189
Ammonia Nitrogen	mg/l	--	--	0.07	0.01	0.11	0.03	0.01	0.08
Chemical Oxygen Demand	mg/l	--	--	3	3	3	3	--	6
Chloride	mg/l	--	250	41.9	46.1	46.8	51.8	63.5	75.9
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	493	540	521	575	564	500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	129	163	168	174	144	181
Nitrate as N	mg/l	10.0	--	--	--	0.3	0.2	0.2	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.51	0.4	--	--	0.37	0.37
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.4	7.8	7.9	7.62	8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.9	1.49
Sulphate	mg/l	--	500 [4]	28	30	24	25	28	29
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	3100	5840	870	3910
Total Organic Carbon	mg/l	--	--	4.8	3.2	3.2	3.4	--	2.6
Total Suspended Solids	mg/l	--	--	245	270	260	288	310	366
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.22	0.05	0.15	0.13	0.05	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.5	40	44.6	46.4	37.5	49.5
Chromium, dissolved	mg/l	0.05	--	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.03	0.02	1.94	2.87	0.05	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	9.83	13.8	13.6	14	12.3	13.9
Manganese, dissolved	mg/l	--	0.05	0.08	0.01	0.09	0.06	0.02	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	4.5	4.2	4.4	2.7	3.4	0.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	50	55.6	60	62.1	52.4	55.2
Zinc, dissolved	mg/l	--	5	0.08	0.02	0.03	0.03	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.002	0.048

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 23-Nov-2001	92-19 23-May-2002	92-19 06-Nov-2002	92-19 30-May-2003	92-19 09-Oct-2003	92-19 14-May-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	201	395	326	355	--	381
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	165	324	267	291	273	312
Ammonia Nitrogen	mg/l	--	--	0.11	0.24	0.31	0.1	0.23	0.06
Chemical Oxygen Demand	mg/l	--	--	4	10	28	14	21	26
Chloride	mg/l	--	250	76.7	502	617	168	582	293
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	508	1890	2630	1440	3020	2230
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	62	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	189	554	503	441	418	469
Nitrate as N	mg/l	10.0	--	0.2	0.5	0.4	0.6	0.3	1.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.22	0.36	0.73	0.45	0.6	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.49	6.68	8.66	6.4	7	6.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.14	0.2	0.21	0.22	0.35	0.66
Sulphate	mg/l	--	500 [4]	28	103	117	166	109	146
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	136	168	308	246	294	796
Total Organic Carbon	mg/l	--	--	4	6	9	8.7	10	9.1
Total Suspended Solids	mg/l	--	--	320	1370	1510	720	1307	1115
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.07	0.07	0.06	0.06	0.06	0.057
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	49.7	183	165	150	140	159
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.005	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.008	0.004
Iron, dissolved	mg/l	--	0.3	0.13	0.02	0.11	0.51	2.3	0.019
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0016	0.0002	0.0007	0.0002
Magnesium, dissolved	mg/l	--	--	15.7	23.6	22	16.2	16.6	17.5
Manganese, dissolved	mg/l	--	0.05	0.02	1.8	1.35	0.74	1.77	0.847
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.03	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	1.9	16.7	16.9	11.3	14.7	13.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	60.6	284	320	151	367	202
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.03	0.01	0.01	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 19-Nov-2004	92-19 24-May-2005	92-19 16-Nov-2005	92-19 25-May-2006	92-19 21-Nov-2006
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	370	332	227	286	284
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	303	272	186	286	284
Ammonia Nitrogen	mg/l	--	--	0.19	0.06	0.1	0.27	0.06
Chemical Oxygen Demand	mg/l	--	--	23	21	22	9	9
Chloride	mg/l	--	250	736	199	271	298	463
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3060	1400	1400	1425	2100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	436	179	146	371	484
Nitrate as N	mg/l	10.0	--	1	0.2	0.1	0.2	0.9
Nitrite as N	mg/l	1.0	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.73	0.6	0.45	0.54	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	5.8	8.57	7.5	6.5
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.73	0.51	0.55	--	--
Sulphate	mg/l	--	500 [4]	110	87	60	119	82
Temperature (Field)	deg c	--	15	--	10.8	9.2	7	7
Total Dissolved Solids	mg/l	--	500	296	695	715	855	1150
Total Organic Carbon	mg/l	--	--	8.7	9.5	10.7	--	--
Total Suspended Solids	mg/l	--	--	1530	250	118	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.001	0.0013
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.064	0.04	0.067	0.037	0.045
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.0005	<0.005	0.0002
Calcium, dissolved	mg/l	--	--	147	55.8	46.8	127	164
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.006	0.007	0.008	0.003	0.003
Iron, dissolved	mg/l	--	0.3	0.128	0.015	0.062	0.071	0.032
Lead, dissolved	mg/l	0.01	--	0.0006	0.0004	<0.0002	<0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	16.5	9.61	6.94	13.2	18.1
Manganese, dissolved	mg/l	--	0.05	1.74	0.118	0.399	0.598	1.56
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	13.7	6.3	5.9	7.9	11.5
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [5]	413	179	219	125	237
Zinc, dissolved	mg/l	--	5	0.005	0.006	0.009	0.006	0.009
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 19-Nov-2004	92-19 24-May-2005	92-19 16-Nov-2005	92-19 25-May-2006	92-19 21-Nov-2006
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	<0.0006	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 15-May-2007	92-19 30-Nov-2007	92-19 22-May-2008	92-19 10-Nov-2008
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	364	332	237	264
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	364	332	240	260
Ammonia Nitrogen	mg/l	--	--	0.14	0.31	<0.01	0.17
Chemical Oxygen Demand	mg/l	--	--	97	61	14	22
Chloride	mg/l	--	250	571	957	318	459
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1400	2700	1800	3100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	367	421	354	351
Nitrate as N	mg/l	10.0	--	1.1	0.7	1.1	0.8
Nitrite as N	mg/l	1.0	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.91	0.87	0.8	0.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.7	6.5	6.7	6.7
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	121	111	105	72
Temperature (Field)	deg c	--	15	8.9	5	10	11
Total Dissolved Solids	mg/l	--	500	1420	1920	887	1060
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0011	0.0018	0.0014	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.078	0.071	0.063	0.044
Cadmium, dissolved	mg/l	0.005	--	0.00014	0.00012	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	125	145	121	120
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	0.008	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.006	0.004	0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.1	0.06	0.006	0.305
Lead, dissolved	mg/l	0.01	--	0.00006	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	13.6	14.4	12.4	12.2
Manganese, dissolved	mg/l	--	0.05	1.19	1.65	0.774	0.29
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.1	9.7	7.7	8.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	357	478	175	227
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 15-May-2007	92-19 30-Nov-2007	92-19 22-May-2008	92-19 10-Nov-2008
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 19-May-2009 G-2	92-19 26-Nov-2009 J-16	92-19 25-May-2010 M-1	92-19 20-Oct-2010 G-1
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	290	361	235	344
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	<2 [13]	<2 [13]	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	290	361	235	344
Ammonia Nitrogen	mg/l	--	--	0.09	0.25	0.07	<0.02
Chemical Oxygen Demand	mg/l	--	--	13	33	28	30
Chloride	mg/l	--	250	432	594	325	738
Conductivity	uS/cm	--	--	2120	2700	1740	3100
Conductivity (Field)	uS/cm	--	--	1900	2300	926	2994
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	411	391	283	725
Nitrate as N	mg/l	10.0	--	0.59	0.16	<0.10	1.28
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.33	0.48	0.20	0.48
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	7.17	7.50	7.67	7.04
pH (Field)	-	--	--	--	6.63	6.70	6.46
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.13	0.20	0.99	0.29
Sulphate	mg/l	--	500 [4]	86	90	56	118
Temperature (Field)	deg c	--	15	7	9.6	13.6	11.3
Total Dissolved Solids	mg/l	--	500	1380	1760	1130	2010
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.05	0.08	0.05	0.07
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	140	130	92	244
Chromium, dissolved	mg/l	0.05	--	0.009	<0.005	0.003	0.009
Cobalt, dissolved	mg/l	--	--	0.0005	0.0009	0.0019	0.0021
Copper, dissolved	mg/l	--	1	0.004	0.007	0.005	0.008
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	0.08	0.09
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	15	16	13	28
Manganese, dissolved	mg/l	--	0.05	0.22	0.60	1.09	1.51
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8	8	7	12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	246	466	221	290
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	0.01
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 19-May-2009 G-2	92-19 26-Nov-2009 J-16	92-19 25-May-2010 M-1	92-19 20-Oct-2010 G-1
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 24-May-2011 G-1	92-19 29-Nov-2011 92-19	92-19 31-May-2012 92-19	92-19 28-Nov-2012 92-19
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	336	362	320	360
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	<2 [13]	<1.0	1.6
Alkalinity (Total as CaCO3)	mg/l	--	--	336	362	320	360
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	<0.050	0.082
Chemical Oxygen Demand	mg/l	--	--	25	28	24	23
Chloride	mg/l	--	250	434	67	110	110
Conductivity	uS/cm	--	--	2220	1020	--	--
Conductivity (Field)	uS/cm	--	--	1943	1044	1192	1256
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	440	419	340	570
Nitrate as N	mg/l	10.0	--	0.81	1.07	4.1	2.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.10	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.35	0.18	0.88	0.60
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	4.2	2.1
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	7.76	7.61	7.51	--
pH (Field)	-	--	--	6.52	6.64	6.69	6.64
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.76	0.30	0.22	0.26
Sulphate	mg/l	--	500 [4]	109	85	140	180
Temperature (Field)	deg c	--	15	11.4	10.0	9.5	7.3
Total Dissolved Solids	mg/l	--	500	1440	663	774	1080
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0010	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.07	0.06	0.052	0.046
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	148	143	120	200
Chromium, dissolved	mg/l	0.05	--	0.007	0.004	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0016	0.0008	<0.00050	0.0005
Copper, dissolved	mg/l	--	1	0.010	0.003	0.0035	0.003
Iron, dissolved	mg/l	--	0.3	0.12	0.10	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	17	15	11	19
Manganese, dissolved	mg/l	--	0.05	0.74	0.37	0.13	0.27
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8	6	5.2	7.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	266	49	100	89
Zinc, dissolved	mg/l	--	5	0.02	<0.01	<0.0050	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 24-May-2011 G-1	92-19 29-Nov-2011 92-19	92-19 31-May-2012 92-19	92-19 28-Nov-2012 92-19
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00025	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00025	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00025	<0.00010
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00050	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00050	<0.00020

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 29-May-2013 92-19	92-19 26-Nov-2013 GW-18	92-19 29-May-2014 92-19	92-19 19-Nov-2014 92-19
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	360	310	360	260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.1	<1.0	<1.0	<1.0
Alkalinity (Total as CaCO3)	mg/l	--	--	360	310	360	260
Ammonia Nitrogen	mg/l	--	--	0.080	<0.050	0.14	<0.050
Chemical Oxygen Demand	mg/l	--	--	31	20	34	9.3
Chloride	mg/l	--	250	84	220	170	100
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1200	1449	1579	1081
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	440	430	420	270
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	0.39
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.72	0.68	0.95	0.32
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	0.39
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	7.50	7.50	7.45	7.39
pH (Field)	-	--	--	6.13	6.53	6.80	6.83
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.48	0.20	0.14	0.19
Sulphate	mg/l	--	500 [4]	210	190	300	98
Temperature (Field)	deg c	--	15	8.7	9.5	10.4	8.5
Total Dissolved Solids	mg/l	--	500	840	952	1100	458
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.071	0.06	0.074	0.08
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	0.00011	<0.00010
Calcium, dissolved	mg/l	--	--	150	140	140	92
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0010	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.0062	0.0048	0.0081	0.0045
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	17	17	18	10
Manganese, dissolved	mg/l	--	0.05	0.62	0.18	0.49	0.079
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.7	6.5	7.1	5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	230	110	210	65
Zinc, dissolved	mg/l	--	5	<0.0050	0.032	0.011	0.0059
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 29-May-2013 92-19	92-19 26-Nov-2013 GW-18	92-19 29-May-2014 92-19	92-19 19-Nov-2014 92-19
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 02-Jun-2015	92-19 26-Nov-2015	92-19 26-May-2016	92-19 17-Nov-2016
				92-19	92-19	92-19	92-19
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	300	391	328	381
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	300	391	328	381
Ammonia Nitrogen	mg/l	--	--	0.06	0.04	0.05	0.04
Chemical Oxygen Demand	mg/l	--	--	30	53	30	36
Chloride	mg/l	--	250	118	163	84	85
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1493	1583	1308	1414
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	294	470	353	408
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1	0.3
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.5	0.5	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	6.66	6.84	6.92	6.67
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.11	0.10	0.11	0.14
Sulphate	mg/l	--	500 [4]	231	268	255	250
Temperature (Field)	deg c	--	15	8.5	10.1	8.6	11.2
Total Dissolved Solids	mg/l	--	500	836	990	866	750
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.057	0.074	0.067	0.077
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	92.8	154	108	130
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.007
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0024	0.0038	0.0064
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	15	20.5	20	20
Manganese, dissolved	mg/l	--	0.05	0.012	0.141	0.114	0.096
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.28	6.65	6.8	7.15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	70.3	173	121	137
Zinc, dissolved	mg/l	--	5	0.007	0.008	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	0.002

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 02-Jun-2015 92-19	92-19 26-Nov-2015 92-19	92-19 26-May-2016 92-19	92-19 17-Nov-2016 92-19
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 24-May-2017	92-19 29-Nov-2017	92-19 24-May-2018	92-19 29-Nov-2018
				92-19	92-19	92-19	92-19
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	354	309	290	400
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	354	309	291	400
Ammonia Nitrogen	mg/l	--	--	0.10	0.07	0.07	0.17
Chemical Oxygen Demand	mg/l	--	--	36	45	92	45
Chloride	mg/l	--	250	115	119	60	420
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1291	1081	949	1625
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	457	392	303	393
Nitrate as N	mg/l	10.0	--	<0.1	4.7	0.2	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.6	0.5	0.5	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	6.94	6.41	6.86	6.54
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.16	0.11	0.14	0.19
Sulphate	mg/l	--	500 [4]	171	199	96	158
Temperature (Field)	deg c	--	15	9.5	7.9	8.0	8.5
Total Dissolved Solids	mg/l	--	500	782	756	520	1280
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.067	0.106	0.054	0.111
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	150	127	97.6	127
Chromium, dissolved	mg/l	0.05	--	0.004	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0064	0.0051	0.0033	0.0035
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	20.2	18.2	14.5	18.6
Manganese, dissolved	mg/l	--	0.05	0.12	0.05	0.612	0.436
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.7	5.31	4.22	7.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	124	86.4	48.1	38
Zinc, dissolved	mg/l	--	5	<0.005	0.006	<0.005	0.009
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 24-May-2017	92-19 29-Nov-2017	92-19 24-May-2018	92-19 29-Nov-2018
				92-19	92-19	92-19	92-19
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 19-Jun-2019 92-19	92-19 20-Nov-2019 92-19
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	191	332
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	191	332
Ammonia Nitrogen	mg/l	--	--	0.10	0.04
Chemical Oxygen Demand	mg/l	--	--	14	30
Chloride	mg/l	--	250	76	93
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	719	1113
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	213	428
Nitrate as N	mg/l	10.0	--	<0.1	0.3
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.2	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	6.48	6.72
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	0.17	0.16
Sulphate	mg/l	--	500 [4]	39	123
Temperature (Field)	deg c	--	15	10.5	9.4
Total Dissolved Solids	mg/l	--	500	406	662
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Aluminum, dissolved	mg/l	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--
Boron, dissolved	mg/l	5	--	0.047	0.078
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	67.7	137
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0019
Copper, dissolved	mg/l	--	1	0.0027	0.0021
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	10.7	21.1
Manganese, dissolved	mg/l	--	0.05	0.023	1.04
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.12	10.8
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	42.3	69.8
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-19 19-Jun-2019 92-19	92-19 20-Nov-2019 92-19
VOCs					
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--
Bromoform	mg/l	--	--	--	--
Bromomethane	mg/l	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--
Chloroform	mg/l	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-4 28-Jun-1995	95-4 22-Nov-1995	95-4 12-Jun-1996	95-4 12-Oct-1996	95-4 18-Jun-1997	95-4 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	158	142	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	130	116	143	179	123	170
Ammonia Nitrogen	mg/l	--	--	0.04	0.01	0.01	0.05	0.17	0.01
Chemical Oxygen Demand	mg/l	--	--	40	25	11	8	3	5
Chloride	mg/l	--	250	42	18.8	22	15.7	12.2	14.3
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	610	430	--	--	410	500
Dissolved Oxygen (Field)	mg/l	--	--	7.45	--	--	--	5.96	--
Hardness, Calcium Carbonate	mg/l	--	--	265	180	242	223	212	273
Nitrate as N	mg/l	10.0	--	11.6	5.8	9.1	7.7	5.6	6.8
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.5	0.48	--	--	--	--
Nitrogen, Organic	mg/l	--	--	3.46	0.47	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.99	7.35	--	--	7.31	6.15
Phosphate	mg/l	--	--	--	0.2	--	--	--	--
Phosphorus	mg/l	--	--	1.44	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	59	42	50	40	37	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	310	220	--	--	210	250
Total Organic Carbon	mg/l	--	--	2	1.7	2.3	2.8	2.2	3.1
Total Suspended Solids	mg/l	--	--	--	--	201	640	873	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.01	0.018	0.04	0.02	0.04
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	78.6	52.7	70	64.1	62.8	81.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.11	0.03	0.07	0.15	0.1
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	16.5	11.7	16.3	15.1	13.1	16.5
Manganese, dissolved	mg/l	--	0.05	0.06	0.02	0.01	0.01	0.01	0.01
Nickel, dissolved	mg/l	--	--	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	9.5	4.6	4.6	0.6	6.5
Sodium, dissolved	mg/l	--	200 [5]	10.6	6.2	11.6	8.8	8.6	7.9
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-4 05-Jun-1998	95-4 29-Oct-1998	95-4 06-May-1999	95-4 19-Oct-1999	95-4 05-May-2000	95-4 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	239	176	268	382	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	156	196	144	220	313	227
Ammonia Nitrogen	mg/l	--	--	0.03	0.04	0.01	0.04	0.01	0.01
Chemical Oxygen Demand	mg/l	--	--	3	3	4	6	3	--
Chloride	mg/l	--	250	11.9	14.1	7.1	10.2	37.7	16.9
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	497	520	370	460	850	630
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	212	239	185	233	479	216
Nitrate as N	mg/l	10.0	--	6.7	--	--	2.4	12.8	4.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	0.47	0.36	--	--	0.46
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7	6.9	7.7	6.9	7.06
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.08
Sulphate	mg/l	--	500 [4]	71	47	34	39	97	63
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	250	260	190	230	425	354
Total Organic Carbon	mg/l	--	--	1.7	4.2	3.6	2.4	6.5	--
Total Suspended Solids	mg/l	--	--	--	--	--	182	154	108
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Boron, dissolved	mg/l	5	--	0.07	0.06	0.03	0.19	0.12	0.04
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	59.1	73.3	54.2	66.8	135	54.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.06	0.17	0.02	0.13	0.05	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	15.5	13.6	13.3	15.8	33.4	19.7
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.01	0.01	0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5	5.3	0.4	5.1	2.2	5.4
Sodium, dissolved	mg/l	--	200 [5]	14.5	10.4	9.5	22.1	16.7	30
Zinc, dissolved	mg/l	--	5	0.019	0.01	0.01	0.1	0.14	0.03
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-4 14-Jun-2001	95-4 23-Nov-2001	95-4 23-May-2002 [11]	95-4 06-Nov-2002 [11]	95-4 30-May-2003 [11]
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	251	306	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	206	251	--	--	--
Ammonia Nitrogen	mg/l	--	--	0.01	0.01	--	--	--
Chemical Oxygen Demand	mg/l	--	--	5	3	--	--	--
Chloride	mg/l	--	250	11	10.3	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	500	522	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	268	302	--	--	--
Nitrate as N	mg/l	10.0	--	2.9	0.6	--	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.33	0.29	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	--	--	--	--
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.1	0.06	--	--	--
Sulphate	mg/l	--	500 [4]	47	30	--	--	--
Temperature (Field)	deg c	--	15	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	320	468	--	--	--
Total Organic Carbon	mg/l	--	--	3.6	5	--	--	--
Total Suspended Solids	mg/l	--	--	259	74	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	--	--	--
Boron, dissolved	mg/l	5	--	0.02	0.04	--	--	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	75.4	81	--	--	--
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	--	--	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	--	--	--
Iron, dissolved	mg/l	--	0.3	0.02	0.02	--	--	--
Lead, dissolved	mg/l	0.01	--	0.0002	0.0007	--	--	--
Magnesium, dissolved	mg/l	--	--	19.4	21	--	--	--
Manganese, dissolved	mg/l	--	0.05	0.01	0.02	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	--	--
Potassium, dissolved	mg/l	--	--	2	0.4	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	14.5	15.6	--	--	--
Zinc, dissolved	mg/l	--	5	0.01	0.01	--	--	--
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.007	0.001	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-4 09-Oct-2003 [11]	95-4 14-May-2004 [11]	95-4 19-Nov-2004 [11]	95-4 24-May-2005 [11]	95-4 16-Nov-2005 [11]
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--
Chloride	mg/l	--	250	--	--	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	--	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	--	--	--
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	--	--	--	--	--
Temperature (Field)	deg c	--	15	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	--	--	--	--	--
Chromium, dissolved	mg/l	0.05	--	--	--	--	--	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	--	--	--
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--
Lead, dissolved	mg/l	0.01	--	--	--	--	--	--
Magnesium, dissolved	mg/l	--	--	--	--	--	--	--
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	--	--	--	--	--
Zinc, dissolved	mg/l	--	5	--	--	--	--	--
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-4 25-May-2006	95-4 16-Nov-2006 [11]	95-4 15-May-2007 [11]	95-4 30-Nov-2007 [14]	95-4 22-May-2008 [11]
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	222	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	222	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	<0.01	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	36	--	--	--	--
Chloride	mg/l	--	250	5	--	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	460	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	323	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.1	--	--	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.64	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.8	--	--	--	--
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	124	--	--	--	--
Temperature (Field)	deg c	--	15	9.5	--	--	--	--
Total Dissolved Solids	mg/l	--	500	393	--	--	--	--
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.001	--	--	--	--
Boron, dissolved	mg/l	5	--	0.021	--	--	--	--
Cadmium, dissolved	mg/l	0.005	--	<0.005	--	--	--	--
Calcium, dissolved	mg/l	--	--	84	--	--	--	--
Chromium, dissolved	mg/l	0.05	--	<0.002	--	--	--	--
Cobalt, dissolved	mg/l	--	--	<0.005	--	--	--	--
Copper, dissolved	mg/l	--	1	0.003	--	--	--	--
Iron, dissolved	mg/l	--	0.3	<0.005	--	--	--	--
Lead, dissolved	mg/l	0.01	--	<0.0002	--	--	--	--
Magnesium, dissolved	mg/l	--	--	27.5	--	--	--	--
Manganese, dissolved	mg/l	--	0.05	0.187	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.6	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	14.2	--	--	--	--
Zinc, dissolved	mg/l	--	5	0.013	--	--	--	--
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	--	--
m,p-Xylenes	mg/l	--	--	<0.001	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0003	--	--	--	--
o-Xylene	mg/l	--	--	<0.0005	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	--	--	--

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-4 10-Nov-2008 [11]	95-4 19-May-2009 [11] 95-4	95-4 27-Nov-2009 J-52	95-4 20-Oct-2010 G-13
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	112	310
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	<2 [13]	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	112	310
Ammonia Nitrogen	mg/l	--	--	--	--	<0.02	<0.02
Chemical Oxygen Demand	mg/l	--	--	--	--	33	25
Chloride	mg/l	--	250	--	--	10	10
Conductivity	uS/cm	--	--	--	--	341	701
Conductivity (Field)	uS/cm	--	--	--	--	309	701
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	76	342
Nitrate as N	mg/l	10.0	--	--	--	0.20	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	<0.10	0.34
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	8.17	8.16
pH (Field)	-	--	--	--	--	8.97	7.46
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.21	0.09
Sulphate	mg/l	--	500 [4]	--	--	42	63
Temperature (Field)	deg c	--	15	--	--	8.4	13.8
Total Dissolved Solids	mg/l	--	500	--	--	222	456
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	--	--	0.004	<0.001
Boron, dissolved	mg/l	5	--	--	--	0.07	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	--	--	19	86
Chromium, dissolved	mg/l	0.05	--	--	--	<0.001	0.003
Cobalt, dissolved	mg/l	--	--	--	--	<0.0002	0.0005
Copper, dissolved	mg/l	--	1	--	--	0.001	0.003
Iron, dissolved	mg/l	--	0.3	--	--	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	--	--	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	--	--	7	31
Manganese, dissolved	mg/l	--	0.05	--	--	<0.01	0.25
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	--	4	6
Sodium, dissolved	mg/l	--	200 [5]	--	--	40	18
Zinc, dissolved	mg/l	--	5	--	--	<0.01	<0.01
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	--	--	<0.001	<0.001
VOCs							
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0004	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-4 24-May-2011 G-44	95-4 22-Nov-2011 [11] 95-4	95-4 31-May-2012 [15] 95-4
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	244	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	250	--	--
Ammonia Nitrogen	mg/l	--	--	<0.02	--	--
Chemical Oxygen Demand	mg/l	--	--	10	--	--
Chloride	mg/l	--	250	8	--	--
Conductivity	uS/cm	--	--	550	--	--
Conductivity (Field)	uS/cm	--	--	552	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	267	--	--
Nitrate as N	mg/l	10.0	--	0.15	--	--
Nitrite as N	mg/l	1.0	--	<0.10	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	8.40	--	--
pH (Field)	-	--	--	7.49	--	--
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.07	--	--
Sulphate	mg/l	--	500 [4]	42	--	--
Temperature (Field)	deg c	--	15	16.9	--	--
Total Dissolved Solids	mg/l	--	500	358	--	--
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	<0.001	--	--
Boron, dissolved	mg/l	5	--	0.03	--	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	--
Calcium, dissolved	mg/l	--	--	69	--	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--	--
Cobalt, dissolved	mg/l	--	--	0.0003	--	--
Copper, dissolved	mg/l	--	1	0.006	--	--
Iron, dissolved	mg/l	--	0.3	<0.03	--	--
Lead, dissolved	mg/l	0.01	--	<0.001	--	--
Magnesium, dissolved	mg/l	--	--	23	--	--
Manganese, dissolved	mg/l	--	0.05	0.03	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	--	--
Sodium, dissolved	mg/l	--	200 [5]	15	--	--
Zinc, dissolved	mg/l	--	5	0.02	--	--
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0004	--	--
Benzene	mg/l	0.001	--	<0.0005	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--
m,p-Xylenes	mg/l	--	--	<0.0010	--	--
Methylene Chloride	mg/l	0.05	--	<0.0040	--	--
o-Xylene	mg/l	--	--	<0.0005	--	--
Toluene	mg/l	0.06	0.024	<0.0005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	--

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 28-Jun-1995	95-8 22-Nov-1995	95-8 12-Jun-1996	95-8 12-Oct-1996	95-8 18-Jun-1997	95-8 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	173	174	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	142	143	151	143	123	150
Ammonia Nitrogen	mg/l	--	--	0.18	0.15	0.12	0.11	0.01	0.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	33	13	15	3	3
Chloride	mg/l	--	250	122	121	115	130	136	146
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	840	860	810	850	840	770
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	8.18	--	--	--	2.84	--
Hardness, Calcium Carbonate	mg/l	--	--	251	265	259	234	288	288
Nitrate as N	mg/l	10.0	--	0.1	0.3	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	4.5	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.32	4.35	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.23	6.87	7.26	7	6.18
Phosphate	mg/l	--	--	--	1.4	--	--	--	--
Phosphorus	mg/l	--	--	1.66	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	74	84	76	79	72	64
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	420	440	410	430	420	360
Total Organic Carbon	mg/l	--	--	7.3	3.6	5.9	4.8	3.8	5.3
Total Suspended Solids	mg/l	--	--	--	--	1480	1780	1230	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.01	0.021	0.05	0.03	0.04
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	56.3	56	57.7	50.7	69.5	65
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.75	3.79	0.56	2.22	0.4
Lead, dissolved	mg/l	0.01	--	0.0002	0.0004	0.0002	0.0002	0.0002	0.0015
Magnesium, dissolved	mg/l	--	--	26.7	30	27.4	25.7	27.3	30.1
Manganese, dissolved	mg/l	--	0.05	0.24	0.27	0.383	0.25	0.39	0.27
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	7.6	6.98	3.8	7.7	7.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	63	67.7	78.5	71.1	71.8	61.4
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 05-Jun-1998	95-8 29-Oct-1998	95-8 06-May-1999	95-8 19-Oct-1999	95-8 05-May-2000	95-8 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	161	178	220	177	187
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	150	132	146	180	145	153
Ammonia Nitrogen	mg/l	--	--	0.22	0.13	0.03	0.08	0.01	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	19	3	3	3	13	--
Chloride	mg/l	--	250	140	142	135	151	138	152
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	836	888	840	908	700	780
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	242	227	266	269	259	208
Nitrate as N	mg/l	10.0	--	1	--	--	0.1	0.2	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	0.49	0.84	--	--	0.52
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	6.7	6.4	7.4	7.2	7.14
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	1.28
Sulphate	mg/l	--	500 [4]	92	75	68	71	67	75
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	416	445	430	450	350	486
Total Organic Carbon	mg/l	--	--	5.2	6.2	4.8	3.8	6	--
Total Suspended Solids	mg/l	--	--	--	--	--	712	598	1010
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Boron, dissolved	mg/l	5	--	0.14	0.07	0.04	0.16	0.12	0.04
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	52.3	50.2	61.4	61.4	58.2	41.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.58	2.72	2.17	1.47	1.73	0.03
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0012
Magnesium, dissolved	mg/l	--	--	26.6	24.8	27.1	27.6	27.2	25.2
Manganese, dissolved	mg/l	--	0.05	0.3	0.37	0.37	0.28	0.32	0.26
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.5	9.8	5	7	2	4.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	93.9	69.1	81.3	90.5	71.7	90
Zinc, dissolved	mg/l	--	5	0.35	0.01	0.01	0.16	0.12	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 14-Jun-2001	95-8 23-Nov-2001	95-8 23-May-2002	95-8 06-Nov-2002	95-8 30-May-2003	95-8 09-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	160	150	173	194	154	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	131	123	142	159	126	184
Ammonia Nitrogen	mg/l	--	--	0.31	0.03	0.22	0.05	0.16	0.1
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	1
Chemical Oxygen Demand	mg/l	--	--	11	4	3	12	7	12
Chloride	mg/l	--	250	139	136	144	158	145	142
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	850	750	770	652	780	940
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	44
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	238	250	247	231	265
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.1	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.86	0.66	1.4	0.33	0.38	0.36
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.1	6.23	6.74	7.2	6.4	7
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.22	1.01	0.6	0.48	0.25	0.19
Sulphate	mg/l	--	500 [4]	76	79	77	64	65	73
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	496	448	564	576	390	512
Total Organic Carbon	mg/l	--	--	5	6	5	5.2	5.2	10
Total Suspended Solids	mg/l	--	--	2150	682	436	554	128	132
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.04	0.05	0.04	0.05	0.03	0.039
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	54.3	51	53.1	53	48.9	56.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.005
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.007
Iron, dissolved	mg/l	--	0.3	0.08	0.04	1.8	0.75	1.13	2.73
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	22.9	26.8	28.4	27.9	26.4	30.2
Manganese, dissolved	mg/l	--	0.05	0.23	0.28	0.23	0.23	0.18	0.203
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	2.4	2.6	6.5	7.6	5.5	6.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	70.1	71.1	64.6	76.7	68.4	90.3
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.02	0.01	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.05	0.001	0.001	0.001	0.001	0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 14-May-2004	95-8 19-Nov-2004	95-8 24-May-2005	95-8 16-Nov-2005	95-8 25-May-2006	95-8 21-Nov-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	162	275	310	222	358	492
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	133	230	254	364	358	492
Ammonia Nitrogen	mg/l	--	--	0.16	0.09	0.05	0.11	0.13	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	13	24	13	31	16	28
Chloride	mg/l	--	250	153	166	193	181	193	167
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	840	1110	1400	1300	1000	1300
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	233	310	366	579	408	552
Nitrate as N	mg/l	10.0	--	0.2	0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.498	0.57	0.44	0.56	0.51	0.92
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	6.7	5.9	--	6.9	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.608	1.06	0.33	0.29	--	--
Sulphate	mg/l	--	500 [4]	71	77	79	107	90	103
Temperature (Field)	deg c	--	15	--	--	6.6	10.7	4	7.5
Total Dissolved Solids	mg/l	--	500	420	550	631	800	734	866
Total Organic Carbon	mg/l	--	--	3.6	5	5.2	10.2	--	--
Total Suspended Solids	mg/l	--	--	424	528	149	165	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	0.0007
Boron, dissolved	mg/l	5	--	0.027	0.038	0.025	0.044	0.038	0.043
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.005	0.0001
Calcium, dissolved	mg/l	--	--	48.9	66.9	75.8	124	86.3	119
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	0.003	<0.002	0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.003	0.002	<0.002	0.007	0.004	0.011
Iron, dissolved	mg/l	--	0.3	0.497	0.205	2.02	0.674	2.16	1.17
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0006	<0.0002	<0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	27	34.8	42.9	65.7	46.7	62
Manganese, dissolved	mg/l	--	0.05	0.17	0.242	0.344	0.312	0.328	0.443
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	5.7	6.7	6.2	9.3	6.3	8.1
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [5]	70.9	89.2	85.1	103	100	110
Zinc, dissolved	mg/l	--	5	0.005	0.005	0.008	0.008	0.008	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.002	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 14-May-2004	95-8 19-Nov-2004	95-8 24-May-2005	95-8 16-Nov-2005	95-8 25-May-2006	95-8 21-Nov-2006
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002

WCC - Navan Waste Recycling and Disposal Facility
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 15-May-2007	95-8 30-Nov-2007	95-8 22-May-2008	95-8 10-Nov-2008	95-8 19-May-2009
								G-12
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	507	531	501	519	417
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	507	531	501	519	417
Ammonia Nitrogen	mg/l	--	--	0.52	1.45	0.85	1.14	0.68
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	92	48	36	27	23
Chloride	mg/l	--	250	172	161	171	151	152
Conductivity	uS/cm	--	--	--	--	--	--	1350
Conductivity (Field)	uS/cm	--	--	1100	1200	1300	1250	1000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	537	517	518	521	432
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	<0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.49	2.49	2	1.95	1.00
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.25
pH (Field)	-	--	--	7	6.7	6.5	6.5	--
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.40
Sulphate	mg/l	--	500 [4]	101	89	88	80	59
Temperature (Field)	deg c	--	15	6.3	5	8.5	7	5
Total Dissolved Solids	mg/l	--	500	881	879	871	857	878
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.0011	0.0011	0.0013	0.001	<0.001
Boron, dissolved	mg/l	5	--	0.038	0.044	0.036	0.042	0.07
Cadmium, dissolved	mg/l	0.005	--	0.00007	<0.00002	<0.00002	0.00025	<0.0001
Calcium, dissolved	mg/l	--	--	115	117	117	122	97
Chromium, dissolved	mg/l	0.05	--	0.003	<0.002	0.002	0.002	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0014
Copper, dissolved	mg/l	--	1	0.003	0.005	<0.002	0.045	0.010
Iron, dissolved	mg/l	--	0.3	3.16	1.55	3.35	0.038	0.03
Lead, dissolved	mg/l	0.01	--	0.00011	<0.00002	<0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	60.7	54.6	54.7	52.5	46
Manganese, dissolved	mg/l	--	0.05	0.508	0.551	0.593	1.36	1.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.5	10.7	9.4	12.4	8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	114	127	125	124	111
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.005	<0.005	<0.01
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 15-May-2007	95-8 30-Nov-2007	95-8 22-May-2008	95-8 10-Nov-2008	95-8 19-May-2009 G-12
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 27-Nov-2009 J-1	95-8 25-May-2010 [12] M-4	95-8 20-Oct-2010 G-11	95-8 24-May-2011 [16] G-6
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	417	475	452	486
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	<2 [13]	<2 [13]	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	417	475	452	486
Ammonia Nitrogen	mg/l	--	--	1.68	1.60	1.77	2.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	45	40	38
Chloride	mg/l	--	250	157	126	145	142
Conductivity	uS/cm	--	--	1350	1410	1360	1410
Conductivity (Field)	uS/cm	--	--	1209	1511	1395	1342
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	423	445	478	569
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.13	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.90	2.00	2.31	2.64
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	7.32	7.31	7.21	7.78
pH (Field)	-	--	--	6.64	6.48	6.63	6.57
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.09	0.11	0.06	0.02
Sulphate	mg/l	--	500 [4]	51	58	56	56
Temperature (Field)	deg c	--	15	4.7	9.4	8.8	13.2
Total Dissolved Solids	mg/l	--	500	878	917	884	916
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.01	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.05	0.05	0.05	0.05
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.0003	0.0001	0.0002
Calcium, dissolved	mg/l	--	--	97	104	114	139
Chromium, dissolved	mg/l	0.05	--	0.008	0.008	0.007	0.006
Cobalt, dissolved	mg/l	--	--	0.0017	0.0029	0.0017	0.0030
Copper, dissolved	mg/l	--	1	0.005	0.046	0.005	0.037
Iron, dissolved	mg/l	--	0.3	3.11	0.54	2.83	0.10
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	44	45	47	54
Manganese, dissolved	mg/l	--	0.05	1.57	2.30	1.54	3.44
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	10	11	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	116	102	116	94
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 27-Nov-2009 J-1	95-8 25-May-2010 [12] M-4	95-8 20-Oct-2010 G-11	95-8 24-May-2011 [16] G-6
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.01
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.04
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 29-Nov-2011	95-8 31-May-2012	95-8 28-Nov-2012	95-8 29-May-2013 [17]
				95-8	95-8	95-8	95-8
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	521	540	690	700
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	1.2	1.6	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	521	540	690	700
Ammonia Nitrogen	mg/l	--	--	2.08	2.3	2.6	3.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	53	90	75
Chloride	mg/l	--	250	137	130	120	130
Conductivity	uS/cm	--	--	1450	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1416	1467	1448
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	516	510	700	730
Nitrate as N	mg/l	10.0	--	<0.10	0.30	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.010	0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.27	3.3	3.6	4.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	0.30	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	7.40	7.36	--	7.36
pH (Field)	-	--	--	--	6.51	6.51	6.61
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.08	0.058	0.052	0.19
Sulphate	mg/l	--	500 [4]	70	69	69	67
Temperature (Field)	deg c	--	15	--	11.0	7.4	12
Total Dissolved Solids	mg/l	--	500	942	872	990	1050
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.0010	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	0.04	0.056	0.052	0.054
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.00027	0.0004	0.00025
Calcium, dissolved	mg/l	--	--	129	130	170	180
Chromium, dissolved	mg/l	0.05	--	0.006	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0020	0.0013	0.0029	0.0035
Copper, dissolved	mg/l	--	1	0.046	0.054	0.05	0.011
Iron, dissolved	mg/l	--	0.3	<0.03	<0.1	<0.1	1.8
Lead, dissolved	mg/l	0.01	--	<0.001	<0.00050	<0.0005	0.00060
Magnesium, dissolved	mg/l	--	--	47	49	64	64
Manganese, dissolved	mg/l	--	0.05	2.61	2.6	6.7	7.4
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13	13	19	18
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	100	100	100	100
Zinc, dissolved	mg/l	--	5	<0.01	0.0064	<0.005	0.0093
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 29-Nov-2011	95-8 31-May-2012	95-8 28-Nov-2012	95-8 29-May-2013 [17]
				95-8	95-8	95-8	95-8
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00025	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00025	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00025	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00025	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.0013	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00025	<0.00025
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00050	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00050	<0.00050

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 26-Nov-2013 GW-13	95-8 29-May-2014 95-8	95-8 19-Nov-2014 95-8	95-8 02-Jun-2015 95-8
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	670	710	670	712
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.2	1.9	1.0	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	670	720	680	713
Ammonia Nitrogen	mg/l	--	--	2.5	2.7	2.8	2.57
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	59	70	65	81
Chloride	mg/l	--	250	140	160	170	185
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1415	1576	1781	1782
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	680	760	700	650
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.068	0.013	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.1	3.3	3.7	3.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	7.27	7.45	7.22	--
pH (Field)	-	--	--	6.73	6.57	6.62	6.57
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.11	0.070	0.063	0.05
Sulphate	mg/l	--	500 [4]	55	42	45	37
Temperature (Field)	deg c	--	15	8.7	9.2	6.0	10.7
Total Dissolved Solids	mg/l	--	500	1010	1050	1010	1080
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	0.057	0.065	0.063	0.059
Cadmium, dissolved	mg/l	0.005	--	0.00023	0.00048	0.00050	0.0003
Calcium, dissolved	mg/l	--	--	170	190	180	148
Chromium, dissolved	mg/l	0.05	--	0.0059	0.0054	<0.0050	0.004
Cobalt, dissolved	mg/l	--	--	0.0032	0.0034	0.0027	0.0031
Copper, dissolved	mg/l	--	1	0.031	0.015	0.0040	0.0196
Iron, dissolved	mg/l	--	0.3	<0.1	1.6	3.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	62	69	64	68
Manganese, dissolved	mg/l	--	0.05	6.9	8.2	6.7	10.2
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16	17	16	15.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	100	120	120	116
Zinc, dissolved	mg/l	--	5	0.0087	0.0082	<0.0050	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.002 [7]

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 26-Nov-2013 GW-13	95-8 29-May-2014 95-8	95-8 19-Nov-2014 95-8	95-8 02-Jun-2015 95-8
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 26-Nov-2015	95-8 26-May-2016	95-8 17-Nov-2016	95-8 24-May-2017
				95-8	95-8	95-8	95-8
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	779	768	773	856
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	779	768	773	856
Ammonia Nitrogen	mg/l	--	--	2.60	2.83	2.25	1.80
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	94	91	88	286
Chloride	mg/l	--	250	177	188	181	172
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1822	1817	1894	1915
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	826	776	712	769
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.7	3.5	3.2	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	6.74	6.77	7.05	6.62
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.05	0.07	0.06	0.02
Sulphate	mg/l	--	500 [4]	32	39	33	26
Temperature (Field)	deg c	--	15	8.4	13.5	10.4	12.0
Total Dissolved Solids	mg/l	--	500	1110	1180	1030	1130
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001	0.002
Boron, dissolved	mg/l	5	--	0.068	0.084	0.058	0.051
Cadmium, dissolved	mg/l	0.005	--	0.0003	0.0003	0.0003	0.0002
Calcium, dissolved	mg/l	--	--	197	197	185	209
Chromium, dissolved	mg/l	0.05	--	0.006	0.006	0.014	0.014
Cobalt, dissolved	mg/l	--	--	0.0034	0.0035	0.0012	0.0026
Copper, dissolved	mg/l	--	1	0.0571	0.0351	0.0547	0.0371
Iron, dissolved	mg/l	--	0.3	0.226	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	81.1	68.7	60.6	59.8
Manganese, dissolved	mg/l	--	0.05	8.9	9.2	5.7	8.23
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.7	21.5	16.5	16.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	139	120	129	128
Zinc, dissolved	mg/l	--	5	0.016	0.006	0.008	0.008
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.006	<0.002 [B]	<0.002 [B]

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 26-Nov-2015	95-8 26-May-2016	95-8 17-Nov-2016	95-8 24-May-2017
				95-8	95-8	95-8	95-8
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 29-Nov-2017	95-8 24-May-2018	95-8 22-Nov-2018
				95-8	95-8	95-8
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	836	941	953
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	836	942	953
Ammonia Nitrogen	mg/l	--	--	2.17	2.42	1.92
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	94	129	117
Chloride	mg/l	--	250	226	200	199
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1818	2068	1819
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	771	962	1120
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.3	4.0	3.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	6.67	6.48	6.68
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.06	0.04	0.08
Sulphate	mg/l	--	500 [4]	25	17	16
Temperature (Field)	deg c	--	15	8.3	11.9	6.8
Total Dissolved Solids	mg/l	--	500	1140	1410	1210
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.083	0.065	0.091
Cadmium, dissolved	mg/l	0.005	--	0.0004	0.0005	0.0003
Calcium, dissolved	mg/l	--	--	200	263	313
Chromium, dissolved	mg/l	0.05	--	0.007	0.008	0.007
Cobalt, dissolved	mg/l	--	--	0.0031	0.0033	0.0035
Copper, dissolved	mg/l	--	1	0.0087	0.112	0.107
Iron, dissolved	mg/l	--	0.3	1.33	<0.1	0.124
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	65.9	73.8	82.8
Manganese, dissolved	mg/l	--	0.05	8.27	11.8	5.83
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.8	17.9	20.9
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	125	117	145
Zinc, dissolved	mg/l	--	5	<0.005	0.007	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.002 [8]	0.004

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 29-Nov-2017 95-8	95-8 24-May-2018 95-8	95-8 22-Nov-2018 95-8
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 19-Jun-2019	95-8 20-Nov-2019
				95-8	95-8
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	943	916
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	944	916
Ammonia Nitrogen	mg/l	--	--	2.25	2.66
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	124	121
Chloride	mg/l	--	250	161	165
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1848	2070
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	864	911
Nitrate as N	mg/l	10.0	--	0.3	<0.1
Nitrite as N	mg/l	1.0	--	0.07	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.4	3.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	6.8	6.5
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	0.02	0.02
Sulphate	mg/l	--	500 [4]	14	14
Temperature (Field)	deg c	--	15	12.5	7.1
Total Dissolved Solids	mg/l	--	500	1260	1250
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.001
Boron, dissolved	mg/l	5	--	0.073	0.067
Cadmium, dissolved	mg/l	0.005	--	0.0003	0.0004
Calcium, dissolved	mg/l	--	--	213	225
Chromium, dissolved	mg/l	0.05	--	0.009	0.013
Cobalt, dissolved	mg/l	--	--	0.0027	0.0043
Copper, dissolved	mg/l	--	1	0.0948	0.0094
Iron, dissolved	mg/l	--	0.3	<0.1	4.02
Lead, dissolved	mg/l	0.01	--	0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	80.6	84.9
Manganese, dissolved	mg/l	--	0.05	11.3	10.6
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	22.6	24.2
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	124	131
Zinc, dissolved	mg/l	--	5	<0.005	0.008
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.010 [8]

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-8 19-Jun-2019	95-8 20-Nov-2019
				95-8	95-8
VOCs					
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--
Bromoform	mg/l	--	--	--	--
Bromomethane	mg/l	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--
Chloroform	mg/l	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 29-Oct-1998	98-1 06-May-1999	98-1 05-May-2000	98-1 24-Oct-2000	98-1 14-Jun-2001	98-1 23-Nov-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	293	342	357	323	272	267
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	240	280	293	265	223	219
Ammonia Nitrogen	mg/l	--	--	0.34	0.63	0.01	0.01	0.34	0.33
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	7	6	--	12	5
Chloride	mg/l	--	250	210	290	197	209	184	181
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1066	1420	1200	1260	1050	1140
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	256	214	218	233	273	278
Nitrate as N	mg/l	10.0	--	--	--	0.3	0.5	0.4	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.87	0.99	--	0.5	0.57	0.62
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.1	7.7	7.7	7.7	6.87
Phosphorus	mg/l	--	--	--	--	--	0.13	0.12	0.07
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	116	33	47	55	63	77
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	536	710	600	612	584	556
Total Organic Carbon	mg/l	--	--	13.8	8.4	4.6	--	3.8	6
Total Suspended Solids	mg/l	--	--	--	--	284	98	74	91
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.12	0.13	0.19	0.08	0.06	0.09
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	64.6	45.2	48.5	49.4	65.9	63.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.13	2.41	0.42	0.03	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	22.9	24.3	23.1	26.7	26.3	29.1
Manganese, dissolved	mg/l	--	0.05	0.53	0.27	0.18	0.19	0.26	0.33
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.5	6.7	8.2	12.4	3.4	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	150	238	200	148	114	131
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.08	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.055	0.001

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 23-May-2002	98-1 06-Nov-2002	98-1 30-May-2003	98-1 09-Oct-2003	98-1 14-May-2004	98-1 19-Nov-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	266	271	271	--	282	329
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4	1	1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	224	222	222	227	231	270
Ammonia Nitrogen	mg/l	--	--	0.26	0.16	0.3	0.22	0.27	0.48
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	2	--	--
Chemical Oxygen Demand	mg/l	--	--	3	13	10	7	16	248
Chloride	mg/l	--	250	189	182	192	196	183	199
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1210	1190	1060	1280	1200	1170
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	53	--	--
Hardness, Calcium Carbonate	mg/l	--	--	266	253	268	242	263	284
Nitrate as N	mg/l	10.0	--	0.3	0.5	0.3	0.3	0.4	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.43	0.99	0.62	0.659	2.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.06	7.6	6.8	7.4	7.5	7.3
Phosphorus	mg/l	--	--	0.09	0.06	0.55	0.36	0.136	3.09
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	63	61	57	51	57	63
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	20800	588	530	626	600	585
Total Organic Carbon	mg/l	--	--	4	4.6	4.6	8	4	6.2
Total Suspended Solids	mg/l	--	--	80	74	627	340	66	740
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.0001
Boron, dissolved	mg/l	5	--	0.07	0.08	0.05	0.072	0.065	0.062
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	61.2	58.3	62.4	54.4	60.3	66.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.004	0.001	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	0.003	0.006
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.19	1.02	0.01	0.007
Lead, dissolved	mg/l	0.01	--	0.0002	0.0004	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	27.6	26	27.2	25.7	27.4	28.5
Manganese, dissolved	mg/l	--	0.05	0.33	0.28	0.38	0.274	0.408	0.454
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	0.01	0.01
Potassium, dissolved	mg/l	--	--	9.3	8.8	7.5	8.8	8.6	8.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	120	120	114	153	148	119
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.005	0.005	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 24-May-2005	98-1 16-Nov-2005	98-1 25-May-2006	98-1 21-Nov-2006	98-1 15-May-2007	98-1 30-Nov-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	178	310	300	328	336
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	254	292	310	300	328	336
Ammonia Nitrogen	mg/l	--	--	0.23	<0.01	0.16	0.04	0.21	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	9	9	6	6	39	47
Chloride	mg/l	--	250	191	246	205	224	275	214
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1800	930	1075	1100	1100	1100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	222	258	263	260	246	291
Nitrate as N	mg/l	10.0	--	0.2	0.5	0.4	0.3	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.54	0.2	0.37	0.33	0.78	0.25
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.1	--	7.7	8.2	8.2	7.6
Phosphorus	mg/l	--	--	0.11	0.09	--	--	--	--
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	55	35	52	42	37	48
Temperature (Field)	deg c	--	15	6.9	11.2	5	7	6.9	6
Total Dissolved Solids	mg/l	--	500	681	725	701	723	824	788
Total Organic Carbon	mg/l	--	--	4	5.4	--	--	--	--
Total Suspended Solids	mg/l	--	--	38	22	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	0.002	0.0029	0.0028
Boron, dissolved	mg/l	5	--	0.095	0.089	0.074	0.084	0.109	0.095
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.0001	0.00003	<0.00002
Calcium, dissolved	mg/l	--	--	47.7	59.3	59	58.6	54.6	67
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.007	<0.005
Copper, dissolved	mg/l	--	1	<0.002	0.004	0.009	0.003	<0.002	0.003
Iron, dissolved	mg/l	--	0.3	0.013	0.007	0.014	0.008	0.235	0.056
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	0.0002	<0.0001	0.00007	<0.00002
Magnesium, dissolved	mg/l	--	--	25.1	26.6	28	27.7	26.7	30.2
Manganese, dissolved	mg/l	--	0.05	0.215	0.192	0.32	0.022	0.19	0.319
Mercury, dissolved	mg/l	0.001	--	<0.00006	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.1	10.3	8.3	9.4	10	10.2
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	208	180	169	180	222	215
Zinc, dissolved	mg/l	--	5	<0.005	0.009	<0.005	0.009	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 24-May-2005	98-1 16-Nov-2005	98-1 25-May-2006	98-1 21-Nov-2006	98-1 15-May-2007	98-1 30-Nov-2007
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	<0.0001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	<0.0001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	<0.0004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	<0.0001	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	<0.0001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	<0.0002	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	<0.0001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	<0.0001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	<0.0001	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	<0.0001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	<0.0001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	<0.0002	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	<0.0001	--	--	--	--	--
Bromoform	mg/l	--	--	<0.0001	--	--	--	--	--
Bromomethane	mg/l	--	--	<0.002	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	<0.0002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	<0.0002	--	--	--	--	--
Chloroform	mg/l	--	--	<0.0003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	<0.0001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	<0.0006	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	<0.0002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	<0.0001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1	98-1	98-1	98-1	98-1
				22-May-2008	10-Nov-2008	19-May-2009	27-Nov-2009	25-May-2010 [12]
						G-18	J-4	M-3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	333	327	364	369	476
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [13]	<2 [13]	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	333	327	364	369	476
Ammonia Nitrogen	mg/l	--	--	0.02	0.08	0.27	0.57	1.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	10	<5	20	25	28
Chloride	mg/l	--	250	247	265	341	467	714
Conductivity	uS/cm	--	--	--	--	1830	2120	3320
Conductivity (Field)	uS/cm	--	--	1250	1300	1200	750	3200
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	278	251	292	213	246
Nitrate as N	mg/l	10.0	--	0.3	0.3	0.15	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.69	0.4	0.46	0.66	1.16
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	7.77	8.22	8.29
pH (Field)	-	--	--	--	7.4	--	7.15	7.78
Phosphorus	mg/l	--	--	--	--	--	0.32	0.54
Phosphorus, dissolved	mg/l	--	--	--	--	0.76	--	--
Sulphate	mg/l	--	500 [4]	43	38	24	6	8
Temperature (Field)	deg c	--	15	--	6	6	5.5	12.6
Total Dissolved Solids	mg/l	--	500	798	822	1190	1380	2160
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.0025	0.0023	0.003	0.004	<0.01
Boron, dissolved	mg/l	5	--	0.092	0.109	0.21	0.18	0.26
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	63.6	56.7	64	44	44
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	0.009	<0.005	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0003	0.0004	0.0004
Copper, dissolved	mg/l	--	1	0.002	0.003	0.001	0.006	0.003
Iron, dissolved	mg/l	--	0.3	0.013	<0.005	0.22	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	28.9	26.5	32	25	33
Manganese, dissolved	mg/l	--	0.05	0.379	0.039	0.27	0.27	0.11
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.1	10.4	11	11	18
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	206	229	243	386	516
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01	0.01	<0.01
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1	98-1	98-1	98-1	98-1
				22-May-2008	10-Nov-2008	19-May-2009	27-Nov-2009	25-May-2010 [12]
						G-18	J-4	M-3
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	<0.0006	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 20-Oct-2010 [12] G-12	98-1 24-May-2011 [12] G-3	98-1 08-Dec-2011 [12] B-1	98-1 31-May-2012 98-1	98-1 28-Nov-2012 98-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	502	355	343	370	390
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	7	<2 [13]	3.7	3.3
Alkalinity (Total as CaCO3)	mg/l	--	--	502	362	343	370	390
Ammonia Nitrogen	mg/l	--	--	1.28	0.88	0.84	0.12	0.77
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	33	20	23	30
Chloride	mg/l	--	250	819	488	389	320	360
Conductivity	uS/cm	--	--	3480	2260	1860	--	--
Conductivity (Field)	uS/cm	--	--	3190	1897	2049	1615	1676
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	260	222	245	240	280
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.37	0.80	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	0.075	0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.61	1.46	1.09	0.79	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	0.88	0.19
pH	-	--	--	8.21	8.32	8.16	8.02	--
pH (Field)	-	--	--	7.82	7.75	7.93	7.59	7.48
Phosphorus	mg/l	--	--	0.53	0.66	0.65	0.073	0.30
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	2	9	6	9	4
Temperature (Field)	deg c	--	15	8.7	12.6	7.1	11.0	7.2
Total Dissolved Solids	mg/l	--	500	2260	1470	1210	974	986
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	0.0016	0.001
Boron, dissolved	mg/l	5	--	0.30	0.16	0.13	0.21	0.21
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	48	46	57	50	58
Chromium, dissolved	mg/l	0.05	--	<0.005	0.005	0.004	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0003	0.0004	0.0003	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.002	0.003	<0.001	0.0017	<0.001
Iron, dissolved	mg/l	--	0.3	0.08	<0.03	0.58	<0.1	0.52
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	34	26	25	28	34
Manganese, dissolved	mg/l	--	0.05	0.09	0.10	0.14	0.25	0.35
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17	12	10	12	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	578	388	271	350	350
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.0091	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1	98-1	98-1	98-1	98-1
				20-Oct-2010 [12]	24-May-2011 [12]	08-Dec-2011 [12]	31-May-2012	28-Nov-2012
				G-12	G-3	B-1	98-1	98-1
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.00010	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.00010	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.00010	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0005	<0.00010	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.00050	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.00010	<0.00025
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.00020	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.00020	<0.00050

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 29-May-2013 98-1	98-1 26-Nov-2013 GW-4	98-1 29-May-2014 98-1	98-1 19-Nov-2014 98-1
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	350	400	300	380
Alkalinity, Carbonate as CaCO3	mg/l	--	--	3.2	3.8	3.2	4.1
Alkalinity (Total as CaCO3)	mg/l	--	--	360	410	300	380
Ammonia Nitrogen	mg/l	--	--	1.2	0.92	0.89	0.94
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	36	23	29	21
Chloride	mg/l	--	250	400	260	330	470
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1459	1659	1613	1934
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	320	340	250	290
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	0.22	0.018	0.165	0.064
Nitrogen, Total Kjeldahl	mg/l	--	--	1.4	1.4	1.4	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.26	<0.10	0.19	<0.10
pH	-	--	--	7.98	8.00	8.06	8.06
pH (Field)	-	--	--	7.40	7.63	7.44	7.52
Phosphorus	mg/l	--	--	0.47	0.48	0.46	0.49
Phosphorus, dissolved	mg/l	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	10	12	28	5
Temperature (Field)	deg c	--	15	10.1	7.3	9.4	7.9
Total Dissolved Solids	mg/l	--	500	1040	1100	1050	1090
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	0.0015	0.0017
Boron, dissolved	mg/l	5	--	0.15	0.11	0.16	0.17
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	82	80	65	68
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.00096	0.00053	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.0012	0.0012	0.0027	<0.0020
Iron, dissolved	mg/l	--	0.3	<0.1	0.26	0.85	1.6
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	28	35	20	30
Manganese, dissolved	mg/l	--	0.05	0.78	0.34	0.17	0.46
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	15	12	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	230	140	250	300
Zinc, dissolved	mg/l	--	5	<0.0050	<0.0050	0.0054	<0.0050
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 29-May-2013 98-1	98-1 26-Nov-2013 GW-4	98-1 29-May-2014 98-1	98-1 19-Nov-2014 98-1
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 02-Jun-2015 98-1	98-1 26-Nov-2015 98-1	98-1 26-May-2016 98-1	98-1 17-Nov-2016 98-1
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	404	389	426	477
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	406	392	428	479
Ammonia Nitrogen	mg/l	--	--	0.92	0.98	1.49	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	28	30	28	56
Chloride	mg/l	--	250	465	472	406	430
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1909	2143	2053	2259
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	293	235	399	322
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.6	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.5	1.4	1.8	1.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.52	8.02	7.95	7.39
Phosphorus	mg/l	--	--	0.39	0.36	0.31	0.41
Phosphorus, dissolved	mg/l	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	5	3	7	3
Temperature (Field)	deg c	--	15	10.1	8.1	13.8	9.7
Total Dissolved Solids	mg/l	--	500	1200	1180	1090	1130
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	0.001	0.002
Boron, dissolved	mg/l	5	--	0.112	0.175	0.17	0.31
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	56.8	51.7	63.5	70.4
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.008
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0010	0.0053
Iron, dissolved	mg/l	--	0.3	<0.1	0.584	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	36.7	25.8	36.3	35.5
Manganese, dissolved	mg/l	--	0.05	0.162	0.285	0.066	0.119
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11.6	10.8	15.3	14.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	164	376	283	319
Zinc, dissolved	mg/l	--	5	0.067	0.012	<0.005	0.017
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	0.003	0.003

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 02-Jun-2015	98-1 26-Nov-2015	98-1 26-May-2016	98-1 17-Nov-2016
				98-1	98-1	98-1	98-1
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 24-May-2017	98-1 29-Nov-2017	98-1 24-May-2018	98-1 29-Nov-2018
				98-1	98-1	98-1	98-1
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	442	547	501	548
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	445	549	504	550
Ammonia Nitrogen	mg/l	--	--	1.43	2.00	1.73	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	47	42	48
Chloride	mg/l	--	250	458	455	478	423
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2194	1982	2196	1901
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	315	357	330	400
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	0.07
Nitrogen, Total Kjeldahl	mg/l	--	--	1.8	2.5	3.0	2.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.75	7.61	7.44	7.47
Phosphorus	mg/l	--	--	0.35	0.46	0.45	0.69
Phosphorus, dissolved	mg/l	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	3	3	2	3
Temperature (Field)	deg c	--	15	11.2	7.7	10.9	7.3
Total Dissolved Solids	mg/l	--	500	1130	1170	1390	1120
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.003	0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.154	0.201	0.173	0.153
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	74.9	78.8	74	82.4
Chromium, dissolved	mg/l	0.05	--	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0008	<0.0005	0.0009
Copper, dissolved	mg/l	--	1	0.0012	0.0008	0.0008	0.0031
Iron, dissolved	mg/l	--	0.3	0.942	4.67	0.699	0.581
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31.1	39	35.2	47.2
Manganese, dissolved	mg/l	--	0.05	0.816	0.8	0.352	0.504
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.8	15	13.5	16.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	353	317	335	332
Zinc, dissolved	mg/l	--	5	0.009	<0.005	0.006	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 24-May-2017	98-1 29-Nov-2017	98-1 24-May-2018	98-1 29-Nov-2018
				98-1	98-1	98-1	98-1
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1	98-1
				19-Jun-2019	20-Nov-2019
				98-1	98-1
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	523	501
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	526	505
Ammonia Nitrogen	mg/l	--	--	2.15	1.23
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	51
Chloride	mg/l	--	250	433	413
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2053	2260
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	414	412
Nitrate as N	mg/l	10.0	--	0.2	0.5
Nitrite as N	mg/l	1.0	--	0.33	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.1	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.37	7.7
Phosphorus	mg/l	--	--	0.39	0.40
Phosphorus, dissolved	mg/l	--	--	--	--
Sulphate	mg/l	--	500 [4]	3	2
Temperature (Field)	deg c	--	15	13.2	5.5
Total Dissolved Solids	mg/l	--	500	1170	1080
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.163	0.157
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	93.7	87
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0009	0.0005
Copper, dissolved	mg/l	--	1	0.0011	0.0016
Iron, dissolved	mg/l	--	0.3	6.58	0.77
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	43.8	47.2
Manganese, dissolved	mg/l	--	0.05	1.39	0.288
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	18.6	19.2
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	327	322
Zinc, dissolved	mg/l	--	5	0.006	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-1 19-Jun-2019	98-1 20-Nov-2019
				98-1	98-1
VOCs					
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--
Bromoform	mg/l	--	--	--	--
Bromomethane	mg/l	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--
Chloroform	mg/l	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-2 06-May-1999	98-2 19-Oct-1999	98-2 24-Oct-2000	98-2 14-Jun-2001	98-2 06-Nov-2002	98-2 30-May-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	610	584	382	289	296	215
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	13	1	2	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	500	500	313	241	243	176
Ammonia Nitrogen	mg/l	--	--	0.83	1.12	0.35	0.76	0.36	0.31
Chemical Oxygen Demand	mg/l	--	--	18	10	--	8	34	12
Chloride	mg/l	--	250	831	834	355	278	305	171
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	1710	1050	2100	890
Hardness, Calcium Carbonate	mg/l	--	--	263	268	189	198	207	195
Nitrate as N	mg/l	10.0	--	--	4.5	0.3	0.4	0.6	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	--	1.8	1.66	0.56	1.09
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.88	7.7	7.9	6.9
Phosphorus	mg/l	--	--	--	--	4.33	2.68	1.97	2.54
Sulphate	mg/l	--	500 [4]	11	13	42	46	46	54
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	836	764	738	445
Total Organic Carbon	mg/l	--	--	11.8	10	--	5.2	4.7	4.5
Total Suspended Solids	mg/l	--	--	--	1020	5450	3560	2430	2170
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	0.002	0.001	0.004	0.001
Boron, dissolved	mg/l	5	--	0.32	0.44	0.17	0.1	0.09	0.06
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	44.8	48.6	35.3	44.1	46.2	42.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	2.15	0.2	0.02	0.07	0.14
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0022	0.0002	0.0005	0.0003
Magnesium, dissolved	mg/l	--	--	31.5	35.2	24.4	21.4	22.2	21.8
Manganese, dissolved	mg/l	--	0.05	0.08	0.24	0.33	0.38	0.53	0.49
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	16.8	19.2	8.4	2.5	8.3	7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	586	718	340	200	213	112
Zinc, dissolved	mg/l	--	5	0.01	0.06	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.001	0.049	0.001	0.001

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-2 19-Nov-2004	98-2 16-Nov-2005	98-2 15-May-2007	98-2 10-Nov-2008	98-2 27-Nov-2009 J-11
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	348	189	422	423	533
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	290	314	422	423	533
Ammonia Nitrogen	mg/l	--	--	0.36	1.1	0.43	1.14	1.40
Chemical Oxygen Demand	mg/l	--	--	13	70	77	17	55
Chloride	mg/l	--	250	255	350	594	547	913
Conductivity	uS/cm	--	--	--	--	--	--	3710
Conductivity (Field)	uS/cm	--	--	1540	1800	1900	2550	2870
Hardness, Calcium Carbonate	mg/l	--	--	211	198	236	229	247
Nitrate as N	mg/l	10.0	--	2	0.5	0.3	0.4	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.64	2.65	1.2	2.28	1.65
pH	-	--	--	--	--	--	--	8.25
pH (Field)	-	--	--	7.5	--	8.1	7.8	8.8
Phosphorus	mg/l	--	--	0.17	8.32	--	--	1.66
Sulphate	mg/l	--	500 [4]	40	39	31	32	3
Temperature (Field)	deg c	--	15	--	11.4	8.2	9	4.3
Total Dissolved Solids	mg/l	--	500	770	958	1430	1320	2410
Total Organic Carbon	mg/l	--	--	1.8	8.8	--	--	--
Total Suspended Solids	mg/l	--	--	32	404	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.0049	0.0034	0.005
Boron, dissolved	mg/l	5	--	0.097	0.252	0.243	0.197	0.37
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.00003	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	44.8	36.9	45	45.8	43
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	0.007
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	0.0006
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.105	0.051	0.339	<0.005	<0.03
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	0.0002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	24	25.7	30	27.7	34
Manganese, dissolved	mg/l	--	0.05	0.217	0.197	0.202	0.002	0.19
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	12.6	12.2	17.2	13.1	18
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	226	314	460	399	635
Zinc, dissolved	mg/l	--	5	0.005	0.007	<0.005	<0.005	<0.01
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001
VOCs								
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-3 24-Oct-2000	98-3 14-Jun-2001	98-3 06-Nov-2002	98-3 30-May-2003	98-3 19-Nov-2004
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	282	154	194	181	198
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	13	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	231	150	159	148	160
Ammonia Nitrogen	mg/l	--	--	1.3	1.19	0.17	0.09	0.98
Chemical Oxygen Demand	mg/l	--	--	--	47	11	2	257
Chloride	mg/l	--	250	4.1	2	20.8	2.6	2
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	440	375	270	320	370
Hardness, Calcium Carbonate	mg/l	--	--	8	13	26	29	26
Nitrate as N	mg/l	10.0	--	0.2	0.3	2.3	1.2	0.9
Nitrite as N	mg/l	1.0	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.52	4.05	0.05	0.29	0.98
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.31	9	8.8	7.5	8.2
Phosphorus	mg/l	--	--	4.11	5.9	1.29	0.96	7.9
Sulphate	mg/l	--	500 [4]	38	42	33	27	26
Temperature (Field)	deg c	--	15	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	340	260	400	160	185
Total Organic Carbon	mg/l	--	--	--	3.8	2.7	3.4	3.2
Total Suspended Solids	mg/l	--	--	11600	8900	1380	1300	2310
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.006	0.008	0.006	0.005	0.004
Boron, dissolved	mg/l	5	--	0.14	0.15	0.15	0.14	0.144
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	2	3.29	5.72	7	6.34
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002
Iron, dissolved	mg/l	--	0.3	0.12	0.02	0.02	0.03	0.009
Lead, dissolved	mg/l	0.01	--	0.0006	0.0003	0.0014	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	0.82	1.24	2.82	2.86	2.57
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.03	0.01	0.015
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	3	0.4	0.4	3.2	3.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	120	83.9	78.3	72.1	67.6
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.003	0.049	0.001	0.001	0.001

WCC - Navan Waste Recycling and Disposal Facility
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Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-3 16-Nov-2005	98-3 15-May-2007	98-3 10-Nov-2008	98-3 27-Nov-2009 J-50	98-3 24-May-2011 [12] G-36
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	217	165	158	153	156
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	4	4
Alkalinity (Total as CaCO3)	mg/l	--	--	178	165	160	158	160
Ammonia Nitrogen	mg/l	--	--	0.26	<0.01	0.2	0.15	<0.02
Chemical Oxygen Demand	mg/l	--	--	16	27	<100	25	10
Chloride	mg/l	--	250	2.9	2.6	2	4	3
Conductivity	uS/cm	--	--	--	--	--	342	360
Conductivity (Field)	uS/cm	--	--	376	240	335	331	338
Hardness, Calcium Carbonate	mg/l	--	--	22	28	24	30	30
Nitrate as N	mg/l	10.0	--	0.4	0.4	0.4	1.05	1.15
Nitrite as N	mg/l	1.0	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.39	0.26	0.62	0.15	0.14
pH	-	--	--	--	--	--	8.48	8.43
pH (Field)	-	--	--	--	8.8	8.2	7.74	8.36
Phosphorus	mg/l	--	--	1.31	--	--	1.34	0.67
Sulphate	mg/l	--	500 [4]	19	28	20	21	21
Temperature (Field)	deg c	--	15	--	8.7	9	8.3	20.8
Total Dissolved Solids	mg/l	--	500	218	216	202	222	234
Total Organic Carbon	mg/l	--	--	3.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	11400	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0077	0.007	0.006	<0.01
Boron, dissolved	mg/l	5	--	0.147	0.135	0.131	0.16	0.14
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.00005	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	5.57	6.56	5.74	7	7
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	0.008	<0.005	<0.0002	0.0002
Copper, dissolved	mg/l	--	1	0.004	<0.002	<0.002	0.004	0.005
Iron, dissolved	mg/l	--	0.3	0.007	0.197	<0.005	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	<0.0002	0.00079	0.00011	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	2.07	2.83	2.39	3	3
Manganese, dissolved	mg/l	--	0.05	0.015	0.015	0.013	0.01	<0.01
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.7	3.3	3.7	4	3
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	79.6	72.1	71.9	75	71
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.01	<0.01
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs								
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-4 29-Oct-1998	98-4 06-May-1999	98-4 19-Oct-1999	98-4 05-May-2000	98-4 24-Oct-2000	98-4 14-Jun-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	151	148	159	143	134	140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	2
Alkalinity (Total as CaCO3)	mg/l	--	--	124	121	130	117	110	119
Ammonia Nitrogen	mg/l	--	--	0.08	0.02	0.04	0.01	0.01	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	3	6	4	--	3
Chloride	mg/l	--	250	8.2	6.9	8	7.1	8.8	8.5
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	888	360	--	330	325	340
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	125	117	114	100	83	100
Nitrate as N	mg/l	10.0	--	--	--	0.6	0.6	0.6	0.7
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.04	1.27	--	--	0.32	0.32
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	6.9	--	7.9	7.55	7.9
Phosphorus	mg/l	--	--	--	--	--	--	0.26	0.67
Sulphate	mg/l	--	500 [4]	116	57	59	49	51	52
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	445	180	--	165	193	292
Total Organic Carbon	mg/l	--	--	12.7	5.1	3.9	2.8	--	1.9
Total Suspended Solids	mg/l	--	--	--	--	352	728	324	1060
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.002	0.002
Boron, dissolved	mg/l	5	--	0.08	0.06	0.17	0.14	0.07	0.06
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	37.8	29.3	29	25.7	21.4	26.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	0.02	1.64	1.12	0.03	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	7.34	10.6	9.97	8.51	7.14	8.42
Manganese, dissolved	mg/l	--	0.05	0.19	0.07	0.06	0.03	0.03	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5	0.8	5.9	0.4	4.3	0.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	53.3	35.7	44.8	39.9	36.5	35.1
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.07	0.02	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.047

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Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-4 23-Nov-2001	98-4 23-May-2002	98-4 06-Nov-2002	98-4 30-May-2003	98-4 09-Oct-2003	98-4 14-May-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	131	131	132	134	--	118
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	107	107	108	110	102	97
Ammonia Nitrogen	mg/l	--	--	0.01	0.21	0.01	0.03	0.02	0.06
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	1	--
Chemical Oxygen Demand	mg/l	--	--	6	3	6	9	4	2
Chloride	mg/l	--	250	9.5	8.8	8.9	8.5	8.2	9.2
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	340	320	241	290	360	320
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	25	--
Hardness, Calcium Carbonate	mg/l	--	--	95	97	87	88	87	88
Nitrate as N	mg/l	10.0	--	0.6	0.6	0.7	0.5	0.6	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.45	0.14	0.24	0.67	0.13	0.16
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.65	7.32	8.2	7.2	7.4	8.2
Phosphorus	mg/l	--	--	0.5	0.3	0.1	1	0.2	0.332
Sulphate	mg/l	--	500 [4]	50	50	48	49	46	49
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	212	306	222	145	185	160
Total Organic Carbon	mg/l	--	--	4	2	2.1	2.3	4	1.5
Total Suspended Solids	mg/l	--	--	1620	1220	974	1480	564	416
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	0.002	0.004	0.003	0.003	0.001
Boron, dissolved	mg/l	5	--	0.08	0.06	0.07	0.05	0.063	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	23.9	24.1	22.2	22.5	19.8	22.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.009	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.004	0.002
Iron, dissolved	mg/l	--	0.3	0.05	0.02	0.02	0.05	0.23	0.006
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	8.51	9.02	7.64	7.69	9.01	7.75
Manganese, dissolved	mg/l	--	0.05	0.03	0.03	0.02	0.01	0.057	0.001
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	0.4	5.3	1.1	3.5	5.3	3.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	40.1	36.7	36.6	37.7	35.5	37.3
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.011	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-4 19-Nov-2004	98-4 24-May-2005	98-4 16-Nov-2005	98-4 25-May-2006	98-4 21-Nov-2006	98-4 15-May-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	137	132	138	108	115	117
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	112	110	113	108	115	117
Ammonia Nitrogen	mg/l	--	--	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	5	6	<5	10	<5	8
Chloride	mg/l	--	250	8.4	8.7	8.9	9.6	8.6	9.2
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	450	360	320	280	350	220
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	87	92	91	81	88	86
Nitrate as N	mg/l	10.0	--	0.6	0.4	0.3	0.5	0.3	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.16	0.14	0.06	0.32	0.12	0.07
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.1	6.4	--	8.1	7.8	8.8
Phosphorus	mg/l	--	--	0.17	0.21	0.21	--	--	--
Sulphate	mg/l	--	500 [4]	51	49	47	48	45	45
Temperature (Field)	deg c	--	15	--	9.7	10.9	11.5	10.5	0
Total Dissolved Solids	mg/l	--	500	225	192	196	186	199	197
Total Organic Carbon	mg/l	--	--	1.4	1.5	3.3	--	--	--
Total Suspended Solids	mg/l	--	--	113	108	96	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	<0.001	<0.001	0.0051	0.0041
Boron, dissolved	mg/l	5	--	0.067	0.042	0.071	0.05	0.059	0.052
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00003
Calcium, dissolved	mg/l	--	--	22.3	22.9	23.2	20.1	22.4	21.6
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.008
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	0.003	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.005	<0.005	0.025	<0.005	<0.005	0.048
Lead, dissolved	mg/l	0.01	--	0.0002	0.0003	<0.0002	<0.0002	<0.0001	0.00006
Magnesium, dissolved	mg/l	--	--	7.62	8.34	7.99	7.38	7.75	7.8
Manganese, dissolved	mg/l	--	0.05	0.004	<0.001	0.003	0.002	<0.001	0.011
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	4.1	3.6	4.5	3.3	4.1	3.6
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	38.4	36.2	39.9	33.7	41.1	38.1
Zinc, dissolved	mg/l	--	5	0.005	<0.005	<0.005	0.006	0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-4 19-Nov-2004	98-4 24-May-2005	98-4 16-Nov-2005	98-4 25-May-2006	98-4 21-Nov-2006	98-4 15-May-2007
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-4 30-Nov-2007	98-4 22-May-2008	98-4 10-Nov-2008	98-4 19-May-2009 G-3	98-4 26-Nov-2009 [11] 98-4	98-4 25-May-2010 [12] M-16
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	112	109	108	109	--	107
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<2 [13]	--	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	112	109	108	109	--	107
Ammonia Nitrogen	mg/l	--	--	<0.01	<0.01	<0.01	<0.02	--	<0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	7	<5	8	--	10
Chloride	mg/l	--	250	8.2	8.8	8.8	9	--	10
Conductivity	uS/cm	--	--	--	--	--	332	--	336
Conductivity (Field)	uS/cm	--	--	380	320	340	340	--	344
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	84	83	79	76	--	83
Nitrate as N	mg/l	10.0	--	0.4	0.3	0.2	0.50	--	0.13
Nitrite as N	mg/l	1.0	--	--	--	--	<0.10	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.05	0.15	0.05	<0.10	--	0.14
pH	-	--	--	--	--	--	8.03	--	8.14
pH (Field)	-	--	--	8.8	8.2	8.1	--	--	8.07
Phosphorus	mg/l	--	--	--	--	--	0.25	--	0.18
Sulphate	mg/l	--	500 [4]	45	46	44	42	--	43
Temperature (Field)	deg c	--	15	9.5	8.5	10	6	--	18.6
Total Dissolved Solids	mg/l	--	500	193	193	186	216	--	218
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0048	0.0033	0.0044	0.004	--	<0.01
Boron, dissolved	mg/l	5	--	0.061	0.049	0.056	0.05	--	0.09
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	--	--	21.6	21.2	20.4	19	--	20
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	0.001	--	0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.0002	--	<0.0002
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.002	--	0.029
Iron, dissolved	mg/l	--	0.3	<0.005	0.008	0.017	<0.03	--	<0.03
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.001	--	<0.001
Magnesium, dissolved	mg/l	--	--	7.44	7.35	6.78	7	--	8
Manganese, dissolved	mg/l	--	0.05	<0.001	<0.001	0.001	<0.01	--	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	3.6	4	3	--	4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	37.3	38.8	36.9	32	--	38
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.01	--	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	--	<0.001

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-4 30-Nov-2007	98-4 22-May-2008	98-4 10-Nov-2008	98-4 19-May-2009 G-3	98-4 26-Nov-2009 [11] 98-4	98-4 25-May-2010 [12] M-16
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0004	--	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	--	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0040	--	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-4	98-4	98-4	98-4
				20-Oct-2010 [12]	24-May-2011 [12]	29-Nov-2011 [12]	31-May-2012 [15]
				G-14	G-45	98-4	98-4
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	111	108	111	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	2	<2 [13]	--
Alkalinity (Total as CaCO3)	mg/l	--	--	111	110	111	--
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	0.02	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	<5	5	--
Chloride	mg/l	--	250	10	10	10	--
Conductivity	uS/cm	--	--	336	344	340	--
Conductivity (Field)	uS/cm	--	--	339	330	374	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	89	85	88	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	--
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.25	<0.10	<0.10	--
pH	-	--	--	8.11	8.32	8.19	--
pH (Field)	-	--	--	7.96	8.02	8.43	--
Phosphorus	mg/l	--	--	0.22	0.19	0.14	--
Sulphate	mg/l	--	500 [4]	44	43	42	--
Temperature (Field)	deg c	--	15	13.3	12.7	9.9	--
Total Dissolved Solids	mg/l	--	500	218	224	221	--
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	--
Boron, dissolved	mg/l	5	--	0.07	0.05	0.08	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	24	21	22	--
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	0.002	--
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0002	<0.0002	--
Copper, dissolved	mg/l	--	1	0.003	0.003	0.002	--
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	--
Magnesium, dissolved	mg/l	--	--	7	8	8	--
Manganese, dissolved	mg/l	--	0.05	<0.01	<0.01	0.02	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	3	4	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	41	37	38	--
Zinc, dissolved	mg/l	--	5	<0.01	0.03	<0.01	--
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	--

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	98-4 20-Oct-2010 [12] G-14	98-4 24-May-2011 [12] G-45	98-4 29-Nov-2011 [12] 98-4	98-4 31-May-2012 [15] 98-4
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	--
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	--

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1A 06-Sep-2005	05-1A 16-Nov-2005	05-1A 25-May-2006	05-1A 31-May-2012 05-1A	05-1A 28-Nov-2012 05-1A	05-1A 29-May-2014 [3] 05-1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1180	228	1020	950	980	950
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	24	20	35
Alkalinity (Total as CaCO3)	mg/l	--	--	969	935	1020	970	1000	990
Ammonia Nitrogen	mg/l	--	--	1.68	1.94	1.76	1.8	2.0	2.5
Chemical Oxygen Demand	mg/l	--	--	263	117	134	110	120	400
Chloride	mg/l	--	250	174	180	198	180	180	200
Conductivity (Field)	uS/cm	--	--	1950	2100	1300	2042	2125	2135
Hardness, Calcium Carbonate	mg/l	--	--	49	54	44	46	50	49
Nitrate as N	mg/l	10.0	--	0.2	0.1	<0.1	<0.10	<0.10	<0.50
Nitrite as N	mg/l	1.0	--	--	--	--	0.037	<0.010	<0.050
Nitrogen, Total Kjeldahl	mg/l	--	--	6.64	4.38	4.84	3.9	4.9	28
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	<0.10	<0.50
pH	-	--	--	--	--	--	8.44	--	8.59
pH (Field)	-	--	--	8.3	--	8.5	8.44	8.53	7.63
Phosphorus	mg/l	--	--	6.87	2.93	--	2.6	3.5	11
Sulphate	mg/l	--	500 [4]	17	18	16	<1	<1	<1
Temperature (Field)	deg c	--	15	16.3	--	6	9.9	7.1	9.3
Total Dissolved Solids	mg/l	--	500	1380	1420	1410	1480	1590	1820
Total Organic Carbon	mg/l	--	--	199	47.7	--	--	--	--
Total Suspended Solids	mg/l	--	--	2720	58	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	<0.001	0.001	0.0011	0.003	0.0031
Boron, dissolved	mg/l	5	--	1.43	1.54	1.33	1.5	1.7	1.7
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	6.22	5.92	4.05	4.3	4.9	4.3
Chromium, dissolved	mg/l	0.05	--	<0.002	0.002	<0.002	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.0019	<0.001	<0.0010
Iron, dissolved	mg/l	--	0.3	0.111	0.241	0.071	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0008	0.001	0.0002	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	8.05	9.48	8.19	8.6	9.1	9.2
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.005	0.0080	0.006	0.0039
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.2	17.7	14.8	14	16	16
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	587	638	573	550	580	580
Zinc, dissolved	mg/l	--	5	0.006	0.008	0.007	0.0070	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	0.0014
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00050	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00050	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00050	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00050	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.0025	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00050	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.0010	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.0010	<0.00020

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1A	05-1A	05-1A
				26-Nov-2015	24-May-2017	29-Nov-2018
				05-1A	05-1A	05-1A
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	954	1050	1040
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [6]	23	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	975	1080	1070
Ammonia Nitrogen	mg/l	--	--	2.03	1.92	1.65
Chemical Oxygen Demand	mg/l	--	--	177	183	181
Chloride	mg/l	--	250	219	189	214
Conductivity (Field)	uS/cm	--	--	2315	2265	2042
Hardness, Calcium Carbonate	mg/l	--	--	39.3	46	64
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.0	4.0	3.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.49	8.38	8.31
Phosphorus	mg/l	--	--	3.04	3.49	3.24
Sulphate	mg/l	--	500 [4]	1	2	2
Temperature (Field)	deg c	--	15	8.9	10.4	7.1
Total Dissolved Solids	mg/l	--	500	1840	1840	1720
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.002	0.004	0.002
Boron, dissolved	mg/l	5	--	1.64	1.57	1.65
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	4.16	4.03	9.36
Chromium, dissolved	mg/l	0.05	--	0.001	0.009	0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0007
Copper, dissolved	mg/l	--	1	<0.0005	0.0011	0.0026
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.119
Lead, dissolved	mg/l	0.01	--	0.0001	0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	7.03	8.68	9.83
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.7	14.7	16.4
Selenium, dissolved	mg/l	0.05	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	612	580	566
Zinc, dissolved	mg/l	--	5	0.009	<0.005	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [7]	<0.002 [8]	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1B 06-Sep-2005	05-1B 16-Nov-2005	05-1B 25-May-2006	05-1B 31-May-2012 05-1B	05-1B 28-Nov-2012 05-1B	05-1B 29-May-2014 05-1B
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	163	262	250	260	240
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	3.6	4.0	5.3
Alkalinity (Total as CaCO3)	mg/l	--	--	254	268	262	250	270	250
Ammonia Nitrogen	mg/l	--	--	0.8	0.98	0.69	0.36	0.94	0.28
Chemical Oxygen Demand	mg/l	--	--	40	44	31	36	73	20
Chloride	mg/l	--	250	24	21.6	20.8	19	21	29
Conductivity (Field)	uS/cm	--	--	460	480	490	555	557	568
Hardness, Calcium Carbonate	mg/l	--	--	28	32	26	27	26	24
Nitrate as N	mg/l	10.0	--	0.1	1.5	0.2	<0.10	0.13	0.22
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	0.019	0.026
Nitrogen, Total Kjeldahl	mg/l	--	--	10.1	5.89	2.28	1.5	<1.0 [10]	<2.0 [10]
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	0.15	0.25
pH	-	--	--	--	--	--	8.19	--	8.36
pH (Field)	-	--	--	7.5	--	8.1	8.55	8.26	7.95
Phosphorus	mg/l	--	--	2.07	0.59	--	1.8	6.1	1.5
Sulphate	mg/l	--	500 [4]	47	36	32	27	23	24
Temperature (Field)	deg c	--	15	11.7	--	8	9.6	7.4	8.9
Total Dissolved Solids	mg/l	--	500	380	390	350	344	516	468
Total Organic Carbon	mg/l	--	--	89.2	17.7	--	--	--	--
Total Suspended Solids	mg/l	--	--	1810	120	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.003	<0.001	<0.001	0.0051	0.004	0.0045
Boron, dissolved	mg/l	5	--	0.263	0.267	0.228	0.24	0.28	0.27
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.0003	<0.005	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	6.27	6.91	5.46	5.3	5.5	4.9
Chromium, dissolved	mg/l	0.05	--	<0.002	0.003	<0.002	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.004	0.004	0.003	0.0078	0.007	0.0032
Iron, dissolved	mg/l	--	0.3	0.086	0.261	0.104	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	0.0003	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	3.02	3.51	3.11	3.3	3	2.8
Manganese, dissolved	mg/l	--	0.05	0.052	0.054	0.026	0.0051	0.012	0.018
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.01	0.02	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	8	8.8	6.8	6.1	6.4	6.7
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	145	153	130	120	130	130
Zinc, dissolved	mg/l	--	5	0.006	0.009	0.01	<0.0050	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.00020	<0.00020

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1B 26-Nov-2015	05-1B 24-May-2017	05-1B 29-Nov-2018
				05-1B	05-1B	05-1B
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	262	268	283
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	<5	6
Alkalinity (Total as CaCO3)	mg/l	--	--	268	273	288
Ammonia Nitrogen	mg/l	--	--	0.33	0.02	0.15
Chemical Oxygen Demand	mg/l	--	--	45	23	29
Chloride	mg/l	--	250	20	17	19
Conductivity (Field)	uS/cm	--	--	598	560	553
Hardness, Calcium Carbonate	mg/l	--	--	21.9	27	34
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	0.6	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.40	8.36	8.47
Phosphorus	mg/l	--	--	1.72	0.85	0.69
Sulphate	mg/l	--	500 [4]	18	20	18
Temperature (Field)	deg c	--	15	9.4	9.7	7.5
Total Dissolved Solids	mg/l	--	500	446	372	396
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004	0.004
Boron, dissolved	mg/l	5	--	0.244	0.278	0.263
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	4.7	5.27	8.1
Chromium, dissolved	mg/l	0.05	--	<0.001	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	0.0046	0.0092
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	2.46	3.3	3.35
Manganese, dissolved	mg/l	--	0.05	0.013	<0.005	0.008
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.17	6.37	6.74
Selenium, dissolved	mg/l	0.05	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	140	122	122
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1C 06-Sep-2005	05-1C 16-Nov-2005	05-1C 25-May-2006	05-1C 31-May-2012 05-1C	05-1C 28-Nov-2012 05-1C	05-1C 29-May-2013 05-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	190	201	136	170	180	170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	1.6	1.9	1.8
Alkalinity (Total as CaCO3)	mg/l	--	--	156	165	136	170	180	170
Ammonia Nitrogen	mg/l	--	--	1.73	0.9	0.06	<0.050	0.11	0.090
Chemical Oxygen Demand	mg/l	--	--	36	11	21	36	14	17
Chloride	mg/l	--	250	59.5	52.2	25.4	41	42	44
Conductivity (Field)	uS/cm	--	--	480	510	350	548	541	528
Hardness, Calcium Carbonate	mg/l	--	--	216	229	156	170	160	180
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.7	0.32	0.44	0.29
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	18.9	5.2	0.73	1.2	0.64	0.46
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	0.32	0.44	0.29
pH	-	--	--	--	--	--	8.00	--	8.05
pH (Field)	-	--	--	7.1	--	7.8	7.74	7.85	7.51
Phosphorus	mg/l	--	--	2.23	0.65	--	1.1	0.85	0.41
Sulphate	mg/l	--	500 [4]	113	86	46	53	48	57
Temperature (Field)	deg c	--	15	11.5	10.4	7	9.1	7.8	8.3
Total Dissolved Solids	mg/l	--	500	405	373	234	326	364	366
Total Organic Carbon	mg/l	--	--	65.1	8.3	--	--	--	--
Total Suspended Solids	mg/l	--	--	2670	520	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.003	0.0032	0.003	0.0019
Boron, dissolved	mg/l	5	--	0.08	0.074	0.028	0.078	0.083	0.077
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	52.7	55.9	42.7	40	40	44
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.003	<0.002	0.0018	0.002	0.0018
Iron, dissolved	mg/l	--	0.3	0.167	0.025	0.009	0.38	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0002	<0.0002	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	20.5	21.7	11.8	16	15	17
Manganese, dissolved	mg/l	--	0.05	0.232	0.112	0.044	0.032	0.002	0.045
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.02	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.9	7.7	6.9	5.2	5.5	5.6
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	61.9	56.1	23.3	50	49	53
Zinc, dissolved	mg/l	--	5	0.007	0.008	0.011	<0.0050	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.00020	<0.00020

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1C 26-Nov-2013 GW-6	05-1C 29-May-2014 05-1C	05-1C 19-Nov-2014 05-1C	05-1C 02-Jun-2015 05-1C	05-1C 26-Nov-2015 05-1C	05-1C 26-May-2016 05-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	170	170	170	170	175	178
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.4	2.1	1.8	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	170	170	170	171	176	179
Ammonia Nitrogen	mg/l	--	--	0.081	0.29	0.096	0.30	0.09	0.30
Chemical Oxygen Demand	mg/l	--	--	10	10	5.1	15	17	<10
Chloride	mg/l	--	250	42	45	45	51	50	55
Conductivity (Field)	uS/cm	--	--	518	531	592	576	565	578
Hardness, Calcium Carbonate	mg/l	--	--	160	180	170	115	138	168
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.013	0.024	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.66	0.88	0.39	0.4	0.4	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.10	<0.10	--	--	--
pH	-	--	--	7.94	8.12	8.06	--	--	--
pH (Field)	-	--	--	7.69	6.71	8.01	7.75	7.99	7.59
Phosphorus	mg/l	--	--	0.36	0.42	0.40	0.29	0.26	0.30
Sulphate	mg/l	--	500 [4]	54	50	50	53	52	56
Temperature (Field)	deg c	--	15	8.6	8.7	5.6	8.4	9.7	9.2
Total Dissolved Solids	mg/l	--	500	310	318	296	324	336	368
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0025	0.0023	0.0027	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.082	0.072	0.075	0.066	0.071	0.072
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	39	42	42	21.2	31.4	40.3
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0012	0.0025	0.0014	<0.0005	<0.0005	0.0009
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	15	17	17	15	14.1	16.2
Manganese, dissolved	mg/l	--	0.05	0.023	0.062	0.021	0.069	0.019	0.038
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.2	5	5.4	4.17	4.45	5.45
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	50	54	55	53.2	62	48.4
Zinc, dissolved	mg/l	--	5	0.012	<0.0050	0.0074	<0.005	0.009	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	0.00079	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1C 17-Nov-2016 05-1C	05-1C 24-May-2017 05-1C	05-1C 29-Nov-2017 05-1C	05-1C 24-May-2018 05-1C	05-1C 29-Nov-2018 05-1C
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	179	187	185	190	198
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	180	188	186	191	199
Ammonia Nitrogen	mg/l	--	--	0.27	0.02	0.16	0.29	0.08
Chemical Oxygen Demand	mg/l	--	--	11	44	51	15	11
Chloride	mg/l	--	250	49	53	58	55	56
Conductivity (Field)	uS/cm	--	--	619	579	553	584	518
Hardness, Calcium Carbonate	mg/l	--	--	164	165	158	173	171
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.4	0.4	0.5	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.22	7.94	6.95	7.77	7.79
Phosphorus	mg/l	--	--	0.32	0.32	0.35	0.39	0.34
Sulphate	mg/l	--	500 [4]	52	53	55	51	51
Temperature (Field)	deg c	--	15	10.0	9.5	8.4	8.7	7.4
Total Dissolved Solids	mg/l	--	500	314	354	314	344	270
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.003	0.002	0.002
Boron, dissolved	mg/l	5	--	0.081	0.074	0.095	0.07	0.113
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	40.5	38.4	38.1	45	41.3
Chromium, dissolved	mg/l	0.05	--	0.003	0.002	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0031	0.0024	0.0022	0.0010	0.0027
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.109	0.231	0.129
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	15.4	16.8	15.3	14.8	16.5
Manganese, dissolved	mg/l	--	0.05	<0.005	0.005	0.026	0.056	0.016
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.26	5.14	5.34	4.66	5.32
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	52.5	53.2	52.2	51.5	54.1
Zinc, dissolved	mg/l	--	5	0.02	0.005	<0.005	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1C 19-Jun-2019	05-1C 20-Nov-2019
				05-1C	05-1C
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	181	166
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	183	167
Ammonia Nitrogen	mg/l	--	--	0.29	0.17
Chemical Oxygen Demand	mg/l	--	--	19	21
Chloride	mg/l	--	250	55	53
Conductivity (Field)	uS/cm	--	--	540	567
Hardness, Calcium Carbonate	mg/l	--	--	172	192
Nitrate as N	mg/l	10.0	--	0.2	0.2
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	6.89	7.98
Phosphorus	mg/l	--	--	0.91	0.33
Sulphate	mg/l	--	500 [4]	52	50
Temperature (Field)	deg c	--	15	10.2	8.0
Total Dissolved Solids	mg/l	--	500	330	356
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002
Boron, dissolved	mg/l	5	--	0.071	0.077
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	41.6	46.2
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0025	0.0016
Iron, dissolved	mg/l	--	0.3	0.188	0.311
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	16.6	18.6
Manganese, dissolved	mg/l	--	0.05	0.046	0.074
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.53	6.8
Selenium, dissolved	mg/l	0.05	--	--	--
Silver, dissolved	mg/l	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	53	57.3
Zinc, dissolved	mg/l	--	5	0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1D 06-Sep-2005	05-1D 16-Nov-2005	05-1D 25-May-2006	05-1D 31-May-2012 05-1D	05-1D 28-Nov-2012 [11] 05-1D	05-1D 29-May-2013 05-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	218	218	169	240	--	220
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	2.0	--	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	179	179	169	240	--	220
Ammonia Nitrogen	mg/l	--	--	4.94	0.26	0.56	<0.050	--	0.082
Chemical Oxygen Demand	mg/l	--	--	37	12	20	13	--	78
Chloride	mg/l	--	250	46.9	27.2	53	30	--	170
Conductivity (Field)	uS/cm	--	--	550	440	470	601	--	922
Hardness, Calcium Carbonate	mg/l	--	--	303	204	191	250	--	470
Nitrate as N	mg/l	10.0	--	0.4	1.4	0.7	<0.10	--	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	--	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	30.3	1.45	2.1	0.93	--	0.99
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	--	<0.10
pH	-	--	--	--	--	--	7.96	--	7.86
pH (Field)	-	--	--	6.9	--	7.8	7.59	--	7.36
Phosphorus	mg/l	--	--	1.45	0.66	--	0.30	--	0.38
Sulphate	mg/l	--	500 [4]	163	53	82	49	--	56
Temperature (Field)	deg c	--	15	17.5	9.9	6	11.0	--	10.0
Total Dissolved Solids	mg/l	--	500	476	301	351	342	--	796
Total Organic Carbon	mg/l	--	--	78.8	5.5	--	--	--	--
Total Suspended Solids	mg/l	--	--	1380	420	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.0010	--	<0.0010
Boron, dissolved	mg/l	5	--	0.053	0.039	0.057	0.039	--	0.042
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	--	<0.00010
Calcium, dissolved	mg/l	--	--	87.1	56.9	45.9	69	--	140
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.0050	--	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	--	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.004	<0.002	0.0037	--	0.0035
Iron, dissolved	mg/l	--	0.3	0.077	0.005	0.123	<0.1	--	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0002	0.0003	<0.00050	--	<0.00050
Magnesium, dissolved	mg/l	--	--	20.8	15	18.5	18	--	32
Manganese, dissolved	mg/l	--	0.05	0.422	0.081	0.1	0.03	--	0.016
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.9	9.8	5.7	7	--	9.5
Selenium, dissolved	mg/l	0.05	--	<0.001	0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	42.6	34.5	46.4	30	--	51
Zinc, dissolved	mg/l	--	5	0.007	0.01	0.019	<0.0050	--	0.0097
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	--	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	--	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	--	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	--	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	--	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	--	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	--	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	--	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	--	<0.00020

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1D 26-Nov-2013 GW-1	05-1D 29-May-2014 95-1D	05-1D 19-Nov-2014 05-1D	05-1D 02-Jun-2015 05-1D	05-1D 26-Nov-2015 05-1D	05-1D 26-May-2016 05-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	200	240	240	242	234	259
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.4	1.4	<1.0	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	200	240	240	243	234	259
Ammonia Nitrogen	mg/l	--	--	<0.050	0.063	<0.050	0.06	0.03	0.03
Chemical Oxygen Demand	mg/l	--	--	11	16	8.1	17	42	31
Chloride	mg/l	--	250	200	480	510	469	418	475
Conductivity (Field)	uS/cm	--	--	952	1734	2164	1924	1782	1940
Hardness, Calcium Carbonate	mg/l	--	--	460	860	890	628	674	644
Nitrate as N	mg/l	10.0	--	0.13	<0.10	<0.10	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.28	0.68	0.37	0.3	0.4	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.13	<0.10	<0.10	--	--	--
pH	-	--	--	7.87	7.79	7.63	--	--	--
pH (Field)	-	--	--	7.25	6.26	7.16	7.24	7.44	7.41
Phosphorus	mg/l	--	--	0.16	0.22	0.33	0.20	0.12	0.20
Sulphate	mg/l	--	500 [4]	58	110	120	121	122	127
Temperature (Field)	deg c	--	15	8.4	9.5	5.8	9.1	8.9	10.5
Total Dissolved Solids	mg/l	--	500	780	1690	1530	1400	1250	1550
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.033	0.038	0.034	0.031	0.033	0.031
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	0.0002
Calcium, dissolved	mg/l	--	--	130	250	250	169	180	181
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0040	0.0064	0.0022	0.0009	0.0011	0.0033
Iron, dissolved	mg/l	--	0.3	<0.1	0.5	0.12	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	34	56	63	50.1	54.4	46.4
Manganese, dissolved	mg/l	--	0.05	0.023	0.0095	0.14	0.042	0.059	0.06
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.2	12	13	10.7	9.88	12.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	46	69	110	121	122	138
Zinc, dissolved	mg/l	--	5	0.022	0.052	0.0063	<0.005	0.008	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	0.002
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	0.00037	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1D 17-Nov-2016 05-1D	05-1D 24-May-2017 05-1D	05-1D 29-Nov-2017 05-1D	05-1D 24-May-2018 05-1D	05-1D 29-Nov-2018 05-1D
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	248	244	251	269	246
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	249	245	251	270	246
Ammonia Nitrogen	mg/l	--	--	0.03	0.03	0.05	0.02	0.06
Chemical Oxygen Demand	mg/l	--	--	15	25	14	37	19
Chloride	mg/l	--	250	285	374	271	524	277
Conductivity (Field)	uS/cm	--	--	1444	1600	961	2163	1089
Hardness, Calcium Carbonate	mg/l	--	--	486	502	358	589	428
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.2	0.5	0.5	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.03	7.40	7.05	7.30	7.45
Phosphorus	mg/l	--	--	0.17	0.08	0.05	0.13	0.04
Sulphate	mg/l	--	500 [4]	86	103	76	109	57
Temperature (Field)	deg c	--	15	9.2	9.9	7.6	8.2	6.7
Total Dissolved Solids	mg/l	--	500	832	1170	718	1630	720
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.04	0.024	0.061	0.029	0.039
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	139	153	102	180	119
Chromium, dissolved	mg/l	0.05	--	0.006	0.005	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0051	0.0046	0.0032	0.0034	0.0053
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	34	29.3	24.7	34	31.5
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	0.109	0.043	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.6	10.1	8.35	10.2	10
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	121	136	136	227	152
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-1D 19-Jun-2019	05-1D 20-Nov-2019
				05-1D	05-1D
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	247	269
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	248	270
Ammonia Nitrogen	mg/l	--	--	0.09	0.02
Chemical Oxygen Demand	mg/l	--	--	<10	11
Chloride	mg/l	--	250	528	323
Conductivity (Field)	uS/cm	--	--	1920	1721
Hardness, Calcium Carbonate	mg/l	--	--	617	474
Nitrate as N	mg/l	10.0	--	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.04	7.23
Phosphorus	mg/l	--	--	0.08	0.10
Sulphate	mg/l	--	500 [4]	99	85
Temperature (Field)	deg c	--	15	11	7.6
Total Dissolved Solids	mg/l	--	500	1400	970
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.04	0.028
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	175	128
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0069	0.0054
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	43.4	37.3
Manganese, dissolved	mg/l	--	0.05	<0.005	0.005
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	11.1
Selenium, dissolved	mg/l	0.05	--	--	--
Silver, dissolved	mg/l	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	240	173
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	11-1	11-1	11-1	11-1	11-1	11-1
				29-Nov-2011 [12]	28-Nov-2012	29-May-2014	26-Nov-2015	24-May-2017	22-Nov-2018
				11-1	11-1	MW11-1	11-1	11-1	11-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	480	460	470	477	527	570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	4.5	10	9	9	8
Alkalinity (Total as CaCO3)	mg/l	--	--	490	460	480	486	536	578
Ammonia Nitrogen	mg/l	--	--	1.20	1.2	1.3	1.05	0.03	0.68
Chemical Oxygen Demand	mg/l	--	--	50	28	27	46	32	48
Chloride	mg/l	--	250	657	700	780	770	630	742
Conductivity	uS/cm	--	--	3000	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2787	2473	2552	2975	3214	2823
Hardness, Calcium Carbonate	mg/l	--	--	292	270	270	219	243	314
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.31	<0.1	0.6	0.1
Nitrite as N	mg/l	1.0	--	<0.10	0.015	0.226	<0.05	<0.25 [9]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.48	1.7	1.8	1.7	0.5	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	0.53	--	--	--
pH	-	--	--	8.33	--	8.36	--	--	--
pH (Field)	-	--	--	7.93	8.15	7.26	8.29	8.04	7.92
Phosphorus	mg/l	--	--	0.65	0.53	0.62	0.24	0.14	0.49
Sulphate	mg/l	--	500 [4]	8	<1	<1	<1	3	2
Temperature (Field)	deg c	--	15	7.0	6.3	9.7	8.0	11.7	7.8
Total Dissolved Solids	mg/l	--	500	1950	1650	1650	1630	1550	1660
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.002	0.0022	0.001	0.005	0.002
Boron, dissolved	mg/l	5	--	0.30	0.36	0.37	0.328	0.281	0.442
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	61	49	49	35.7	46.2	61.9
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.0050	<0.001	0.013	<0.001
Cobalt, dissolved	mg/l	--	--	0.0015	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0034	<0.0005	0.0029	0.0046
Iron, dissolved	mg/l	--	0.3	<0.03	0.5	0.16	0.158	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	34	36	36	31.5	30.9	38.7
Manganese, dissolved	mg/l	--	0.05	0.39	0.11	0.11	0.081	<0.005	0.027
Potassium, dissolved	mg/l	--	--	16	19	19	15.6	16.8	20.4
Sodium, dissolved	mg/l	--	200 [5]	490	590	520	646	523	611
Zinc, dissolved	mg/l	--	5	0.01	<0.005	0.0063	0.016	0.006	0.006
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.001	<0.002 [8]	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Up-Gradient Monitoring Wells

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2018).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised June 2006).
(3)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(4)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(5)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(6)	Elevated detection limit due to dilution required because of high target analyte concentration.
(7)	Elevated Reporting Limit due to matrix interference.
(8)	Elevated Reporting Limit due to matrix interference.
(9)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(10)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
(11)	Monitoring location was dry during this sampling event. No sample was collected.
(12)	Arsenic MRL elevated due to matrix interference.
(13)	pH < 8.3. Calculations not available.
(14)	Insufficient water for sample collection or analysis at this monitoring location during sampling event.
(15)	Monitoring location has been decommissioned.
(16)	Due to matrix interference 10x dilution factor required for VOCs.
(17)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-1 09-Jun-1992	92-1 01-Nov-1992	92-1 15-Jun-1994	92-1 02-Nov-1994	92-1 22-Nov-1995	92-1 12-Oct-1996
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	996	1061	--	771	848	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	10	--
Alkalinity (Total as CaCO3)	mg/l	--	--	816	870	706	642	712	716
Ammonia Nitrogen	mg/l	--	--	--	--	--	1.09	0.77	1.12
Chemical Oxygen Demand	mg/l	--	--	--	--	323	363	27	20
Chloride	mg/l	--	250	307	404	390	266	235	186
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2486	2579	2210	2140	2180	1910
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	4.14	--	--
Hardness, Calcium Carbonate	mg/l	--	--	73.89	66	63	49	40	36
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	3.1	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	2.33	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.21	8.12	8.52	8.82	9.13	8.31
Phosphate	mg/l	--	--	--	--	--	--	1.7	--
Phosphorus	mg/l	--	--	--	--	1.63	1.095	--	--
Sulphate	mg/l	--	500 [6]	70	87.5	5.3	6	5	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1120	1080	1090	960
Total Organic Carbon	mg/l	--	--	--	--	11.8	23.3	10.8	8.9
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	4560
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	**0.1**	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.199	--	--
Boron, dissolved	mg/l	5	--	--	--	0.98	0.868	0.89	0.8
Cadmium, dissolved	mg/l	0.005	--	--	--	--	**0.01**	0.001	--
Calcium, dissolved	mg/l	--	--	7	7.77	9	3.8	4.5	4.4
Chromium, dissolved	mg/l	0.05	--	--	--	0.012	0.01	0.03	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0154	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	2.993	1.19	2.11	2.4
Lead, dissolved	mg/l	0.01	--	--	--	0.0012	**0.1**	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	13.7	11.4	10	2.115	7.01	5.96
Manganese, dissolved	mg/l	--	0.05	--	--	0.062	0.032	0.04	0.04
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	22.49	18	22	8.481	13.3	12.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	555.9	728	423	414.9	461	386
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.072	0.001	--	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-1 06-Nov-1997	92-1 05-Jun-1998	92-1 26-Aug-1998	92-1 29-Oct-1998	92-1 06-May-1999	92-1 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	359	910	824	997
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	640	450	294	746	710	817
Ammonia Nitrogen	mg/l	--	--	0.7	0.63	0.21	6.05	1.34	0.06
Chemical Oxygen Demand	mg/l	--	--	17	35	49	392	310	--
Chloride	mg/l	--	250	196	450	20.9	275	285	275
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1900	1893	1130	2040	1930	2130
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	36	552	559	54	36	28
Nitrate as N	mg/l	10.0	--	0.1	1	1.1	--	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	7.18	9.11	1.56
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.01	--	7.21	8.4	8.4	8.59
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	1.59
Sulphate	mg/l	--	500 [6]	1	39	314	2	1	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	950	946	563	1020	960	1170
Total Organic Carbon	mg/l	--	--	9.6	7.4	22	11.7	16.5	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	244
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.91	1.04	0.47	1.08	1.03	0.96
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	4.14	165	136	6.61	2.32	2.39
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.06	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.29	19.6	2.6	0.45	0.06	0.07
Lead, dissolved	mg/l	0.01	--	0.0002	0.0067	0.0002	0.0002	0.0015	0.022
Magnesium, dissolved	mg/l	--	--	6.1	33.4	52.6	9.01	6.69	5.3
Manganese, dissolved	mg/l	--	0.05	0.03	1.05	1.16	0.02	0.01	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.06	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	13.8	20.9	6.5	28.5	10.2	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	384	281	78.6	499	532	490
Zinc, dissolved	mg/l	--	5	0.01	0.14	0.52	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-1 14-Jun-2001	92-1 06-Nov-2002	92-1 30-May-2003	92-1 19-Nov-2004	92-1 16-Nov-2005
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	865	955	893	889	188
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	741	783	732	729	770
Ammonia Nitrogen	mg/l	--	--	1.26	0.74	0.62	1.03	0.95
Chemical Oxygen Demand	mg/l	--	--	27	39	27	41	35
Chloride	mg/l	--	250	219	334	236	248	240
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1550	2020	1780	2180	1900
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	25	30	29	27	32
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	<1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.69	1.33	1.32	1.67	1.56
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.4	8.2	7.3	8.4	--
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.37	1.27	1.26	1.48	0.98
Sulphate	mg/l	--	500 [6]	1	1	1	10	<1
Temperature (Field)	deg c	--	15	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	966	1160	1150	1090	1260
Total Organic Carbon	mg/l	--	--	10.4	11	12	10	12
Total Suspended Solids	mg/l	--	--	2490	102	80	114	50
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.001	0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.94	0.99	0.94	1	1.02
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	2.26	3.08	3.44	2.22	3.11
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.07	0.02	0.07	0.041	0.039
Lead, dissolved	mg/l	0.01	--	0.0002	0.0013	0.0005	0.0007	<0.0002
Magnesium, dissolved	mg/l	--	--	4.6	5.48	4.85	5.14	5.8
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.003	0.004
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	6.8	10.7	11.1	11.7	13.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	423	498	448	477	548
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.005	0.006
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.039	0.001	0.001	0.001	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-1	92-1	92-1	92-1	92-1	92-1
				15-May-2007	10-Nov-2008	26-Nov-2009	24-May-2011 [4]	28-Nov-2012	29-May-2014
						M-4	G-19	92-1	92-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	770	750	724	713	700	700
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	27	37	25	30
Alkalinity (Total as CaCO3)	mg/l	--	--	770	750	751	750	730	730
Ammonia Nitrogen	mg/l	--	--	0.67	0.9	1.01	0.96	1.2	1.2
Chemical Oxygen Demand	mg/l	--	--	84	<100	93	35	37	40
Chloride	mg/l	--	250	268	286	277	299	290	320
Conductivity	uS/cm	--	--	--	--	2250	2340	--	--
Conductivity (Field)	uS/cm	--	--	1500	1900	1995	2089	2191	2031
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	31	41	35	39	36	36
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	0.014
Nitrogen, Total Kjeldahl	mg/l	--	--	2.05	7.62	1.32	1.37	2.7	6.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.60	8.74	--	8.66
pH (Field)	-	--	--	8.9	8.2	8.55	8.72	8.53	8.39
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.98	1.31	1.3	1.2
Sulphate	mg/l	--	500 [6]	1	2	2	<1	<1	<1
Temperature (Field)	deg c	--	15	10.2	9	10	12.5	6.0	11.1
Total Dissolved Solids	mg/l	--	500	1210	1280	1460	1520	1360	1350
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0013	0.0025	0.002	<0.01	<0.001	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.927	0.939	0.9	1.0	1.2	1.1
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	3.1	4.14	4	4	3.5	3.5
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	0.007	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.0002	0.0003	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.001	0.002	<0.001	0.0020
Iron, dissolved	mg/l	--	0.3	0.131	0.065	0.09	0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00006	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	5.74	7.35	6	7	6.6	6.7
Manganese, dissolved	mg/l	--	0.05	0.017	0.013	0.02	0.01	0.004	0.0036
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.8	14.3	11	12	13	13
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	458	511	449	552	550	550
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01	0.01	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	Jan-92	92-1	92-1
				26-Nov-2015	24-May-2017	22-Nov-2018
				92-1	92-1	92-1
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	746	776	830
Alkalinity, Carbonate as CaCO3	mg/l	--	--	16	18	11
Alkalinity (Total as CaCO3)	mg/l	--	--	762	795	841
Ammonia Nitrogen	mg/l	--	--	1.22	1.21	1.15
Chemical Oxygen Demand	mg/l	--	--	67	41	68
Chloride	mg/l	--	250	347	334	372
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2262	2309	2096
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	28.4	36	63
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.8	2.0	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.69	8.63	8.47
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	1.13	1.13	1.40
Sulphate	mg/l	--	500 [6]	<1	<1	<1
Temperature (Field)	deg c	--	15	9.7	11.4	9.1
Total Dissolved Solids	mg/l	--	500	1370	1360	1390
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	1.16	1.08	1.08
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	2.5	3.3	11.9
Chromium, dissolved	mg/l	0.05	--	<0.001	0.01	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0007	0.0020
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.111
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	5.39	6.69	8.06
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	0.016
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11.1	13.1	14.9
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	592	557	549
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [11]	<0.002 [10]	0.004
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-5 09-Jun-1992	92-5 01-Nov-1992	92-5 08-Jun-1993	92-5 04-Nov-1993	92-5 15-Jun-1994	92-5 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	922	928	926	910	--	669
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	<1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	756	761	759	746	752	724
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	1.73
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	138	242
Chloride	mg/l	--	250	928	1240	1315	1375	1480	1090
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4255	4404	3990	4380	4890	4880
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	6.02
Hardness, Calcium Carbonate	mg/l	--	--	361.84	361	286	276	318	320
Nitrate as N	mg/l	10.0	--	--	--	0.3	8.17	0.1	0.4
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.67	8.05	7.9	8.06	7.94	8.27
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	1.45	0.577
Sulphate	mg/l	--	500 [6]	29	25.5	4.8	7.1	1.9	1.9
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	2555	2520	2460	2440
Total Organic Carbon	mg/l	--	--	--	--	--	--	22.2	26.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	0.139	0.068	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.088
Boron, dissolved	mg/l	5	--	--	--	--	--	1.19	1.068
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**
Calcium, dissolved	mg/l	--	--	47.6	46	36.1	35	42.1	28.04
Chromium, dissolved	mg/l	0.05	--	--	--	**0.1**	<0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.017	0.01	0.0151	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.247	<0.1	0.436	0.159
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	**0.116**	0.0013	**0.1**
Magnesium, dissolved	mg/l	--	--	59	59.8	47.6	45.7	51.6	23.816
Manganese, dissolved	mg/l	--	0.05	--	--	0.087	0.01	0.192	0.075
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.023	<0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	23	28.1	28.3	26.7	35	21.69
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	827.7	1050	909	945	791	848.8
Zinc, dissolved	mg/l	--	5	--	--	0.083	<0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.007	0.063	0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-5 28-Jun-1995	92-5 23-Nov-1995	92-5 12-Oct-1996	92-5 06-Nov-1997	92-5 05-Jun-1998	92-5 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	871	893	--	--	--	900
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	714	732	764	808	672	738
Ammonia Nitrogen	mg/l	--	--	2.3	1.34	2.18	1.25	0.93	1.98
Chemical Oxygen Demand	mg/l	--	--	188	68	43	36	31	51
Chloride	mg/l	--	250	167	1100	1110	944	1120	1110
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4820	5080	4550	4600	4550	4400
Dissolved Oxygen (Field)	mg/l	--	--	4.64	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	221	269	239	266	252	246
Nitrate as N	mg/l	10.0	--	0.1	0.6	0.1	0.1	2.8	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	8	4.5	--	--	--	5.84
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.7	3.16	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.85	8.75	7.76	7.48	--	7.8
Phosphate	mg/l	--	--	--	0.7	--	--	--	--
Phosphorus	mg/l	--	--	4.3	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	6	1	4	1	39	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2410	2540	2280	2310	2270	2200
Total Organic Carbon	mg/l	--	--	24.6	19.9	17.5	18.4	18.8	22.4
Total Suspended Solids	mg/l	--	--	--	--	1730	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.83	0.91	0.96	1.8	1.18	1.13
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	28.5	32.1	28	32.7	30	31.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.06	0.38	0.97	0.54	1.27	0.45
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0008
Magnesium, dissolved	mg/l	--	--	36.1	45.2	40.5	44.2	42.5	40.3
Manganese, dissolved	mg/l	--	0.05	0.1	0.12	0.11	0.1	0.13	0.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	26.2	25.4	24.7	31	27.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	693	841	937	908	1140	951
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.13	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-5 24-Oct-2000	92-5 14-Jun-2001	92-5 06-Nov-2002	92-5 30-May-2003	92-5 19-Nov-2004	92-5 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1050	936	977	911	982	198
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	861	768	801	747	805	810
Ammonia Nitrogen	mg/l	--	--	1.07	1.99	2.63	2.14	2.38	1.7
Chemical Oxygen Demand	mg/l	--	--	--	51	99	68	67	74
Chloride	mg/l	--	250	1230	1100	1120	1190	1200	1120
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4660	4350	4530	4270	4710	3400
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	272	214	250	227	231	253
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	0.2	1	1.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.77	3.14	4.89	3.63	3.3	3.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.06	7.8	7.8	7.1	7.9	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.42	2.79	4.96	1.2	1	1.62
Sulphate	mg/l	--	500 [6]	3	1	2	2	10	<1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2700	2300	2610	--	2355	2700
Total Organic Carbon	mg/l	--	--	--	18.7	19.1	17.9	16.3	20.6
Total Suspended Solids	mg/l	--	--	4360	2070	2220	856	710	28
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.001	0.003	0.003	0.001	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.15	1.18	1.18	1.11	1.14	1.21
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0001
Calcium, dissolved	mg/l	--	--	28.7	26.9	29.5	29	29.4	32.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.27	0.12	0.56	1.06	0.404	0.312
Lead, dissolved	mg/l	0.01	--	0.022	0.0002	0.0059	0.0006	0.0013	0.0007
Magnesium, dissolved	mg/l	--	--	48.6	35.6	42.8	37.5	38.3	41.9
Manganese, dissolved	mg/l	--	0.05	0.09	0.08	0.1	0.08	0.083	0.081
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	26.4	21	25.8	27.7	28.2	31.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	937	923	984	812	877	1010
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.006
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.003	0.08	0.001	0.001	0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-5 15-May-2007	92-5 10-Nov-2008	92-5 26-Nov-2009 [20] M-2	92-5 24-May-2011 [4] G-23	92-5 28-Nov-2012 92-5	92-5 29-May-2014 92-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	840	810	796	766	750	760
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [8]	23	9.7	15
Alkalinity (Total as CaCO3)	mg/l	--	--	840	810	796	789	760	770
Ammonia Nitrogen	mg/l	--	--	1.16	1.64	2.01	1.92	1.9	1.7
Chemical Oxygen Demand	mg/l	--	--	107	61	60	65	68	53
Chloride	mg/l	--	250	1200	1230	1110	1100	1100	1200
Conductivity	uS/cm	--	--	--	--	4850	4890	--	--
Conductivity (Field)	uS/cm	--	--	3500	4350	>3999	>3999	3871	3903
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	235	229	224	244	250	260
Nitrate as N	mg/l	10.0	--	0.2	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.76	3.25	2.99	3.05	2.7	2.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.19	8.50	--	8.33
pH (Field)	-	--	--	8.4	8	7.9	8.09	8.04	7.63
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.95	1.52	1.5	0.98
Sulphate	mg/l	--	500 [6]	2	1	4	<1	<1	<1
Temperature (Field)	deg c	--	15	10.2	8	10.8	12.5	8.5	11.6
Total Dissolved Solids	mg/l	--	500	2700	2680	3150	3180	2590	2590
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0076	0.0064	0.009	<0.01	0.002	0.0037 [17]
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.1	1.11	0.96	1.3	1.4	1.3
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	30.3	29.2	27	30	31	32
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0006	0.0008	0.0005	0.00059
Copper, dissolved	mg/l	--	1	0.006	0.003	0.007	0.006	0.003	0.0028
Iron, dissolved	mg/l	--	0.3	0.413	0.015	<0.03	<0.03	<0.1	0.18
Lead, dissolved	mg/l	0.01	--	0.00016	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	38.7	37.9	38	41	42	44
Manganese, dissolved	mg/l	--	0.05	0.023	0.032	<0.01	0.02	<0.002	0.036
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	29.9	27.8	24	27	27	27
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	887	864	884	833	930	830
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.01	0.02	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00025	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-5 26-Nov-2015	92-5 24-May-2017	92-5 29-Nov-2018
				92-5	92-5	92-5
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	790	834	884
Alkalinity, Carbonate as CaCO3	mg/l	--	--	13	12	15
Alkalinity (Total as CaCO3)	mg/l	--	--	803	847	899
Ammonia Nitrogen	mg/l	--	--	0.05	0.01	0.20
Chemical Oxygen Demand	mg/l	--	--	105	111	147
Chloride	mg/l	--	250	1180	1160	1120
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	271	94	327
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [9]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.3	1.7	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.01	8.00	8.1
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.96	0.92	1.43
Sulphate	mg/l	--	500 [6]	<1	1	<1
Temperature (Field)	deg c	--	15	9.8	11.9	6.9
Total Dissolved Solids	mg/l	--	500	2730	2620	2600
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Aluminum, dissolved	mg/l	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.008	0.003
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	1.35	0.981	1.26
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29	31.1	41.8
Chromium, dissolved	mg/l	0.05	--	<0.001	0.017	0.002
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0012
Copper, dissolved	mg/l	--	1	<0.0005	0.0013	0.0046
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.645
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	48.2	3.9	54
Manganese, dissolved	mg/l	--	0.05	0.011	0.12	0.024
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	22.7	27.9	33.6
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1060	981	1010
Zinc, dissolved	mg/l	--	5	0.008	<0.005	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.004 [11]	<0.010 [10]	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 09-Jun-1992	92-7 01-Nov-1992	92-7 08-Jun-1993	92-7 04-Nov-1993	92-7 15-Jun-1994	92-7 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	561	529	515	538	--	503
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	<1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	460	434	422	441	442	420
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	0.89
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	143	115
Chloride	mg/l	--	250	298	407	465	568	720	410
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1822	1687	1780	1930	2060	2050
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	8.72
Hardness, Calcium Carbonate	mg/l	--	--	219.79	161	145	147	167	169
Nitrate as N	mg/l	10.0	--	--	--	0.3	3.1	0.1	1.08
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.76	8.02	7.3	7.7	7.53	7.94
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	3.85	0.356
Sulphate	mg/l	--	500 [6]	13	4.7	1.8	4.4	2.6	2.3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1176	1000	1040	1030
Total Organic Carbon	mg/l	--	--	--	--	--	--	15.2	19
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	2.91	0.344	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.04
Boron, dissolved	mg/l	5	--	--	--	--	--	0.4	0.442
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**
Calcium, dissolved	mg/l	--	--	34.9	24	21.1	22.5	25.5	20.64
Chromium, dissolved	mg/l	0.05	--	--	--	0.018	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.1	0.01	0.0116	0.029
Iron, dissolved	mg/l	--	0.3	--	--	1.587	0.1	1.891	0.742
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	**0.0356**	0.0012	**0.1**
Magnesium, dissolved	mg/l	--	--	32.18	24.6	22.3	22	25.2	10.426
Manganese, dissolved	mg/l	--	0.05	--	--	0.238	0.261	0.405	0.213
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.024	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.06	13.1	15.7	13.4	35.3	8.746
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	313.3	369	349	388	320	331
Zinc, dissolved	mg/l	--	5	--	--	0.059	0.01	0.01	0.456
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.019	0.087	0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 28-Jun-1995	92-7 23-Nov-1995	92-7 12-Jun-1996	92-7 12-Oct-1996	92-7 18-Jun-1997	92-7 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	524	597	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	430	462	462	479	452	466
Ammonia Nitrogen	mg/l	--	--	0.8	0.39	0.7	0.99	0.49	0.68
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	125	48	45	30	34	34
Chloride	mg/l	--	250	300	342	377	320	404	396
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2030	2100	1970	1800	1980	2020
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.07	--	--	--	2.77	--
Hardness, Calcium Carbonate	mg/l	--	--	155	158	159	149	176	176
Nitrate as N	mg/l	10.0	--	0.1	0.8	0.6	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.8	1.8	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	6	1.41	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.49	8.16	7.69	7.23	7.69	7.27
Phosphate	mg/l	--	--	--	0.3	--	--	--	--
Phosphorus	mg/l	--	--	4.1	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	2	4	4	9	1	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1020	1050	990	900	990	1010
Total Organic Carbon	mg/l	--	--	15.8	14.8	15.2	15	13.5	14.7
Total Suspended Solids	mg/l	--	--	--	--	1960	546	1340	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.37	0.36	0.387	0.39	0.52	0.45
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	24.4	23.8	22.6	21.3	26.8	27.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	0.82	1.27	1.6	0.57	2.67
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	0.0002	0.0002	0.0002	0.0008
Magnesium, dissolved	mg/l	--	--	22.5	23.6	24.5	22.9	26.1	25.9
Manganese, dissolved	mg/l	--	0.05	0.38	0.4	0.361	0.39	0.33	0.45
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	14	16.2	11.4	12.9	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	339	371	38.1	321	325	331
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

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Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 05-Jun-1998	92-7 30-Oct-1998	92-7 06-May-1999	92-7 19-Oct-1999	92-7 05-May-2000	92-7 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	366	372	471	684	620
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	23	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	456	300	305	424	561	508
Ammonia Nitrogen	mg/l	--	--	0.5	0.93	0.27	0.9	0.03	0.41
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	43	28	21	21	33	--
Chloride	mg/l	--	250	388	250	226	368	375	410
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2020	1562	1180	1740	1800	2100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	173	142	165	176	166	168
Nitrate as N	mg/l	10.0	--	1.6	--	--	0.1	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.93	1.44	--	--	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.3	7.1	7.6	7.6	7.57
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.46
Sulphate	mg/l	--	500 [6]	47	29	31	13	9	8
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1000	783	590	870	900	1100
Total Organic Carbon	mg/l	--	--	13.7	9.4	9.2	10.6	11.8	--
Total Suspended Solids	mg/l	--	--	--	--	--	1640	210	116
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.54	0.4	0.25	0.46	0.53	0.45
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.1	28.2	32.6	32.3	28.7	25.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.49	0.39	0.14	2.34	0.68	0.18
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0003	0.0002	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	25.9	17.4	20	22.8	22.6	25.4
Manganese, dissolved	mg/l	--	0.05	0.37	0.27	0.24	0.19	0.03	0.37
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	14.4	12.5	11.3	12.7	6.2	11.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	443	244	226	334	382	459
Zinc, dissolved	mg/l	--	5	0.22	0.01	0.01	0.13	0.1	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001

Report of Monitoring Results - Groundwater
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 14-Jun-2001	92-7 23-Nov-2001	92-7 23-May-2002	92-7 06-Nov-2002	92-7 30-May-2003	92-7 09-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	561	583	542	597	575	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	18	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	460	478	474	489	471	480
Ammonia Nitrogen	mg/l	--	--	0.74	0.86	0.59	0.95	0.44	1.15
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	3
Chemical Oxygen Demand	mg/l	--	--	30	32	19	42	68	43
Chloride	mg/l	--	250	414	400	396	388	410	396
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1700	1750	1980	2000	1940	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	112
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	135	179	178	166	159	161
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.1	0.2	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.57	1.73	1.09	1.89	1.33	1.83
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.03	7.17	7.7	7	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.65	0.3	0.27	0.62	0.34	0.55
Sulphate	mg/l	--	500 [6]	5	12	7	8	6	4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1100	1040	1080	1180	970	1139
Total Organic Carbon	mg/l	--	--	12.9	17	13	13.2	13.2	15
Total Suspended Solids	mg/l	--	--	167	82	45	202	76	100
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.47	0.56	0.47	0.44	0.44	0.445
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	20.9	28.6	29.5	25.3	24.9	23.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.006
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.003
Iron, dissolved	mg/l	--	0.3	0.16	0.15	0.05	0.05	0.2	2.19
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.001	0.0005	0.0009
Magnesium, dissolved	mg/l	--	--	20	26.2	25.4	25	23.4	24.6
Manganese, dissolved	mg/l	--	0.05	0.01	0.36	0.31	0.57	0.27	0.296
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	9.5	13.7	15.3	12.8	13.2	13.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	382	388	366	348	385	386
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.01	0.01	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.054	0.001	0.001	0.001	0.001	0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 14-May-2004	92-7 19-Nov-2004	92-7 24-May-2005	92-7 16-Nov-2005	92-7 25-May-2006	92-7 21-Nov-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	597	634	605	303	515	528
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	489	520	496	496	515	528
Ammonia Nitrogen	mg/l	--	--	0.71	1.12	0.58	1.08	0.72	1.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	44	43	33	39	35	38
Chloride	mg/l	--	250	397	397	381	387	413	387
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2090	2290	2500	2000	1700	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	167	169	174	178	160	175
Nitrate as N	mg/l	10.0	--	0.2	1	0.2	0.6	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.53	1.8	1.27	1.63	1.79	1.72
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.3	7.9	7.1	--	7.7	6.7
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.35	0.57	0.31	0.44	--	--
Sulphate	mg/l	--	500 [6]	10	20	9	10	10	12
Temperature (Field)	deg c	--	15	--	--	10.6	--	5.5	11.5
Total Dissolved Solids	mg/l	--	500	1045	1145	1130	1210	1180	1200
Total Organic Carbon	mg/l	--	--	11.7	12.5	12.8	14.6	--	--
Total Suspended Solids	mg/l	--	--	43	910	31	110	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	0.0015
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.451	0.478	0.451	0.489	0.404	0.448
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	0.0002	<0.005	<0.0001
Calcium, dissolved	mg/l	--	--	25.8	26.3	25.8	27.2	24	26.7
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.052	0.747	0.039	0.667	0.053	1.19
Lead, dissolved	mg/l	0.01	--	0.0003	0.0006	0.0011	0.0009	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	24.9	25.2	26.5	26.8	24.4	26.2
Manganese, dissolved	mg/l	--	0.05	0.163	0.349	0.098	0.319	0.267	0.718
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	14.3	14.1	15	16.2	13.2	14.3
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [7]	411	397	384	456	402	410
Zinc, dissolved	mg/l	--	5	0.005	0.005	0.005	0.009	<0.005	0.006
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.003	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 14-May-2004	92-7 19-Nov-2004	92-7 24-May-2005	92-7 16-Nov-2005	92-7 25-May-2006	92-7 21-Nov-2006
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 15-May-2007	92-7 30-Nov-2007	92-7 22-May-2008	92-7 10-Nov-2008	92-7 19-May-2009 G-9	92-7 26-Nov-2009 M-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	531	540	531	543	517	534
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	531	540	531	543	517	534
Ammonia Nitrogen	mg/l	--	--	<0.01	0.94	0.46	1.08	0.36	1.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	55	72	26	34	30	40
Chloride	mg/l	--	250	437	432	413	413	402	421
Conductivity	uS/cm	--	--	--	--	--	--	2240	2280
Conductivity (Field)	uS/cm	--	--	2190	1500	1900	1850	--	1998
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	168	170	166	174	165	163
Nitrate as N	mg/l	10.0	--	0.6	0.2	0.1	0.1	0.29	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.69	1.58	1.25	1.69	0.93	1.41
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.97	8.21
pH (Field)	-	--	--	8.1	7.9	7.7	7.5	--	7.66
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.36	0.45
Sulphate	mg/l	--	500 [6]	9	4	8	13	7	7
Temperature (Field)	deg c	--	15	10	8	12	8	--	11.6
Total Dissolved Solids	mg/l	--	500	1250	1330	1230	1220	1460	1480
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0019	0.0015	0.0021	0.0013	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.468	0.469	0.43	0.435	1.62	0.49
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25.4	26	25.1	26.5	25	24
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.005	0.008
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0002	0.0003
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	0.003	0.001
Iron, dissolved	mg/l	--	0.3	0.019	0.728	0.025	0.009	<0.03	0.28
Lead, dissolved	mg/l	0.01	--	0.00004	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	25.4	25.5	25.1	26.3	25	25
Manganese, dissolved	mg/l	--	0.05	0.004	0.325	0.32	0.025	<0.01	0.29
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	15.5	13.6	14.6	13	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	417	502	422	403	389	427
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 15-May-2007	92-7 30-Nov-2007	92-7 22-May-2008	92-7 10-Nov-2008	92-7 19-May-2009 G-9	92-7 26-Nov-2009 M-6
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 25-May-2010 [4] M-13	92-7 20-Oct-2010 [4] G-9	92-7 24-May-2011 [4] G-15	92-7 29-Nov-2011 [4] 92-7	92-7 31-May-2012 92-7
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	513	534	541	552	530
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [6]	<2 [6]	12	12	8.7
Alkalinity (Total as CaCO3)	mg/l	--	--	513	534	553	565	540
Ammonia Nitrogen	mg/l	--	--	0.34	0.95	0.56	0.74	0.10
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	55	35	38	45
Chloride	mg/l	--	250	387	393	403	399	370
Conductivity	uS/cm	--	--	2260	2210	2300	2350	--
Conductivity (Field)	uS/cm	--	--	2306	2108	2099	2165	2011
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	179	197	176	186	170
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.028
Nitrogen, Total Kjeldahl	mg/l	--	--	0.64	1.67	0.90	0.90	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	8.25	7.94	8.38	8.38	8.24
pH (Field)	-	--	--	7.69	7.62	7.73	8.12	7.79
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.31	0.43	0.27	0.46	0.21
Sulphate	mg/l	--	500 [6]	10	7	6	14	9
Temperature (Field)	deg c	--	15	17.6	11.3	12.2	9.2	11.0
Total Dissolved Solids	mg/l	--	500	1470	1440	1500	1530	1240
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.49	0.47	0.48	0.46	0.52
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	27	31	26	30	26
Chromium, dissolved	mg/l	0.05	--	<0.005	0.009	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0005	0.0003	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.001	0.003	0.001	0.0018
Iron, dissolved	mg/l	--	0.3	0.49	0.90	0.18	0.58	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	27	29	27	27	26
Manganese, dissolved	mg/l	--	0.05	0.54	0.41	0.41	0.10	0.042
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	14	14	13	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	387	388	384	378	420
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	<0.01	<0.0050
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 25-May-2010 [4] M-13	92-7 20-Oct-2010 [4] G-9	92-7 24-May-2011 [4] G-15	92-7 29-Nov-2011 [4] 92-7	92-7 31-May-2012 92-7
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	0.0005	<0.0004	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 28-Nov-2012	92-7 29-May-2013 [5]	92-7 26-Nov-2013 [5]	92-7 29-May-2014	92-7 19-Nov-2014	92-7 02-Jun-2015
				92-7	92-7	GW-21	92-7	92-7	92-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	540	540	570	570	560	585
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.3	6.3	6.4	9.8	6.0	6
Alkalinity (Total as CaCO3)	mg/l	--	--	550	540	570	580	570	591
Ammonia Nitrogen	mg/l	--	--	1.1	1.0	1.2	0.59	1.1	0.47
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	45	41	45	42	83
Chloride	mg/l	--	250	380	400	380	390	420	428
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1979	1818	1891	1939	2268	2185
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	190	190	190	210	210	159
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.026	0.029	0.026	0.022	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.5	1.5	1.9	1.5	1.7	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.11	<0.10	<0.10	<0.10	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.09	8.08	8.27	8.06	--
pH (Field)	-	--	--	7.77	7.18	7.09	7.52	7.76	7.73
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.47	0.47	0.77	0.35	0.56	0.19
Sulphate	mg/l	--	500 [6]	7	3	4	<1	1	4
Temperature (Field)	deg c	--	15	9.8	10.6	10.5	10.9	7.4	10.2
Total Dissolved Solids	mg/l	--	500	1250	1260	1240	1230	1270	1320
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0017	<0.0010	<0.0010	<0.0010	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.58	0.48	0.47	0.56	0.53	0.334
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	28	28	29	32	33	26.2
Chromium, dissolved	mg/l	0.05	--	<0.005	0.012	<0.0050	<0.0050	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.001	0.0020	<0.0010	0.0024	<0.0020	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.56	<0.1	0.68	0.214
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	30	28	29	32	32	22.8
Manganese, dissolved	mg/l	--	0.05	0.003	0.02	0.42	0.33	0.5	0.236
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	14	14	15	15	12.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	440	440	410	460	450	466
Zinc, dissolved	mg/l	--	5	<0.005	0.0062	0.0096	<0.0050	0.039	0.055
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 28-Nov-2012 92-7	92-7 29-May-2013 [5] 92-7	92-7 26-Nov-2013 [5] GW-21	92-7 29-May-2014 92-7	92-7 19-Nov-2014 92-7	92-7 02-Jun-2015 92-7
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00050	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00050	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00050	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00050	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0025	<0.0013	<0.0013	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.00050	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0010	<0.00050	<0.00050	<0.00020	<0.00020	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0010	<0.00050	<0.00050	<0.00020	<0.00020	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 26-Nov-2015	92-7 26-May-2016	92-7 17-Nov-2016	92-7 24-May-2017	92-7 29-Nov-2017	92-7 24-May-2018
				92-7	92-7	92-7	92-7	92-7	92-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	598	609	617	635	645	673
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	5	6	5
Alkalinity (Total as CaCO3)	mg/l	--	--	602	612	620	640	651	678
Ammonia Nitrogen	mg/l	--	--	1.07	0.72	1.30	0.69	1.17	0.71
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	72	63	84	46	41	74
Chloride	mg/l	--	250	431	446	434	433	462	430
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2257	2242	2376	2262	2053	2308
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	167	209	208	199	206	212
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.8	1.5	2.0	1.2	1.6	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.04	8.30	7.55	7.72	7.56	7.59
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.46	0.51	0.65	0.28	0.40	0.28
Sulphate	mg/l	--	500 [6]	2	4	2	3	5	4
Temperature (Field)	deg c	--	15	9.5	14.7	11.6	10.3	9.2	10.3
Total Dissolved Solids	mg/l	--	500	1320	1360	1270	1300	1330	1390
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001	0.002	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.522	0.555	0.711	0.46	0.535	0.527
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	26.5	31	31.2	31.3	30.1	33.3
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	0.009	0.011	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0020	0.0008	0.0013	0.0014	0.0011
Iron, dissolved	mg/l	--	0.3	0.404	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	24.4	31.9	31.7	29.3	31.7	31.3
Manganese, dissolved	mg/l	--	0.05	0.431	0.019	0.023	0.197	<0.005	0.13
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.4	16.6	14.6	14	15.1	14.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	491	436	464	469	441	426
Zinc, dissolved	mg/l	--	5	0.008	0.007	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.005	0.003	<0.002 [10]	<0.001	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 26-Nov-2015	92-7 26-May-2016	92-7 17-Nov-2016	92-7 24-May-2017	92-7 29-Nov-2017	92-7 24-May-2018
				92-7	92-7	92-7	92-7	92-7	92-7
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 22-Nov-2018	92-7 19-Jun-2019	92-7 20-Nov-2019
				92-7	92-7	92-7
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	697	640	621
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	9	6
Alkalinity (Total as CaCO3)	mg/l	--	--	702	649	627
Ammonia Nitrogen	mg/l	--	--	1.20	0.38	1.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	39	41
Chloride	mg/l	--	250	429	428	457
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2153	2202	2390
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	265	394	288
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.3
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.2	0.7	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	7.83	7.71	7.74
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.49	0.20	0.38
Sulphate	mg/l	--	500 [6]	4	4	8
Temperature (Field)	deg c	--	15	9.2	13.3	8.8
Total Dissolved Solids	mg/l	--	500	1320	1350	1290
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Aluminum, dissolved	mg/l	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.57	0.765	0.453
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.4	58.8	42.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0033	0.0046	0.0015
Iron, dissolved	mg/l	--	0.3	0.574	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	41.2	60	44.2
Manganese, dissolved	mg/l	--	0.05	0.411	<0.005	0.047
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18	26.7	20.3
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	529	444	448
Zinc, dissolved	mg/l	--	5	<0.005	0.006	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.005

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-7 22-Nov-2018	92-7 19-Jun-2019	92-7 20-Nov-2019
				92-7	92-7	92-7
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-8 09-Jun-1992	92-8 01-Nov-1992	92-8 22-Jun-1994	92-8 02-Nov-1994	92-8 28-Jun-1995	92-8 23-Nov-1995
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	503	1010	--	763	500	694
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	412	828	804	637	410	569
Ammonia Nitrogen	mg/l	--	--	--	--	--	4.62	3.1	0.15
Chemical Oxygen Demand	mg/l	--	--	--	--	214	194	138	85
Chloride	mg/l	--	250	173	213	310	156	102	148
Conductivity (Field)	uS/cm	--	--	1613	2300	2200	1650	1270	2200
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	9.22	7.64	--
Hardness, Calcium Carbonate	mg/l	--	--	485.3	760	596	416	341	890
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.54	1.3	0.8
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	10.8	5.7
Nitrogen, Organic	mg/l	--	--	--	--	--	--	7.7	5.55
pH (Field)	-	--	--	7.07	7.04	6.5	7.06	6.74	7.06
Phosphate	mg/l	--	--	--	--	--	--	--	0.3
Phosphorus	mg/l	--	--	--	--	0.82	0.249	3.25	--
Sulphate	mg/l	--	500 [6]	159	223.5	67.3	55.1	492	352
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1110	830	640	1100
Total Organic Carbon	mg/l	--	--	--	--	55.6	32	35.7	26.4
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.058	--	--
Boron, dissolved	mg/l	5	--	--	--	2.1	1.635	1.84	2.4
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	0.0001
Calcium, dissolved	mg/l	--	--	130.9	174	132	68.36	75.3	179
Chromium, dissolved	mg/l	0.05	--	--	--	0.01	0.01	0.01	0.03
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0198	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.433	0.491	0.07	10.4
Lead, dissolved	mg/l	0.01	--	--	--	0.0003	0.1	0.0012	0.0002
Magnesium, dissolved	mg/l	--	--	38.44	78.9	64.6	25.716	36.8	106
Manganese, dissolved	mg/l	--	0.05	--	--	4.193	1.802	1.85	3.26
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.59	21.5	27.9	9.917	--	21.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	143.4	233	166	171.6	130	144
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.021	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.142	0.001	0.001	--

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-8 12-Jun-1996	92-8 12-Oct-1996	92-8 18-Jun-1997	92-8 06-Nov-1997	92-8 26-Aug-1998	92-8 29-Oct-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	826	468
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	12	1
Alkalinity (Total as CaCO3)	mg/l	--	--	416	410	341	396	697	384
Ammonia Nitrogen	mg/l	--	--	6.2	1.96	0.18	4.66	1.01	1.24
Chemical Oxygen Demand	mg/l	--	--	72	45	44	82	56	7
Chloride	mg/l	--	250	68	29.3	72.8	26	387	39.4
Conductivity (Field)	uS/cm	--	--	1360	1250	1470	1200	2370	1310
Dissolved Oxygen (Field)	mg/l	--	--	--	--	4.23	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	429	575	756	745	59	553
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	1.43
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.81	6.53	7.1	6.74	8.4	6.5
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	214	299	365	348	5	325
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	680	620	740	600	1200	660
Total Organic Carbon	mg/l	--	--	29	18.9	7.9	28.8	7	18
Total Suspended Solids	mg/l	--	--	379	146	435	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.19	0.78	0.33	0.22	1.14	0.44
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	93.1	135	179	181	6.12	144
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	27.2	12.2	5.19	22.2	5.02	9.21
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002
Magnesium, dissolved	mg/l	--	--	47	57.1	74.2	70.2	10.6	47.1
Manganese, dissolved	mg/l	--	0.05	3.05	3.48	1.08	0.66	0.11	3.83
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	14.4	11.7	5.3	10.2	16.2	8.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	165	75.6	88.6	56.7	621	93
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.08	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-8 06-May-1999	92-8 19-Oct-1999	92-8 05-May-2000	92-8 24-Oct-2000	92-8 14-Jun-2001	92-8 23-Nov-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	344	512	803	741	403	604
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	282	420	659	607	330	495
Ammonia Nitrogen	mg/l	--	--	0.01	0.47	0.01	1	1.52	1.94
Chemical Oxygen Demand	mg/l	--	--	39	19	372	--	47	45
Chloride	mg/l	--	250	18.7	12.9	30	50.7	18.8	45.8
Conductivity (Field)	uS/cm	--	--	1230	1000	1500	1400	1050	1400
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	710	481	814	703	507	618
Nitrate as N	mg/l	10.0	--	--	0.1	0.1	0.1	0.1	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	1.24	--	--	3.35	2.08	2.6
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	6.9	6.7	6.57	6.7	6.31
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.67	0.38	0.28
Sulphate	mg/l	--	500 [6]	460	110	240	184	315	208
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	615	500	750	870	830	868
Total Organic Carbon	mg/l	--	--	14	9.5	122	--	14.8	23
Total Suspended Solids	mg/l	--	--	--	128	428	1800	170	204
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.09	0.45	0.27	0.21	0.21	0.4
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	188	130	178	143	115	139
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	7.93	3.91	52.7	12.6	16	32.7
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	0.0002	0.0012	0.0002	--
Magnesium, dissolved	mg/l	--	--	57.6	37.4	88.5	84.1	53.5	65.9
Manganese, dissolved	mg/l	--	0.05	0.83	0.85	4.48	4.53	1.88	2.35
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	1.1	4.2	0.4	6.5	1.5	2.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	27.1	53.6	60	74.9	50	94.7
Zinc, dissolved	mg/l	--	5	0.02	0.47	0.03	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.006	0.073	0.001

WCC - Navan Waste Recycling and Disposal Facility
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-8 23-May-2002	92-8 06-Nov-2002 [3]	92-8 30-May-2003	92-8 09-Oct-2003 [3]	92-8 14-May-2004	92-8 19-Nov-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	401	--	641	--	772	750
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	329	--	525	--	633	615
Ammonia Nitrogen	mg/l	--	--	1.16	--	1.12	--	0.83	0.94
Chemical Oxygen Demand	mg/l	--	--	37	--	74	--	55	50
Chloride	mg/l	--	250	51.8	--	24.4	--	67.7	28
Conductivity (Field)	uS/cm	--	--	980	--	1150	--	1600	1750
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	486	--	468	--	781	778
Nitrate as N	mg/l	10.0	--	0.1	--	0.2	--	0.2	1
Nitrogen, Total Kjeldahl	mg/l	--	--	1.95	--	3.63	--	1.81	1.76
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.82	--	6.4	--	6.9	6.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.3	--	0.41	--	0.31	0.24
Sulphate	mg/l	--	500 [6]	208	--	197	--	269	290
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	736	--	--	--	800	875
Total Organic Carbon	mg/l	--	--	13	--	13.8	--	10.6	10.7
Total Suspended Solids	mg/l	--	--	184	--	200	--	112	100
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	--	0.001	--	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.21	--	0.25	--	0.484	0.446
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	119	--	117	--	178	189
Chromium, dissolved	mg/l	0.05	--	0.01	--	0.01	--	0.001	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	--	0.01	--	0.002	0.002
Iron, dissolved	mg/l	--	0.3	8.87	--	3.92	--	9.73	6.9
Lead, dissolved	mg/l	0.01	--	0.0002	--	0.0002	--	0.0011	0.0002
Magnesium, dissolved	mg/l	--	--	45.8	--	42.7	--	81.9	74.4
Manganese, dissolved	mg/l	--	0.05	1.5	--	1	--	2.2	2.76
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	--	0.02	--	0.01	0.01
Potassium, dissolved	mg/l	--	--	5.2	--	6	--	6.4	6.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	56.7	--	107	--	109	71.9
Zinc, dissolved	mg/l	--	5	0.02	--	0.01	--	0.005	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	0.001	--	0.001	0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-8 24-May-2005	92-8 16-Nov-2005 [3]	92-8 25-May-2006	92-8 19-Dec-2008
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	714	--	685	1540
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	585	--	685	1540
Ammonia Nitrogen	mg/l	--	--	0.76	--	1.03	0.35
Chemical Oxygen Demand	mg/l	--	--	35	--	42	214
Chloride	mg/l	--	250	23.3	--	15.2	280
Conductivity (Field)	uS/cm	--	--	1800	--	1200	3100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	757	--	696	1310
Nitrate as N	mg/l	10.0	--	0.1	--	<0.1	0.2
Nitrogen, Total Kjeldahl	mg/l	--	--	1.43	--	1.81	4.19
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH (Field)	-	--	--	6.6	--	6.9	6.6
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.24	--	--	--
Sulphate	mg/l	--	500 [6]	260	--	208	34
Temperature (Field)	deg c	--	15	9.4	--	5	4
Total Dissolved Solids	mg/l	--	500	980	--	964	2050
Total Organic Carbon	mg/l	--	--	12	--	--	--
Total Suspended Solids	mg/l	--	--	80	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.001	--	<0.001	0.0048
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.382	--	0.284	9.88
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	<0.005	<0.00002
Calcium, dissolved	mg/l	--	--	177	--	166	307
Chromium, dissolved	mg/l	0.05	--	<0.002	--	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	--	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	18.2	--	35.1	0.873
Lead, dissolved	mg/l	0.01	--	0.0007	--	<0.0002	<0.00002
Magnesium, dissolved	mg/l	--	--	76.9	--	68	133
Manganese, dissolved	mg/l	--	0.05	2.16	--	2.28	5.08
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	5.5	--	5	8
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	74.7	--	57.2	353
Zinc, dissolved	mg/l	--	5	0.006	--	0.011	0.007
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	<0.001	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-8 24-May-2005	92-8 16-Nov-2005 [3]	92-8 25-May-2006	92-8 19-Dec-2008
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	<0.0002	--	--	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	0.001
Bromodichloromethane	mg/l	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	<0.0002	--	--	--
Chloroform	mg/l	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005
Styrene	mg/l	--	--	<0.0006	--	--	--
Tetrachloroethylene	mg/l	0.01	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-9 09-Jun-1992	92-9 01-Nov-1992	92-9 08-Jun-1993	92-9 04-Nov-1993	92-9 15-Jun-1994	92-9 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	849	931	910	921	--	853
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	696	763	746	755	764	710
Ammonia Nitrogen	mg/l	--	--	1.57	2.34	--	--	--	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	4.6	8.3	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	219	97.8	--	--	79	90
Chloride	mg/l	--	250	820	1003	1005	1450	1290	882
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3813	3938	3580	3890	4170	3990
Dissolved Inorganic Carbon	mg/l	--	--	153.6	175.2	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	5.59
Hardness, Calcium Carbonate	mg/l	--	--	258	238	213	224	280	269
Nitrate as N	mg/l	10.0	--	0.54	0.24	0.3	9.1	1.3	1.51
Nitrite as N	mg/l	1.0	--	0.1	0.17	0.1	0.12	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.64	8.12	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.07	5.78	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.18	8.1	7.65	8.07	7.73	7.99
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.57	0.71	--	--	1	0.626
Sulphate	mg/l	--	500 [6]	46	13	8.5	13	18	21.4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2168	2164	2248	2290	2100	2000
Total Organic Carbon	mg/l	--	--	25.2	23.9	--	--	21.7	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.25	0.423	0.01	--	0.148
Arsenic, dissolved	mg/l	0.01	--	0.001	0.004	--	--	--	**0.1**
Barium, dissolved	mg/l	1	--	0.05	0.11	--	--	--	0.037
Boron, dissolved	mg/l	5	--	0.99	1.05	--	--	0.97	0.92
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**
Calcium, dissolved	mg/l	--	--	30.15	26.3	23.6	25.9	35.1	23.15
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.014	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.01	0.01	0.0186	0.01
Iron, dissolved	mg/l	--	0.3	0.4	0.13	0.249	0.1	0.243	0.223
Lead, dissolved	mg/l	0.01	--	**0.1**	**0.17**	**0.1**	**0.105**	0.0015	**0.1**
Magnesium, dissolved	mg/l	--	--	44.39	41.8	37.5	38.7	46.7	20.626
Manganese, dissolved	mg/l	--	0.05	0.13	0.05	0.057	0.053	0.06	0.044
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.023	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	22.56	28.8	30.8	26.4	34.7	17.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	690.1	931	762	819	689	716.5
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.042	0.01	0.01	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.014	0.002	0.002	0.002	0.114	0.001

Report of Monitoring Results - Groundwater
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-9 28-Jun-1995	92-9 22-Nov-1995	92-9 12-Oct-1996	92-9 06-Nov-1997	92-9 05-Jun-1998	92-9 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	883	880	--	--	--	961
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	8	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	724	734	748	780	790	788
Ammonia Nitrogen	mg/l	--	--	0.97	0.51	1.41	1.04	1.05	1.24
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	65	60	5	56	37	70
Chloride	mg/l	--	250	875	838	858	840	1110	980
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4130	4260	--	3900	4220	3970
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.86	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	220	194	225	228	222	230
Nitrate as N	mg/l	10.0	--	0.1	1.7	0.7	0.1	1.9	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	5	2.45	--	--	--	3.07
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	4.03	1.94	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.63	8.12	--	6.95	--	7.9
Phosphate	mg/l	--	--	--	0.3	--	--	--	--
Phosphorus	mg/l	--	--	0.99	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	15	20	13	6	38	10
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2070	2140	--	1960	2100	1990
Total Organic Carbon	mg/l	--	--	25.2	16.9	17.9	19.6	18.3	23.5
Total Suspended Solids	mg/l	--	--	--	--	93	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.83	1.23	0.86	0.98	1.05	1.04
Cadmium, dissolved	mg/l	0.005	--	0.0005	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.2	24.3	25.7	20.1	24.4	26.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	0.18	0.94	0.69	0.4	0.44
Lead, dissolved	mg/l	0.01	--	0.0006	0.0002	0.0002	0.0002	0.0002	0.0004
Magnesium, dissolved	mg/l	--	--	37.2	31.8	38.5	42.6	38.6	39.4
Manganese, dissolved	mg/l	--	0.05	0.04	0.03	0.1	0.06	0.05	0.05
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	23.9	24.4	25.6	30.9	25.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	682	880	668	653	983	865
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.13	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-9 24-Oct-2000	92-9 14-Jun-2001	92-9 06-Nov-2002	92-9 30-May-2003	92-9 19-Nov-2004	92-9 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1050	781	910	886	1020	189
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	47	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	861	720	846	726	835	775
Ammonia Nitrogen	mg/l	--	--	1.33	1.59	1.86	0.62	1.74	1.82
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	52	70	57	66	50
Chloride	mg/l	--	250	950	883	844	904	929	857
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3660	3500	3990	1150	4050	2900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	229	214	219	197	208	215
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.2	0.3	1	0.8
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.22	2.85	3.02	1.99	2.76	2.95
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.03	7.9	7.7	6.4	7.9	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.04	0.68	0.71	0.81	0.85	0.97
Sulphate	mg/l	--	500 [6]	2	8	6	5	10	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	12.8
Total Dissolved Solids	mg/l	--	500	2400	2000	2220	575	2025	2230
Total Organic Carbon	mg/l	--	--	--	16.7	19	16.6	17.8	21.6
Total Suspended Solids	mg/l	--	--	182	70	47	25	122	25
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.001	0.002	0.003	0.002	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.97	1.04	0.98	0.93	1.02	1.01
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0003
Calcium, dissolved	mg/l	--	--	23.7	27.8	26.1	24.5	25.6	26.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.2	0.05	0.03	0.46	0.279	0.473
Lead, dissolved	mg/l	0.01	--	0.022	0.0002	0.0028	0.0007	0.002	0.001
Magnesium, dissolved	mg/l	--	--	41.3	35.2	37.3	32.9	35.1	36
Manganese, dissolved	mg/l	--	0.05	0.04	0.03	0.03	0.05	0.046	0.061
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	24.1	20.6	24.8	24	26	28
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	796	768	840	688	744	832
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.003	0.102	0.001	0.001	0.001	<0.001

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Report of Monitoring Results - Groundwater
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-9	92-9	92-9	92-9	92-9	92-9
				15-May-2007	10-Nov-2008	26-Nov-2009	24-May-2011 [4]	28-Nov-2012	29-May-2014
						J-22	G-17	92-9	92-9
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	800	765	760	754	710	710
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [8]	21	7.7	16
Alkalinity (Total as CaCO3)	mg/l	--	--	800	765	760	776	720	730
Ammonia Nitrogen	mg/l	--	--	1.78	2.01	1.59	1.78	2.0	1.8
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	82	72	60	58	63	54
Chloride	mg/l	--	250	923	1010	852	834	790	850
Conductivity	uS/cm	--	--	--	--	3960	4100	--	--
Conductivity (Field)	uS/cm	--	--	2800	3300	3421	3488	3281	3349
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	195	196	159	200	200	210
Nitrate as N	mg/l	10.0	--	0.2	<0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	0.151
Nitrogen, Total Kjeldahl	mg/l	--	--	3.16	3.24	2.41	3.26	3.0	2.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	0.16
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.23	8.48	--	8.37
pH (Field)	-	--	--	8.2	7.8	7.79	7.92	8.08	7.63
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.94	1.01	1.0	0.79
Sulphate	mg/l	--	500 [6]	1	<1	4	<1	<1	<1
Temperature (Field)	deg c	--	15	9.8	7	10.5	14.4	8.1	12.5
Total Dissolved Solids	mg/l	--	500	2220	2270	2570	2660	2120	2120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0058	0.0063	0.008	<0.01	0.001	0.0031
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.893	0.935	0.93	0.79	1.1	1
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	24.7	24.5	19	24	25	26
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.007	<0.005	0.0007	0.0007	0.0006	0.00063
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.001	<0.001	<0.001	0.0021
Iron, dissolved	mg/l	--	0.3	0.047	0.035	0.79	0.32	<0.1	0.31
Lead, dissolved	mg/l	0.01	--	0.00005	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	32.3	32.8	27	34	35	36
Manganese, dissolved	mg/l	--	0.05	0.027	0.061	0.06	0.07	0.13	0.033
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	26.1	25.1	21	24	23	23
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	729	721	726	810	780	670
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01	<0.01	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00050	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00050	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0025	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-9 26-Nov-2015	92-9 24-May-2017	92-9 22-Nov-2018
				92-9	92-9	92-9
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	772	785	838
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	13	16
Alkalinity (Total as CaCO3)	mg/l	--	--	784	798	854
Ammonia Nitrogen	mg/l	--	--	2.25	0.02	2.37
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	221	96	74
Chloride	mg/l	--	250	855	813	853
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3698	3695	3439
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	164	190	255
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [9]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.4	1.4	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.03	8.06	7.85
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.99	0.85	0.99
Sulphate	mg/l	--	500 [6]	<1	1	<1
Temperature (Field)	deg c	--	15	9.6	11.6	9.4
Total Dissolved Solids	mg/l	--	500	2100	2080	2120
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Aluminum, dissolved	mg/l	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.005	0.002
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.926	0.804	0.949
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	22.7	24	33.9
Chromium, dissolved	mg/l	0.05	--	<0.001	0.029	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0005	0.0009
Copper, dissolved	mg/l	--	1	<0.0005	0.0015	0.0027
Iron, dissolved	mg/l	--	0.3	0.507	<0.1	0.499
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	26	31.5	41.3
Manganese, dissolved	mg/l	--	0.05	0.069	0.035	0.079
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	19.4	24.4	27.1
Selenium, dissolved	mg/l	0.05	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	835	795	855
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [11]	<0.002 [10]	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 09-Jun-1992	92-10 01-Nov-1992	92-10 08-Jun-1993	92-10 04-Nov-1993	92-10 15-Jun-1994	92-10 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1078	980	937	939	--	907
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	884	803	768	770	760	756
Ammonia Nitrogen	mg/l	--	--	0.74	0.48	--	--	--	0.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	1.4	2.5	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	187	64.5	--	--	54	93
Chloride	mg/l	--	250	221	260	170	289	600	177
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2250	2100	1820	2100	2110	2070
Dissolved Inorganic Carbon	mg/l	--	--	201.6	224.4	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	8.12
Hardness, Calcium Carbonate	mg/l	--	--	793.65	515	589	600	621	615
Nitrate as N	mg/l	10.0	--	0.24	0.24	0.3	2.39	0.1	0.42
Nitrite as N	mg/l	1.0	--	0.1	0.1	0.1	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.68	1.21	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.94	0.73	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.88	7.89	6.85	7.34	6.92	7.27
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.28	0.86	--	--	1.45	0.362
Sulphate	mg/l	--	500 [6]	95	95	103	116	98	110
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1492	1268	1220	1180	1070	1040
Total Organic Carbon	mg/l	--	--	27.7	22.4	--	--	15.6	19
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.21	0.152	0.044	--	0.069
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	--	--	--	**0.1**
Barium, dissolved	mg/l	1	--	0.07	0.14	--	--	--	0.052
Boron, dissolved	mg/l	5	--	1.1	1.31	--	--	1.18	1.517
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**
Calcium, dissolved	mg/l	--	--	132.9	37.9	89.2	99.7	97	92.06
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.03	0.01	0.0142	0.01
Iron, dissolved	mg/l	--	0.3	0.66	0.3	0.341	0.1	0.431	0.366
Lead, dissolved	mg/l	0.01	--	**0.1**	**0.05**	**0.1**	**0.0235**	0.0007	**0.1**
Magnesium, dissolved	mg/l	--	--	112.1	102	88.9	85.1	91.9	71.786
Manganese, dissolved	mg/l	--	0.05	1.45	0.92	0.97	0.787	0.558	1.039
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.028	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	13.03	18.1	16.1	18.9	18.4	12.13
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	211.2	260	227	289	200	228.9
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.101	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.006	0.002	0.002	0.002	0.223	0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 28-Jun-1995	92-10 22-Nov-1995	92-10 12-Jun-1996	92-10 12-Oct-1996	92-10 18-Jun-1997	92-10 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	915	969	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	750	794	783	752	749	630
Ammonia Nitrogen	mg/l	--	--	0.16	0.1	0.24	0.62	0.1	0.34
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	60	40	29	5	27	29
Chloride	mg/l	--	250	120	125	145	142	139	174
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1950	2040	1830	1790	1850	1900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.44	--	--	--	3.31	--
Hardness, Calcium Carbonate	mg/l	--	--	619	229	631	551	735	638
Nitrate as N	mg/l	10.0	--	1.7	0.5	0.6	0.6	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4	1.3	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	3.84	1.2	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	8.09	7.12	6.86	7.24	6.28
Phosphate	mg/l	--	--	--	0.1	--	--	--	--
Phosphorus	mg/l	--	--	1.84	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	15	101	128	120	140	136
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	980	1020	920	900	920	980
Total Organic Carbon	mg/l	--	--	14.3	12.9	13.2	12.8	12	12.1
Total Suspended Solids	mg/l	--	--	--	--	380	1290	2170	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.49	0.76	1.47	1.62	1.88	1.59
Cadmium, dissolved	mg/l	0.005	--	0.0011	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	107	25.4	106	92.2	142	120
Chromium, dissolved	mg/l	0.05	--	0.02	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	0.2	0.665	0.78	2.12	0.93
Lead, dissolved	mg/l	0.01	--	0.0017	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	84.4	39.6	87.7	76.9	91.1	81
Manganese, dissolved	mg/l	--	0.05	0.52	0.56	0.745	0.68	1.06	0.64
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	26	17.4	15.3	10.4	15.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	195	738	214	214	184	213
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 05-Jun-1998	92-10 30-Oct-1998	92-10 06-May-1999	92-10 19-Oct-1999	92-10 06-May-2000	92-10 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	810	773	732	833	732
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	656	664	634	600	683	600
Ammonia Nitrogen	mg/l	--	--	0.41	0.49	0.47	0.35	0.01	0.23
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	44	13	26	6	11	--
Chloride	mg/l	--	250	214	190	210	156	59.2	232
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1970	1860	1780	1600	1500	1590
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	528	504	477	384	358	394
Nitrate as N	mg/l	10.0	--	1.3	--	--	0.8	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	1.3	1.39	--	--	1.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.1	7.3	7.6	7.4	7.36
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.73
Sulphate	mg/l	--	500 [6]	132	122	105	100	82	66
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	980	920	890	800	750	1030
Total Organic Carbon	mg/l	--	--	13.2	14.6	12.4	9.4	8.4	--
Total Suspended Solids	mg/l	--	--	--	--	--	1380	210	852
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.5	1.27	1.3	1.33	1.05	1.08
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	87.5	77.1	82.1	65.4	58.3	58.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.17	1.71	1.08	2.54	1.86	0.38
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0004	0.0002	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	74.3	75.8	65.1	52.8	51	60.3
Manganese, dissolved	mg/l	--	0.05	0.92	0.81	0.64	0.47	0.59	0.41
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	17.5	19.7	12.6	15.7	5.9	12.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	280	247	217	285	250	235
Zinc, dissolved	mg/l	--	5	0.12	0.01	0.01	0.1	0.17	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 14-Jun-2001	92-10 23-Nov-2001	92-10 23-May-2002	92-10 06-Nov-2002	92-10 30-May-2003	92-10 09-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	620	588	638	659	684	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	4	12	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	518	482	543	540	561	570
Ammonia Nitrogen	mg/l	--	--	0.34	0.33	0.25	0.26	0.26	0.54
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	2
Chemical Oxygen Demand	mg/l	--	--	10	21	12	19	16	68
Chloride	mg/l	--	250	128	194	141	116	158	195
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1200	1270	1590	1550	1560	1640
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	127
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	413	408	445	361	395	350
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.2	0.4	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.85	1.57	0.46	0.77	0.88	1.07
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.3	6.4	6.92	7.2	6.7	7.3
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.49	1.36	0.21	0.34	0.5	0.53
Sulphate	mg/l	--	500 [6]	60	58	104	96	89	68
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	796	912	824	810	780	992
Total Organic Carbon	mg/l	--	--	8.3	14	8	7.3	7.7	14
Total Suspended Solids	mg/l	--	--	360	832	190	460	256	280
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.13	1.35	1.06	0.97	0.94	0.845
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	75.6	65.9	77.4	60	69.1	58.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002
Iron, dissolved	mg/l	--	0.3	0.18	0.03	0.56	0.76	0.7	0.598
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0005
Magnesium, dissolved	mg/l	--	--	54.4	59.2	61.2	51.4	53.9	49.7
Manganese, dissolved	mg/l	--	0.05	0.26	0.46	0.23	0.39	0.27	0.356
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	7.9	11.3	13.2	14.8	13.5	14.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	164	206	167	221	196	264
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.01	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.037	0.001	0.001	0.001	0.001	0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 14-May-2004	92-10 19-Nov-2004	92-10 24-May-2005	92-10 16-Nov-2005	92-10 25-May-2006	92-10 21-Nov-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	688	732	702	148	590	624
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	564	600	575	605	590	624
Ammonia Nitrogen	mg/l	--	--	0.25	0.32	0.58	0.05	0.06	0.25
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	26	23	19	15	7	11
Chloride	mg/l	--	250	186	147	168	172	160	126
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1650	1670	2000	1600	1400	1500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	338	459	410	501	490	471
Nitrate as N	mg/l	10.0	--	0.3	<1	0.3	0.3	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.96	0.74	1.16	0.49	0.55	0.64
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.4	7.3	6.6	--	7.3	6.7
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.47	0.2	0.65	0.26	--	--
Sulphate	mg/l	--	500 [6]	83	110	156	124	176	178
Temperature (Field)	deg c	--	15	--	--	9.8	12.6	5	10.5
Total Dissolved Solids	mg/l	--	500	825	835	1080	1030	1020	1060
Total Organic Carbon	mg/l	--	--	7.4	7	8	9.2	--	--
Total Suspended Solids	mg/l	--	--	136	526	3220	139	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.002	<0.001	0.0011
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.826	1.1	0.879	1.08	0.873	0.986
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.005	<0.0001
Calcium, dissolved	mg/l	--	--	56.5	81.3	67.3	90.2	87.6	83.2
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.002	0.004	0.009	0.002
Iron, dissolved	mg/l	--	0.3	0.526	0.479	0.379	0.057	0.029	0.531
Lead, dissolved	mg/l	0.01	--	0.0003	0.0005	0.0006	<0.0002	0.0003	<0.0001
Magnesium, dissolved	mg/l	--	--	48	62.2	58.7	67.1	65.9	64
Manganese, dissolved	mg/l	--	0.05	0.284	0.237	0.432	0.169	0.464	1.31
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	15.8	14.9	17.2	17.2	13.6	15.7
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	<0.001	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	294	185	286	214	175	215
Zinc, dissolved	mg/l	--	5	0.005	0.005	<0.005	0.011	0.007	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.002	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 14-May-2004	92-10 19-Nov-2004	92-10 24-May-2005	92-10 16-Nov-2005	92-10 25-May-2006	92-10 21-Nov-2006
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 15-May-2007	92-10 30-Nov-2007	92-10 22-May-2008	92-10 10-Nov-2008	92-10 19-May-2009 G-7	92-10 26-Nov-2009 J-18
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	612	595	550	720	949 [8]	784
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	612	595	550	720	949	784
Ammonia Nitrogen	mg/l	--	--	0.15	0.54	0.18	0.55	0.43	0.49
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	59	19	38	65	53
Chloride	mg/l	--	250	171	190	191	192	150	229
Conductivity	uS/cm	--	--	--	--	--	--	2240	2180
Conductivity (Field)	uS/cm	--	--	1300	1400	1500	1700	1700	1911
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	442	420	402	460	871	463
Nitrate as N	mg/l	10.0	--	0.3	0.1	0.2	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.66	1	0.87	1.22	1.49	0.94
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.16	7.86
pH (Field)	-	--	--	7.7	8	7.3	7.1	--	6.95
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.06	0.68
Sulphate	mg/l	--	500 [6]	155	122	131	124	139	92
Temperature (Field)	deg c	--	15	10.5	9	10.5	10	10	10.9
Total Dissolved Solids	mg/l	--	500	1080	1090	1050	1160	1460	1420
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0011	0.002	0.0014	0.0016	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.869	0.85	0.778	0.949	3.96	1.3
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	77.8	73.2	70.2	82.2	189	80
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.005	0.006
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0028	0.0004
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	0.003	0.001
Iron, dissolved	mg/l	--	0.3	0.201	1.38	0.479	0.466	1.91	4.74
Lead, dissolved	mg/l	0.01	--	0.00004	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	60.3	57.7	55.2	61.9	97	64
Manganese, dissolved	mg/l	--	0.05	0.133	0.994	4.32	3	2.91	1.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.7	15.8	14.2	16	9	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	236	276	257	245	151	272
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 15-May-2007	92-10 30-Nov-2007	92-10 22-May-2008	92-10 10-Nov-2008	92-10 19-May-2009 G-7	92-10 26-Nov-2009 J-18
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 25-May-2010 [4] M-10	92-10 20-Oct-2010 [4] G-7	92-10 24-May-2011 G-22	92-10 29-Nov-2011 [4] 92-10	92-10 31-May-2012 92-10	92-10 28-Nov-2012 92-10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	728	720	688	688	660	650
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	5.7	5.8
Alkalinity (Total as CaCO3)	mg/l	--	--	728	720	688	688	660	660
Ammonia Nitrogen	mg/l	--	--	0.45	0.52	0.30	0.63	0.46	0.83
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	43	38	45	36	40
Chloride	mg/l	--	250	199	195	187	193	210	210
Conductivity	uS/cm	--	--	2080	2000	1940	2010	--	--
Conductivity (Field)	uS/cm	--	--	2051	1991	1865	1529	1723	1807
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	548	540	457	477	440	440
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.14	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.013	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.75	1.64	0.74	0.78	1.3	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	7.97	7.63	8.20	8.14	7.97	--
pH (Field)	-	--	--	7.33	7.17	7.30	7.36	7.30	7.40
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.39	0.41	0.42	0.40	0.28	0.48
Sulphate	mg/l	--	500 [6]	96	98	103	78	69	58
Temperature (Field)	deg c	--	15	15.3	10.7	12.6	8.8	10.0	9.4
Total Dissolved Solids	mg/l	--	500	1350	1300	1260	1310	1140	1180
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.001	<0.01	<0.0010	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.6	1.5	1.0	1.4	1	1.1
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	94	96	76	84	71	70
Chromium, dissolved	mg/l	0.05	--	0.006	0.006	<0.005	0.007	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0006	0.0006	0.0005	0.0004	0.00054	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.001	0.005	0.002	0.0021	0.001
Iron, dissolved	mg/l	--	0.3	0.38	5.89	<0.03	0.55	0.18	1.9
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	76	73	65	65	63	64
Manganese, dissolved	mg/l	--	0.05	0.82	1.77	0.62	1.98	0.84	0.99
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17	15	16	16	16	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	231	251	247	243	300	280
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	0.01	<0.01	<0.0050	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

WCC - Navan Waste Recycling and Disposal Facility
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Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 25-May-2010 [4] M-10	92-10 20-Oct-2010 [4] G-7	92-10 24-May-2011 G-22	92-10 29-Nov-2011 [4] 92-10	92-10 31-May-2012 92-10	92-10 28-Nov-2012 92-10
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.00050

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 29-May-2013 [5]	92-10 26-Nov-2013 [5]	92-10 29-May-2014	92-10 19-Nov-2014	92-10 02-Jun-2015	92-10 26-Nov-2015
				92-10	GW-24	92-10	92-10	92-10	92-10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	620	650	640	630	660	589
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.7	4.7	7.8	4.3	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	630	650	640	640	664	591
Ammonia Nitrogen	mg/l	--	--	0.57	0.62	0.52	0.59	0.09	0.75
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	36	25	29	72	116
Chloride	mg/l	--	250	180	170	230	200	218	128
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1462	1543	1706	1761	1803	1489
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	390	400	390	420	339	382
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	0.2
Nitrite as N	mg/l	1.0	--	0.037	<0.010	<0.010	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.1	1.5	1.7	1.1	0.6	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	7.90	7.89	8.11	7.86	--	--
pH (Field)	-	--	--	6.87	6.92	7.07	7.34	7.54	7.31
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.40	0.43	0.42	0.14	2.10
Sulphate	mg/l	--	500 [6]	74	77	55	67	68	112
Temperature (Field)	deg c	--	15	9.8	10.0	11.0	8.9	9.1	10.4
Total Dissolved Solids	mg/l	--	500	1110	1060	1090	1040	1140	914
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.91	0.96	0.9	0.95	0.694	0.772
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	66	68	64	72	39.9	49.5
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	0.0026	0.0033	0.0032	<0.0005	0.0012
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.29	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	56	56	56	58	58	62.7
Manganese, dissolved	mg/l	--	0.05	0.74	0.33	0.48	0.26	<0.005	0.011
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16	15	16	15	12.4	12.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	310	220	310	270	274	317
Zinc, dissolved	mg/l	--	5	<0.0050	0.0059	0.018	<0.0050	0.008	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001

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Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 29-May-2013 [5]	92-10 26-Nov-2013 [5]	92-10 29-May-2014	92-10 19-Nov-2014	92-10 02-Jun-2015	92-10 26-Nov-2015
				92-10	GW-24	92-10	92-10	92-10	92-10
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005

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Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 26-May-2016	92-10 17-Nov-2016	92-10 24-May-2017	92-10 29-Nov-2017	92-10 24-May-2018	92-10 22-Nov-2018
				92-10	92-10	92-10	92-10	92-10	92-10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	660	662	678	661	725	808
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	664	665	682	666	729	811
Ammonia Nitrogen	mg/l	--	--	0.16	0.62	0.03	0.49	0.35	0.62
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	76	78	39	34	67	77
Chloride	mg/l	--	250	210	201	194	218	180	200
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1732	1849	1760	1576	1827	1777
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	390	399	374	376	434	552
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.8	1.0	0.5	0.9	1.4	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.42	7.09	7.45	7.29	7.23	7.18
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.60	0.57	0.14	0.45	0.87	0.93
Sulphate	mg/l	--	500 [6]	82	82	74	80	76	70
Temperature (Field)	deg c	--	15	12.5	11.0	11.0	8.7	11.1	10.4
Total Dissolved Solids	mg/l	--	500	1080	1020	1010	970	1080	1010
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.881	1.14	0.805	0.856	0.888	1.03
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	66.1	69.1	68.4	63.8	77	93.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.007	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.0028	0.0027	0.0028	0.0018	0.0028	0.0044
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.362	<0.1	0.824
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	54.7	55	49.4	52.7	58.8	77.4
Manganese, dissolved	mg/l	--	0.05	<0.005	1.28	<0.005	0.333	0.006	0.785
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.5	14.4	13.9	14.3	14.5	18.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	246	261	261	224	236	283
Zinc, dissolved	mg/l	--	5	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	0.002	<0.001	<0.001	0.003

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 26-May-2016 92-10	92-10 17-Nov-2016 92-10	92-10 24-May-2017 92-10	92-10 29-Nov-2017 92-10	92-10 24-May-2018 92-10	92-10 22-Nov-2018 92-10
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 19-Jun-2019	92-10 20-Nov-2019
				92-10	92-10
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	827	774
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	832	779
Ammonia Nitrogen	mg/l	--	--	0.24	0.58
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	84	86
Chloride	mg/l	--	250	227	226
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1925	2040
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	589	588
Nitrate as N	mg/l	10.0	--	<0.1	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.26	7.18
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	0.15	0.66
Sulphate	mg/l	--	500 [6]	60	57
Temperature (Field)	deg c	--	15	12.2	9.6
Total Dissolved Solids	mg/l	--	500	1240	1160
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Aluminum, dissolved	mg/l	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--
Boron, dissolved	mg/l	5	--	1.09	0.903
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	103	101
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.0053	0.0023
Iron, dissolved	mg/l	--	0.3	<0.1	0.66
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	80.7	81.5
Manganese, dissolved	mg/l	--	0.05	0.876	1.2
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	19.6	21.6
Selenium, dissolved	mg/l	0.05	--	--	--
Silver, dissolved	mg/l	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	272	290
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-10 19-Jun-2019	92-10 20-Nov-2019
				92-10	92-10
VOCs					
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--
Bromoform	mg/l	--	--	--	--
Bromomethane	mg/l	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--
Chloroform	mg/l	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-11 09-Jun-1992	92-11 01-Nov-1992	92-11 15-Jun-1994	92-11 02-Nov-1994	92-11 28-Jun-1995	92-11 22-Nov-1995
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	795	705	--	907	754	664
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	652	578	796	756	618	544
Ammonia Nitrogen	mg/l	--	--	--	--	--	3.65	4.3	0.46
Chemical Oxygen Demand	mg/l	--	--	--	--	87	128	113	65
Chloride	mg/l	--	250	145	93	79	35	139	55
Conductivity (Field)	uS/cm	--	--	2014	1937	1990	2020	1620	1890
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	10.47	7	--
Hardness, Calcium Carbonate	mg/l	--	--	647.71	662	740	869	679	658
Nitrate as N	mg/l	10.0	--	--	--	1.56	5.92	0.1	1.7
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	20.3	2.5
Nitrogen, Organic	mg/l	--	--	--	--	--	--	16	2.04
pH (Field)	-	--	--	7.76	7.13	6.68	7.34	7.03	7.52
Phosphate	mg/l	--	--	--	--	--	--	--	0.5
Phosphorus	mg/l	--	--	--	--	0.54	0.376	14.4	--
Sulphate	mg/l	--	500 [6]	204	423.5	189	229	99	362
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1000	1010	820	940
Total Organic Carbon	mg/l	--	--	--	--	22.4	25.5	37.7	15.8
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.116	--	--
Boron, dissolved	mg/l	5	--	--	--	2.74	2.339	1.92	1.31
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	0.0001
Calcium, dissolved	mg/l	--	--	179.4	188	202	234.6	194	225
Chromium, dissolved	mg/l	0.05	--	--	--	--	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0212	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.702	0.526	0.04	0.14
Lead, dissolved	mg/l	0.01	--	--	--	0.0003	0.1	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	48.4	46.7	57.2	42.426	46.5	50.8
Manganese, dissolved	mg/l	--	0.05	--	--	2.892	3.357	2.82	0.66
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.06
Potassium, dissolved	mg/l	--	--	28.2	19	31.8	22.39	--	23.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	189.9	199	110	92.17	92.5	125
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.134	0.002	0.001	--

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-11 12-Jun-1996	92-11 12-Oct-1996	92-11 18-Jun-1997	92-11 06-Nov-1997	92-11 05-Jun-1998	92-11 30-Oct-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	420
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	605	603	604	390	512	344
Ammonia Nitrogen	mg/l	--	--	2.5	1.07	0.16	0.04	0.14	0.13
Chemical Oxygen Demand	mg/l	--	--	45	33	41	30	41	12
Chloride	mg/l	--	250	34	43.3	88.5	109	85.4	19.9
Conductivity (Field)	uS/cm	--	--	1690	1640	1620	1770	1518	940
Dissolved Oxygen (Field)	mg/l	--	--	--	--	6.17	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	886	753	793	759	695	500
Nitrate as N	mg/l	10.0	--	1.5	1.1	0.1	1	1.6	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	0.73
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.85	6.81	7.05	6.27	--	6.7
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	320	352	273	398	283	183
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	850	820	810	930	760	470
Total Organic Carbon	mg/l	--	--	18.5	16.8	16.1	12.9	12.6	12.7
Total Suspended Solids	mg/l	--	--	481	323	3460	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.54	1.85	1.96	1.28	1.45	1.25
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	236	204	199	204	172	140
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.89	0.88	0.94	0.16	0.18	1.13
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	71	58.3	70.9	59.8	63.7	36.4
Manganese, dissolved	mg/l	--	0.05	2.23	2.45	2.44	0.1	1.04	1.05
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	20.8	20.2	15.1	15.3	11.2	16.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	110	110	106	100	118	40
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.36	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-11 06-May-1999	92-11 19-Oct-1999	92-11 05-May-2000	92-11 24-Oct-2000	92-11 14-Jun-2001	92-11 23-Nov-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	380	427	388	549	421	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	312	350	318	450	345	227
Ammonia Nitrogen	mg/l	--	--	0.01	0.06	0.01	0.07	0.01	0.01
Chemical Oxygen Demand	mg/l	--	--	7	10	18	--	7	15
Chloride	mg/l	--	250	10.2	9.5	9	41.5	22.5	51.7
Conductivity (Field)	uS/cm	--	--	860	740	700	1320	900	1300
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	473	385	354	577	535	696
Nitrate as N	mg/l	10.0	--	--	0.2	0.1	0.2	0.6	0.2
Nitrogen, Total Kjeldahl	mg/l	--	--	0.36	--	--	0.68	0.5	0.51
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.1	7.4	6.9	6.91	6.9	6.41
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.3	0.28	0.29
Sulphate	mg/l	--	500 [6]	185	110	91	263	179	395
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	430	370	350	884	632	952
Total Organic Carbon	mg/l	--	--	6.2	4.8	4.3	--	6.6	11
Total Suspended Solids	mg/l	--	--	--	123	170	346	218	326
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.48	0.89	0.5	0.9	0.39	0.53
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	130	100	104	152	160	190
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	0.16	0.1	0.16	0.02	0.03
Lead, dissolved	mg/l	0.01	--	0.0004	0.0002	0.0002	0.0022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	35.6	32.4	22.7	47.9	32.9	53.8
Manganese, dissolved	mg/l	--	0.05	0.1	0.03	0.02	0.16	0.01	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.03	0.02	0.02
Potassium, dissolved	mg/l	--	--	0.7	5.7	1.1	6.2	2.4	2.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	36.9	50	28	58.9	36.9	91.1
Zinc, dissolved	mg/l	--	5	0.01	0.27	0.22	0.03	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.026	0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-11 23-May-2002	92-11 06-Nov-2002	92-11 30-May-2003	92-11 09-Oct-2003 [3]	92-11 14-May-2004	92-11 19-Nov-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	410	659	780	--	651	802
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	1	1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	352	540	639	--	534	657
Ammonia Nitrogen	mg/l	--	--	0.13	0.04	0.09	--	0.04	0.5
Chemical Oxygen Demand	mg/l	--	--	3	29	14	--	24	45
Chloride	mg/l	--	250	52	66	80	--	95.2	34
Conductivity (Field)	uS/cm	--	--	1150	1630	1300	--	1980	1900
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	536	554	471	--	832	667
Nitrate as N	mg/l	10.0	--	3.1	0.2	0.4	--	0.3	1
Nitrogen, Total Kjeldahl	mg/l	--	--	0.62	0.54	0.65	--	0.5	1.47
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.96	6.6	6.5	--	7.2	6.9
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.24	0.05	0.21	--	0.14	0.15
Sulphate	mg/l	--	500 [6]	407	323	325	--	831	350
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	990	1100	650	--	990	950
Total Organic Carbon	mg/l	--	--	6	8.3	6.9	--	6.7	10.2
Total Suspended Solids	mg/l	--	--	306	137	15	--	52	118
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	--	0.001	0.008
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.73	0.99	0.7	--	0.606	0.833
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	138	178	133	--	219	171
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	--	0.001	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	--	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.21	--	0.015	21.4
Lead, dissolved	mg/l	0.01	--	0.0003	0.0007	0.0002	--	0.0002	0.0008
Magnesium, dissolved	mg/l	--	--	31.1	44.1	33.8	--	69.1	58.4
Manganese, dissolved	mg/l	--	0.05	0.01	0.02	0.01	--	0.002	8.21
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	--	0.01	0.01
Potassium, dissolved	mg/l	--	--	5.5	11.8	7.9	--	10.4	10.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	150	164	191	--	232	185
Zinc, dissolved	mg/l	--	5	0.01	0.02	0.01	--	0.005	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	--	0.001	0.001

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-11 24-May-2005	92-11 16-Nov-2005	92-11 25-May-2006	92-11 19-Dec-2008
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	799	176	595	1590
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	655	720	595	1590
Ammonia Nitrogen	mg/l	--	--	0.35	0.39	0.14	0.5
Chemical Oxygen Demand	mg/l	--	--	34	38	17	314
Chloride	mg/l	--	250	32.8	14.5	17.2	300
Conductivity (Field)	uS/cm	--	--	2150	1600	1300	2700
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	628	663	487	1230
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.3	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	1.31	1.4	0.61	5.76
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH (Field)	-	--	--	6.5	--	7.1	6.1
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.23	0.2	--	--
Sulphate	mg/l	--	500 [6]	370	220	410	92
Temperature (Field)	deg c	--	15	11.4	--	4	6
Total Dissolved Solids	mg/l	--	500	1210	1090	1110	2150
Total Organic Carbon	mg/l	--	--	6.6	9	--	--
Total Suspended Solids	mg/l	--	--	94	94	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	<0.001	0.0032
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.529	0.784	0.551	10.4
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00002
Calcium, dissolved	mg/l	--	--	159	173	119	298
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.01	<0.002
Iron, dissolved	mg/l	--	0.3	10.3	8.74	0.828	0.657
Lead, dissolved	mg/l	0.01	--	0.0006	0.0002	<0.0002	<0.00002
Magnesium, dissolved	mg/l	--	--	55.8	56.2	45.9	119
Manganese, dissolved	mg/l	--	0.05	3.08	2.92	1.62	3.39
Mercury, dissolved	mg/l	0.001	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	9.1	11.6	6.2	11.6
Selenium, dissolved	mg/l	0.05	--	0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [7]	181	186	157	373
Zinc, dissolved	mg/l	--	5	<0.005	0.008	<0.005	0.007
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.004	<0.001	<0.001	0.004

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	92-11 24-May-2005	92-11 16-Nov-2005	92-11 25-May-2006	92-11 19-Dec-2008
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	<0.0002	--	--	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	0.0009
Bromodichloromethane	mg/l	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	<0.0002	--	--	--
Chloroform	mg/l	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	0.0011
m,p-Xylenes	mg/l	--	--	<0.001	--	<0.001	0.0032
Methylene Chloride	mg/l	0.05	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	0.0009
Styrene	mg/l	--	--	<0.0006	--	--	--
Tetrachloroethylene	mg/l	0.01	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-1 09-Jan-1990	94-1 02-Mar-1990	94-1 28-Mar-1990	94-1 01-Aug-1990	94-1 06-Nov-1990	94-1 29-Nov-1991
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1210	1220	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	2256	1000	950	1014	1060
Ammonia Nitrogen	mg/l	--	--	0.64	--	--	2.2	1.8	0.5
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--
Chloride	mg/l	--	250	993	978	954	950	920	746
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2742	--	4352	4664	4368	7500
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	260	265	278	229	180	186
Nitrate as N	mg/l	10.0	--	18	59.6	19.5	3.83	1.88	--
Nitrite as N	mg/l	1.0	--	1.3	--	--	0.21	0.001	1.97
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.67	8.25	8.11	8.26	8.2	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	34	30.3	30	20	11	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	2256	2412	--	--	--
Total Organic Carbon	mg/l	--	--	35.5	--	--	27	22.3	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	0.58	--	--	0.1	--	0.5
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	30.3	31	34	27	21	21.8
Chromium, dissolved	mg/l	0.05	--	0.13	--	--	0.05	--	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	--	--	0.05	--	0.02
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--
Lead, dissolved	mg/l	0.01	--	0.58	--	--	0.05	--	0.001
Magnesium, dissolved	mg/l	--	--	44.9	50	52	39	31	32
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.04	--	--	0.05	--	0.07
Potassium, dissolved	mg/l	--	--	62.5	31	31	23	23	21
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	790	1357	995	1063	1157	717
Zinc, dissolved	mg/l	--	5	0.17	--	--	0.05	--	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	--	--	0.003	0.002	0.002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-1 09-Jun-1992	94-1 01-Nov-1992	94-1 08-Jun-1993	94-1 04-Nov-1993	94-1 15-Jun-1994	94-1 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1205	1561	1276	1300	--	1233
Alkalinity, Carbonate as CaCO3	mg/l	--	--	14.4	1	1	<1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1012	1280	1046	1063	1040	1030
Ammonia Nitrogen	mg/l	--	--	2.28	1.86	--	--	--	1.35
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	3	20.8	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	94	72.8	--	--	153	221
Chloride	mg/l	--	250	890	1018	1020	1250	1430	1040
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4685	4485	3760	4380	5340	5070
Cyanide	mg/l	0.2	--	**0.276**	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	213	250.3	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	6.06
Hardness, Calcium Carbonate	mg/l	--	--	202.56	198	200	237	293	278
Nitrate as N	mg/l	10.0	--	0.3	1.5	0.48	**10.8**	0.1	1.98
Nitrite as N	mg/l	1.0	--	0.1	0.18	0.1	0.14	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.36	4.01	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.08	2.15	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.37	7.99	7.82	8.18	7.96	8.19
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.36	1.1	--	--	2.63	1.1
Sulphate	mg/l	--	500 [6]	0.35	2	1.8	4.6	64	30.9
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2737	2915	2692	2640	2680	2550
Total Organic Carbon	mg/l	--	--	33.8	22.5	--	--	21.6	25
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.14	0.102	<0.01	--	0.01
Arsenic, dissolved	mg/l	0.01	--	0.001	0.003	--	--	--	**0.1**
Barium, dissolved	mg/l	1	--	0.04	0.1	--	--	--	0.057
Boron, dissolved	mg/l	5	--	1.42	1.34	--	--	1.37	1.143
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**
Calcium, dissolved	mg/l	--	--	20.6	22.1	22	29.3	40.4	22.63
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.01	<0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.01	<0.01	0.0225	0.01
Iron, dissolved	mg/l	--	0.3	0.2	0.1	0.1	<0.1	0.299	0.1
Lead, dissolved	mg/l	0.01	--	**0.1**	**0.09**	**0.1**	**0.13**	0.0018	**0.1**
Magnesium, dissolved	mg/l	--	--	36.7	34.6	35.2	39.7	46.6	19.606
Manganese, dissolved	mg/l	--	0.05	0.03	0.05	0.062	0.057	0.129	0.093
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.02	<0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	16.5	25.4	24	25	37.7	15.33
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1049	1110	984	1020	897	95.5
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.031	<0.01	0.01	0.011
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.002	0.002	0.002	0.01	0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-1 28-Jun-1995	94-1 23-Nov-1995	94-1 12-Oct-1996	94-1 06-Nov-1997	94-1 05-Jun-1998	94-1 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1268	1370	--	--	--	1430
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1040	1120	1140	1130	1020	1170
Ammonia Nitrogen	mg/l	--	--	1.47	0.6	2.31	1.34	1.03	1.34
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	100	65	43	36	55	35
Chloride	mg/l	--	250	1095	1070	928	1060	1130	1190
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5300	5520	5340	4980	5090	4950
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.13	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	191	212	215	211	208	226
Nitrate as N	mg/l	10.0	--	1.8	2.2	0.1	0.1	4.6	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.5	4.3	--	--	--	5.69
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.03	3.7	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.06	8.41	7.83	7.78	--	7.9
Phosphate	mg/l	--	--	--	0.5	--	--	--	--
Phosphorus	mg/l	--	--	2.41	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	23	20	10	3	41	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2570	2770	2680	2500	2550	2490
Total Organic Carbon	mg/l	--	--	20.3	17.9	16.4	17	16.2	23.5
Total Suspended Solids	mg/l	--	--	--	--	2310	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.04	1.03	1.15	1.18	1.36	1.37
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	23	24	24.5	24.7	23.2	28.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	1.14	1.43	0.83	3.19	0.02
Lead, dissolved	mg/l	0.01	--	0.001	0.0003	0.0002	0.0002	0.0012	0.0005
Magnesium, dissolved	mg/l	--	--	31.9	36.6	36.9	35.8	35.9	37.3
Manganese, dissolved	mg/l	--	0.05	0.06	0.02	0.1	0.08	0.11	0.08
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	28.9	28.1	25.4	30.8	26
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	864	949	1000	1010	1330	1150
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.13	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-1 24-Oct-2000	94-1 14-Jun-2001	94-1 06-Nov-2002	94-1 30-May-2003	94-1 19-Nov-2004	94-1 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1540	1100	1440	1310	1400	279
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	97	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1260	1060	1180	1070	1150	1150
Ammonia Nitrogen	mg/l	--	--	0.72	1.26	2.01	0.27	1.83	1.81
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	41	94	60	60	64
Chloride	mg/l	--	250	1200	1100	1080	1100	1140	997
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5210	4800	4860	4410	5320	1700
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	219	204	196	178	191	199
Nitrate as N	mg/l	10.0	--	1.5	0.3	0.2	1.2	1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.5	2.86	0.41	1.77	3.11	3.22
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.15	8	7.9	7.3	7.9	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.02	3.15	0.58	2.17	0.99	1.17
Sulphate	mg/l	--	500 [6]	7	4	4	3	10	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3200	2800	2910	2205	2660	2900
Total Organic Carbon	mg/l	--	--	--	15.1	15.3	14.6	15.6	19.4
Total Suspended Solids	mg/l	--	--	1410	2700	4730	2370	99	32
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.003	0.002	0.003	0.003	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.27	1.37	1.2	1.2	1.28	1.34
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0002
Calcium, dissolved	mg/l	--	--	22.9	26.5	24.5	22	23.9	24.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.37	0.13	0.02	0.26	0.071	0.345
Lead, dissolved	mg/l	0.01	--	0.022	0.0002	0.0094	0.0012	0.0009	0.0006
Magnesium, dissolved	mg/l	--	--	39.3	33.4	32.8	29.9	32	33.5
Manganese, dissolved	mg/l	--	0.05	0.08	0.06	0.08	0.06	0.059	0.084
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	26.7	21.4	24.6	25.2	28.1	30
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1110	1060	1120	921	1200	1150
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.01	0.005	0.006
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-1 15-May-2007	94-1 10-Nov-2008	94-1 26-Nov-2009 [21] M-1	94-1 24-May-2011 [4] G-35	94-1 28-Nov-2012 94-1	94-1 29-May-2014 94-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1120	1090	1100	1080	1100	1100
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	23	39	20	38
Alkalinity (Total as CaCO3)	mg/l	--	--	1120	1090	1120	1120	1100	1100
Ammonia Nitrogen	mg/l	--	--	0.76	0.58	2.49	2.50	2.6	2.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	151	72	110	65	65	59
Chloride	mg/l	--	250	1050	1100	1090	1010	1000	1100
Conductivity	uS/cm	--	--	--	--	5220	5250	--	--
Conductivity (Field)	uS/cm	--	--	3600	4450	>3999	>3999	3972	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	174	163	173	193	200	190
Nitrate as N	mg/l	10.0	--	0.2	0.8	0.49	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	0.020	0.080
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	2.33	3.43	3.27	4.9	5.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	0.11
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.35	8.58	--	8.58
pH (Field)	-	--	--	8.5	7.9	7.69	8.17	8.12	7.89
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	3.85	2.30	4.1	2.2
Sulphate	mg/l	--	500 [6]	2	2	5	<1	1	2
Temperature (Field)	deg c	--	15	9.4	10	10.3	15.4	8.8	11.7
Total Dissolved Solids	mg/l	--	500	2820	2820	3390	3410	2860	2850
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0096	0.0071	<0.01	<0.01	0.002	0.0025 [17]
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.13	1.12	1.8	1.3	1.5	1.4
Cadmium, dissolved	mg/l	0.005	--	0.00005	<0.00002	<0.001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	22.1	20.3	20	23	24	23
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	0.014	<0.005	<0.01
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.002	0.0007	0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.005	0.003	<0.01	0.005	<0.001	0.0020
Iron, dissolved	mg/l	--	0.3	0.178	0.006	<0.3	<0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00021	<0.00002	<0.01	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	28.8	27.4	30	33	34	32
Manganese, dissolved	mg/l	--	0.05	0.017	0.049	<0.1	0.03	0.14	0.065
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.5	25.2	23	27	25	24
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1020	984	1001	1100	1100	990
Zinc, dissolved	mg/l	--	5	0.013	<0.005	<0.1	0.02	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-1 26-Nov-2015	94-1 24-May-2017	94-1 22-Nov-2018
				94-1	94-1	94-1
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1060	1030	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [13]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1070	1050	1160
Ammonia Nitrogen	mg/l	--	--	1.04	0.02	0.36
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	542	69	231
Chloride	mg/l	--	250	1110	1100	1110
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	>3999
Cyanide	mg/l	0.2	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	170	191	270
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [9]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.1	1.2	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.08	8.14	8.25
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	3.20	1.05	2.78
Sulphate	mg/l	--	500 [6]	<1	1	2
Temperature (Field)	deg c	--	15	7.3	11.6	8.6
Total Dissolved Solids	mg/l	--	500	2940	2870	2910
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Aluminum, dissolved	mg/l	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.008	0.003
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	1.44	1.12	1.47
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	22.4	23.9	33.9
Chromium, dissolved	mg/l	0.05	--	<0.001	0.02	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	<0.0005	0.0016	0.0033
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	27.7	31.9	44.9
Manganese, dissolved	mg/l	--	0.05	0.123	0.018	0.021
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	21.3	25.9	31
Selenium, dissolved	mg/l	0.05	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1230	1130	1050
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [11]	<0.010 [10]	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 09-Jan-1990	94-2 02-Mar-1990	94-2 20-Mar-1990	94-2 01-Aug-1990	94-2 06-Nov-1990	94-2 29-Nov-1991
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	995	1000	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	14.4	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1196	840	820	782	858	857
Ammonia Nitrogen	mg/l	--	--	0.1	--	--	1.24	0.57	0.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--
Chloride	mg/l	--	250	2070	539	549	553	513	532
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5180	--	3076	3290	2891	2890
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	710	294	302	244	212	204
Nitrate as N	mg/l	10.0	--	**68**	**38.9**	**11.5**	2.81	0.52	1.02
Nitrite as N	mg/l	1.0	--	0.1	--	--	0.1	0.01	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.92	8.39	8.18	8.32	8.2	8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	43	35.6	42	25	27	10
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	1548	1628	--	--	--
Total Organic Carbon	mg/l	--	--	--	--	--	23	18.1	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	0.1	--	0.5
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	77.3	35	35	30	27	27.6
Chromium, dissolved	mg/l	0.05	--	--	--	--	0.05	--	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	--	0.05	--	0.002
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--
Lead, dissolved	mg/l	0.01	--	--	--	--	**0.05**	--	0.001
Magnesium, dissolved	mg/l	--	--	126	43	47	41	35	32.7
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	0.05	--	0.05
Potassium, dissolved	mg/l	--	--	2070	539	549	553	17	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1919	800	688	693	66	532
Zinc, dissolved	mg/l	--	5	--	--	--	0.05	--	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.13	0.002	0.002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 09-Jun-1992	94-2 01-Nov-1992	94-2 15-Jun-1994	94-2 02-Nov-1994	94-2 28-Jun-1995	94-2 23-Nov-1995
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	927	1058	--	868	952	1030
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	760	868	756	724	780	840
Ammonia Nitrogen	mg/l	--	--	0.27	1.69	--	0.15	0.17	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	1.9	21.3	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	178	58.2	84	115	65	50
Chloride	mg/l	--	250	505	667	530	392	430	400
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3077	3120	2970	2930	2880	3060
Dissolved Inorganic Carbon	mg/l	--	--	165.1	213.2	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	9.09	8.7	--
Hardness, Calcium Carbonate	mg/l	--	--	209.78	203	409	323	270	268
Nitrate as N	mg/l	10.0	--	0.66	1.35	0.3	0.1	0.1	0.3
Nitrite as N	mg/l	1.0	--	0.1	0.16	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.4	2.24	--	--	8.8	1.11
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.13	0.55	--	--	8.63	1.07
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.27	8.1	7.07	7.68	7.65	8.32
Phosphate	mg/l	--	--	--	--	--	--	--	0.3
Phosphorus	mg/l	--	--	0.47	1.3	0.85	0.266	0.36	--
Sulphate	mg/l	--	500 [6]	19	8	127	116	81	98
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1660	1884	1490	1470	1460	1530
Total Organic Carbon	mg/l	--	--	27.4	18.9	18.4	19	16.1	15
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.1	--	0.111	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.003	--	**0.1**	--	--
Barium, dissolved	mg/l	1	--	0.04	0.1	--	0.058	--	--
Boron, dissolved	mg/l	5	--	0.88	0.96	1.12	0.89	0.62	0.62
Cadmium, dissolved	mg/l	0.005	--	--	--	--	**0.01**	0.0015	0.0001
Calcium, dissolved	mg/l	--	--	22.45	24.3	64.6	34.69	37.1	35.1
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.01	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.0194	0.016	0.02	0.01
Iron, dissolved	mg/l	--	0.3	0.2	0.07	0.421	0.38	0.04	0.35
Lead, dissolved	mg/l	0.01	--	**0.1**	**0.05**	0.0008	**0.1**	0.0051	0.0002
Magnesium, dissolved	mg/l	--	--	37.26	34.5	62	25.676	42.6	43.2
Manganese, dissolved	mg/l	--	0.05	0.02	0.13	0.725	0.359	0.4	0.32
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	12.56	17.3	17.8	10.8	--	14.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	513.4	768	415	514.6	492	542
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.1	0.076	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.002	0.011	0.005	0.001	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 12-Jun-1996	94-2 18-Jun-1997	94-2 06-Nov-1997	94-2 05-Jun-1998	94-2 30-Oct-1998	94-2 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	986	1090
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	813	917	800	874	808	897
Ammonia Nitrogen	mg/l	--	--	0.12	0.37	0.32	0.23	0.11	0.23
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	26	38	48	9	42
Chloride	mg/l	--	250	455	458	520	509	470	552
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2970	2760	2800	3020	2930	3010
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	3.88	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	265	261	243	241	197	244
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	1	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	0.94	1.19
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.03	7.76	7.56	--	7.6	7.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	55	58	47	53	52	21
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1490	1380	1410	1510	1480	1510
Total Organic Carbon	mg/l	--	--	15.5	13.9	13.9	14	16.4	16.6
Total Suspended Solids	mg/l	--	--	343	567	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.728	0.88	0.76	0.93	0.95	0.87
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	33.1	34.5	32.6	30.6	26.5	32.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.549	0.77	0.48	0.48	0.46	0.29
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005
Magnesium, dissolved	mg/l	--	--	43.8	41.8	38.7	39.4	31.8	39.2
Manganese, dissolved	mg/l	--	0.05	0.339	0.25	0.22	0.32	0.27	0.24
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	19.7	12.5	16.3	15.1	16.4	5.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	586	496	495	709	599	625
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.16	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 19-Oct-1999	94-2 05-May-2000	94-2 24-Oct-2000	94-2 14-Jun-2001	94-2 23-Nov-2001	94-2 23-May-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	900	1161	1100	826	859	765
Alkalinity, Carbonate as CaCO3	mg/l	--	--	59	1	1	58	1	49
Alkalinity (Total as CaCO3)	mg/l	--	--	826	952	901	773	704	708
Ammonia Nitrogen	mg/l	--	--	0.22	0.05	0.03	0.06	0.02	0.06
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	33	38	--	30	25	15
Chloride	mg/l	--	250	532	370	453	371	362	347
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2800	2850	2910	2400	2360	2660
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	240	237	248	242	240	224
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.3	0.1	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	0.64	0.95	0.66	0.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7.6	7.41	7.7	6.97	7.23
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.41	0.33	0.29	0.36
Sulphate	mg/l	--	500 [6]	40	90	67	68	86	73
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1390	1425	1530	1440	1340	1330
Total Organic Carbon	mg/l	--	--	13.6	13.2	--	11	10	11
Total Suspended Solids	mg/l	--	--	208	100	55	55	137	152
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	0.003	0.001	0.003	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.02	0.84	0.74	0.9	0.99	0.71
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	33.9	31.9	30	36.3	33.4	33.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.15	0.51	0.28	0.08	0.03	0.02
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	0.0022	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	37.2	37.8	42	36.7	38	33.9
Manganese, dissolved	mg/l	--	0.05	0.18	0.25	0.45	0.13	0.13	0.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.9	9.4	17.7	7	7.8	13.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	700	623	645	487	509	452
Zinc, dissolved	mg/l	--	5	0.12	0.08	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.001	0.084	0.001	0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 06-Nov-2002	94-2 30-May-2003	94-2 09-Oct-2003	94-2 14-May-2004	94-2 19-Nov-2004	94-2 24-May-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	867	982	--	952	1090	1050
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	711	805	805	780	890	860
Ammonia Nitrogen	mg/l	--	--	0.06	0.07	0.05	0.03	0.01	0.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	1	--	--	--
Chemical Oxygen Demand	mg/l	--	--	32	39	35	34	41	33
Chloride	mg/l	--	250	383	420	421	421	491	438
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2670	2560	2700	2710	2900	3300
Dissolved Inorganic Carbon	mg/l	--	--	--	--	185	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	221	204	201	219	213	226
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.1	0.2	1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.6	0.78	0.68	0.7	0.63	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7	7.5	7.8	7.8	7.2
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.32	0.45	0.43	0.31	0.38	0.4
Sulphate	mg/l	--	500 [6]	59	43	38	46	30	34
Temperature (Field)	deg c	--	15	--	--	--	--	--	10.1
Total Dissolved Solids	mg/l	--	500	1500	1280	1541	1355	1450	1620
Total Organic Carbon	mg/l	--	--	10.7	10.7	14	9.8	11.4	11
Total Suspended Solids	mg/l	--	--	44	35	56	35	28	43
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.004	0.002	0.001	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.79	0.66	0.667	0.678	0.763	0.717
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	29.2	28.9	26.8	30	29.4	29
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.003	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.004	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.11	0.2	1.33	0.049	0.137	0.061
Lead, dissolved	mg/l	0.01	--	0.0021	0.0008	0.0009	0.0007	0.0005	0.0012
Magnesium, dissolved	mg/l	--	--	35.9	32.1	32.7	35.1	33.9	37.3
Manganese, dissolved	mg/l	--	0.05	0.12	0.01	0.17	0.3	0.151	0.135
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	12.8	12.8	13.8	14.7	15.1	16.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	468	505	524	547	572	569
Zinc, dissolved	mg/l	--	5	0.02	0.01	0.005	0.005	0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.002

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Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 06-Nov-2002	94-2 30-May-2003	94-2 09-Oct-2003	94-2 14-May-2004	94-2 19-Nov-2004	94-2 24-May-2005
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 16-Nov-2005	94-2 25-May-2006	94-2 21-Nov-2006	94-2 15-May-2007	94-2 30-Nov-2007	94-2 22-May-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	209	865	904	890	900	840
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	855	865	904	890	900	840
Ammonia Nitrogen	mg/l	--	--	0.17	0.01	0.01	<0.01	0.1	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	26	29	49	68	27
Chloride	mg/l	--	250	386	449	446	430	470	472
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2400	2400	2600	1900	1300	2500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	228	210	194	214	215	213
Nitrate as N	mg/l	10.0	--	0.4	0.1	0.1	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.73	0.98	0.62	0.68	0.81	0.76
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.7	7.1	8.1	7.8	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.46	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	43	32	30	23	23	21
Temperature (Field)	deg c	--	15	--	5	10	9.3	6.5	9.5
Total Dissolved Solids	mg/l	--	500	1670	1660	1660	1610	1830	1640
Total Organic Carbon	mg/l	--	--	13	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	33	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	<0.001	0.0067	0.0068	0.0054	0.0047
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.726	0.595	0.579	0.621	0.714	0.602
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.005	<0.0001	0.00004	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	31.3	28.1	26.9	29.8	29.6	29.4
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.276	0.055	0.761	0.453	0.378	0.302
Lead, dissolved	mg/l	0.01	--	0.0002	0.0004	<0.0001	0.00004	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	36.5	33.9	30.9	34	34.3	33.9
Manganese, dissolved	mg/l	--	0.05	0.396	0.175	0.346	0.331	0.184	0.289
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.5	13.6	14.1	15.1	17.5	13.7
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	657	597	567	545	710	566
Zinc, dissolved	mg/l	--	5	0.008	<0.005	0.008	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 16-Nov-2005	94-2 25-May-2006	94-2 21-Nov-2006	94-2 15-May-2007	94-2 30-Nov-2007	94-2 22-May-2008
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 10-Nov-2008	94-2 19-May-2009 G-21	94-2 26-Nov-2009 M-5	94-2 25-May-2010 [4] M-18	94-2 20-Oct-2010 [4] G-15	94-2 24-May-2011 [4] G-28
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	880	862	877	838	860	854
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	27
Alkalinity (Total as CaCO3)	mg/l	--	--	880	862	877	838	860	881
Ammonia Nitrogen	mg/l	--	--	0.1	0.07	0.04	0.04	0.11	0.17
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	31	35	35	38	45	33
Chloride	mg/l	--	250	500	455	478	432	471	476
Conductivity	uS/cm	--	--	--	2950	2990	2920	2960	3070
Conductivity (Field)	uS/cm	--	--	2500	2500	2799	2876	2780	2735
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	211	219	195	221	211	227
Nitrate as N	mg/l	10.0	--	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.69	0.49	0.40	0.55	0.47	0.62
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.10	8.07	8.28	8.09	8.52
pH (Field)	-	--	--	7.7	--	7.47	7.82	7.75	7.79
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.68	0.52	0.57	0.63	0.69
Sulphate	mg/l	--	500 [6]	14	14	15	17	12	10
Temperature (Field)	deg c	--	15	9	10	10.5	22.3	14.9	15.6
Total Dissolved Solids	mg/l	--	500	1660	1920	1940	1900	1920	2000
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0047	0.006	0.006	<0.01	<0.01	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.606	0.74	0.90	0.68	0.58	0.7
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29.3	30	27	29	30	30
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.005	0.006	<0.005	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0004	0.0004	0.0005	0.0005	0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.002	0.001	0.002	0.001	0.004
Iron, dissolved	mg/l	--	0.3	<0.005	<0.03	0.95	0.34	0.73	<0.03
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	33.4	35	31	36	33	37
Manganese, dissolved	mg/l	--	0.05	0.036	<0.01	0.25	0.20	0.25	0.03
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.2	13	12	14	12	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	543	542	569	536	592	564
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	<0.01	<0.01	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 10-Nov-2008	94-2 19-May-2009 G-21	94-2 26-Nov-2009 M-5	94-2 25-May-2010 [4] M-18	94-2 20-Oct-2010 [4] G-15	94-2 24-May-2011 [4] G-28
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	<0.0006	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2	94-2	94-2	94-2	94-2	94-2
				29-Nov-2011 [4]	31-May-2012	28-Nov-2012	29-May-2013 [5]	26-Nov-2013	29-May-2014
				94-2	94-2	94-2	94-2	GW-9	94-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	859	840	840	840	860	830
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	12	14	12	13	15
Alkalinity (Total as CaCO3)	mg/l	--	--	878	850	850	850	880	850
Ammonia Nitrogen	mg/l	--	--	0.06	<0.050	0.18	0.31	0.28	0.20
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	33	43	39	41	33
Chloride	mg/l	--	250	458	440	420	500	510	460
Conductivity	uS/cm	--	--	3000	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2590	2530	2438	2460	2399	2515
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	191	220	230	240	200	250
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.48	1.2	0.87	1.0	1.0	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	8.38	8.20	--	8.17	8.22	8.29
pH (Field)	-	--	--	7.68	7.78	7.72	7.60	7.61	7.90
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.46	0.41	0.49	0.56	0.61	0.42
Sulphate	mg/l	--	500 [6]	11	<20	13	<1	<1	<1
Temperature (Field)	deg c	--	15	9.7	11.1	9.7	11.4	8.5	10.8
Total Dissolved Solids	mg/l	--	500	1950	1610	1680	1810	1700	1670
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.0026	0.002	0.0017	0.0026	0.0019
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.59	0.63	0.7	0.72	0.55	0.79
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	27	30	31	33	29	33
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.005	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0003	<0.00050	<0.0005	<0.00050	0.00051	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.0025	0.002	0.0017	0.0014	0.0021
Iron, dissolved	mg/l	--	0.3	0.08	<0.1	<0.1	<0.1	0.19	0.51
Lead, dissolved	mg/l	0.01	--	<0.001	<0.00050	<0.0005	0.00057	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	30	35	37	38	32	40
Manganese, dissolved	mg/l	--	0.05	0.02	0.0029	<0.002	0.22	0.33	0.2
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	13	14	14	13	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	543	550	590	550	550	580
Zinc, dissolved	mg/l	--	5	<0.01	<0.0050	<0.005	<0.0050	0.027	0.039
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 29-Nov-2011 [4]	94-2 31-May-2012	94-2 28-Nov-2012	94-2 29-May-2013 [5]	94-2 26-Nov-2013	94-2 29-May-2014
				94-2	94-2	94-2	94-2	GW-9	94-2
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0013	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.00050	0.00043	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 19-Nov-2014 [5]	94-2 02-Jun-2015	94-2 26-Nov-2015	94-2 26-May-2016	94-2 17-Nov-2016	94-2 24-May-2017
				94-2	94-2	94-2	94-2	94-2	94-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	870	902	885	922	925	949
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	13	9	9	9	11
Alkalinity (Total as CaCO3)	mg/l	--	--	880	915	894	931	934	960
Ammonia Nitrogen	mg/l	--	--	0.14	0.33	0.32	0.28	0.43	0.92
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	42	56	44	44	58
Chloride	mg/l	--	250	560	564	527	559	584	596
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2674	2864	2895	2853	3019	3060
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	185	219	245	244	228
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.25 [9]
Nitrogen, Total Kjeldahl	mg/l	--	--	0.75	0.9	1.1	0.9	0.9	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	8.16	--	--	--	--	--
pH (Field)	-	--	--	7.82	7.80	7.74	8.11	7.94	7.82
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.40	0.61	0.48	0.55	0.73
Sulphate	mg/l	--	500 [6]	<1	6	7	6	4	4
Temperature (Field)	deg c	--	15	6.5	11.3	8.0	15.1	11.1	13.1
Total Dissolved Solids	mg/l	--	500	1680	1760	1700	1870	1810	1840
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0020	0.001	0.002	0.002	0.005	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.61	0.549	0.539	0.663	0.862	0.63
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31	28.9	28.3	34.2	33.2	32.3
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.012	0.011
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0020	<0.0005	<0.0005	0.0009	0.0008	0.0016
Iron, dissolved	mg/l	--	0.3	0.62	<0.1	0.5	0.135	0.382	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	36	27.4	36.1	38.8	39.1	35.9
Manganese, dissolved	mg/l	--	0.05	0.34	0.036	0.259	0.092	0.408	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	12.3	11.4	15	13.6	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	600	611	632	542	639	629
Zinc, dissolved	mg/l	--	5	<0.0050	<0.005	0.008	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.002 [11]	<0.002 [11]	0.008	0.004	<0.004 [10]

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 19-Nov-2014 [5]	94-2 02-Jun-2015	94-2 26-Nov-2015	94-2 26-May-2016	94-2 17-Nov-2016	94-2 24-May-2017
				94-2	94-2	94-2	94-2	94-2	94-2
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 29-Nov-2017	94-2 24-May-2018	94-2 22-Nov-2018	94-2 19-Jun-2019 [25]	94-2 20-Nov-2019
				94-2	94-2	94-2	94-2	94-2
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	941	959	981	--	873
Alkalinity, Carbonate as CaCO3	mg/l	--	--	13	12	12	--	16
Alkalinity (Total as CaCO3)	mg/l	--	--	954	971	993	--	889
Ammonia Nitrogen	mg/l	--	--	0.37	0.25	0.51	--	0.35
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	60	61	76	--	54
Chloride	mg/l	--	250	629	548	544	--	588
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2593	2981	2725	--	3010
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	210	245	280	--	295
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	--	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.0	1.8	--	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.68	7.58	8.09	--	7.94
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.60	0.51	1.52	--	0.68
Sulphate	mg/l	--	500 [6]	6	6	9	--	5
Temperature (Field)	deg c	--	15	8.6	14.9	5.9	--	8.5
Total Dissolved Solids	mg/l	--	500	1820	1850	1730	--	1780
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.003	--	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.6	0.655	0.604	--	0.433
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	--	--	29.9	35.2	38.5	--	40.7
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	--	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0008	--	0.0006
Copper, dissolved	mg/l	--	1	0.0007	0.0010	0.0037	--	0.0014
Iron, dissolved	mg/l	--	0.3	0.612	0.222	0.178	--	0.462
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	--	0.0001
Magnesium, dissolved	mg/l	--	--	33	38.1	44.6	--	47
Manganese, dissolved	mg/l	--	0.05	0.42	0.258	0.544	--	0.354
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	14.1	16.3	--	20.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	598	565	641	--	636
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	--	0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	--	0.003

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-2 29-Nov-2017	94-2 24-May-2018	94-2 22-Nov-2018	94-2 19-Jun-2019 [25]	94-2 20-Nov-2019
				94-2	94-2	94-2	94-2	94-2
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	--	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--	<0.0005

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-3 15-Jun-1994	94-3 02-Nov-1994	94-3 28-Jun-1995	94-3 23-Nov-1995	94-3 12-Jun-1996	94-3 12-Oct-1996
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	907	453	850	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	940	756	372	697	466	533
Ammonia Nitrogen	mg/l	--	--	--	2.23	1.2	1.38	0.94	1.39
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	260	158	85	78	33	30
Chloride	mg/l	--	250	360	132	223	274	132	138
Conductivity (Field)	uS/cm	--	--	3070	2270	1960	2650	1680	1960
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	10.19	8.2	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	878	783	787	853	588	514
Nitrate as N	mg/l	10.0	--	0.1	4.38	1.7	2	0.6	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	6.4	4.6	--	--
Nitrogen, Organic	mg/l	--	--	--	--	5.2	3.22	--	--
pH (Field)	-	--	--	6.69	7.08	7.55	7.52	7.06	6.68
Phosphate	mg/l	--	--	--	--	--	0.4	--	--
Phosphorus	mg/l	--	--	2.25	0.392	1.08	--	--	--
Sulphate	mg/l	--	500 [6]	369	359	355	272	279	234
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1550	1140	999	1330	840	980
Total Organic Carbon	mg/l	--	--	42.2	--	29	23.7	16.1	16.4
Total Suspended Solids	mg/l	--	--	--	--	--	--	853	396
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.097	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.1	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.104	--	--	--	--
Boron, dissolved	mg/l	5	--	5.41	3.981	0.68	0.76	1.06	1.36
Cadmium, dissolved	mg/l	0.005	--	--	0.001	0.0004	0.0001	--	--
Calcium, dissolved	mg/l	--	--	170	165.1	198	212	133	117
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0233	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.691	0.435	0.46	6.46	5.73	4.67
Lead, dissolved	mg/l	0.01	--	0.0007	0.1	0.0007	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	110	61.336	70.2	77.6	61.6	53.3
Manganese, dissolved	mg/l	--	0.05	1.708	1.313	1.05	1.69	1.47	1.22
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.05	0.02	0.02
Potassium, dissolved	mg/l	--	--	48	22.77	--	20.4	15.9	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	285	172.1	107	219	217	214
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.048	--	0.001	--	--	--

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-3 18-Jun-1997	94-3 06-Nov-1997	94-3 05-Jun-1998	94-3 29-Oct-1998	94-3 06-May-1999	94-3 19-Oct-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	556	588	650
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	10
Alkalinity (Total as CaCO3)	mg/l	--	--	511	620	530	456	482	549
Ammonia Nitrogen	mg/l	--	--	0.73	0.82	0.29	0.19	0.12	0.18
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	16	46	39	3	10	92
Chloride	mg/l	--	250	86.6	212	145	62.9	71	226
Conductivity (Field)	uS/cm	--	--	1370	1900	1700	1571	1450	1800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	2.47	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	445	492	435	363	527	456
Nitrate as N	mg/l	10.0	--	0.1	0.1	1.4	--	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	0.75	0.94	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.25	6.55	--	6.6	6.7	7.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	190	137	234	203	280	163
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	680	1010	842	788	720	900
Total Organic Carbon	mg/l	--	--	8.9	17.8	14.5	12.5	8.8	14.9
Total Suspended Solids	mg/l	--	--	1590	--	--	--	--	2020
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.43	1.63	1.71	1.7	1.01	1.67
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	102	103	97	87.5	128	96.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.02	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.44	4.05	3.24	2.3	0.21	6.74
Lead, dissolved	mg/l	0.01	--	0.0002	0.0005	0.0002	0.0002	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	45.7	56.3	46.1	35.2	49.6	51.6
Manganese, dissolved	mg/l	--	0.05	1.04	0.89	0.67	0.92	0.66	1
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.04	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	9.5	16.4	16.5	7.9	1.2	10.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	173	251	268	161	152	307
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.71	0.01	0.01	0.25
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-3 05-May-2000	94-3 24-Oct-2000	94-3 14-Jun-2001	94-3 23-Nov-2001	94-3 23-May-2002	94-3 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	708	732	476	405	412	754
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	15	1
Alkalinity (Total as CaCO3)	mg/l	--	--	580	600	390	332	362	618
Ammonia Nitrogen	mg/l	--	--	0.01	0.02	0.03	0.02	0.17	0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	11	--	10	12	13	18
Chloride	mg/l	--	250	39	127	51.1	45.9	43.6	56.5
Conductivity (Field)	uS/cm	--	--	1400	1900	1130	1240	980	1380
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	570	404	408	531	374	515
Nitrate as N	mg/l	10.0	--	0.2	0.4	0.1	0.2	0.2	1.9
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	0.75	0.45	0.68	0.52	0.5
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	6.81	6.9	6.19	6.77	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.24	0.26	0.29	0.21	0.17
Sulphate	mg/l	--	500 [6]	300	203	195	209	128	147
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	700	1000	782	770	564	868
Total Organic Carbon	mg/l	--	--	7.8	--	6.1	9	5	6.1
Total Suspended Solids	mg/l	--	--	182	376	172	414	224	153
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.96	1.53	1.12	1.1	0.48	0.98
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	141	78.2	98.2	132	94.6	126
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.16	0.07	0.02	0.03	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0007
Magnesium, dissolved	mg/l	--	--	52.1	50.7	39.5	48.9	33.4	48.6
Manganese, dissolved	mg/l	--	0.05	0.1	0.31	0.08	0.03	0.34	0.09
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	0.6	8.6	0.4	5.5	5	7.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	135	224	147	120	77.3	122
Zinc, dissolved	mg/l	--	5	0.2	0.01	0.01	0.01	0.02	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.001	0.034	0.001	0.001	0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-3 30-May-2003	94-3 09-Oct-2003	94-3 14-May-2004	94-3 19-Nov-2004	94-3 24-May-2005	94-3 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	671	--	776	824	781	179
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	550	579	636	675	640	735
Ammonia Nitrogen	mg/l	--	--	0.16	0.38	0.31	0.16	0.28	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	2	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	17	21	23	28	20	15
Chloride	mg/l	--	250	27.9	97.8	41.2	58	54.4	63.9
Conductivity (Field)	uS/cm	--	--	1240	1500	1490	1760	1950	1700
Dissolved Inorganic Carbon	mg/l	--	--	--	129	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	529	434	553	530	589	659
Nitrate as N	mg/l	10.0	--	2.7	0.1	0.3	1	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.92	1.04	0.81	0.9	0.79	0.44
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.5	7	6.9	7	6.8	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.23	0.64	0.21	0.57	0.14	0.16
Sulphate	mg/l	--	500 [6]	161	138	179	170	186	200
Temperature (Field)	deg c	--	15	--	--	--	--	9	--
Total Dissolved Solids	mg/l	--	500	620	958	745	880	989	1120
Total Organic Carbon	mg/l	--	--	6.9	11	6.2	7.5	6.7	9.2
Total Suspended Solids	mg/l	--	--	188	519	108	17	99	90
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.64	1.24	0.797	1.16	0.95	1.51
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	139	98.9	137	131	140	159
Chromium, dissolved	mg/l	0.05	--	0.01	0.001	0.001	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.003	0.003	0.002	<0.002	0.006
Iron, dissolved	mg/l	--	0.3	0.27	0.126	0.03	0.05	0.533	0.013
Lead, dissolved	mg/l	0.01	--	0.0002	0.0003	0.0003	0.0002	0.0009	0.0003
Magnesium, dissolved	mg/l	--	--	44.1	45.4	51.3	49.2	58.3	63.8
Manganese, dissolved	mg/l	--	0.05	0.55	0.501	0.544	0.259	1.3	0.019
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	7.6	10.6	8.8	8.6	8.8	11.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	0.001	<0.001
Sodium, dissolved	mg/l	--	200 [7]	104	219	159	172	164	200
Zinc, dissolved	mg/l	--	5	0.01	0.009	0.005	0.005	<0.005	0.009
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-3 30-May-2003	94-3 09-Oct-2003	94-3 14-May-2004	94-3 19-Nov-2004	94-3 24-May-2005	94-3 16-Nov-2005
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-3 25-May-2006	94-3 19-Dec-2008
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	660	770
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	660	770
Ammonia Nitrogen	mg/l	--	--	0.2	0.08
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	24	<5
Chloride	mg/l	--	250	39.7	49.7
Conductivity (Field)	uS/cm	--	--	1325	1600
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	662	756
Nitrate as N	mg/l	10.0	--	0.2	0.4
Nitrite as N	mg/l	1.0	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.98	0.52
Nitrogen, Organic	mg/l	--	--	--	--
pH (Field)	-	--	--	7.9	7.3
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	--	--
Sulphate	mg/l	--	500 [6]	330	270
Temperature (Field)	deg c	--	15	5.5	4
Total Dissolved Solids	mg/l	--	500	1150	1250
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Aluminum, dissolved	mg/l	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0006
Barium, dissolved	mg/l	1	--	--	--
Boron, dissolved	mg/l	5	--	0.773	1.1
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.00002
Calcium, dissolved	mg/l	--	--	156	176
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	0.003
Iron, dissolved	mg/l	--	0.3	0.014	0.024
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.00002
Magnesium, dissolved	mg/l	--	--	66.1	77.1
Manganese, dissolved	mg/l	--	0.05	0.777	0.392
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.4	11
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	157	200
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-3 25-May-2006	94-3 19-Dec-2008
VOCs					
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--
Bromoform	mg/l	--	--	--	--
Bromomethane	mg/l	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--
Chloroform	mg/l	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3A 06-Sep-2005	05-3A 16-Nov-2005	05-3A 25-May-2006	05-3A 15-May-2007	05-3A 10-Nov-2008	05-3A 26-Nov-2009 M-11
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1030	200	845	885	800	829
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	29
Alkalinity (Total as CaCO3)	mg/l	--	--	845	820	845	885	800	858
Ammonia Nitrogen	mg/l	--	--	0.78	0.77	0.72	0.64	0.79	0.75
Chemical Oxygen Demand	mg/l	--	--	278	33	351	83	93	85
Chloride	mg/l	--	250	226	235	272	270	265	160
Conductivity	uS/cm	--	--	--	--	--	--	--	2330
Conductivity (Field)	uS/cm	--	--	1900	3000	1800	1700	1800	2075
Hardness, Calcium Carbonate	mg/l	--	--	42	31	25	25	25	28
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	0.1	0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	6.01	1.2	1.99	1.42	2.16	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	8.57
pH (Field)	-	--	--	8.4	--	8.5	8.9	8.4	8.83
Phosphorus	mg/l	--	--	8.2	0.15	--	--	--	2.48
Sulphate	mg/l	--	500 [6]	5	<1	1	2	2	2
Temperature (Field)	deg c	--	15	11.8	--	7	8.8	4	8.7
Total Dissolved Solids	mg/l	--	500	1380	1340	1320	1280	1300	1510
Total Organic Carbon	mg/l	--	--	53.2	10.9	--	--	--	--
Total Suspended Solids	mg/l	--	--	6760	63	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	<0.001	0.0015	0.0021	0.002
Boron, dissolved	mg/l	5	--	0.978	0.964	0.828	0.826	0.878	0.98
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	7.05	3.62	2.32	2.41	2.38	3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.009
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0002
Copper, dissolved	mg/l	--	1	<0.002	0.002	<0.002	<0.002	<0.002	0.001
Iron, dissolved	mg/l	--	0.3	0.334	0.08	0.062	0.128	<0.005	0.08
Lead, dissolved	mg/l	0.01	--	0.0008	0.0017	0.0002	0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	6.03	5.26	4.59	4.66	4.74	5
Manganese, dissolved	mg/l	--	0.05	0.017	0.003	0.002	0.005	0.008	<0.01
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.5	10.6	8.5	8.9	9.5	8
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	625	599	535	461	533	493
Zinc, dissolved	mg/l	--	5	0.007	0.007	0.01	0.02	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3A 24-May-2011 [4]	05-3A 29-Nov-2012	05-3A 29-May-2014	05-3A 26-Nov-2015	05-3A 24-May-2017	05-3A 29-Nov-2018
				G-42	05-3A	05-3A	05-3A	05-3A	05-3A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	778	790	770	823	858	889
Alkalinity, Carbonate as CaCO3	mg/l	--	--	42	34	30	22	16	20
Alkalinity (Total as CaCO3)	mg/l	--	--	820	830	800	845	874	910
Ammonia Nitrogen	mg/l	--	--	0.76	0.96	0.88	0.84	0.81	0.77
Chemical Oxygen Demand	mg/l	--	--	575	45	39	118	32	40
Chloride	mg/l	--	250	273	240	260	294	285	297
Conductivity	uS/cm	--	--	2410	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2157	1898	1998	2246	2266	2042
Hardness, Calcium Carbonate	mg/l	--	--	35	28	31	25.5	41	51
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.55	2.2	2.8	2.4	1.5	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.10	--	--	--
pH	-	--	--	8.76	8.66	8.62	--	--	--
pH (Field)	-	--	--	8.71	8.65	7.79	8.64	8.37	8.54
Phosphorus	mg/l	--	--	1.09	0.51	0.26	0.67	0.12	0.19
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	3	<1
Temperature (Field)	deg c	--	15	12.0	6.9	9.0	8.4	10.1	7.8
Total Dissolved Solids	mg/l	--	500	1570	1310	1320	1440	1340	1360
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.0010	<0.0010	<0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	0.87	0.97	1	0.962	1.01	0.98
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.00011	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	4	3.2	3.3	2.73	5.45	9.76
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.0050	<0.001	0.009	<0.001
Cobalt, dissolved	mg/l	--	--	0.0003	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.002	<0.0010	0.0023	<0.0005	0.0005	0.0022
Iron, dissolved	mg/l	--	0.3	0.07	0.12	<0.1	<0.1	<0.1	0.13
Lead, dissolved	mg/l	0.01	--	<0.001	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	6	4.9	5.6	4.54	6.67	6.45
Manganese, dissolved	mg/l	--	0.05	<0.01	0.0025	<0.0020	<0.005	0.025	0.011
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9	8.3	8.9	8.01	9.62	10
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	476	540	580	617	572	536
Zinc, dissolved	mg/l	--	5	0.01	<0.0050	<0.0050	0.01	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.002 [11]	<0.002 [10]	0.002
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3B 06-Sep-2005	05-3B 16-Nov-2005	05-3B 25-May-2006	05-3B 15-May-2007	05-3B 10-Nov-2008	05-3B 26-Nov-2009 J-20
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1340	256	1160	1190	1170	1130
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	27
Alkalinity (Total as CaCO3)	mg/l	--	--	1100	1050	1160	1190	1170	1160
Ammonia Nitrogen	mg/l	--	--	18	7.1	3.21	2.38	2.84	2.83
Chemical Oxygen Demand	mg/l	--	--	143	139	124	142	104	95
Chloride	mg/l	--	250	434	423	482	465	469	451
Conductivity	uS/cm	--	--	--	--	--	--	--	3410
Conductivity (Field)	uS/cm	--	--	2800	2100	2900	2400	2900	2820
Hardness, Calcium Carbonate	mg/l	--	--	60	91	77	70	65	69
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.1	0.1	0.2	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	19.7	10.9	6.3	6.12	5.29	4.12
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	8.41
pH (Field)	-	--	--	7.7	--	8.2	8.5	8.2	8.2
Phosphorus	mg/l	--	--	1.41	3.18	--	--	--	6.94
Sulphate	mg/l	--	500 [6]	109	152	72	23	2	4
Temperature (Field)	deg c	--	15	12.5	--	9	8.6	7	8.0
Total Dissolved Solids	mg/l	--	500	2110	2100	2030	1920	1880	2220
Total Organic Carbon	mg/l	--	--	87	47.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	220	30	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.007	**0.013**	0.01	**0.0138**	0.0006	0.010
Boron, dissolved	mg/l	5	--	1.64	1.74	1.52	1.46	1.53	1.8
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00005	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	8.66	10.7	8.92	8.11	7.27	8
Chromium, dissolved	mg/l	0.05	--	0.005	0.005	0.004	0.003	<0.002	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005
Copper, dissolved	mg/l	--	1	0.009	0.003	0.009	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.766	1.15	3.05	1.68	0.374	1.19
Lead, dissolved	mg/l	0.01	--	0.0029	0.0007	0.0013	0.00041	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	9.43	15.7	13.4	12.2	11.4	12
Manganese, dissolved	mg/l	--	0.05	0.12	0.128	0.071	0.037	0.016	0.03
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.06	0.04	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.4	25.7	21.6	21	19.8	19
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	866	862	751	673	669	816
Zinc, dissolved	mg/l	--	5	<0.005	0.01	0.02	<0.005	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3B 24-May-2011 [4] G-41	05-3B 29-Nov-2012 05-3B	05-3B 29-May-2014 [12] 05-3B	05-3B 26-Nov-2015 05-3B	05-3B 24-May-2017 05-3B	05-3B 29-Nov-2018 05-3B
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1080	1100	1100	1090	1050	1150
Alkalinity, Carbonate as CaCO3	mg/l	--	--	52	35	36	<25 [13]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1135	1100	1100	1110	1070	1170
Ammonia Nitrogen	mg/l	--	--	2.64	0.51	2.8	3.35	2.76	3.09
Chemical Oxygen Demand	mg/l	--	--	85	41	76	115	89	102
Chloride	mg/l	--	250	433	410	440	470	459	449
Conductivity	uS/cm	--	--	3510	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2563	2776	2865	3230	3248	2919
Hardness, Calcium Carbonate	mg/l	--	--	76	70	80	249	73	105
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.50	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.050	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.70	4.6	4.6	5.3	4.3	4.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.50	--	--	--
pH	-	--	--	8.71	8.53	8.54	--	--	--
pH (Field)	-	--	--	8.40	8.43	8.10	8.43	8.35	8.49
Phosphorus	mg/l	--	--	7.09	7.1	6.6	6.72	5.73	5.95
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	5	9
Temperature (Field)	deg c	--	15	10.2	6.8	10.2	8.5	10.5	7.6
Total Dissolved Solids	mg/l	--	500	2280	1880	1830	2020	1990	2020
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.0038	0.0034	0.004	0.01	0.005
Boron, dissolved	mg/l	5	--	1.5	1.8	1.8	1.97	1.62	1.97
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	9	8.3	9.3	8.04	8.55	16.1
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.0050	0.006	0.013	0.002
Cobalt, dissolved	mg/l	--	--	0.0005	<0.00050	<0.00050	<0.0005	<0.0005	0.0008
Copper, dissolved	mg/l	--	1	0.003	<0.0010	0.0023	<0.0005	0.0040	0.0035
Iron, dissolved	mg/l	--	0.3	0.65	0.45	0.65	0.632	0.125	0.805
Lead, dissolved	mg/l	0.01	--	<0.001	<0.00050	<0.00050	<0.0001	0.0003	0.0004
Magnesium, dissolved	mg/l	--	--	13	12	14	11.3	12.6	15.7
Manganese, dissolved	mg/l	--	0.05	0.02	0.02	0.024	0.022	0.019	0.027
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	19	18	20	17.2	19.8	23.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	784	740	720	878	817	842
Zinc, dissolved	mg/l	--	5	<0.01	<0.0050	0.0052	0.009	0.013	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.002 [11]	<0.004 [10]	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0010	<0.0010	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.00040	<0.00040	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00040	<0.00040	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3C 06-Sep-2005	05-3C 16-Nov-2005	05-3C 25-May-2006	05-3C 15-May-2007	05-3C 30-Nov-2007	05-3C 22-May-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1090	227	880	995	1050	1010
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	891	930	880	995	1050	1010
Ammonia Nitrogen	mg/l	--	--	28.9	9.81	2.46	1.88	2.02	1.28
Chemical Oxygen Demand	mg/l	--	--	139	151	113	134	150	104
Chloride	mg/l	--	250	264	269	286	320	331	330
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2600	860	1950	1500	1700	2300
Hardness, Calcium Carbonate	mg/l	--	--	71	91	85	87	92	88
Nitrate as N	mg/l	10.0	--	<0.1	0.2	1.2	0.1	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	34.8	12.6	4.46	5.04	3.9	3.63
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.7	--	8.2	8.6	8.2	8.2
Phosphorus	mg/l	--	--	2	1.2	--	--	--	--
Sulphate	mg/l	--	500 [6]	200	119	80	35	19	13
Temperature (Field)	deg c	--	15	14.4	--	6.5	8.8	5.5	10.5
Total Dissolved Solids	mg/l	--	500	1770	1700	1560	1530	1770	1620
Total Organic Carbon	mg/l	--	--	72.6	41.3	--	--	--	--
Total Suspended Solids	mg/l	--	--	524	2520	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.003	0.008	0.009	**0.013**	**0.0246**	**0.0141**
Boron, dissolved	mg/l	5	--	1.32	1.47	1.28	1.06	1.41	1.35
Cadmium, dissolved	mg/l	0.005	--	0.0002	<0.0001	<0.005	0.00008	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	11.4	13.5	10.7	10.6	12.6	11.6
Chromium, dissolved	mg/l	0.05	--	0.003	0.005	0.003	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.011	0.006	0.003	0.003	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.199	1.81	1.56	2.05	2.77	2.08
Lead, dissolved	mg/l	0.01	--	0.0012	0.0003	0.0011	0.00032	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	10.4	14	14.3	14.7	14.6	14.4
Manganese, dissolved	mg/l	--	0.05	0.156	0.225	0.111	0.074	0.119	0.091
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.04	0.04	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.02	--	--	--	--
Potassium, dissolved	mg/l	--	--	23	21.4	16.6	15.9	17.8	16
Selenium, dissolved	mg/l	0.05	--	0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	711	708	635	536	736	630
Zinc, dissolved	mg/l	--	5	0.009	0.01	0.006	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	0.0013
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3C 10-Nov-2008	05-3C 19-May-2009 G-14	05-3C 26-Nov-2009 J-17	05-3C 25-May-2010 [4] M-21	05-3C 20-Oct-2010 [4] G-26	05-3C 24-May-2011 [4] G-43
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1030	960	946	935	932	936
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	21	21	22	22	44
Alkalinity (Total as CaCO3)	mg/l	--	--	1030	981	967	957	954	980
Ammonia Nitrogen	mg/l	--	--	1.53	1.67	1.52	1.27	1.14	1.44
Chemical Oxygen Demand	mg/l	--	--	91	70	98	70	80	70
Chloride	mg/l	--	250	335	303	302	281	308	291
Conductivity	uS/cm	--	--	--	2700	2640	2680	2610	2770
Conductivity (Field)	uS/cm	--	--	2100	1300	2287	2641	2533	1162
Hardness, Calcium Carbonate	mg/l	--	--	53	83	92	87	88	96
Nitrate as N	mg/l	10.0	--	0.2	<0.10	0.23	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	3.55	3.35	2.46	2.27	2.52	2.97
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.36	8.38	8.39	8.39	8.70
pH (Field)	-	--	--	8.1	--	8.27	8.24	8.4	8.29
Phosphorus	mg/l	--	--	--	2.12	2.61	2.38	2.22	2.40
Sulphate	mg/l	--	500 [6]	15	14	30	15	25	10
Temperature (Field)	deg c	--	15	8	11	8.1	21.4	11.9	11.0
Total Dissolved Solids	mg/l	--	500	1560	1760	1720	1740	1700	1800
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0008	**0.013**	**0.016**	<0.01	<0.01	<0.01
Boron, dissolved	mg/l	5	--	1.37	1.43	1.4	1.8	1.4	1.6
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	5.92	10	12	10	12	12
Chromium, dissolved	mg/l	0.05	--	0.002	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0005	0.0005	0.0005	0.0006	0.0006
Copper, dissolved	mg/l	--	1	0.004	0.006	0.011	0.002	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.477	0.58	0.41	1.53	0.29	2.64
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	9.37	14	15	15	14	16
Manganese, dissolved	mg/l	--	0.05	0.021	0.05	0.03	0.06	0.03	0.06
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.8	13	15	14	14	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	560	565	535	559	629	561
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	<0.01	0.01	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	<0.0006	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3C 29-Nov-2011 05-3C	05-3C 31-May-2012 05-3C	05-3C 29-Nov-2012 05-3C	05-3C 29-May-2013 [5] 05-3C	05-3C 26-Nov-2013 [14] GW-15	05-3C 29-May-2014 [15] 05-3C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	976	970	950	900	1000	910
Alkalinity, Carbonate as CaCO3	mg/l	--	--	33	21	25	17	22	25
Alkalinity (Total as CaCO3)	mg/l	--	--	1010	990	970	920	1000	940
Ammonia Nitrogen	mg/l	--	--	1.20	0.95	0.79	0.81	1.6	1.3
Chemical Oxygen Demand	mg/l	--	--	55	66	54	53	72	66
Chloride	mg/l	--	250	304	280	270	270	320	270
Conductivity	uS/cm	--	--	2760	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2144	2225	1873	1478	2124	1893
Hardness, Calcium Carbonate	mg/l	--	--	93	94	160	140	110	88
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.16	0.23	<1.0	<0.50
Nitrite as N	mg/l	1.0	--	<0.10	0.20	0.10	0.40	0.14	0.287
Nitrogen, Total Kjeldahl	mg/l	--	--	2.08	2.4	2.3	1.8	3.5	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	0.26	0.26	0.64	<1.0	<0.50
pH	-	--	--	8.56	8.37	8.44	8.29	8.38	8.46
pH (Field)	-	--	--	8.00	8.12	7.86	7.82	7.73	7.76
Phosphorus	mg/l	--	--	1.57	0.63	1.1	1.0	2.3	1.8
Sulphate	mg/l	--	500 [6]	9	<1	3	8	<1	<1
Temperature (Field)	deg c	--	15	7.3	10.7	7.4	11.4	6.7	9.2
Total Dissolved Solids	mg/l	--	500	1790	1510	1410	1570	1530	1530
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.0045	0.0039	0.0039	0.0038	0.0042
Boron, dissolved	mg/l	5	--	1.6	1.4	1.1	1.3	1.3	1.6
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	11	12	28	22	17	11
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	0.0068	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0006	0.00055	0.00058	<0.00050	0.00076	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.0071	0.0021	0.0018	0.0012	0.0023
Iron, dissolved	mg/l	--	0.3	0.36	0.62	0.26	0.3	0.2	1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.00050	<0.00050	0.00059	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	16	16	22	20	17	15
Manganese, dissolved	mg/l	--	0.05	0.04	0.052	0.11	0.079	0.28	0.057
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	14	15	14	14	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	615	620	490	530	570	560
Zinc, dissolved	mg/l	--	5	<0.01	0.017	0.0077	<0.0050	0.0099	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0013	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3C 19-Nov-2014 [16]	05-3C 02-Jun-2015	05-3C 26-Nov-2015	05-3C 26-May-2016	05-3C 17-Nov-2016	05-3C 24-May-2017
				05-3C	05-3C	05-3C	05-3C	05-3D	05-3C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	920	969	868	928	1000	674
Alkalinity, Carbonate as CaCO3	mg/l	--	--	18	25	14	14	13	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	940	994	882	942	1010	678
Ammonia Nitrogen	mg/l	--	--	1.3	1.48	1.20	0.28	2.12	0.01
Chemical Oxygen Demand	mg/l	--	--	74	85	58	78	111	28
Chloride	mg/l	--	250	270	348	214	257	316	107
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2090	2319	2053	2106	2751	1537
Hardness, Calcium Carbonate	mg/l	--	--	150	127	79.1	158	280	323
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.126	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.9	3.3	2.6	1.5	3.3	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.17	--	--	--	--	--
pH	-	--	--	8.31	--	--	--	--	--
pH (Field)	-	--	--	8.10	8.15	7.94	7.97	7.91	7.64
Phosphorus	mg/l	--	--	2.2	1.77	1.38	0.98	2.41	0.15
Sulphate	mg/l	--	500 [6]	3	10	50	29	16	94
Temperature (Field)	deg c	--	15	3.2	8.8	7.9	9.9	8.9	8.9
Total Dissolved Solids	mg/l	--	500	1470	1560	1270	1440	1610	928
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0033	0.003	0.004	0.003	0.003	0.001
Boron, dissolved	mg/l	5	--	1.2	0.864	1.71	1.05	0.839	0.434
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	22	20.4	9.86	25.3	50.7	61.3
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	0.001	<0.001	0.008	0.005
Cobalt, dissolved	mg/l	--	--	0.00091	0.0019	<0.0005	0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0033	<0.0005	<0.0005	0.0008	0.0044	0.0046
Iron, dissolved	mg/l	--	0.3	0.14	0.621	0.558	0.278	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	22	18.4	13.2	23	37.2	41.4
Manganese, dissolved	mg/l	--	0.05	0.055	0.312	0.05	0.159	0.289	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13	9.97	13.3	12.9	11.4	11.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	520	470	71.7	420	339	245
Zinc, dissolved	mg/l	--	5	0.011	0.012	0.01	0.006	0.016	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.002 [11]	<0.002 [11]	0.006	0.007	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3C 29-Nov-2017	05-3C 24-May-2018	05-3C 29-Nov-2018	05-3C 19-Jun-2019	05-3C 20-Nov-2019
				05-3C	05-3C	05-3C	05-3C	05-3C
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	880	932	1050	957	1030
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25 [9]	<25 [9]	25	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	891	942	1070	982	1040
Ammonia Nitrogen	mg/l	--	--	1.62	1.71	1.75	0.62	1.71
Chemical Oxygen Demand	mg/l	--	--	86	97	88	84	80
Chloride	mg/l	--	250	360	341	364	316	385
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2439	2639	2434	2497	2730
Hardness, Calcium Carbonate	mg/l	--	--	83	82	121	90.4	121
Nitrate as N	mg/l	10.0	--	0.3	0.2	<0.1	0.9	0.2
Nitrite as N	mg/l	1.0	--	0.27	0.05	0.08	0.10	0.40
Nitrogen, Total Kjeldahl	mg/l	--	--	3.3	3.5	3.6	2.1	2.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.81	8.11	8.39	7.77	8.27
Phosphorus	mg/l	--	--	2.18	2.05	2.21	0.83	2.31
Sulphate	mg/l	--	500 [6]	8	11	2	23	2
Temperature (Field)	deg c	--	15	7.8	10.6	7.7	13.3	5.8
Total Dissolved Solids	mg/l	--	500	1570	1740	1680	1580	1710
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.005	0.005	0.005	0.004	0.005
Boron, dissolved	mg/l	5	--	1.67	1.59	1.54	1.49	1.42
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	10.3	10.7	18.8	10.7	14.4
Chromium, dissolved	mg/l	0.05	--	0.001	0.001	0.002	0.001	0.002
Cobalt, dissolved	mg/l	--	--	0.0006	0.0005	0.0014	0.0006	0.0006
Copper, dissolved	mg/l	--	1	0.0037	0.0030	0.0065	0.0106	0.0031
Iron, dissolved	mg/l	--	0.3	0.149	0.194	1.32	0.502	0.429
Lead, dissolved	mg/l	0.01	--	0.0001	0.0002	0.0003	<0.0001	0.0004
Magnesium, dissolved	mg/l	--	--	14	13.4	17.9	15.4	20.7
Manganese, dissolved	mg/l	--	0.05	0.024	0.018	0.058	0.029	0.052
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.1	14.6	16.8	16.2	21.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	608	574	658	557	640
Zinc, dissolved	mg/l	--	5	<0.005	0.009	0.005	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.005	<0.001	0.004
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3D 06-Sep-2005	05-3D 16-Nov-2005	05-3D 25-May-2006	05-3D 15-May-2007	05-3D 30-Nov-2007	05-3D 22-May-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	593	271	480	478	507	484
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	486	444	480	478	507	484
Ammonia Nitrogen	mg/l	--	--	0.3	<0.01	0.21	<0.01	<0.01	<0.01
Chemical Oxygen Demand	mg/l	--	--	43	12	28	47	59	15
Chloride	mg/l	--	250	80.7	66.7	77.1	76	77.8	83.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1600	2500	950	900	750	1050
Hardness, Calcium Carbonate	mg/l	--	--	233	258	224	249	257	251
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.3	0.2	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.82	0.41	0.67	0.44	0.37	0.42
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.4	--	7.7	7.9	8.1	7.5
Phosphorus	mg/l	--	--	3.35	0.55	--	--	--	--
Sulphate	mg/l	--	500 [6]	137	101	96	94	91	89
Temperature (Field)	deg c	--	15	17.3	--	8.5	8.5	5	10.5
Total Dissolved Solids	mg/l	--	500	843	720	722	701	775	743
Total Organic Carbon	mg/l	--	--	35.2	4.1	--	--	--	--
Total Suspended Solids	mg/l	--	--	4570	659	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.005	0.001	0.001	0.0014	0.0019	0.0014
Boron, dissolved	mg/l	5	--	0.621	0.483	0.376	0.31	0.421	0.346
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00013	<0.00002	0.00015
Calcium, dissolved	mg/l	--	--	44.3	47.5	39.1	44.5	46.8	45.1
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.007	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.003	0.006	0.013	0.003	0.004	0.004
Iron, dissolved	mg/l	--	0.3	0.038	0.012	0.014	0.009	0.005	0.02
Lead, dissolved	mg/l	0.01	--	0.0005	0.0004	0.0007	0.0002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	29.8	33.8	30.8	33.5	34.1	33.6
Manganese, dissolved	mg/l	--	0.05	0.255	0.269	0.232	0.079	0.013	0.366
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.02	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.2	13.6	10.7	9.4	11.8	10
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	258	204	189	156	208	190
Zinc, dissolved	mg/l	--	5	0.014	0.017	0.017	0.015	<0.005	0.017
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3D 10-Nov-2008	05-3D 19-May-2009 G-15	05-3D 26-Nov-2009 J-13	05-3D 25-May-2010 [4] M-26	05-3D 20-Oct-2010 [4] G-27	05-3D 24-May-2011 G-40
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	505	508	538	515	565	576
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [6]	<2 [6]	<2 [6]	<2 [6]	14
Alkalinity (Total as CaCO3)	mg/l	--	--	505	508	538	515	565	590
Ammonia Nitrogen	mg/l	--	--	<0.01	0.05	0.02	0.06	0.05	0.06
Chemical Oxygen Demand	mg/l	--	--	<5	10	15	10	15	10
Chloride	mg/l	--	250	84	79	89	76	84	82
Conductivity	uS/cm	--	--	--	1310	1370	1320	1400	1430
Conductivity (Field)	uS/cm	--	--	1100	1050	1227	1246	1400	1122
Hardness, Calcium Carbonate	mg/l	--	--	264	268	239	274	312	296
Nitrate as N	mg/l	10.0	--	0.2	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.37	0.18	<0.10	0.13	0.12	0.56
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.04	8.05	8.14	8.00	8.42
pH (Field)	-	--	--	7.5	--	7.23	7.46	7.62	7.38
Phosphorus	mg/l	--	--	--	0.15	0.35	0.17	0.11	0.08
Sulphate	mg/l	--	500 [5]	91	78	90	79	80	79
Temperature (Field)	deg c	--	15	8	8	7.8	20.2	12.2	15.0
Total Dissolved Solids	mg/l	--	500	771	852	890	858	910	930
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0016	0.001	0.001	<0.01	0.001	<0.001
Boron, dissolved	mg/l	5	--	0.427	0.45	0.51	0.40	0.50	0.39
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	48.6	48	48	47	54	51
Chromium, dissolved	mg/l	0.05	--	<0.002	0.004	0.004	0.004	0.006	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.0002	<0.0002	0.0011	0.0006	0.0020
Copper, dissolved	mg/l	--	1	0.003	0.006	0.005	0.008	0.003	0.005
Iron, dissolved	mg/l	--	0.3	<0.005	<0.03	<0.03	0.05	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	34.7	36	29	38	43	41
Manganese, dissolved	mg/l	--	0.05	0.004	0.09	0.02	1.99	0.62	1.60
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.3	9	10	12	13	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	197	195	207	209	235	187
Zinc, dissolved	mg/l	--	5	<0.005	0.01	0.01	0.02	<0.01	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	<0.0006	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3D 29-Nov-2011 [4]	05-3D 31-May-2012	05-3D 29-Nov-2012	05-3D 29-May-2013	05-3D 26-Nov-2013	05-3D 29-May-2014
				05-3D	05-3D	05-3D	05-3D	GW-19	05-3D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	617	610	640	640	670	660
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [6]	6.5	8.5	6.1	6.0	6.8
Alkalinity (Total as CaCO3)	mg/l	--	--	617	620	650	650	680	670
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.050	0.080	0.11	<0.050	0.11
Chemical Oxygen Demand	mg/l	--	--	8	9.2	15	21	11	46
Chloride	mg/l	--	250	84	75	74	77	78	77
Conductivity	uS/cm	--	--	1460	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1437	1313	1341	1241	1324	1324
Hardness, Calcium Carbonate	mg/l	--	--	291	290	330	320	330	280
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.010	0.018	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.16	0.64	0.63	0.57	0.54	0.55
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
pH	-	--	--	8.16	8.05	8.15	8.01	7.98	8.04
pH (Field)	-	--	--	7.68	7.95	7.75	7.47	7.55	7.35
Phosphorus	mg/l	--	--	0.06	0.089	0.085	0.17	0.070	0.052
Sulphate	mg/l	--	500 [5]	82	71	71	72	77	72
Temperature (Field)	deg c	--	15	6.9	11.3	6.0	11.8	6.8	8.6
Total Dissolved Solids	mg/l	--	500	949	840	858	920	866	866
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.46	0.39	0.53	0.4	0.5	0.39
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	54	50	59	56	58	49
Chromium, dissolved	mg/l	0.05	--	0.005	<0.0050	0.0060	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0017	0.00072	0.0012	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.005	0.0042	0.0033	0.0055	0.0041	0.0044
Iron, dissolved	mg/l	--	0.3	<0.03	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	38	39	45	43	45	38
Manganese, dissolved	mg/l	--	0.05	0.08	1.7	0.84	0.98	0.18	0.23
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11	10	13	11	13	9.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	216	210	240	220	260	220
Zinc, dissolved	mg/l	--	5	<0.01	0.015	0.012	0.0070	0.036	0.0090
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3D 19-Nov-2014	05-3D 02-Jun-2015	05-3D 26-Nov-2015	05-3D 26-May-2016	05-3D 17-Nov-2016	05-3D 24-May-2017
				05-3D	05-3D	05-3D	05-3D	05-3C	05-3D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	650	658	642	646	651	1070
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.1	<5	<5	<5	<5	17
Alkalinity (Total as CaCO3)	mg/l	--	--	660	661	644	648	654	1090
Ammonia Nitrogen	mg/l	--	--	<0.050	0.10	0.02	0.04	0.08	1.91
Chemical Oxygen Demand	mg/l	--	--	9.6	18	18	19	40	98
Chloride	mg/l	--	250	88	92	98	104	106	342
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1499	1419	1494	1455	1596	2590
Hardness, Calcium Carbonate	mg/l	--	--	320	190	322	276	315	86
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.24	0.2	0.3	0.3	0.3	3.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--
pH	-	--	--	7.83	--	--	--	--	--
pH (Field)	-	--	--	7.49	7.49	7.67	7.78	7.56	8.18
Phosphorus	mg/l	--	--	0.076	<0.01	0.04	0.06	0.25	2.28
Sulphate	mg/l	--	500 [6]	79	83	87	91	100	9
Temperature (Field)	deg c	--	15	5.9	8.7	7.1	9.4	9.7	10.2
Total Dissolved Solids	mg/l	--	500	850	918	874	896	882	1660
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	0.001	0.01
Boron, dissolved	mg/l	5	--	0.46	0.193	0.424	0.343	0.578	1.32
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	57	29.4	45.7	49.8	57	10.9
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.006	0.011
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0067	0.0013	0.0006	0.0027	0.0045	0.0008
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.635
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	43	28.3	50.5	36.8	41.9	14.4
Manganese, dissolved	mg/l	--	0.05	0.063	0.06	<0.005	0.091	0.058	0.046
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	7.92	10	10.7	11.7	14.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	260	222	282	188	249	697
Zinc, dissolved	mg/l	--	5	0.024	0.007	0.009	0.011	0.007	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.002	<0.001	<0.004 [10]
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-3D 29-Nov-2017	05-3D 24-May-2018	05-3D 29-Nov-2018	05-3D 19-Jun-2019	05-3D 20-Nov-2019
				05-3D	05-3D	05-3D	05-3D	05-3D
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	714	714	753	694	666
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	6	5
Alkalinity (Total as CaCO3)	mg/l	--	--	718	718	756	701	671
Ammonia Nitrogen	mg/l	--	--	0.22	0.03	0.16	0.04	0.22
Chemical Oxygen Demand	mg/l	--	--	33	20	37	11	25
Chloride	mg/l	--	250	126	111	112	113	116
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1470	1608	1457	1518	1646
Hardness, Calcium Carbonate	mg/l	--	--	322	334	369	380	378
Nitrate as N	mg/l	10.0	--	<0.1	0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.6	0.4	0.4	0.2	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.40	7.49	7.78	7.53	7.4
Phosphorus	mg/l	--	--	0.40	0.10	0.20	0.16	0.16
Sulphate	mg/l	--	500 [6]	113	107	107	111	110
Temperature (Field)	deg c	--	15	8.8	9.0	8.2	12.7	9.3
Total Dissolved Solids	mg/l	--	500	970	992	646	970	1060
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.523	0.593	0.581	0.444	0.435
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	53.5	60.1	62.7	67.2	60
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0006	<0.0005	0.0007
Copper, dissolved	mg/l	--	1	0.0070	0.0039	0.0109	0.0051	0.0030
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.499	0.122	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0018	0.0003	<0.0001
Magnesium, dissolved	mg/l	--	--	45.8	44.7	51.6	51.5	55.4
Manganese, dissolved	mg/l	--	0.05	0.6	<0.005	0.248	0.052	0.623
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13	11.7	14.4	14.8	18.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	247	236	0.283	258	276
Zinc, dissolved	mg/l	--	5	0.01	0.006	0.015	0.006	0.008
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.003	<0.001	0.003
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-8 06-Sep-2005 [3]	05-8 16-Nov-2005	05-8 25-May-2006	05-8 21-Nov-2006	05-8 15-May-2007	05-8 30-Nov-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	159	855	876	980	1040
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	650	855	876	980	1040
Ammonia Nitrogen	mg/l	--	--	--	3.29	2.02	0.79	2.22	0.35
Chemical Oxygen Demand	mg/l	--	--	--	61	57	39	169	108
Chloride	mg/l	--	250	--	89.9	27.9	16.8	24.3	122
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1600	1400	1425	1300	1500
Hardness, Calcium Carbonate	mg/l	--	--	--	649	794	769	794	1040
Nitrate as N	mg/l	10.0	--	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	5.48	3.48	1.74	4.35	1.69
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	6.8	6.9	7.2	6.9
Phosphorus	mg/l	--	--	--	2.06	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	220	203	169	79	139
Temperature (Field)	deg c	--	15	--	--	4	11	9	11.5
Total Dissolved Solids	mg/l	--	500	--	1100	1120	1070	1080	1370
Total Organic Carbon	mg/l	--	--	--	17.5	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	4590	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	0.007	<0.001	0.0006	0.0013	0.0013
Boron, dissolved	mg/l	5	--	--	0.642	0.262	0.368	0.306	1.51
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00007	<0.00002
Calcium, dissolved	mg/l	--	--	--	136	179	165	174	222
Chromium, dissolved	mg/l	0.05	--	--	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	0.045	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	--	19.6	21	2.49	9.56	6.03
Lead, dissolved	mg/l	0.01	--	--	<0.0002	0.0008	<0.0001	0.00011	<0.00002
Magnesium, dissolved	mg/l	--	--	--	75.4	84.4	86.9	87.5	119
Manganese, dissolved	mg/l	--	0.05	--	1.63	2.36	3.23	3.02	4.47
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	14.6	5.9	5.8	6.8	6.4
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	169	86.8	91.4	109	129
Zinc, dissolved	mg/l	--	5	--	0.016	0.026	0.01	0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-8 28-Feb-2008	05-8 22-May-2008	05-8 10-Nov-2008	05-8 19-Dec-2008	05-8 19-May-2009 G-20	05-8 26-Nov-2009 M-15
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	940	970	1900	1850	1610	1400
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	940	970	1900	1850	1613	1400
Ammonia Nitrogen	mg/l	--	--	0.44	<0.01	0.8	0.72	0.72	0.67
Chemical Oxygen Demand	mg/l	--	--	43	67	214	272	140	130
Chloride	mg/l	--	250	81.2	103	444	409	302	243
Conductivity	uS/cm	--	--	--	--	--	--	3450	2960
Conductivity (Field)	uS/cm	--	--	--	1700	3500	3200	--	2511
Hardness, Calcium Carbonate	mg/l	--	--	925	1030	1500	1390	1220	1120
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.75	1.81	5.56	5.34	3.34	2.56
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	6.71	7.21
pH (Field)	-	--	--	--	6.5	6.6	6.6	--	6.34
Phosphorus	mg/l	--	--	--	--	--	--	0.53	0.79
Sulphate	mg/l	--	500 [6]	144	123	12	7	16	21
Temperature (Field)	deg c	--	15	--	10.5	11	5	--	11.4
Total Dissolved Solids	mg/l	--	500	1200	1260	2560	2490	2240	1920
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0015	0.0011	0.0023	0.005	0.003	0.004
Boron, dissolved	mg/l	5	--	0.966	1.01	**13.1**	**12.6**	**8.71**	**5.9**
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	200	223	341	325	262	248
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0022	0.0015
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.006	0.003	0.006	0.001
Iron, dissolved	mg/l	--	0.3	6.52	4.52	0.054	0.938	<0.03	7.09
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	103	116	158	140	138	122
Manganese, dissolved	mg/l	--	0.05	4.09	4.88	5.75	5.26	6.76	5.29
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6	4.9	12.3	12.5	8	12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	93.6	98.4	443	476	297	263
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.026	0.02	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.004	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	**0.0011**	**0.0015**	**0.0020**	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	0.0053	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	0.0015	<0.0005	<0.0005
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-8 25-May-2010 [4] M-12	05-8 20-Oct-2010 G-8	05-8 24-May-2011 G-14	05-8 29-Nov-2011 [4] 05-8	05-8 31-May-2012 05-8	05-8 28-Nov-2012 05-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1250	1210	1100	1170	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	2.7	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	1248	1210	1100	1170	1200	1200
Ammonia Nitrogen	mg/l	--	--	0.57	0.76	0.70	1.16	0.74	1.0
Chemical Oxygen Demand	mg/l	--	--	75	85	55	85	56	61
Chloride	mg/l	--	250	133	135	91	158	43	96
Conductivity	uS/cm	--	--	2490	2420	2110	2380	--	--
Conductivity (Field)	uS/cm	--	--	2474	2277	1688	2127	1866	1922
Hardness, Calcium Carbonate	mg/l	--	--	1040	1140	982	818	960	920
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	1.51	2.29	1.55	2.71	1.7	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	7.14	7.02	7.76	7.51	7.38	--
pH (Field)	-	--	--	6.64	6.64	6.40	6.67	6.56	6.50
Phosphorus	mg/l	--	--	0.20	0.70	0.50	0.52	0.29	0.29
Sulphate	mg/l	--	500 [6]	29	36	34	5	<1	<1
Temperature (Field)	deg c	--	15	16.3	13	16.5	9.3	11.0	10.1
Total Dissolved Solids	mg/l	--	500	1620	1570	1370	1550	1240	1330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.001	<0.001	<0.01	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	4.8	3.6	0.50	3.6	1.6	2.7
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	222	255	207	166	210	190
Chromium, dissolved	mg/l	0.05	--	0.006	0.006	0.008	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0010	0.0012	0.0010	0.0004	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.006	0.003	0.004	<0.001	0.0016	0.001
Iron, dissolved	mg/l	--	0.3	0.92	2.39	0.11	13.0	1.8	3.8
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	119	122	113	98	110	110
Manganese, dissolved	mg/l	--	0.05	5.63	6.38	6.78	3.19	7	4.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	9	8	12	7.6	12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	211	194	140	225	130	190
Zinc, dissolved	mg/l	--	5	0.02	0.02	0.02	<0.01	<0.0050	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00050	<0.00050
Benzene	mg/l	0.001	--	<0.0005	0.0008	<0.0005	<0.0005	<0.00050	<0.00050
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00050	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0025	<0.0025
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	<0.0010
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	<0.0010

Report of Monitoring Results - Groundwater
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-8 29-May-2013 [5]	05-8 26-Nov-2013 [5]	05-8 29-May-2014	05-8 19-Nov-2014 [16]	05-8 02-Jun-2015
				05-8	GW-23	05-8	05-8	05-8
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1200	1200	1100	1200	983
Alkalinity, Carbonate as CaCO3	mg/l	--	--	2.2	2.2	1.8	1.9	<50
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1200	1100	1200	984
Ammonia Nitrogen	mg/l	--	--	1.8	1.7	1.5	0.95	1.04
Chemical Oxygen Demand	mg/l	--	--	78	57	51	61	69
Chloride	mg/l	--	250	70	64	30	95	67
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1733	1727	1566	2174	2045
Hardness, Calcium Carbonate	mg/l	--	--	1000	990	970	1100	933
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	2.5	2.4	2.0	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--
pH	-	--	--	7.29	7.29	7.25	7.21	--
pH (Field)	-	--	--	6.52	6.40	6.65	6.86	6.58
Phosphorus	mg/l	--	--	0.14	0.13	0.21	0.21	0.09
Sulphate	mg/l	--	500 [6]	<1	<1	3	<1	<1
Temperature (Field)	deg c	--	15	9.7	8.6	10.6	7.0	9.2
Total Dissolved Solids	mg/l	--	500	1330	1280	1030	1300	1300
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	1.6	1.2	0.4	1.9	1.07
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	220	220	220	230	169
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	<0.0010	0.0023	0.0010	<0.0005
Iron, dissolved	mg/l	--	0.3	0.69	8.8	<0.1	0.76	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	120	110	100	120	124
Manganese, dissolved	mg/l	--	0.05	6.8	8.2	7.6	7	6.82
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.3	7.1	4	8.6	6.37
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	140	110	49	150	126
Zinc, dissolved	mg/l	--	5	<0.0050	<0.0050	<0.0050	<0.0050	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.0056	0.0019	0.0015	0.0048	<0.002 [11]
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005
Benzene	mg/l	0.001	--	<0.00025	<0.00025	0.00033	<0.00020	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.0013	<0.00050	<0.0010	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	<0.00050	<0.00020	<0.00040	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00050	<0.00020	<0.00040	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-8 26-Nov-2015 [3]	05-8 26-May-2016	05-8 17-Nov-2016	05-8 24-May-2017	05-8 29-Nov-2017	05-8 24-May-2018
				05-8	05-8	05-8	05-8	05-8	05-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1080	1030	1120	1020	1310
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<25 [9]	<25 [9]	<25 [9]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	--	1080	1040	1120	1020	1310
Ammonia Nitrogen	mg/l	--	--	--	0.88	1.25	0.21	0.84	0.39
Chemical Oxygen Demand	mg/l	--	--	--	54	95	54	87	134
Chloride	mg/l	--	250	--	55	90	14	68	121
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1983	2205	1888	2003	2388
Hardness, Calcium Carbonate	mg/l	--	--	--	987	937	1140	891	1220
Nitrate as N	mg/l	10.0	--	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	--	1.6	2.1	1.0	2.3	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	6.58	6.94	6.65	6.41	6.52
Phosphorus	mg/l	--	--	--	0.18	0.79	0.06	1.95	0.14
Sulphate	mg/l	--	500 [6]	--	2	<1	<1	1	1
Temperature (Field)	deg c	--	15	--	13.4	11.4	10.4	9.4	12.0
Total Dissolved Solids	mg/l	--	500	--	1330	1300	1170	1130	1570
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	<0.001	0.002	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	--	0.824	2.36	0.273	1.98	3.21
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	--	208	197	258	200	274
Chromium, dissolved	mg/l	0.05	--	--	<0.001	0.016	0.01	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	0.0007
Copper, dissolved	mg/l	--	1	--	<0.0005	0.0017	0.0019	0.0008	0.0008
Iron, dissolved	mg/l	--	0.3	--	<0.1	10	0.46	4.12	0.878
Lead, dissolved	mg/l	0.01	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	--	114	108	120	95.1	130
Manganese, dissolved	mg/l	--	0.05	--	8.74	5.59	12.6	9.67	12.5
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	8.06	11.7	3.69	4.93	4.96
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	84.9	159	55.4	90.4	124
Zinc, dissolved	mg/l	--	5	--	<0.005	0.005	0.006	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	<0.004 [10]	0.007	<0.002 [10]	<0.001	<0.002 [10]
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-8 22-Nov-2018	05-8 19-Jun-2019	05-8 20-Nov-2019
				05-8	05-8	05-8
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1500	1250	1310
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25 [9]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1500	1260	1310
Ammonia Nitrogen	mg/l	--	--	0.90	0.79	0.42
Chemical Oxygen Demand	mg/l	--	--	174	110	141
Chloride	mg/l	--	250	219	113	94
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2506	2173	2520
Hardness, Calcium Carbonate	mg/l	--	--	1630	942	1200
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.5	2.5	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	6.65	6.71	6.87
Phosphorus	mg/l	--	--	0.24	0.13	0.11
Sulphate	mg/l	--	500 [6]	3	1	9
Temperature (Field)	deg c	--	15	9.8	13.3	6.5
Total Dissolved Solids	mg/l	--	500	1700	1400	1550
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	12.9	2.48	4.67
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	396	195	254
Chromium, dissolved	mg/l	0.05	--	0.001	0.001	0.002
Cobalt, dissolved	mg/l	--	--	0.0027	0.0009	0.0027
Copper, dissolved	mg/l	--	1	0.0012	0.0046	0.0015
Iron, dissolved	mg/l	--	0.3	7.95	0.21	10.3
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	156	110	137
Manganese, dissolved	mg/l	--	0.05	12.9	13.7	13.2
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11.6	6.52	11.7
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	226	136	190
Zinc, dissolved	mg/l	--	5	<0.005	0.008	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	0.006	0.003	0.006
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	0.0006
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-11 06-Sep-2005 [3]	05-11 16-Nov-2005	05-11 25-May-2006	05-11 21-Nov-2006	05-11 15-May-2007	05-11 30-Nov-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	157	474	422	444	955
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	645	474	422	444	955
Ammonia Nitrogen	mg/l	--	--	--	2	0.93	0.91	0.52	0.96
Chemical Oxygen Demand	mg/l	--	--	--	54	26	25	53	112
Chloride	mg/l	--	250	--	38	26.5	7.9	7.9	118
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1700	1025	1400	1100	1500
Hardness, Calcium Carbonate	mg/l	--	--	--	645	427	553	539	889
Nitrate as N	mg/l	10.0	--	--	<0.1	0.1	0.2	0.2	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.79	1.56	1.49	1.15	2.23
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.3	7	7.4	7.3
Phosphorus	mg/l	--	--	--	0.6	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	320	240	540	360	183
Temperature (Field)	deg c	--	15	--	--	8.5	10.5	11.8	11
Total Dissolved Solids	mg/l	--	500	--	1180	822	1140	937	1390
Total Organic Carbon	mg/l	--	--	--	16.3	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	1310	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	0.005	<0.001	0.0007	0.0006	0.0032
Boron, dissolved	mg/l	5	--	--	0.832	0.566	0.572	0.547	1.97
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00003	<0.00002
Calcium, dissolved	mg/l	--	--	--	153	98.7	136	130	206
Chromium, dissolved	mg/l	0.05	--	--	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	0.003	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	--	17.3	5	3.01	4.59	19.1
Lead, dissolved	mg/l	0.01	--	--	<0.0002	<0.0002	<0.0001	0.00003	<0.00002
Magnesium, dissolved	mg/l	--	--	--	63.9	43.9	51.9	52.3	91.1
Manganese, dissolved	mg/l	--	0.05	--	2.14	1.13	1.21	1.3	3.14
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	10.6	7.4	5.8	6.8	10.4
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	197	119	143	102	191
Zinc, dissolved	mg/l	--	5	--	0.015	0.01	0.008	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	0.0013
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	0.0014
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	0.0009
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	0.0006

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-11 28-Feb-2008	05-11 22-May-2008	05-11 10-Nov-2008	05-11 19-Dec-2008	05-11 19-May-2009 G-8	05-11 26-Nov-2009 J-19
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	740	1030	1830	1400	793	723
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [6]	<2 [6]
Alkalinity (Total as CaCO3)	mg/l	--	--	740	1030	1830	1400	793	723
Ammonia Nitrogen	mg/l	--	--	0.87	0.46	0.61	0.56	0.42	0.57
Chemical Oxygen Demand	mg/l	--	--	41	86	242	117	45	63
Chloride	mg/l	--	250	68.6	156	351	267	218	76
Conductivity	uS/cm	--	--	--	--	--	--	2190	1700
Conductivity (Field)	uS/cm	--	--	--	2000	3300	2100	--	2119
Hardness, Calcium Carbonate	mg/l	--	--	745	995	1600	1030	558	700
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.08	2.49	4.27	2.63	1.14	1.26
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.56	7.47
pH (Field)	-	--	--	--	6.6	6.7	607	--	6.54
Phosphorus	mg/l	--	--	--	--	--	--	0.40	0.06
Sulphate	mg/l	--	500 [6]	230	153	69	107	97	146
Temperature (Field)	deg c	--	15	--	10	9	5	--	11.0
Total Dissolved Solids	mg/l	--	500	1150	1460	2500	1810	1420	1110
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0016	0.0027	0.0035	0.002	0.001	0.003
Boron, dissolved	mg/l	5	--	1.19	2.38	**13.4**	**6.33**	1.24	4.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	170	231	356	240	98	155
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	0.009	0.009
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0002	0.0014
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.006	<0.002	0.004	0.002
Iron, dissolved	mg/l	--	0.3	9.53	13.9	4.13	3.29	<0.03	12.0
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	77.6	102	172	104	76	76
Manganese, dissolved	mg/l	--	0.05	2.52	3.65	4.17	3.4	0.04	2.37
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.2	8.4	15	10.8	14	10
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	130	176	430	235	241	105
Zinc, dissolved	mg/l	--	5	0.01	0.006	<0.005	<0.005	<0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	0.0007	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	**0.0013**	**0.0012**	0.001	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-11 25-May-2010 [4] M-11	05-11 20-Oct-2010 [4] G-6	05-11 24-May-2011 G-18	05-11 29-Nov-2011 05-11	05-11 31-May-2012 05-11	05-11 28-Nov-2012 05-11
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	921	696	744	678	630	580
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [6]	<2 [6]	<2 [6]	<2 [6]	3.5	1.4
Alkalinity (Total as CaCO3)	mg/l	--	--	921	696	744	678	630	580
Ammonia Nitrogen	mg/l	--	--	0.53	0.68	0.35	0.49	0.26	0.65
Chemical Oxygen Demand	mg/l	--	--	73	55	35	40	30	32
Chloride	mg/l	--	250	115	80	89	66	49	42
Conductivity	uS/cm	--	--	2120	1650	1760	1550	--	--
Conductivity (Field)	uS/cm	--	--	2095	1805	934	1151	1015	1085
Hardness, Calcium Carbonate	mg/l	--	--	947	661	634	578	610	560
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.018	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	1.30	1.57	0.85	0.77	0.75	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	7.47	7.23	7.96	7.72	7.77	--
pH (Field)	-	--	--	6.63	7	6.86	6.74	6.85	6.73
Phosphorus	mg/l	--	--	0.05	0.08	0.03	0.03	<0.020	0.024
Sulphate	mg/l	--	500 [5]	128	135	117	131	130	160
Temperature (Field)	deg c	--	15	21.3	11.3	15.8	9.5	9.9	10.5
Total Dissolved Solids	mg/l	--	500	1380	1070	1140	1010	744	878
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	3.6	2.2	0.51	2.4	2.1	1.7
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	206	146	132	126	130	120
Chromium, dissolved	mg/l	0.05	--	0.004	0.006	0.005	0.004	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0035	0.0012	0.0016	0.0008	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.002	0.001	0.004	0.002	<0.0010	<0.001
Iron, dissolved	mg/l	--	0.3	12.5	9.65	<0.03	<0.03	3.6	2.2
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	105	72	74	64	71	63
Manganese, dissolved	mg/l	--	0.05	2.95	1.57	0.84	0.65	0.69	0.34
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11	9	10	9	10	10
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	149	111	111	106	110	83
Zinc, dissolved	mg/l	--	5	0.01	<0.01	0.01	<0.01	<0.0050	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025	<0.00050
Benzene	mg/l	0.001	--	<0.0005	0.0006	<0.0005	<0.0005	<0.00025	<0.00050
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0025
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0010
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.0010

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-11 29-May-2013	05-11 26-Nov-2013 [5]	05-11 29-May-2014	05-11 19-Nov-2014	05-11 02-Jun-2015	05-11 26-Nov-2015
				05-11	GW-25	05-11	05-11	05-11	05-11
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	400	440	390	390	442	471
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.2	1.6	1.6	<1.0	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	400	440	390	390	443	472
Ammonia Nitrogen	mg/l	--	--	0.15	0.90	0.26	0.12	0.24	0.05
Chemical Oxygen Demand	mg/l	--	--	27	34	15	17	21	33
Chloride	mg/l	--	250	11	8	10	5	9	5
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	822	889	813	908	973	1097
Hardness, Calcium Carbonate	mg/l	--	--	510	510	500	480	389	585
Nitrate as N	mg/l	10.0	--	0.11	<0.10	<0.10	<0.10	<0.1	0.1
Nitrite as N	mg/l	1.0	--	0.018	0.027	0.048	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.34	1.3	0.52	0.48	0.3	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.12	<0.10	0.13	<0.10	--	--
pH	-	--	--	7.50	7.60	7.65	7.38	--	--
pH (Field)	-	--	--	6.82	7.09	6.88	6.88	6.91	6.82
Phosphorus	mg/l	--	--	0.035	0.048	0.045	0.056	<0.01	0.01
Sulphate	mg/l	--	500 [6]	150	160	150	110	148	183
Temperature (Field)	deg c	--	15	8.6	9.0	9.8	6.8	8.5	10.4
Total Dissolved Solids	mg/l	--	500	682	650	650	526	662	732
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.41	0.36	0.41	0.65	0.148	0.405
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	120	130	120	110	84.6	128
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0016	0.0026	0.0016	0.00057	0.0009	0.0011
Copper, dissolved	mg/l	--	1	0.0015	0.0015	0.0034	0.0018	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	50	48	50	50	43	64.4
Manganese, dissolved	mg/l	--	0.05	0.64	1.1	0.64	0.63	0.472	0.51
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.6	6.6	6.1	7.1	4.48	5.84
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	37	39	33	41	23.3	43.4
Zinc, dissolved	mg/l	--	5	<0.0050	0.0090	<0.0050	<0.0050	0.005	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-11 26-May-2016	05-11 17-Nov-2016	05-11 24-May-2017	05-11 29-Nov-2017	05-11 24-May-2018	05-11 29-Nov-2018
				05-11	05-11	05-11	05-11	05-11	05-11
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	432	389	672	900	1400	1800
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<25 [9]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	432	389	673	901	1400	1800
Ammonia Nitrogen	mg/l	--	--	0.28	0.27	0.16	0.50	1.72	1.99
Chemical Oxygen Demand	mg/l	--	--	24	24	24	93	138	192
Chloride	mg/l	--	250	7	6	22	120	199	250
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	979	1785	1337	1913	3123	3102
Hardness, Calcium Carbonate	mg/l	--	--	473	890	655	916	1190	2030
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.5	0.4	1.6	4.6	5.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.10	6.91	6.81	6.51	6.69	6.67
Phosphorus	mg/l	--	--	0.09	0.06	0.03	0.11	0.13	0.17
Sulphate	mg/l	--	500 [6]	136	708	130	63	64	35
Temperature (Field)	deg c	--	15	11.8	12.0	10.4	9.3	10.2	9.1
Total Dissolved Solids	mg/l	--	500	630	1320	812	1130	2060	2210
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.397	0.663	0.361	2.46	3.93	13.9
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	110	230	170	215	288	516
Chromium, dissolved	mg/l	0.05	--	<0.001	0.006	0.005	<0.001	<0.001	0.002
Cobalt, dissolved	mg/l	--	--	0.0020	0.0010	0.0024	0.0053	0.0027	0.0059
Copper, dissolved	mg/l	--	1	0.0008	0.0013	0.0057	0.0008	0.0014	0.0036
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	5.8	<0.1	1.17
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0007	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	48.4	76.4	56	92.2	113	181
Manganese, dissolved	mg/l	--	0.05	1.04	0.626	1.01	3.72	5.23	5.63
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.96	7.92	5.83	8.5	9.51	19
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	33.5	42.8	22.7	79.9	166	335
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.008	<0.005	0.007	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.001	<0.001	<0.001	0.004	0.004
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-11 19-Jun-2019	05-11 20-Nov-2019
				05-11	05-11
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1330	1170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1330	1170
Ammonia Nitrogen	mg/l	--	--	2.27	0.76
Chemical Oxygen Demand	mg/l	--	--	124	129
Chloride	mg/l	--	250	173	128
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2431	2670
Hardness, Calcium Carbonate	mg/l	--	--	1160	939
Nitrate as N	mg/l	10.0	--	<0.1	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.1	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	6.85	6.97
Phosphorus	mg/l	--	--	0.12	0.16
Sulphate	mg/l	--	500 [6]	44	77
Temperature (Field)	deg c	--	15	14.2	8.5
Total Dissolved Solids	mg/l	--	500	1660	1480
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002
Boron, dissolved	mg/l	5	--	5.73	6.13
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	266	185
Chromium, dissolved	mg/l	0.05	--	0.001	0.002
Cobalt, dissolved	mg/l	--	--	0.0029	0.0026
Copper, dissolved	mg/l	--	1	0.0013	0.0007
Iron, dissolved	mg/l	--	0.3	<0.1	10.2
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	121	116
Manganese, dissolved	mg/l	--	0.05	6.68	4.34
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.5	16.3
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	189	189
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.004 [10]
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-R3 06-Sep-2005 [3]	05-R3 16-Nov-2005	05-R3 25-May-2006	05-R3 21-Nov-2006	05-R3 15-May-2007	05-R3 30-Nov-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	140	720	765	768	815
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	575	720	765	768	815
Ammonia Nitrogen	mg/l	--	--	--	6.74	0.54	0.38	0.11	0.12
Chemical Oxygen Demand	mg/l	--	--	--	106	25	15	38	57
Chloride	mg/l	--	250	--	80.2	81.9	76	79.6	68.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1600	1300	1425	1300	1375
Hardness, Calcium Carbonate	mg/l	--	--	--	556	501	547	554	601
Nitrate as N	mg/l	10.0	--	--	<0.1	0.8	0.8	0.5	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	33.1	1.16	0.84	0.67	0.49
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.2	7.1	7.6	7.6
Phosphorus	mg/l	--	--	--	5.05	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	300	185	196	198	211
Temperature (Field)	deg c	--	15	--	--	4.5	11.5	11.1	9
Total Dissolved Solids	mg/l	--	500	--	1160	1080	1150	1150	1230
Total Organic Carbon	mg/l	--	--	--	26.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	1200	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	0.008	<0.001	0.001	0.0008	0.001
Boron, dissolved	mg/l	5	--	--	1.27	1.06	1.28	1.1	1.18
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00006	<0.00002
Calcium, dissolved	mg/l	--	--	--	129	108	121	122	139
Chromium, dissolved	mg/l	0.05	--	--	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	0.009	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	<0.002	0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	--	15.2	0.022	<0.005	0.06	0.089
Lead, dissolved	mg/l	0.01	--	--	<0.0002	<0.0002	<0.0001	0.00005	<0.00002
Magnesium, dissolved	mg/l	--	--	--	57	56.1	59.9	60.5	62
Manganese, dissolved	mg/l	--	0.05	--	1.19	1.18	1.21	0.844	0.551
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	15.3	10.1	11.7	10.3	10.2
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	225	208	220	212	246
Zinc, dissolved	mg/l	--	5	--	0.017	0.006	0.008	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-R3 28-Feb-2008	05-R3 22-May-2008	05-R3 10-Nov-2008	05-R3 19-Dec-2008	05-R3 19-May-2009 G-24	05-R3 26-Nov-2009 M-16
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	800	850	920	870	899	908
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [6]	<2 [6]
Alkalinity (Total as CaCO3)	mg/l	--	--	800	850	920	870	899	908
Ammonia Nitrogen	mg/l	--	--	<0.01	0.04	0.26	0.03	0.09	0.53
Chemical Oxygen Demand	mg/l	--	--	<5	17	14	15	23	27
Chloride	mg/l	--	250	72.8	71.7	74.1	65.9	60	73
Conductivity	uS/cm	--	--	--	--	--	--	1940	2000
Conductivity (Field)	uS/cm	--	--	--	--	1600	1500	1500	1776
Hardness, Calcium Carbonate	mg/l	--	--	601	639	639	666	646	580
Nitrate as N	mg/l	10.0	--	0.4	0.3	0.2	0.5	0.18	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.34	0.5	0.65	0.37	0.36	0.60
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.06	7.45
pH (Field)	-	--	--	--	--	6.8	7.3	--	6.79
Phosphorus	mg/l	--	--	--	--	--	--	0.06	0.18
Sulphate	mg/l	--	500 [5]	202	186	158	150	173	153
Temperature (Field)	deg c	--	15	--	--	9	5	8	10.7
Total Dissolved Solids	mg/l	--	500	1180	1210	1240	1210	1260	1300
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.0008	0.0008	0.0008	<0.001	0.002
Boron, dissolved	mg/l	5	--	1.08	1.01	1.17	1.24	1.75	1.4
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	136	142	143	152	145	120
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	0.009	0.003
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0005	0.0008
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.031	0.279	0.099	0.006	<0.03	3.93
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	63.6	69.3	68.5	69.5	69	68
Manganese, dissolved	mg/l	--	0.05	0.614	1.19	0.964	1.5	0.42	1.61
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.5	10.3	11.7	12.5	9	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	213	218	230	236	204	224
Zinc, dissolved	mg/l	--	5	<0.005	0.005	<0.005	<0.005	<0.01	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-R3 25-May-2010 M-15	05-R3 20-Oct-2010 G-10	05-R3 24-May-2011 G-16	05-R3 29-Nov-2011 05-R3	05-R3 31-May-2012 05-R3	05-R3 28-Nov-2012 05-R3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	852	896	951	968	940	940
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	4.4	5.0
Alkalinity (Total as CaCO3)	mg/l	--	--	852	896	951	968	940	940
Ammonia Nitrogen	mg/l	--	--	0.10	0.06	0.26	0.25	<0.050	0.11
Chemical Oxygen Demand	mg/l	--	--	23	30	23	25	21	25
Chloride	mg/l	--	250	58	55	51	81	46	44
Conductivity	uS/cm	--	--	1950	1970	1980	2030	--	--
Conductivity (Field)	uS/cm	--	--	1954	1905	1745	1852	1780	1792
Hardness, Calcium Carbonate	mg/l	--	--	732	784	766	660	750	780
Nitrate as N	mg/l	10.0	--	0.14	<0.10	<0.10	0.11	0.21	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.28	0.83	0.50	0.62	0.58	0.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	0.21	<0.10
pH	-	--	--	7.76	7.40	7.98	7.76	7.70	--
pH (Field)	-	--	--	6.88	6.98	6.86	6.83	6.99	6.79
Phosphorus	mg/l	--	--	0.07	0.04	0.05	0.05	0.059	0.028
Sulphate	mg/l	--	500 [6]	192	193	158	131	160	170
Temperature (Field)	deg c	--	15	14.5	11.9	16.7	9.5	10.6	8.6
Total Dissolved Solids	mg/l	--	500	1270	1280	1290	1320	1230	1280
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	1.4	1.1	0.97	1.4	0.97	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	163	187	173	134	170	180
Chromium, dissolved	mg/l	0.05	--	0.005	0.005	0.002	0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0007	0.0012	0.0007	0.0007	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.004	0.006	0.002	0.0024	0.002
Iron, dissolved	mg/l	--	0.3	0.24	0.31	<0.03	1.18	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	79	77	81	79	81	81
Manganese, dissolved	mg/l	--	0.05	0.81	1.10	0.52	1.91	1.1	0.39
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	10	10	12	11	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	218	197	170	222	180	190
Zinc, dissolved	mg/l	--	5	0.01	<0.01	0.01	<0.01	0.016	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	--	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	--	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	--	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	--	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	--	<0.0002	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-R3 29-May-2013	05-R3 26-Nov-2013 [5]	05-R3 29-May-2014	05-R3 19-Nov-2014	05-R3 02-Jun-2015	05-R3 26-Nov-2015
				05-R3	GW-22	05-R3	05-R3	05-R3	05-R3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	940	970	960	940	958	978
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.2	4.1	5.2	3.2	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	950	970	960	940	959	980
Ammonia Nitrogen	mg/l	--	--	0.074	0.087	0.075	0.051	0.07	0.05
Chemical Oxygen Demand	mg/l	--	--	27	27	15	17	19	32
Chloride	mg/l	--	250	43	42	46	39	48	49
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1611	1646	1704	1878	1860	1849
Hardness, Calcium Carbonate	mg/l	--	--	820	750	790	820	702	800
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.17	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.50	0.45	0.43	0.33	0.2	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	0.17	<0.10	--	--
pH	-	--	--	7.68	7.65	7.76	7.56	--	--
pH (Field)	-	--	--	6.95	6.93	7.27	7.08	6.99	6.98
Phosphorus	mg/l	--	--	0.046	0.053	0.049	0.060	0.04	0.04
Sulphate	mg/l	--	500 [6]	150	150	160	170	184	144
Temperature (Field)	deg c	--	15	9.9	9.0	11.4	7.2	10.2	10.4
Total Dissolved Solids	mg/l	--	500	1250	1220	1220	1180	1290	1250
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.97	0.96	0.91	0.94	0.698	0.838
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	190	170	180	190	132	153
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0019	0.0024	0.0031	0.0017	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	0.2	<0.1	0.31	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	83	81	84	85	90.3	101
Manganese, dissolved	mg/l	--	0.05	0.51	0.55	0.25	0.41	0.583	0.804
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.8	11	9.2	9.7	7.95	9.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	180	180	190	180	195	187
Zinc, dissolved	mg/l	--	5	<0.0050	0.0074	<0.0050	0.0065	0.011	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [11]	0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-R3 26-May-2016	05-R3 17-Nov-2016	05-R3 24-May-2017	05-R3 29-Nov-2017	05-R3 24-May-2018	05-R3 22-Nov-2018
				05-R3	05-R3	05-R3	05-R3	05-R3	05-R3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	960	981	939	917	1030	991
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	961	983	941	919	1030	992
Ammonia Nitrogen	mg/l	--	--	0.02	0.13	0.03	0.12	0.10	0.03
Chemical Oxygen Demand	mg/l	--	--	16	28	17	30	48	21
Chloride	mg/l	--	250	42	42	20	21	20	21
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1880	2018	1874	1656	1790	1435
Hardness, Calcium Carbonate	mg/l	--	--	764	788	933	789	824	797
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.4	0.3	0.3	0.5	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.18	7.34	6.89	6.81	6.92	7.25
Phosphorus	mg/l	--	--	0.07	0.08	0.03	0.04	0.06	0.06
Sulphate	mg/l	--	500 [6]	223	168	296	282	131	127
Temperature (Field)	deg c	--	15	13.1	11.8	11.8	10.6	11.2	9.2
Total Dissolved Solids	mg/l	--	500	1320	1200	1290	1130	1150	990
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.796	1.14	0.58	0.649	0.501	0.62
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	172	174	229	186	195	185
Chromium, dissolved	mg/l	0.05	--	<0.001	0.012	0.008	0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0010	0.0026	0.0024	0.0016	0.0015	0.0037
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.4
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	81.5	85.7	87.5	78.8	81.7	81.5
Manganese, dissolved	mg/l	--	0.05	0.233	0.725	0.008	0.063	1.38	0.363
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.76	11.7	6.97	8.7	7.99	9.51
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	173	169	171	167	137	123
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.001	<0.001	<0.001	<0.001	0.003
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	05-R3 19-Jun-2019	05-R3 20-Nov-2019
				05-R3	05-R3
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	899	756
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	902	760
Ammonia Nitrogen	mg/l	--	--	0.05	0.02
Chemical Oxygen Demand	mg/l	--	--	18	23
Chloride	mg/l	--	250	21	18
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1560	1625
Hardness, Calcium Carbonate	mg/l	--	--	814	613
Nitrate as N	mg/l	10.0	--	<0.1	0.2
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.22	7.07
Phosphorus	mg/l	--	--	0.03	0.04
Sulphate	mg/l	--	500 [6]	123	162
Temperature (Field)	deg c	--	15	14.1	7.4
Total Dissolved Solids	mg/l	--	500	1020	1100
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.507	0.446
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	183	118
Chromium, dissolved	mg/l	0.05	--	<0.001	0.003
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0019	0.0025
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	86.4	77.1
Manganese, dissolved	mg/l	--	0.05	0.417	0.083
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.85	10.2
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	128	125
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1A 30-Nov-2007	07-1A 28-Feb-2008	07-1A 22-May-2008	07-1A 13-Aug-2008	07-1A 10-Nov-2008	07-1A 25-May-2010 [4] M-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	860	795	820	805	800	761
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	28
Alkalinity (Total as CaCO3)	mg/l	--	--	860	795	820	805	800	789
Ammonia Nitrogen	mg/l	--	--	1.42	1.48	1.39	1.38	1.39	1.27
Chemical Oxygen Demand	mg/l	--	--	68	32	85	45	23	33
Chloride	mg/l	--	250	421	402	407	405	402	343
Conductivity	uS/cm	--	--	--	--	--	--	--	2640
Conductivity (Field)	uS/cm	--	--	2000	--	2350	2500	2250	2693
Hardness, Calcium Carbonate	mg/l	--	--	44	40	40	42	40	49
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1	<0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.19	2.65	3.92	2.93	1.99	1.66
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	8.59
pH (Field)	-	--	--	8.6	--	8.6	9	8.5	8.72
Phosphorus	mg/l	--	--	--	--	--	--	--	1.07
Sulphate	mg/l	--	500 [6]	4	1	2	<1	<1	<1
Temperature (Field)	deg c	--	15	3.5	--	11.5	11	7	11.9
Total Dissolved Solids	mg/l	--	500	1660	1440	1510	1440	1460	1720
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0044	0.0035	0.0025	0.0008	0.001	<0.01
Boron, dissolved	mg/l	5	--	1.05	0.993	1.01	1.03	1.06	1.3
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	2.8	2.4	2.4	2.9	2.27	3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.008
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0003
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.004	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.018	0.071	0.054	0.05	0.015	0.06
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	0.0002	0.00015	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	8.98	8.25	8.33	8.46	8.44	10
Manganese, dissolved	mg/l	--	0.05	0.004	0.005	0.003	0.003	0.002	<0.01
Potassium, dissolved	mg/l	--	--	17.5	14.2	14.9	15.6	15.9	16
Sodium, dissolved	mg/l	--	200 [7]	687	531	578	518	550	515
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1A 24-May-2011 [4]	07-1A 28-Nov-2012	07-1A 29-May-2014	07-1A 26-Nov-2015	07-1A 24-May-2017	07-1A 29-Nov-2018
				G-7	07-1A	07-1A	07-1A	07-1A	07-1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	784	780	770	815	864	898
Alkalinity, Carbonate as CaCO3	mg/l	--	--	37	18	30	20	18	22
Alkalinity (Total as CaCO3)	mg/l	--	--	821	800	800	835	882	920
Ammonia Nitrogen	mg/l	--	--	1.37	2.1	1.6	1.50	1.61	1.89
Chemical Oxygen Demand	mg/l	--	--	33	820	110	56	34	39
Chloride	mg/l	--	250	382	360	380	406	469	482
Conductivity	uS/cm	--	--	2730	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2429	2381	2336	2585	2885	2620
Hardness, Calcium Carbonate	mg/l	--	--	45	45	46	36.5	54	79
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.78	13	5.3	2.0	2.5	2.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.10	--	--	--
pH	-	--	--	8.70	--	8.62	--	--	--
pH (Field)	-	--	--	8.59	8.64	8.10	8.68	8.51	8.57
Phosphorus	mg/l	--	--	0.52	30	3.0	0.49	0.34	0.46
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	18.0	7.5	9.9	8.7	10.4	6.8
Total Dissolved Solids	mg/l	--	500	1770	1560	1460	1600	1640	1650
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.001	<0.0010	<0.001	0.002	<0.001
Boron, dissolved	mg/l	5	--	1.0	1.3	1.2	1.26	1.24	1.26
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3	3.1	3	2.73	3.23	10.5
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.0050	<0.001	0.011	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0002	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.001	<0.001	0.0017	<0.0005	0.0015	0.0024
Iron, dissolved	mg/l	--	0.3	0.07	<0.1	<0.1	<0.1	<0.1	0.182
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	9	9.1	9.3	7.21	11.1	12.9
Manganese, dissolved	mg/l	--	0.05	<0.01	0.003	0.0050	<0.005	<0.005	<0.005
Potassium, dissolved	mg/l	--	--	15	15	14	12.9	16.6	18.7
Sodium, dissolved	mg/l	--	200 [7]	606	630	530	677	674	706
Zinc, dissolved	mg/l	--	5	<0.01	<0.005	<0.0050	0.007	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.002 [11]	<0.002 [10]	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00020	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00020	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00020	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.00020	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0010	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00020	<0.00010	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.00040	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00040	<0.00020	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1B 30-Nov-2007	07-1B 28-Feb-2008	07-1B 22-May-2008	07-1B 13-Aug-2008	07-1B 10-Nov-2008	07-1B 25-May-2010 [4] M-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	965	925	920	945	950	902
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	965	925	920	945	950	902
Ammonia Nitrogen	mg/l	--	--	2.99	3.06	2.51	2.74	3.14	2.54
Chemical Oxygen Demand	mg/l	--	--	130	82	77	124	68	65
Chloride	mg/l	--	250	1470	1480	1470	1510	1520	1260
Conductivity	uS/cm	--	--	--	--	--	--	--	5690
Conductivity (Field)	uS/cm	--	--	4500	--	>5000	>5000	>5000	>3999
Hardness, Calcium Carbonate	mg/l	--	--	389	333	357	362	366	346
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	0.1	<0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	5.21	5.31	4.41	5.6	4.85	3.89
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	8.28
pH (Field)	-	--	--	7.8	--	7.8	8.2	7.6	7.54
Phosphorus	mg/l	--	--	--	--	--	--	--	0.67
Sulphate	mg/l	--	500 [6]	200	185	132	73	52	30
Temperature (Field)	deg c	--	15	3	--	11.5	12	7	11.0
Total Dissolved Solids	mg/l	--	500	3890	3430	3420	3320	3330	3700
Metals									
Arsenic, dissolved	mg/l	0.01	--	**0.0119**	**0.0216**	**0.0154**	**0.0108**	0.0049	<0.1
Boron, dissolved	mg/l	5	--	1.06	1.04	1.05	1.06	1.1	0.95
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	45.8	33.6	40.7	43.1	42.2	38
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0010
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.6	2.71	1.06	0.179	0.033	1.35
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	0.0005	<0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	66.8	60.6	62.1	61.8	63.4	61
Manganese, dissolved	mg/l	--	0.05	0.111	0.09	0.084	0.104	0.075	0.09
Potassium, dissolved	mg/l	--	--	40.7	34.4	35.8	38.1	36.1	32
Sodium, dissolved	mg/l	--	200 [7]	1440	1070	1120	1030	1040	955
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1B 24-May-2011 [4]	07-1B 28-Nov-2012	07-1B 29-May-2014 [5]	07-1B 26-Nov-2015	07-1B 24-May-2017	07-1B 22-Nov-2018
				G-9	07-1B	07-1B	07-1B	07-1B	07-1B
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	942	910	900	967	1030	1040
Alkalinity, Carbonate as CaCO3	mg/l	--	--	20	8.5	18	19	17	8
Alkalinity (Total as CaCO3)	mg/l	--	--	962	920	920	987	1050	1050
Ammonia Nitrogen	mg/l	--	--	2.77	3.2	3.2	3.06	3.31	3.14
Chemical Oxygen Demand	mg/l	--	--	63	69	61	119	91	80
Chloride	mg/l	--	250	1360	1300	1400	1420	1480	1390
Conductivity	uS/cm	--	--	6020	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	>3999	>3999	>3999	3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	355	380	370	376	331	562
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	0.010	<0.010	<0.05	<0.50 [9]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.95	4.3	4.0	4.1	4.1	4.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.10	--	--	--
pH	-	--	--	8.35	--	8.34	--	--	--
pH (Field)	-	--	--	7.78	7.99	7.73	8.02	7.94	8.1
Phosphorus	mg/l	--	--	0.99	0.96	1.5	0.89	1.05	0.92
Sulphate	mg/l	--	500 [6]	7	<1	<1	4	3	2
Temperature (Field)	deg c	--	15	10.0	7.0	10.5	8.8	9.9	7.1
Total Dissolved Solids	mg/l	--	500	3910	3190	3050	3160	3340	3160
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.1	0.006	0.0077 [17]	0.003	0.012	0.003
Boron, dissolved	mg/l	5	--	0.9	1.3	1.2	1.31	0.914	1.47
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	40	42	41	29.2	40.5	60.6
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.0050	<0.001	0.04	<0.001
Cobalt, dissolved	mg/l	--	--	0.0011	0.0007	0.00074	0.0005	0.0006	0.0012
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0010	<0.0005	0.0034	0.0029
Iron, dissolved	mg/l	--	0.3	1.59	1.3	0.75	0.519	0.832	1.53
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	0.0003	<0.0001
Magnesium, dissolved	mg/l	--	--	62	66	65	73.4	55.9	99.7
Manganese, dissolved	mg/l	--	0.05	0.14	0.083	0.079	0.067	0.07	0.119
Potassium, dissolved	mg/l	--	--	30	32	30	27.2	31.6	47.6
Sodium, dissolved	mg/l	--	200 [7]	1190	1100	1200	1260	1180	1180
Zinc, dissolved	mg/l	--	5	0.01	<0.005	<0.0050	0.008	0.012	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.002 [11]	<0.010 [10]	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00050	<0.00020	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00050	<0.00020	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00050	<0.00020	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.00050	<0.00020	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0025	<0.0010	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00050	<0.00020	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0010	<0.00040	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0010	<0.00040	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1C 30-Nov-2007	07-1C 28-Feb-2008	07-1C 22-May-2008	07-1C 13-Aug-2008	07-1C 10-Nov-2008	07-1C 19-May-2009 G-4
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	642	672	660	660	666	657
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [6]
Alkalinity (Total as CaCO3)	mg/l	--	--	642	672	660	660	666	657
Ammonia Nitrogen	mg/l	--	--	1.41	0.73	0.66	0.79	0.75	0.30
Chemical Oxygen Demand	mg/l	--	--	360	13	40	102	29	18
Chloride	mg/l	--	250	562	471	507	505	605	425
Conductivity	uS/cm	--	--	--	--	--	--	--	2760
Conductivity (Field)	uS/cm	--	--	2100	--	2850	2600	2350	2300
Hardness, Calcium Carbonate	mg/l	--	--	252	245	260	245	235	243
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.1	0.2	0.2	0.42
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	5.52	2.23	1.93	1.88	1.73	0.66
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	7.78
pH (Field)	-	--	--	7.6	--	7.4	7.8	7.3	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.26
Sulphate	mg/l	--	500 [6]	197	176	163	158	119	119
Temperature (Field)	deg c	--	15	3.5	--	10.5	11	8	8
Total Dissolved Solids	mg/l	--	500	1900	1670	1710	1640	1740	1790
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0048	0.0068	0.0084	0.0026	0.012	0.004
Boron, dissolved	mg/l	5	--	0.474	0.45	0.429	0.432	0.474	0.48
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	37.5	33.8	36.2	33.9	33.2	33
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0006
Copper, dissolved	mg/l	--	1	<0.002	0.003	<0.002	<0.002	0.003	0.004
Iron, dissolved	mg/l	--	0.3	0.149	0.122	1.44	0.005	0.01	<0.03
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	38.5	39	41.2	39	37.1	39
Manganese, dissolved	mg/l	--	0.05	0.479	0.403	0.469	0.461	0.466	0.40
Potassium, dissolved	mg/l	--	--	17.9	14.9	14.9	16.1	15.6	12
Sodium, dissolved	mg/l	--	200 [7]	662	535	551	495	526	471
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1C 26-Nov-2009 J-15	07-1C 25-May-2010 [4] M-6	07-1C 20-Oct-2010 [4] G-5	07-1C 24-May-2011 [4] G-4	07-1C 29-Nov-2011 [4] 07-1C
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	666	639	661	671	674
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	14
Alkalinity (Total as CaCO3)	mg/l	--	--	666	639	661	671	688
Ammonia Nitrogen	mg/l	--	--	0.53	0.49	0.28	0.59	0.40
Chemical Oxygen Demand	mg/l	--	--	30	25	40	30	30
Chloride	mg/l	--	250	454	422	468	452	460
Conductivity	uS/cm	--	--	2820	2760	2820	2840	2870
Conductivity (Field)	uS/cm	--	--	2420	2845	2945	2576	2534
Hardness, Calcium Carbonate	mg/l	--	--	158	186	191	199	136
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.70	0.62	0.60	0.81	0.50
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	8.06	8.10	7.79	8.26	8.35
pH (Field)	-	--	--	7.16	7.65	7.04	7.57	7.47
Phosphorus	mg/l	--	--	0.21	0.26	0.10	0.40	0.29
Sulphate	mg/l	--	500 [6]	115	108	98	86	84
Temperature (Field)	deg c	--	15	9.3	10.2	10.2	13.6	7.9
Total Dissolved Solids	mg/l	--	500	1830	1790	1830	1850	1870
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.005	<0.01	<0.01	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.52	0.43	0.44	0.44	0.50
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	22	25	27	27	18
Chromium, dissolved	mg/l	0.05	--	<0.005	0.004	0.009	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	0.0007	0.0006	0.0005	0.0006	0.0003
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.001	0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.11	0.40	0.75	0.88	<0.03
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	25	30	30	32	22
Manganese, dissolved	mg/l	--	0.05	0.38	0.32	0.38	0.34	0.14
Potassium, dissolved	mg/l	--	--	12	12	11	13	11
Sodium, dissolved	mg/l	--	200 [7]	537	531	510	502	521
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.01	0.01	<0.01
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1C 31-May-2012	07-1C 28-Nov-2012	07-1C 29-May-2013	07-1C 26-Nov-2013	07-1C 29-May-2014	07-1C 19-Nov-2014
				07-1C	07-1C	07-1C	GW-20	07-1C	07-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	650	670	680	680	660	660
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7.7	5.5	5.8	7.6	8.6	6.2
Alkalinity (Total as CaCO3)	mg/l	--	--	660	680	690	680	670	670
Ammonia Nitrogen	mg/l	--	--	0.56	0.41	0.49	0.25	0.60	0.25
Chemical Oxygen Demand	mg/l	--	--	34	28	29	26	26	23
Chloride	mg/l	--	250	420	400	310	410	440	510
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2433	2423	1976	2172	2366	2664
Hardness, Calcium Carbonate	mg/l	--	--	150	150	230	180	200	160
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.11	0.16	0.10	<0.10
Nitrite as N	mg/l	1.0	--	0.050	<0.010	0.057	0.021	0.060	0.049
Nitrogen, Total Kjeldahl	mg/l	--	--	1.4	1.6	0.93	0.85	1.2	0.94
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.11	<0.10	0.17	0.18	0.16	<0.10
pH	-	--	--	8.10	--	7.96	8.08	8.14	8.00
pH (Field)	-	--	--	7.40	7.62	6.99	7.23	7.65	7.69
Phosphorus	mg/l	--	--	0.34	0.36	0.21	0.25	0.49	0.33
Sulphate	mg/l	--	500 [6]	72	75	94	81	66	54
Temperature (Field)	deg c	--	15	9.2	8.5	8.7	7.7	9.8	6.0
Total Dissolved Solids	mg/l	--	500	1560	1590	1600	1560	1490	1460
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0043	0.004	0.0030	0.0029	0.0049	0.0038
Boron, dissolved	mg/l	5	--	0.5	0.59	0.56	0.48	0.52	0.53
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	21	20	31	25	27	23
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.005	<0.0050	0.0054	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.00050	<0.00050	0.00054	<0.00050
Copper, dissolved	mg/l	--	1	<0.0010	<0.001	0.0014	0.0012	0.0025	<0.0020
Iron, dissolved	mg/l	--	0.3	0.5	0.46	<0.1	<0.1	1.4	0.87
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	24	24	38	28	31	24
Manganese, dissolved	mg/l	--	0.05	0.24	0.32	0.33	0.28	0.35	0.27
Potassium, dissolved	mg/l	--	--	12	13	14	12	13	12
Sodium, dissolved	mg/l	--	200 [7]	560	570	560	510	570	550
Zinc, dissolved	mg/l	--	5	<0.0050	<0.005	<0.0050	0.0086	<0.0050	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1C 02-Jun-2015	07-1C 26-Nov-2015	07-1C 26-May-2016	07-1C 17-Nov-2016	07-1C 24-May-2017	07-1C 29-Nov-2017
				07-1C	07-1C	07-1C	07-1C	07-1C	07-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	693	709	712	713	735	737
Alkalinity, Carbonate as CaCO3	mg/l	--	--	8	6	5	5	<5	8
Alkalinity (Total as CaCO3)	mg/l	--	--	701	716	718	718	740	745
Ammonia Nitrogen	mg/l	--	--	0.60	0.32	0.71	0.54	1.14	0.40
Chemical Oxygen Demand	mg/l	--	--	40	32	31	49	30	39
Chloride	mg/l	--	250	528	450	509	511	434	478
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2555	2678	2628	2773	2528	2303
Hardness, Calcium Carbonate	mg/l	--	--	161	114	177	152	192	153
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.1	1.0	1.2	0.8	1.6	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.46	7.65	7.73	7.28	7.55	7.50
Phosphorus	mg/l	--	--	0.38	0.50	0.45	0.32	0.64	0.35
Sulphate	mg/l	--	500 [6]	56	73	63	65	105	108
Temperature (Field)	deg c	--	15	9.5	9.3	9.3	10.1	8.5	8.2
Total Dissolved Solids	mg/l	--	500	1700	1460	1630	1570	1520	1560
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.003	0.004	0.003	0.007	0.005	0.003
Boron, dissolved	mg/l	5	--	0.314	0.535	0.482	0.619	0.456	0.522
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	22.9	17	24.7	21.4	27	22.1
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.006	0.01	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	<0.0005	0.0006	0.0012	0.0011
Iron, dissolved	mg/l	--	0.3	0.563	0.724	0.351	0.273	<0.1	0.133
Lead, dissolved	mg/l	0.01	--	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	25.2	17.4	27.9	23.9	30.2	23.7
Manganese, dissolved	mg/l	--	0.05	0.33	0.34	0.279	0.429	0.341	0.3
Potassium, dissolved	mg/l	--	--	10.7	10.8	14.2	12.5	13.1	13.6
Sodium, dissolved	mg/l	--	200 [7]	586	587	502	587	583	553
Zinc, dissolved	mg/l	--	5	<0.005	0.009	<0.005	<0.005	0.006	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [11]	<0.001	0.003	0.004	<0.002 [10]	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1C 24-May-2018	07-1C 22-Nov-2018	07-1C 19-Jun-2019	07-1C 20-Nov-2019 [18]
				07-1C	07-1C	07-1C	07-1C
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	742	781	661	682
Alkalinity, Carbonate as CaCO3	mg/l	--	--	8	7	<5	9
Alkalinity (Total as CaCO3)	mg/l	--	--	750	788	665	690
Ammonia Nitrogen	mg/l	--	--	0.68	0.38	0.61	0.36
Chemical Oxygen Demand	mg/l	--	--	67	40	28	42
Chloride	mg/l	--	250	465	552	418	448
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2701	2379	2442	2600
Hardness, Calcium Carbonate	mg/l	--	--	201	192	229	276
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.3	0.8	0.9	0.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.36	7.85	7.49	--
Phosphorus	mg/l	--	--	0.64	0.41	0.66	0.54
Sulphate	mg/l	--	500 [6]	93	81	117	115
Temperature (Field)	deg c	--	15	9.0	7.7	11.7	8.4
Total Dissolved Solids	mg/l	--	500	1560	1730	1440	1470
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.003	0.003	0.003	0.004
Boron, dissolved	mg/l	5	--	0.542	0.55	0.452	0.421
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	30.1	29.1	34	39.6
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0006	0.0007	0.0006
Copper, dissolved	mg/l	--	1	0.0005	0.0038	0.0010	0.0016
Iron, dissolved	mg/l	--	0.3	0.426	0.218	0.917	0.411
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0001	0.0006	0.0002
Magnesium, dissolved	mg/l	--	--	30.5	28.9	35	43.1
Manganese, dissolved	mg/l	--	0.05	0.312	0.22	0.389	0.401
Potassium, dissolved	mg/l	--	--	13.4	16.2	14.1	19.5
Sodium, dissolved	mg/l	--	200 [7]	509	597	442	518
Zinc, dissolved	mg/l	--	5	0.005	<0.005	0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.006	<0.001	<0.001
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1D 30-Nov-2007	07-1D 28-Feb-2008	07-1D 22-May-2008	07-1D 13-Aug-2008	07-1D 10-Nov-2008	07-1D 19-May-2009 G-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	730	690	654	681	717	618
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	730	690	654	681	717	618
Ammonia Nitrogen	mg/l	--	--	1.31	1.26	0.8	1.18	1.21	1.75
Chemical Oxygen Demand	mg/l	--	--	307	58	54	114	43	33
Chloride	mg/l	--	250	105	90.7	77.2	96.4	104	63
Conductivity	uS/cm	--	--	--	--	--	--	--	1460
Conductivity (Field)	uS/cm	--	--	1300	--	1500	1450	1400	1100
Hardness, Calcium Carbonate	mg/l	--	--	383	401	381	357	386	319
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.2	0.2	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	7.44	3.91	3.24	3.32	3.2	2.37
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	7.23
pH (Field)	-	--	--	6.8	--	6.8	7.2	6.7	--
Phosphorus	mg/l	--	--	--	--	--	--	--	1.15
Sulphate	mg/l	--	500 [6]	182	164	150	140	140	108
Temperature (Field)	deg c	--	15	5.5	--	10.5	15	8	8
Total Dissolved Solids	mg/l	--	500	1210	1050	1040	1020	1080	949
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0086	0.0048	0.0044	0.0015	0.0045	<0.001
Boron, dissolved	mg/l	5	--	0.431	0.314	0.326	0.424	0.446	0.33
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	65.1	71.9	65.1	61.3	72.6	57
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.006
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	8.46	12.8	14.1	2.95	8.04	2.19
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	53.5	53.7	53.2	49.6	49.8	43
Manganese, dissolved	mg/l	--	0.05	2.14	2.67	2.13	2.14	2.71	2.78
Potassium, dissolved	mg/l	--	--	12	8	9.5	11.2	10.3	6
Sodium, dissolved	mg/l	--	200 [7]	347	234	270	248	259	187
Zinc, dissolved	mg/l	--	5	<0.005	0.013	0.008	<0.005	<0.005	0.03
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1D 26-Nov-2009 J-14	07-1D 25-May-2010 [4] M-5	07-1D 20-Oct-2010 [4] G-3	07-1D 24-May-2011 [4] G-12	07-1D 29-Nov-2011 [4] 07-1D
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	697	635	709	642	690
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	697	635	709	642	690
Ammonia Nitrogen	mg/l	--	--	1.52	1.73	1.21	0.62	0.98
Chemical Oxygen Demand	mg/l	--	--	90	40	38	30	33
Chloride	mg/l	--	250	95	59	84	58	62
Conductivity	uS/cm	--	--	1660	1440	1590	1440	1450
Conductivity (Field)	uS/cm	--	--	1456	1423	1530	1070	1468
Hardness, Calcium Carbonate	mg/l	--	--	333	369	404	397	403
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	0.12	0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.94	2.23	1.75	1.09	1.96
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	7.64	7.39	7.16	7.86	7.73
pH (Field)	-	--	--	6.51	6.99	6.73	6.89	7.07
Phosphorus	mg/l	--	--	1.12	0.92	1.39	0.55	0.34
Sulphate	mg/l	--	500 [6]	102	59	60	80	52
Temperature (Field)	deg c	--	15	9.1	13.2	9	14.0	7.7
Total Dissolved Solids	mg/l	--	500	1080	936	1030	936	942
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.004	<0.01	<0.01	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.48	0.31	0.52	0.26	0.44
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	64	67	81	78	79
Chromium, dissolved	mg/l	0.05	--	0.005	0.004	0.007	0.002	0.006
Cobalt, dissolved	mg/l	--	--	0.0007	0.0006	0.0005	0.0009	0.0006
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.001	0.003	<0.001
Iron, dissolved	mg/l	--	0.3	9.01	14.2	19.1	4.81	10.5
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	42	49	49	49	50
Manganese, dissolved	mg/l	--	0.05	2.01	2.79	3.55	1.63	3.22
Potassium, dissolved	mg/l	--	--	9	8	8	8	8
Sodium, dissolved	mg/l	--	200 [7]	237	211	207	174	208
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.01	0.01	<0.01
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1D 31-May-2012	07-1D 28-Nov-2012	07-1D 29-May-2013	07-1D 26-Nov-2013	07-1D 29-May-2014 [19]	07-1D 19-Nov-2014
				07-1D	07-1D	7-1D	GW-12	07-1D	07-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	620	700	510	630	370	610
Alkalinity, Carbonate as CaCO3	mg/l	--	--	2.0	1.5	1.8	1.9	1.8	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	630	700	510	630	370	610
Ammonia Nitrogen	mg/l	--	--	1.0	1.4	0.82	1.6	0.90	0.61
Chemical Oxygen Demand	mg/l	--	--	33	41	36	34	25	25
Chloride	mg/l	--	250	46	75	30	41	19	58
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1201	1447	977	1202	862	1161
Hardness, Calcium Carbonate	mg/l	--	--	380	430	390	360	350	400
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.69	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	0.014	0.016	0.095	0.016	0.043	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	2.1	1.3	2.4	1.5	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	0.78	<0.10	<0.10	<0.10
pH	-	--	--	7.54	--	7.57	7.51	7.70	7.43
pH (Field)	-	--	--	6.95	6.76	6.62	6.76	7.07	6.83
Phosphorus	mg/l	--	--	0.32	0.51	0.35	0.58	0.41	0.38
Sulphate	mg/l	--	500 [6]	66	50	65	50	34	44
Temperature (Field)	deg c	--	15	9.9	7.8	9.0	7.7	9.5	7.6
Total Dissolved Solids	mg/l	--	500	824	950	746	736	418	600
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	0.001	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.39	0.64	0.41	0.36	0.42	0.28
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	74	78	75	81	65	96
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.00050	0.0008	<0.00050	0.00079	<0.00050	0.0011
Copper, dissolved	mg/l	--	1	0.0014	0.001	0.0015	0.0014	0.0016	0.0013
Iron, dissolved	mg/l	--	0.3	4.5	7	3.4	2.1	10	3.5
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	48	57	50	40	45	38
Manganese, dissolved	mg/l	--	0.05	1.7	4.1	2.2	1.7	2.1	3
Potassium, dissolved	mg/l	--	--	6.5	9.3	6.1	6.8	6.9	7.6
Sodium, dissolved	mg/l	--	200 [7]	170	230	160	130	160	100
Zinc, dissolved	mg/l	--	5	<0.0050	<0.005	<0.0050	0.011	<0.0050	0.0056
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020

WCC - Navan Waste Recycling and Disposal Facility
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1D 02-Jun-2015	07-1D 26-Nov-2015	07-1D 26-May-2016	07-1D 17-Nov-2016	07-1D 24-May-2017	07-1D 29-Nov-2017
				07-1D	07-1D	07-1D	07-1D	07-1D	07-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	503	471	477	516	383	455
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	504	471	477	517	384	456
Ammonia Nitrogen	mg/l	--	--	1.23	1.48	1.00	0.48	0.45	0.26
Chemical Oxygen Demand	mg/l	--	--	37	32	38	27	61	51
Chloride	mg/l	--	250	42	33	54	71	23	34
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1153	1138	1261	1571	1046	1175
Hardness, Calcium Carbonate	mg/l	--	--	236	365	441	561	438	527
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.2	0.1	<0.1	0.5
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.9	1.9	1.3	1.0	1.8	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.85	6.95	7.19	7.25	7.09	7.04
Phosphorus	mg/l	--	--	0.37	0.58	0.40	0.34	0.60	1.07
Sulphate	mg/l	--	500 [6]	61	58	153	313	220	270
Temperature (Field)	deg c	--	15	9.3	9.0	9.3	10.3	9.3	7.1
Total Dissolved Solids	mg/l	--	500	684	596	760	986	698	796
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.293	0.33	0.359	0.386	0.172	0.267
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	48.6	68.9	84.8	142	127	143
Chromium, dissolved	mg/l	0.05	--	<0.001	0.001	<0.001	0.006	0.003	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0009	0.0019	0.0030	0.0025
Iron, dissolved	mg/l	--	0.3	3.28	4.66	4.71	2.05	0.497	1.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	27.7	46.7	55.7	50.1	29.2	41.3
Manganese, dissolved	mg/l	--	0.05	1.57	1.31	2.03	0.824	0.27	0.487
Potassium, dissolved	mg/l	--	--	5.78	6.12	7.68	7.53	7.08	7.51
Sodium, dissolved	mg/l	--	200 [7]	121	137	152	105	42.3	62.9
Zinc, dissolved	mg/l	--	5	<0.005	0.009	0.009	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.005	0.002	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	07-1D 24-May-2018 07-1D	07-1D 22-Nov-2018 07-1D	07-1D 19-Jun-2019 07-1D	07-1D 20-Nov-2019 07-1D
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	439	545	426	361
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	440	546	428	361
Ammonia Nitrogen	mg/l	--	--	0.28	0.04	0.26	0.10
Chemical Oxygen Demand	mg/l	--	--	55	30	68	52
Chloride	mg/l	--	250	24	35	17	28
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1099	971	1025	1178
Hardness, Calcium Carbonate	mg/l	--	--	503	592	485	539
Nitrate as N	mg/l	10.0	--	1.4	0.6	0.8	1.7
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.1	0.9	2.2	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	6.92	7.17	7.05	6.8
Phosphorus	mg/l	--	--	1.08	0.73	1.42	0.61
Sulphate	mg/l	--	500 [6]	196	207	197	215
Temperature (Field)	deg c	--	15	9.5	7	12.6	7.8
Total Dissolved Solids	mg/l	--	500	748	822	686	752
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.245	0.877	0.247	0.286
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	136	122	119	134
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0022	0.0042	0.0032	0.0031
Iron, dissolved	mg/l	--	0.3	0.57	2.61	<0.1	0.662
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	39.7	69.7	45.6	49.7
Manganese, dissolved	mg/l	--	0.05	0.334	1.03	0.67	0.344
Potassium, dissolved	mg/l	--	--	5.38	9.11	7.07	7.56
Sodium, dissolved	mg/l	--	200 [7]	48.6	139	63.8	63.3
Zinc, dissolved	mg/l	--	5	<0.005	0.007	0.008	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-C 05-May-2000	MW-C 24-Oct-2000	MW-C 14-Jun-2001	MW-C 23-Nov-2001	MW-C 23-May-2002	MW-C 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	454	628	366	381	412	666
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	10	1
Alkalinity (Total as CaCO3)	mg/l	--	--	372	515	300	312	395	546
Ammonia Nitrogen	mg/l	--	--	0.12	0.37	0.33	0.01	0.35	0.65
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	8	77	56	120
Chloride	mg/l	--	250	103	212	122	206	117	279
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1150	1660	1100	1670	1410	1900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	212	182	224	331	344	147
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	15.5	2.66	3.43	2.26	3.26
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	7.5	7.1	6.94	6.94	7.8
Phosphorus	mg/l	--	--	--	7.27	5.4	5.15	2.81	8.71
Sulphate	mg/l	--	500 [6]	155	77	156	315	220	56
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	575	890	706	958	876	1100
Total Organic Carbon	mg/l	--	--	--	--	13.5	21	14	18.1
Total Suspended Solids	mg/l	--	--	22300	37000	5930	9420	3440	6550
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.004
Boron, dissolved	mg/l	5	--	0.99	0.75	1.06	1.36	1.34	0.72
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	40.5	28.5	42.2	57	62.9	22.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.02	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.09	6.35	0.04	0.04	0.03	0.05
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0019
Magnesium, dissolved	mg/l	--	--	26.5	27	28.8	45.8	45.4	21.9
Manganese, dissolved	mg/l	--	0.05	0.46	0.63	0.22	0.14	0.2	0.2
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	4.7	9.2	2.2	3.2	6.2	7.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	200	353	161	294	216	347
Zinc, dissolved	mg/l	--	5	0.03	0.04	0.01	0.01	0.02	0.04
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.03	0.001	0.001	0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-C 30-May-2003	MW-C 09-Oct-2003	MW-C 14-May-2004	MW-C 19-Nov-2004	MW-C 24-May-2005	MW-C 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	403	--	523	695	539	256
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	330	528	429	570	442	420
Ammonia Nitrogen	mg/l	--	--	0.14	0.59	0.13	0.08	<0.01	0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	3	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	59	89	43	70	59
Chloride	mg/l	--	250	201	171	123	153	67.2	235
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1500	1880	1790	1820	1700	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	122	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	372	125	402	454	423	594
Nitrate as N	mg/l	10.0	--	1	0.1	0.2	1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4.9	2.79	3.77	0.94	2.19	1.37
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7.4	7.5	7.3	6.9	--
Phosphorus	mg/l	--	--	3.01	2.15	2.87	1.09	2.12	2.06
Sulphate	mg/l	--	500 [6]	335	64	320	290	167	420
Temperature (Field)	deg c	--	15	--	--	--	--	10	--
Total Dissolved Solids	mg/l	--	500	750	950	895	910	804	1450
Total Organic Carbon	mg/l	--	--	16.2	15	15.7	11.8	10.2	19.4
Total Suspended Solids	mg/l	--	--	5900	1130	4360	1010	233	1430
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	1.12	0.716	1.25	1.38	1.18	1.24
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	67.1	19.4	71.8	86.2	74	116
Chromium, dissolved	mg/l	0.05	--	0.01	0.016	0.001	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.012	0.007	0.002	<0.002	0.003
Iron, dissolved	mg/l	--	0.3	0.33	0.42	1.13	0.346	1.93	0.76
Lead, dissolved	mg/l	0.01	--	0.0002	0.0007	0.0003	0.0007	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	49.7	18.7	54.1	58.1	57.8	74.1
Manganese, dissolved	mg/l	--	0.05	0.25	0.401	0.47	1.1	0.591	0.329
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	0.00014	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	4.8	8.6	4.6	5.4	3.9	7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001
Sodium, dissolved	mg/l	--	200 [7]	266	351	274	288	170	351
Zinc, dissolved	mg/l	--	5	0.01	0.027	0.006	0.005	0.008	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.003	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-C 30-May-2003	MW-C 09-Oct-2003	MW-C 14-May-2004	MW-C 19-Nov-2004	MW-C 24-May-2005	MW-C 16-Nov-2005
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-C 25-May-2006	MW-C 21-Nov-2006	MW-C 15-May-2007	MW-C 30-Nov-2007	MW-C 22-May-2008	MW-C 10-Nov-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	448	458	507	447	410	570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	448	458	507	447	410	570
Ammonia Nitrogen	mg/l	--	--	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	20	27	120	80	<5	31
Chloride	mg/l	--	250	159	76.9	62.9	197	99.8	157
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1450	1200	800	1425	1350	1400
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	395	351	433	459	396	454
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.47	0.9	1.4	1.72	0.8	0.63
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	8.1	7.9	7.8	7.3	7.1
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	360	182	139	370	250	240
Temperature (Field)	deg c	--	15	6.5	6.5	9.2	6.5	14.5	6
Total Dissolved Solids	mg/l	--	500	1220	864	772	1320	957	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0016	0.0024	0.0016	0.0015	0.0008
Boron, dissolved	mg/l	5	--	1.15	1.1	0.778	0.932	1.06	1.22
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	69.5	61.4	81.4	82.4	71.6	83.9
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	1.86	2.64	3.31	0.879	0.778	0.086
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0001	0.00005	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	53.8	48.1	55.8	61.5	52.8	59.5
Manganese, dissolved	mg/l	--	0.05	0.254	0.373	0.517	0.434	0.188	0.078
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.5	5	3.6	6.5	4.8	6.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	306	212	121	335	227	268
Zinc, dissolved	mg/l	--	5	0.018	0.007	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-C 25-May-2006	MW-C 21-Nov-2006	MW-C 15-May-2007	MW-C 30-Nov-2007	MW-C 22-May-2008	MW-C 10-Nov-2008
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	<0.0006	<0.0006
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-C 19-May-2009 G-16	MW-C 26-Nov-2009 J-8	MW-C 25-May-2010 M-20	MW-C 20-Oct-2010 G-19	MW-C 24-May-2011 G-27	MW-C 29-Nov-2011 [4] MW-C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	511	546	390	434	384	580
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	511	546	390	434	384	580
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	0.04	0.02	<0.02	0.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	23	40	23	40	25	50
Chloride	mg/l	--	250	86	108	53	121	47	269
Conductivity	uS/cm	--	--	1420	1600	1080	1570	1060	2060
Conductivity (Field)	uS/cm	--	--	1150	1457	917	1527	1202	1863
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	380	411	334	390	329	195
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.32	0.23	0.41	0.35	0.16	1.18
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	7.66	7.82	7.96	7.69	8.28	8.15
pH (Field)	-	--	--	--	6.29	7.18	7.1	7.11	7.65
Phosphorus	mg/l	--	--	0.71	0.90	0.85	0.87	0.35	2.17
Sulphate	mg/l	--	500 [6]	133	160	102	222	116	103
Temperature (Field)	deg c	--	15	7	8	20.2	11.8	12.4	8.5
Total Dissolved Solids	mg/l	--	500	923	1040	702	1020	689	1340
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	<0.01
Boron, dissolved	mg/l	5	--	0.94	0.9	0.69	1.1	0.86	0.80
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	68	79	66	72	69	32
Chromium, dissolved	mg/l	0.05	--	0.004	0.004	0.004	0.005	0.004	0.009
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0003	0.0002	0.0003	0.0003	0.0003
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	0.001	0.002	<0.001
Iron, dissolved	mg/l	--	0.3	0.39	0.83	0.78	0.39	1.62	0.72
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	51	52	41	51	38	28
Manganese, dissolved	mg/l	--	0.05	0.06	0.29	0.09	0.58	0.11	0.42
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	4	4	7	4	8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	160	193	105	223	114	355
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-C 19-May-2009 G-16	MW-C 26-Nov-2009 J-8	MW-C 25-May-2010 M-20	MW-C 20-Oct-2010 G-19	MW-C 24-May-2011 G-27	MW-C 29-Nov-2011 [4] MW-C
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-C 31-May-2012 MW-C	MW-C 28-Nov-2012 MW-C	MW-C 29-May-2013 [22] MW-C	MW-C 26-Nov-2013 [23] GW-2	MW-C 29-May-2014 MW-C	MW-C 19-Nov-2014 MW-C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	350	510	390	540	350	510
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.8	2.4	2.7	6.7	3.0	3.0
Alkalinity (Total as CaCO3)	mg/l	--	--	350	520	400	550	350	510
Ammonia Nitrogen	mg/l	--	--	<0.050	0.16	0.20	0.33	0.11	0.080
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	31	35	87	52	25	38
Chloride	mg/l	--	250	120	190	63	240	100	140
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1633	1949	1090	1711	1420	1776
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	420	470	340	280	340	340
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	0.021	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.87	1.3	2.7	2.2	2.2	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
pH	-	--	--	7.74	--	7.86	8.12	7.96	7.79
pH (Field)	-	--	--	7.39	7.23	7.36	7.54	7.61	7.39
Phosphorus	mg/l	--	--	0.40	0.83	4.8	1.6	1.3	1.6
Sulphate	mg/l	--	500 [6]	370	350	220	160	350	250
Temperature (Field)	deg c	--	15	10.6	6.3	10.7	6.7	11.6	6.4
Total Dissolved Solids	mg/l	--	500	1130	1410	900	1250	1040	1060
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0011	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	1.1	1.2	0.9	0.78	0.92	0.9
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	85	81	67	47	63	61
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.00050	0.00052	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.0019	<0.001	<0.0010	<0.0010	0.0035	<0.0020
Iron, dissolved	mg/l	--	0.3	0.19	0.39	<0.1	0.2	0.17	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	50	64	41	39	43	46
Manganese, dissolved	mg/l	--	0.05	0.44	0.97	0.19	0.62	0.14	0.42
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.4	8.7	5	8.2	5.5	7.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	220	330	180	400	210	310
Zinc, dissolved	mg/l	--	5	<0.0050	<0.005	<0.0050	0.0052	<0.0050	0.034
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	0.0054	0.015	0.0012	<0.0010	<0.0010

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VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0013	<0.0013	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00050	0.00073	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-C 02-Jun-2015	MW-C 26-Nov-2015	MW-C 26-May-2016	MW-C 17-Nov-2016	MW-C 24-May-2017	MW-C 29-Nov-2017
				MW-C	MW-C	MW-C	MW-C	MW-C	MW-C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	431	580	303	574	332	472
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	433	583	304	577	333	475
Ammonia Nitrogen	mg/l	--	--	0.13	0.64	0.13	0.54	0.04	0.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	217	131	83	55	40
Chloride	mg/l	--	250	89	322	65	269	134	102
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1464	1997	1203	2136	1829	1375
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	382	276	283	216	396	343
Nitrate as N	mg/l	10.0	--	<0.1	0.2	<0.1	0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.6	3.0	1.2	1.7	0.8	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.18	7.74	7.89	8.07	7.75	7.98
Phosphorus	mg/l	--	--	0.55	3.70	1.41	1.41	0.64	1.64
Sulphate	mg/l	--	500 [6]	342	140	263	165	473	339
Temperature (Field)	deg c	--	15	10.4	7.2	11.5	10.3	10.8	5.7
Total Dissolved Solids	mg/l	--	500	978	1220	802	1180	1270	958
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.728	0.833	0.429	0.94	0.482	0.665
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	60.8	32.3	62.3	36.9	83.6	60.8
Chromium, dissolved	mg/l	0.05	--	<0.001	0.001	<0.001	0.008	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0011	0.0015	0.0061	0.0016
Iron, dissolved	mg/l	--	0.3	0.396	0.408	0.134	0.11	0.124	0.349
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0001
Magnesium, dissolved	mg/l	--	--	55.9	47.3	30.9	30.2	45.5	46.4
Manganese, dissolved	mg/l	--	0.05	0.158	0.814	0.066	0.202	0.119	0.607
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.55	7.9	4.72	7.87	5.25	6.53
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	195	509	101	414	172	235
Zinc, dissolved	mg/l	--	5	<0.005	0.01	0.006	<0.005	0.006	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.003	<0.001	<0.001	<0.001

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				MW-C	MW-C	MW-C	MW-C	MW-C	MW-C
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-C 24-May-2018	MW-C 22-Nov-2018	MW-C 19-Jun-2019	MW-C 20-Nov-2019
				MW-C	MW-C	MW-C	MW-C
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	518	573	457	565
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	520	576	460	570
Ammonia Nitrogen	mg/l	--	--	0.07	0.06	0.16	0.31
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	107	105	140	127
Chloride	mg/l	--	250	57	201	68	283
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1248	1649	1351	2040
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	326	430	427	298
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.4
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	1.5	1.2	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.29	7.75	7.32	7.69
Phosphorus	mg/l	--	--	1.18	1.69	1.39	1.78
Sulphate	mg/l	--	500 [6]	186	197	317	165
Temperature (Field)	deg c	--	15	10.9	5.8	13	7.9
Total Dissolved Solids	mg/l	--	500	818	1090	986	1220
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.002
Boron, dissolved	mg/l	5	--	0.407	0.781	0.392	0.633
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	68.9	85.3	86.8	48.7
Chromium, dissolved	mg/l	0.05	--	<0.001	0.004	0.004	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0015	0.0012	0.0005
Copper, dissolved	mg/l	--	1	0.0010	0.0087	0.0050	0.0028
Iron, dissolved	mg/l	--	0.3	0.312	1.77	1.56	0.223
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0009	0.0010	<0.0001
Magnesium, dissolved	mg/l	--	--	37.3	52.7	51.1	42.9
Manganese, dissolved	mg/l	--	0.05	0.054	0.076	0.168	0.426
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.5	9.27	6.44	10.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	94.5	298	141	376
Zinc, dissolved	mg/l	--	5	<0.005	0.008	0.009	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	<0.001	0.002

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				MW-C	MW-C	MW-C	MW-C
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 05-May-2000	MW-E 24-Oct-2000	MW-E 14-Jun-2001	MW-E 23-Nov-2001	MW-E 23-May-2002	MW-E 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	388	668	390	400	338	615
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	7	1
Alkalinity (Total as CaCO3)	mg/l	--	--	318	548	320	328	289	504
Ammonia Nitrogen	mg/l	--	--	0.16	0.29	0.36	0.02	0.37	0.09
Chemical Oxygen Demand	mg/l	--	--	--	--	61	84	184	87
Chloride	mg/l	--	250	32.8	154	130	59	53.9	143
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	850	1770	1500	1230	570	--
Hardness, Calcium Carbonate	mg/l	--	--	295	607	483	628	304	667
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.2	0.1	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.12	2.94	3.27	4.31	1.99
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	7.07	7	6.22	7.26	--
Phosphorus	mg/l	--	--	--	2.45	2.25	3.81	5.09	2.7
Sulphate	mg/l	--	500 [6]	102	320	354	340	163	420
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	1152	1070	942	636	1320
Total Organic Carbon	mg/l	--	--	--	--	22.5	31	27	19.1
Total Suspended Solids	mg/l	--	--	452	3890	2140	2740	4670	1910
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.99	1.47	1.41	2.26	0.94	1.63
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	70.1	111	108	120	67.7	133
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.2	0.7	0.71	0.47	0.31	0.16
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0025
Magnesium, dissolved	mg/l	--	--	28.8	80	51.7	49.5	32.7	81.3
Manganese, dissolved	mg/l	--	0.05	0.54	2.23	1.51	0.61	0.01	0.13
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	4.8	11.8	4.7	4	4.7	12.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	87.5	180	135	119	97.8	186
Zinc, dissolved	mg/l	--	5	0.04	0.01	0.01	0.01	0.02	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.016	0.001	0.001	0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 30-May-2003	MW-E 09-Oct-2003 [3]	MW-E 14-May-2004	MW-E 19-Nov-2004	MW-E 24-May-2005	MW-E 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	244	--	490	527	398	131
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	200	--	402	432	326	531
Ammonia Nitrogen	mg/l	--	--	0.08	--	0.17	0.08	<0.01	<0.01
Chemical Oxygen Demand	mg/l	--	--	38	--	62	49	49	35
Chloride	mg/l	--	250	22.7	--	47.4	65	21.5	94.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	980	--	1510	1360	1650	1600
Hardness, Calcium Carbonate	mg/l	--	--	264	--	602	549	330	511
Nitrate as N	mg/l	10.0	--	0.1	--	0.2	1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.27	--	2.13	1.38	1.46	0.98
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	--	7.2	7.6	6.9	--
Phosphorus	mg/l	--	--	0.69	--	1.12	0.85	0.66	0.31
Sulphate	mg/l	--	500 [6]	95	--	273	300	98	250
Temperature (Field)	deg c	--	15	--	--	--	--	7.8	--
Total Dissolved Solids	mg/l	--	500	382	--	755	680	477	989
Total Organic Carbon	mg/l	--	--	13.6	--	14.5	15.4	15.1	15.1
Total Suspended Solids	mg/l	--	--	628	--	700	304	516	232
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	--	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.8	--	1.16	1.4	0.804	1.33
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	67.5	--	156	148	84.9	134
Chromium, dissolved	mg/l	0.05	--	0.01	--	0.001	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	--	0.002	0.005	0.002	0.005
Iron, dissolved	mg/l	--	0.3	0.58	--	0.305	0.071	0.364	0.057
Lead, dissolved	mg/l	0.01	--	0.0003	--	0.0002	0.0003	0.0007	<0.0002
Magnesium, dissolved	mg/l	--	--	23.2	--	51.7	43.5	28.6	42.6
Manganese, dissolved	mg/l	--	0.05	0.26	--	0.52	0.086	0.728	0.077
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	--	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	3.1	--	4	4.1	2.1	4.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	0.001
Sodium, dissolved	mg/l	--	200 [7]	64.3	--	107	119	47.6	149
Zinc, dissolved	mg/l	--	5	0.01	--	0.005	0.005	0.007	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	0.001	0.001	0.002	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 30-May-2003	MW-E 09-Oct-2003 [3]	MW-E 14-May-2004	MW-E 19-Nov-2004	MW-E 24-May-2005	MW-E 16-Nov-2005
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 25-May-2006	MW-E 21-Nov-2006	MW-E 15-May-2007	MW-E 30-Nov-2007	MW-E 22-May-2008	MW-E 10-Nov-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	242	308	380	567	222	290
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	242	308	380	567	222	290
Ammonia Nitrogen	mg/l	--	--	0.06	<0.01	<0.01	0.02	<0.01	0.08
Chemical Oxygen Demand	mg/l	--	--	38	33	74	71	35	30
Chloride	mg/l	--	250	21.5	22	23.3	120	25.5	69
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	525	650	700	1200	450	1000
Hardness, Calcium Carbonate	mg/l	--	--	261	339	338	549	170	397
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	0.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.85	0.92	0.81	0.91	0.84	0.74
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	8	7.9	7.8	7.1	7.2
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	75	127	71	270	66	167
Temperature (Field)	deg c	--	15	7	6	10.4	4.5	10.5	6
Total Dissolved Solids	mg/l	--	500	394	513	484	1130	332	661
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0007	0.0005	0.0007	0.0006	0.0004
Boron, dissolved	mg/l	5	--	0.732	0.807	0.683	1.32	0.535	0.84
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00004	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	64.9	91.9	93.3	117	43	97.5
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.006	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	0.003	<0.002	0.003	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.153	0.042	0.12	0.039	0.387	0.069
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0001	0.00006	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	24.1	26.7	25.5	62.3	15.3	37.2
Manganese, dissolved	mg/l	--	0.05	0.383	0.158	0.119	0.029	0.272	0.037
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.7	3.1	1.9	12.1	2.3	6.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	62.9	57.6	39.7	213	45.2	110
Zinc, dissolved	mg/l	--	5	0.005	0.007	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 25-May-2006	MW-E 21-Nov-2006	MW-E 15-May-2007	MW-E 30-Nov-2007	MW-E 22-May-2008	MW-E 10-Nov-2008
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	<0.0006	<0.0006
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 19-May-2009 G-11	MW-E 26-Nov-2009 J-6	MW-E 25-May-2010 M-23	MW-E 20-Oct-2010 G-20	MW-E 24-May-2011 G-34	MW-E 29-Nov-2011 MW-E
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	336	361	464	316	243	485
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	336	361	464	316	243	485
Ammonia Nitrogen	mg/l	--	--	0.05	0.08	0.21	<0.02	0.03	0.05
Chemical Oxygen Demand	mg/l	--	--	43	88	43	50	20	50
Chloride	mg/l	--	250	61	50	84	66	30	126
Conductivity	uS/cm	--	--	1050	1040	1430	1050	629	1590
Conductivity (Field)	uS/cm	--	--	550	1140	1070	1012	470	1538
Hardness, Calcium Carbonate	mg/l	--	--	327	379	426	436	252	443
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.59	0.49	0.71	0.47	0.23	0.83
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	7.64	7.99	7.89	7.76	8.10	8.12
pH (Field)	-	--	--	--	6.69	7.36	7.4	7.07	7.32
Phosphorus	mg/l	--	--	1.00	0.26	0.30	0.24	0.12	0.06
Sulphate	mg/l	--	500 [6]	125	125	163	152	44	205
Temperature (Field)	deg c	--	15	8	7.8	21.1	11.4	12.5	8.0
Total Dissolved Solids	mg/l	--	500	683	676	930	683	409	1030
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.55	0.9	0.73	0.61	0.31	0.97
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	78	99	88	122	68	95
Chromium, dissolved	mg/l	0.05	--	0.002	0.003	0.003	0.003	0.003	0.004
Cobalt, dissolved	mg/l	--	--	0.0003	0.0006	0.0006	0.0003	0.0008	0.0003
Copper, dissolved	mg/l	--	1	0.003	0.003	0.004	0.003	0.004	0.005
Iron, dissolved	mg/l	--	0.3	0.59	0.17	1.59	0.33	0.59	0.07
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	32	32	50	32	20	50
Manganese, dissolved	mg/l	--	0.05	0.14	0.36	0.27	0.09	0.37	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5	8	9	3	3	9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	86	77	137	74	36	167
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 19-May-2009 G-11	MW-E 26-Nov-2009 J-6	MW-E 25-May-2010 M-23	MW-E 20-Oct-2010 G-20	MW-E 24-May-2011 G-34	MW-E 29-Nov-2011 MW-E
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 31-May-2012 [24]	MW-E 28-Nov-2012	MW-E 29-May-2013	MW-E 26-Nov-2013	MW-E 29-May-2014 [19]
				MW-E	MW-E	MW-E	GW-14	MW-E
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	270	280	460	240
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.6	2.0	1.5	2.9	1.3
Alkalinity (Total as CaCO3)	mg/l	--	--	310	270	280	460	240
Ammonia Nitrogen	mg/l	--	--	<0.050	0.092	0.11	0.12	0.13
Chemical Oxygen Demand	mg/l	--	--	30	30	58	120	60
Chloride	mg/l	--	250	46	48	32	120	54
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	918	1194	630	1455	601
Hardness, Calcium Carbonate	mg/l	--	--	260	420	300	570	210
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.74	0.88	2.1	6.4	7.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
pH	-	--	--	7.73	--	7.76	7.83	7.77
pH (Field)	-	--	--	7.16	7.46	7.19	7.41	7.61
Phosphorus	mg/l	--	--	0.16	0.18	1.7	3.1	1.2
Sulphate	mg/l	--	500 [6]	150	260	99	320	120
Temperature (Field)	deg c	--	15	12.6	5.7	11.2	7.0	11.6
Total Dissolved Solids	mg/l	--	500	760	832	554	1110	588
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.37	0.53	0.38	1	0.25
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	68	110	82	130	56
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.005	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	0.00082	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.0033	0.003	0.0025	0.0027	0.0048
Iron, dissolved	mg/l	--	0.3	0.22	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	21	32	23	60	16
Manganese, dissolved	mg/l	--	0.05	0.14	0.023	0.36	0.023	<0.0020
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	2.7	3.2	1.9	10	1.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	63	86	47	200	31
Zinc, dissolved	mg/l	--	5	<0.0050	<0.005	<0.0050	0.02	<0.0050
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 31-May-2012 [24]	MW-E 28-Nov-2012	MW-E 29-May-2013	MW-E 26-Nov-2013	MW-E 29-May-2014 [19]
				MW-E	MW-E	MW-E	GW-14	MW-E
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 19-Nov-2014 [16]	MW-E 02-Jun-2015	MW-E 26-Nov-2015	MW-E 26-May-2016	MW-E 17-Nov-2016	MW-E 24-May-2017
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	460	509	621	529	374	393
Alkalinity, Carbonate as CaCO3	mg/l	--	--	2.5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	460	511	623	531	375	384
Ammonia Nitrogen	mg/l	--	--	0.073	0.21	0.09	0.29	0.07	0.09
Chemical Oxygen Demand	mg/l	--	--	72	14	105	73	49	50
Chloride	mg/l	--	250	41	114	124	120	111	82
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1192	1293	1692	1472	1728	1080
Hardness, Calcium Carbonate	mg/l	--	--	660	404	718	395	830	533
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	0.7	1.6	1.2	0.8	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--
pH	-	--	--	7.76	--	--	--	--	--
pH (Field)	-	--	--	7.34	7.12	7.40	7.64	7.81	7.46
Phosphorus	mg/l	--	--	2.2	0.17	0.95	0.45	0.21	0.43
Sulphate	mg/l	--	500 [6]	240	227	225	241	436	272
Temperature (Field)	deg c	--	15	5.3	11.0	7.6	11.3	9.7	10.8
Total Dissolved Solids	mg/l	--	500	850	922	1090	1070	1120	908
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.79	0.39	1.42	0.503	1.24	0.457
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	180	103	139	104	214	128
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.006	0.002
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0033	<0.0005	<0.0005	0.0017	0.0034	0.0024
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	49	35.5	90	32.9	71.5	52.2
Manganese, dissolved	mg/l	--	0.05	0.02	<0.005	0.035	0.032	<0.005	0.031
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.4	3.43	10.6	3.55	8.2	3.35
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	100	71	218	65.5	173	122
Zinc, dissolved	mg/l	--	5	<0.0050	<0.005	0.009	0.005	<0.005	0.006
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	0.002	<0.001	0.004	0.002	<0.001

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 19-Nov-2014 [16]	MW-E 02-Jun-2015	MW-E 26-Nov-2015	MW-E 26-May-2016	MW-E 17-Nov-2016	MW-E 24-May-2017
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 29-Nov-2017	MW-E 24-May-2018	MW-E 22-Nov-2018	MW-E 19-Jun-2019	MW-E 20-Nov-2019
				MW-E	MW-E	MW-E	MW-E	MW-E
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	469	492	416	366	472
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	471	494	418	368	476
Ammonia Nitrogen	mg/l	--	--	0.10	0.10	0.06	0.26	0.05
Chemical Oxygen Demand	mg/l	--	--	47	59	113	103	102
Chloride	mg/l	--	250	88	71	140	70	124
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1221	1183	1298	935	1887
Hardness, Calcium Carbonate	mg/l	--	--	609	371	798	388	627
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.8	0.9	2.2	1.6	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.67	7.19	7.72	7.12	7.78
Phosphorus	mg/l	--	--	0.24	0.36	1.39	0.93	1.32
Sulphate	mg/l	--	500 [6]	393	289	407	138	60
Temperature (Field)	deg c	--	15	5.6	10.9	4.9	13.9	7.4
Total Dissolved Solids	mg/l	--	500	1090	1030	1160	662	1360
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.448	0.255	1.12	0.235	0.854
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	163	104	187	100	150
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0026	0.0017	0.0046	0.0034	0.0035
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.157	<0.1	0.151
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	49.1	27.2	80.1	33.5	61.2
Manganese, dissolved	mg/l	--	0.05	0.012	0.639	0.11	0.342	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.21	1.59	13.2	4.77	10.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	87.7	37.9	198	76.4	152
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	MW-E 29-Nov-2017	MW-E 24-May-2018	MW-E 22-Nov-2018	MW-E 19-Jun-2019	MW-E 20-Nov-2019
				MW-E	MW-E	MW-E	MW-E	MW-E
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Immediately Downgradient Groundwater Monitoring Wells

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2018).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised June 2006).
(3)	Monitoring location was dry during this sampling event. No sample was collected.
(4)	Arsenic MRL elevated due to matrix interference.
(5)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted
(6)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(7)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(8)	pH < 8.3. Calculations not available.
(9)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(10)	Elevated Reporting Limit due to matrix interference.
(11)	Elevated Reporting Limit due to matrix interference.
(12)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(13)	Elevated detection limit due to dilution required because of high target analyte concentration.
(14)	Nitrite/Nitrate: Due to the colour interferences, sample required dilution. Detection limits were adjusted
(15)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted
(16)	VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted
(17)	Detection Limit was raised due to matrix interferences.
(18)	pH Parameter was not measured.
(19)	Elevated ion balance was confirmed by re-analysis.
(20)	TKN results may be biased low due to elevated dissolved salt content.
(21)	Metals MRL elevated due to matrix interference.
(22)	VOC Analysis: Due to high concentrations of non-target analytes, sample required dilution. Detection limits were adjusted accordingly.
(23)	VOC Analysis: Due to high concentrations of non- target analytes, sample required dilution. Detection limits were adjusted accordingly.
(24)	Elevated ion balance result was confirmed by re-analysis.
(25)	Inadvertently, no sample was collected at this location.

WCC - Navan Waste Recyling and Disposal Facility
Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-4 15-Jun-1994	94-4 01-Nov-1994	94-4 28-Jun-1995	94-4 22-Nov-1995	94-4 12-Oct-1996	94-4 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1347	1442	1030	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1092	1123	1182	840	1280	1270
Ammonia Nitrogen	mg/l	--	--	--	2.77	4.6	3.75	3.47	4.84
Chemical Oxygen Demand	mg/l	--	--	437	283	188	100	70	62
Chloride	mg/l	--	250	1900	1530	1685	1610	1570	1730
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6150	6900	7000	7440	7120	6190
Dissolved Oxygen (Field)	mg/l	--	--	--	6.64	3.08	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	570	598	436	461	421	476
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	1.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	11.3	5.75	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	6.7	2	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.77	8.08	7.89	8.36	7.69	8.5
Phosphate	mg/l	--	--	--	--	--	1.6	--	--
Phosphorus	mg/l	--	--	39.6	0.797	6.5	--	--	--
Sulphate	mg/l	--	500 [5]	27.4	13.8	5	32	15	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3090	3460	3510	3720	3570	3470
Total Organic Carbon	mg/l	--	--	19	25.9	22.5	17.5	19.2	18.5
Total Suspended Solids	mg/l	--	--	--	--	--	--	4520	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.02	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.1	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.124	--	--	--	--
Boron, dissolved	mg/l	5	--	1.34	1.465	1.3	1.19	1.43	1.47
Cadmium, dissolved	mg/l	0.005	--	--	0.01	0.0001	0.0001	--	--
Calcium, dissolved	mg/l	--	--	69	39.34	45.3	45.9	41.3	50
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.04	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0201	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.409	0.1	0.03	1.31	1.07	0.92
Lead, dissolved	mg/l	0.01	--	0.002	0.1	0.0009	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	96.6	58.416	77.4	83.1	76.3	84.2
Manganese, dissolved	mg/l	--	0.05	0.116	0.153	0.18	0.2	0.17	0.18
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.025	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	54.9	25.61	--	37.7	33.2	37.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	1040	1327	1045	1150	1330	1210
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.049	--	0.001	--	--	--

WCC - Navan Waste Recyling and Disposal Facility
Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-4 05-Jun-1998	94-4 06-May-1999	94-4 24-Oct-2000	94-4 14-Jun-2001	94-4 06-Nov-2002	94-4 30-May-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1600	1730	1300	1720	1480
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	90	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1220	1310	1420	1210	1410	1220
Ammonia Nitrogen	mg/l	--	--	3.84	3.92	3.47	4.48	4.05	3.62
Chemical Oxygen Demand	mg/l	--	--	64	64	--	61	76	66
Chloride	mg/l	--	250	1580	1690	1760	1500	1680	1650
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6720	6540	6790	5000	6700	5400
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	431	456	474	449	439	397
Nitrate as N	mg/l	10.0	--	1	--	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	5.4	5.32	5.28	5.8	5.84
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.8	8.22	8	7.8	6.9
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.03	2.21	2.59	2.42
Sulphate	mg/l	--	500 [5]	38	1	1	6	2	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3350	3280	3850	3860	4040	2700
Total Organic Carbon	mg/l	--	--	18.4	24	--	17.3	17.5	17.1
Total Suspended Solids	mg/l	--	--	--	--	932	1560	1110	720
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	0.004	0.003	0.001	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.65	1.67	1.61	1.75	1.58	1.48
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	42.1	46.1	41.4	49.6	43.4	42.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.15	1.03	0.66	0.41	0.32	1.05
Lead, dissolved	mg/l	0.01	--	0.0003	0.0005	0.022	0.0002	0.004	0.0009
Magnesium, dissolved	mg/l	--	--	78.1	81.8	90.1	79	80.2	70.8
Manganese, dissolved	mg/l	--	0.05	0.19	0.17	0.14	0.11	0.14	0.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	39.6	34.3	29.2	33.2	34	35.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	1660	1400	1410	1350	1430	1150
Zinc, dissolved	mg/l	--	5	0.12	0.01	0.01	0.01	0.02	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.003	0.054	0.001	0.001

WCC - Navan Waste Recyling and Disposal Facility
Report of Monitoring Results - Groundwater
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-4 19-Nov-2004	94-4 16-Nov-2005	94-4 15-May-2007	94-4 10-Nov-2008	94-4 26-Nov-2009 [20] J-2	94-4 24-May-2011 [21] G-25
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1610	160	1320	1230	1320	1260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<2 [8]	39
Alkalinity (Total as CaCO3)	mg/l	--	--	1320	1310	1320	1230	1320	1300
Ammonia Nitrogen	mg/l	--	--	3.66	3.94	3.56	4	3.93	3.60
Chemical Oxygen Demand	mg/l	--	--	69	99	114	76	68	60
Chloride	mg/l	--	250	1700	1600	1750	1690	1630	1620
Conductivity	uS/cm	--	--	--	--	--	--	7080	7310
Conductivity (Field)	uS/cm	--	--	7110	5500	4100	>5000	799	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	412	430	393	342	405	414
Nitrate as N	mg/l	10.0	--	1	0.1	0.1	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	4.97	6.08	5.51	5.22	4.59	5.60
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	8.21	8.52
pH (Field)	-	--	--	8	--	8.4	7.9	6.89	7.94
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.25	3.18	--	--	1.20	1.50
Sulphate	mg/l	--	500 [5]	10	1	1	<1	<1	<1
Temperature (Field)	deg c	--	15	--	--	8.8	5	7.8	11.1
Total Dissolved Solids	mg/l	--	500	3555	3990	4200	3770	4600	4750
Total Organic Carbon	mg/l	--	--	17.1	21.1	--	--	--	--
Total Suspended Solids	mg/l	--	--	184	43	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.009	0.0057	<0.01	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.58	1.61	1.37	1.39	1.6	1.8
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.00005	<0.00002	<0.001	<0.0001
Calcium, dissolved	mg/l	--	--	42.8	45.9	41.8	33.6	42	42
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.002	0.0008
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	<0.002	<0.01	0.003
Iron, dissolved	mg/l	--	0.3	0.266	0.57	0.465	0.265	<0.3	0.34
Lead, dissolved	mg/l	0.01	--	0.0016	0.0004	0.00012	<0.00002	<0.01	<0.001
Magnesium, dissolved	mg/l	--	--	74.2	76.7	70.3	62.8	73	75
Manganese, dissolved	mg/l	--	0.05	0.117	0.125	0.105	0.06	0.1	0.11
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	37.3	40.6	38.1	34.2	32	37
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	1590	1470	1500	1200	1390	1430
Zinc, dissolved	mg/l	--	5	0.005	0.006	<0.005	<0.005	<0.1	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010	<0.01
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040	<0.04
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.005
Styrene	mg/l	--	--	--	--	--	<0.0006	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-4 29-Nov-2012 [22]	94-4 29-May-2014 [23]	94-4 26-Nov-2015	94-4 24-May-2017	94-4 22-Nov-2018	94-4 19-Jun-2019
				94-4	94-4	94-4	94-4	94-4	94-4
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1300	1300	1240	1320	1310	1070
Alkalinity, Carbonate as CaCO3	mg/l	--	--	25	29	<25 [24]	<25 [10]	<25 [10]	<25 [10]
Alkalinity (Total as CaCO3)	mg/l	--	--	1300	1300	1240	1330	1330	1080
Ammonia Nitrogen	mg/l	--	--	4.2	4.1	4.03	5.16 [25]	4.05	4.36
Chemical Oxygen Demand	mg/l	--	--	65	70	99	107	102	84
Chloride	mg/l	--	250	1500	1700	1710	1690	1810	1640
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	>3999	>3999	3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	400	410	378	373	589	443
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.05	<0.50 [10]	<1.00 [10]	<0.50 [10]
Nitrogen, Total Kjeldahl	mg/l	--	--	5.3	5.3	5.6	4.9	5.9	5.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	8.32	8.39	--	--	--	--
pH (Field)	-	--	--	8.02	7.29	8.04	8.00	8.03	7.98
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.6	1.4	1.60	1.11	1.95	1.41
Sulphate	mg/l	--	500 [5]	<1	<1	<1	<1	1	<1
Temperature (Field)	deg c	--	15	6.7	10.0	9.0	10.6	5.7	11.2
Total Dissolved Solids	mg/l	--	500	3860	3600	3860	4040	3960	3690
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0062	<0.0050	0.002	0.01	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.6	1.6	1.47	1.17	1.58	0.14
Cadmium, dissolved	mg/l	0.005	--	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	43	41	26.1	41.7	61.8	48.2
Chromium, dissolved	mg/l	0.05	--	<0.025	<0.025	<0.001	0.021	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0025	<0.0025	<0.0005	0.0005	0.0009	0.0006
Copper, dissolved	mg/l	--	1	<0.0050	0.0058	<0.0005	0.0012	0.0033	0.0012
Iron, dissolved	mg/l	--	0.3	<0.5	<0.5	<0.1	<0.1	0.208	0.21
Lead, dissolved	mg/l	0.01	--	<0.0025	<0.0025	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	72	73	75.9	65.3	105	78.4
Manganese, dissolved	mg/l	--	0.05	0.12	0.12	0.089	0.089	0.138	0.112
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	31	31	27	32.5	42.5	32.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	1400	1300	1350	1360	1290	1060
Zinc, dissolved	mg/l	--	5	<0.025	<0.025	0.009	<0.005	<0.005	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.002 [9]	<0.010 [11]	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0010	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00040	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00040	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 15-Jun-1994	94-5 02-Nov-1994	94-5 28-Jun-1995	94-5 22-Nov-1995	94-5 12-Jun-1996	94-5 12-Oct-1996
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	841	929	81	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	622	701	762	804	796	840
Ammonia Nitrogen	mg/l	--	--	--	0.66	0.86	0.5	0.85	1.14
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	171	150	275	63	33	26
Chloride	mg/l	--	250	1400	795	880	915	900	870
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3550	4050	4060	4480	3850	4450
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	7.95	7.27	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	448	474	425	444	449	419
Nitrate as N	mg/l	10.0	--	0.1	--	0.1	1.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	15.5	3.25	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	14.64	2.75	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.17	7.66	7.4	8.22	8.03	7.25
Phosphate	mg/l	--	--	--	--	--	0.8	--	--
Phosphorus	mg/l	--	--	6.7	0.391	7.22	--	--	--
Sulphate	mg/l	--	500 [5]	32.5	17.1	5	4	5	4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1790	2040	2060	2240	2070	2230
Total Organic Carbon	mg/l	--	--	12	16.5	22	9.1	12.2	11
Total Suspended Solids	mg/l	--	--	--	--	--	--	2940	1070
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.062	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.1	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.061	--	--	--	--
Boron, dissolved	mg/l	5	--	0.44	0.601	0.45	0.4	0.48	0.61
Cadmium, dissolved	mg/l	0.005	--	--	0.01	0.0001	0.0001	--	--
Calcium, dissolved	mg/l	--	--	66.6	48.11	57.2	57	56.6	53
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0173	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.39	0.175	0.02	0.9	1.2	0.55
Lead, dissolved	mg/l	0.01	--	0.0011	0.1	0.0005	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	68.5	44.206	67.8	72.4	73.8	68.7
Manganese, dissolved	mg/l	--	0.05	0.78	0.933	1.29	1.37	1.47	1.22
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.9	8.244	--	15.2	17.7	13.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	508	651.7	630	711	694	658
Zinc, dissolved	mg/l	--	5	0.01	0.012	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.12	0.005	0.001	--	--	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 18-Jun-1997	94-5 06-Nov-1997	94-5 05-Jun-1998	94-5 30-Oct-1998	94-5 06-May-1999	94-5 19-Oct-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	996	1040	983
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	26
Alkalinity (Total as CaCO3)	mg/l	--	--	871	276	869	816	852	850
Ammonia Nitrogen	mg/l	--	--	0.85	0.68	0.56	0.79	0.36	0.97
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	13	35	42	24	30	12
Chloride	mg/l	--	250	881	812	1020	910	970	951
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3900	3930	4280	4350	4030	3800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	2.34	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	499	468	440	361	457	443
Nitrate as N	mg/l	10.0	--	0.1	0.6	1.8	--	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	2.14	2.08	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.54	7.88	--	7.2	7.2	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [5]	1	98	37	2	2	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1830	1990	2150	2180	2020	1900
Total Organic Carbon	mg/l	--	--	9.9	11.6	11.5	11.4	12.2	11.2
Total Suspended Solids	mg/l	--	--	1880	--	--	--	--	1320
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.69	0.62	0.64	0.75	0.6	0.84
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	69	65	55.8	49.4	59.4	61.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.53	0.44	1.69	0.2	0.93	1.53
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	78.3	73.4	72.1	57.6	74	69.5
Manganese, dissolved	mg/l	--	0.05	1.56	1.68	1.85	1.8	1.93	1.58
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	14.6	15.6	13.4	16.2	17.4	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	608	613	893	762	765	876
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.14	0.01	0.01	0.11
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 05-May-2000	94-5 24-Oct-2000	94-5 14-Jun-2001	94-5 23-Nov-2001	94-5 23-May-2002	94-5 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1220	1140	826	991	888	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	39	1	38	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1000	935	741	812	791	936
Ammonia Nitrogen	mg/l	--	--	0.01	0.27	0.98	0.84	0.91	0.26
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	40	--	28	37	15	34
Chloride	mg/l	--	250	845	1010	910	898	925	855
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4025	4250	3750	3560	770	4000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	463	475	458	465	455	435
Nitrate as N	mg/l	10.0	--	0.2	0.8	0.3	0.2	0.1	0.9
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	1.02	2	1.94	1.68	1.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.67	7.5	7.22	6.74	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.68	1.37	1.31	0.85	0.64
Sulphate	mg/l	--	500 [5]	2	1	2	3	3	5
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	4910	2260	2160	2260	2000	2300
Total Organic Carbon	mg/l	--	--	12.1	--	10.3	16	12	11.4
Total Suspended Solids	mg/l	--	--	--	556	1120	1130	792	454
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.78	0.66	0.64	0.8	0.61	0.7
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	60.1	56.4	65.8	59.6	61.5	64.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	4.96	0.22	0.85	0.11	0.87	0.33
Lead, dissolved	mg/l	0.01	--	0.0002	0.022	0.0032	0.0002	0.0002	0.006
Magnesium, dissolved	mg/l	--	--	75.1	81.1	71.3	76.9	73.1	71.1
Manganese, dissolved	mg/l	--	0.05	1.62	1.88	2.03	1.95	2.17	1.7
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	11.1	13.7	5.2	7.3	13.8	13.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	770	763	714	811	657	731
Zinc, dissolved	mg/l	--	5	0.21	0.01	0.01	0.01	0.02	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.001	0.113	0.001	0.001	0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 30-May-2003	94-5 09-Oct-2003	94-5 14-May-2004	94-5 19-Nov-2004	94-5 24-May-2005	94-5 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	915	--	939	1070	1040	220
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	750	845	770	875	850	900
Ammonia Nitrogen	mg/l	--	--	0.92	1.01	0.85	0.32	0.92	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	5	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	25	25	38	34	25	25
Chloride	mg/l	--	250	840	798	950	943	853	886
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3280	3980	3950	4370	4200	3000
Dissolved Inorganic Carbon	mg/l	--	--	--	189	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	419	395	444	415	437	417
Nitrate as N	mg/l	10.0	--	0.2	0.4	0.4	1	0.2	0.7
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.16	2.09	2.31	1.22	1.97	0.97
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7.4	7.6	7.6	7.2	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.18	1.21	1.4	0.54	0.78	1.86
Sulphate	mg/l	--	500 [5]	3	3	4	10	5	4
Temperature (Field)	deg c	--	15	--	--	--	--	8.4	--
Total Dissolved Solids	mg/l	--	500	1640	2118	1975	2185	2170	2340
Total Organic Carbon	mg/l	--	--	11.1	24	9.2	10	9.2	11.2
Total Suspended Solids	mg/l	--	--	708	580	648	1450	852	436
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003	0.001	0.001	0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.5	0.617	0.548	0.651	0.534	0.671
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	57.6	53.4	59.4	56.9	57.5	58.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.002	0.001	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.002	0.002	0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	3.09	0.541	0.898	0.676	0.226	0.149
Lead, dissolved	mg/l	0.01	--	0.0015	0.001	0.0015	0.0017	0.0017	0.0004
Magnesium, dissolved	mg/l	--	--	66.9	63.7	71.8	66.5	71.3	66.1
Manganese, dissolved	mg/l	--	0.05	1.99	1.53	2.07	1.86	2.04	1.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	12.3	13.3	13.4	14.7	14.1	15.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001
Sodium, dissolved	mg/l	--	200 [6]	626	677	686	712	672	779
Zinc, dissolved	mg/l	--	5	0.02	0.005	0.005	0.005	0.008	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	<0.001	<0.001

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Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 30-May-2003	94-5 09-Oct-2003	94-5 14-May-2004	94-5 19-Nov-2004	94-5 24-May-2005	94-5 16-Nov-2005
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 25-May-2006	94-5 21-Nov-2006	94-5 15-May-2007	94-5 30-Nov-2007	94-5 22-May-2008
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	860	892	880	895	820
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	860	892	880	895	820
Ammonia Nitrogen	mg/l	--	--	0.98	0.54	0.94	0.6	0.57
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	25	49	89	75	7
Chloride	mg/l	--	250	942	906	928	939	866
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3300	3450	2600	2000	3950
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	425	396	404	408	407
Nitrate as N	mg/l	10.0	--	0.2	0.3	0.1	0.4	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.89	2.2	2	1.72	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7.2	8.1	8.1	7.6
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [5]	5	4	5	4	5
Temperature (Field)	deg c	--	15	4.5	7.5	7.3	5	12
Total Dissolved Solids	mg/l	--	500	2370	2290	2240	2490	2220
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0035	0.0056	0.0038	0.0052
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.586	0.629	0.487	0.619	0.543
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00004	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	56.7	52.6	54.7	57	55.1
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.007	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	1.93	0.759	1.35	0.076	1.55
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0001	0.00004	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	69	64.4	65.1	64.5	65.6
Manganese, dissolved	mg/l	--	0.05	1.56	1.41	1.88	1.66	1.63
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	14.6	13	16.8	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	775	709	646	870	718
Zinc, dissolved	mg/l	--	5	<0.005	0.008	<0.005	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 25-May-2006	94-5 21-Nov-2006	94-5 15-May-2007	94-5 30-Nov-2007	94-5 22-May-2008
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	<0.0006
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 10-Nov-2008	94-5 19-May-2009 G-13	94-5 26-Nov-2009 J-5	94-5 20-Oct-2010 [26] G-24	94-5 24-May-2011 [26] G-38
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	860	832	869	863	853
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [6]	<2 [6]	<2 [6]	20
Alkalinity (Total as CaCO3)	mg/l	--	--	860	832	869	863	873
Ammonia Nitrogen	mg/l	--	--	0.78	0.82	0.66	0.76	0.90
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	33	38	55	50	60
Chloride	mg/l	--	250	879	822	868	872	798
Conductivity	uS/cm	--	--	--	4010	4170	4120	4080
Conductivity (Field)	uS/cm	--	--	3500	3400	3511	3808	2603
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	379	385	363	411	352
Nitrate as N	mg/l	10.0	--	0.3	0.19	0.12	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.64	1.47	1.12	1.37	1.67
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	7.94	8.17	8.04	8.40
pH (Field)	-	--	--	7.4	--	7.12	7.67	7.41
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	7.56	1.44	2.58	1.65
Sulphate	mg/l	--	500 [5]	4	5	7	6	5
Temperature (Field)	deg c	--	15	7	10	3.0	10.8	19.1
Total Dissolved Solids	mg/l	--	500	2190	2610	2710	2680	2650
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0033	0.003	0.005	<0.01	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.584	0.60	0.73	0.62	0.42
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	51	52	48	54	47
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.005	<0.005	<0.005	0.009
Cobalt, dissolved	mg/l	--	--	<0.005	0.0009	0.0011	0.0009	0.0010
Copper, dissolved	mg/l	--	1	<0.002	0.002	0.002	0.001	0.003
Iron, dissolved	mg/l	--	0.3	0.022	<0.03	0.34	0.75	0.43
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	61.1	62	59	67	57
Manganese, dissolved	mg/l	--	0.05	1.42	1.74	1.60	1.67	1.53
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13.3	11	13	12	10
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	664	680	780	720	698
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	<0.01	0.02
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5	94-5	94-5	94-5	94-5
				10-Nov-2008	19-May-2009	26-Nov-2009	20-Oct-2010 [26]	24-May-2011 [26]
					G-13	J-5	G-24	G-38
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	<0.0006	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 29-Nov-2011 [26]	94-5 31-May-2012 [27]	94-5 29-Nov-2012	94-5 29-May-2013 [28]	94-5 26-Nov-2013
				94-5	94-5	94-5	94-5	GW-16
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	852	810	830	820	870
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	7.6	11	7.3	9.2
Alkalinity (Total as CaCO3)	mg/l	--	--	852	820	840	830	880
Ammonia Nitrogen	mg/l	--	--	0.61	0.97	0.78	1.5	0.81
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	35	40	70	47
Chloride	mg/l	--	250	823	750	770	890	860
Conductivity	uS/cm	--	--	4050	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3657	3337	3227	3096	3225
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	398	310	390	430	410
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.14	0.68	0.22
Nitrite as N	mg/l	1.0	--	<0.10	0.12	<0.010	0.10	0.023
Nitrogen, Total Kjeldahl	mg/l	--	--	1.05	1.8	2.6	4.5	5.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	0.13	0.14	0.78	0.24
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	7.95	8.00	8.16	7.98	8.05
pH (Field)	-	--	--	7.57	7.48	7.66	6.95	7.54
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.09	2.8	2.1	8.7	4.0
Sulphate	mg/l	--	500 [5]	5	<1	1	<1	<1
Temperature (Field)	deg c	--	15	7.6	10.5	6.2	9.8	6.3
Total Dissolved Solids	mg/l	--	500	2630	2050	2190	2370	2220
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.0015	0.0028	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.63	0.46	0.67	0.6	0.64
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	54	44	51	60	54
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0009	0.00080	0.00075	0.0011	0.0011
Copper, dissolved	mg/l	--	1	0.002	0.0023	0.0012	0.0020	0.0019
Iron, dissolved	mg/l	--	0.3	0.17	0.7	0.27	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	0.0018	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	64	49	64	68	67
Manganese, dissolved	mg/l	--	0.05	1.87	1.6	2.1	2.2	1.5
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	9.1	12	12	13
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	684	520	720	650	660
Zinc, dissolved	mg/l	--	5	<0.01	0.0061	<0.0050	<0.0050	0.0065
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010

Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5	94-5	94-5	94-5	94-5
				29-Nov-2011 [26]	31-May-2012 [27]	29-Nov-2012	29-May-2013 [28]	26-Nov-2013
				94-5	94-5	94-5	94-5	GW-16
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.00025	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.00050	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.00050	<0.00020

WCC - Navan Waste Recyling and Disposal Facility
Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 29-May-2014	94-5 19-Nov-2014	94-5 02-Jun-2015	94-5 26-Nov-2015	94-5 26-May-2016
				94-5	94-5	94-5	94-5	94-5
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	810	840	756	871	878
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	7.9	8	9	7
Alkalinity (Total as CaCO3)	mg/l	--	--	820	850	765	880	885
Ammonia Nitrogen	mg/l	--	--	1.3	1.0	1.28	0.64	1.38
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	76	122	233	114
Chloride	mg/l	--	250	840	860	754	874	871
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3227	3726	3707	3815	3748
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	370	410	305	381	324
Nitrate as N	mg/l	10.0	--	<0.10	0.18	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.095	0.059	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.9	4.3	2.4	1.7	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.12	0.24	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	8.13	8.00	--	--	--
pH (Field)	-	--	--	6.60	7.59	7.43	7.58	7.39
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.4	10	1.27	2.56	1.32
Sulphate	mg/l	--	500 [5]	<1	<1	8	10	7
Temperature (Field)	deg c	--	15	9.5	7.8	7.7	8.5	9.8
Total Dissolved Solids	mg/l	--	500	2100	2170	1910	2210	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0013	0.0014	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.52	0.72	0.223	0.627	0.457
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	49	58	40.9	37.6	45.2
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.01 [29]	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.00085	0.0010	0.0006	0.0008	0.0007
Copper, dissolved	mg/l	--	1	0.0023	0.0011	<0.0005	<0.0005	0.0007
Iron, dissolved	mg/l	--	0.3	0.48	0.48	<0.1	0.221	0.293
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	61	66	49.3	69.6	51.3
Manganese, dissolved	mg/l	--	0.05	1.7	1.9	1.78	1.62	1.67
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	13	6.72	10.2	10.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	580	740	507	731	498
Zinc, dissolved	mg/l	--	5	<0.0050	<0.0050	0.007	0.008	0.008
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.002 [9]	<0.002 [9]	0.004

WCC - Navan Waste Recyling and Disposal Facility
Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 29-May-2014	94-5 19-Nov-2014	94-5 02-Jun-2015	94-5 26-Nov-2015	94-5 26-May-2016
				94-5	94-5	94-5	94-5	94-5
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recyling and Disposal Facility
Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 17-Nov-2016	94-5 24-May-2017	94-5 29-Nov-2017	94-5 24-May-2018	94-5 22-Nov-2018
				94-5	94-5	94-5	94-5	94-5
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	912	905	902	929	977
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7	7	10	9	10
Alkalinity (Total as CaCO3)	mg/l	--	--	918	912	912	938	987
Ammonia Nitrogen	mg/l	--	--	1.14	0.68	0.74	1.43	0.71
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	88	205	98	391	89
Chloride	mg/l	--	250	909	882	892	855	886
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3999	3702	3308	3860	3411
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	377	459	368	334	497
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.2	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [10]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	2.3	1.6	4.8	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.89	7.48	7.08	7.44	7.64
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	4.88	3.83	3.42	6.74	2.34
Sulphate	mg/l	--	500 [5]	7	8	13	8	11
Temperature (Field)	deg c	--	15	9.7	11.7	7.5	9.5	6.3
Total Dissolved Solids	mg/l	--	500	2270	2180	2080	2250	1560
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.775	0.396	0.601	0.455	1.12
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	51.6	55	51	50.8	65
Chromium, dissolved	mg/l	0.05	--	0.012	0.008	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0007	0.0006	0.0009	0.0007	0.0013
Copper, dissolved	mg/l	--	1	0.0010	0.0024	0.0011	<0.0005	0.0040
Iron, dissolved	mg/l	--	0.3	0.23	0.246	0.214	0.741	0.155
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	60.3	78.2	58.4	50.3	81.4
Manganese, dissolved	mg/l	--	0.05	2.17	1.78	2	1.82	1.52
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.7	8.18	11.7	8.73	16.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	699	807	675	507	795
Zinc, dissolved	mg/l	--	5	<0.005	0.006	<0.005	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [11]	<0.002 [11]	<0.002 [11]	<0.001	<0.001

WCC - Navan Waste Recyling and Disposal Facility
Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 17-Nov-2016	94-5 24-May-2017	94-5 29-Nov-2017	94-5 24-May-2018	94-5 22-Nov-2018
				94-5	94-5	94-5	94-5	94-5
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 19-Jun-2019 [39] 94-5	94-5 20-Nov-2019 94-5
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	848
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	12
Alkalinity (Total as CaCO3)	mg/l	--	--	--	860
Ammonia Nitrogen	mg/l	--	--	--	0.94
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	159
Chloride	mg/l	--	250	--	995
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	3810
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	471
Nitrate as N	mg/l	10.0	--	--	0.8
Nitrite as N	mg/l	1.0	--	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	--	7.61
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	--	4.76
Sulphate	mg/l	--	500 [5]	--	10
Temperature (Field)	deg c	--	15	--	7.7
Total Dissolved Solids	mg/l	--	500	--	2220
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Aluminum, dissolved	mg/l	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--
Boron, dissolved	mg/l	5	--	--	0.387
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	--	63.8
Chromium, dissolved	mg/l	0.05	--	--	<0.001
Cobalt, dissolved	mg/l	--	--	--	0.0008
Copper, dissolved	mg/l	--	1	--	0.0014
Iron, dissolved	mg/l	--	0.3	--	0.297
Lead, dissolved	mg/l	0.01	--	--	<0.0001
Magnesium, dissolved	mg/l	--	--	--	75.6
Manganese, dissolved	mg/l	--	0.05	--	1.81
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	19
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	--	745
Zinc, dissolved	mg/l	--	5	--	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	--	0.002

Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-5 19-Jun-2019 [39] 94-5	94-5 20-Nov-2019 94-5
VOCs					
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--
Benzene	mg/l	0.001	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--
Bromoform	mg/l	--	--	--	--
Bromomethane	mg/l	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--
Chloroform	mg/l	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005
Styrene	mg/l	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0005

Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 15-Jun-1994	94-6 02-Nov-1994	94-6 28-Jun-1995	94-6 22-Nov-1995	94-6 12-Jun-1996	94-6 12-Oct-1996
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	322	529	610	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	276	268	434	500	412	420
Ammonia Nitrogen	mg/l	--	--	--	0.11	0.01	0.03	0.1	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	141	105	80	70	35	33
Chloride	mg/l	--	250	245	266	275	236	216	248
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1280	1710	1850	1840	1730	2030
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	9.02	6.31	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	180	290	254	234	248	191
Nitrate as N	mg/l	10.0	--	1.6	0.1	2.7	0.1	0.1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	3.3	2.45	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	3.29	2.42	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.2	7.17	6.78	7.29	7.03	6.82
Phosphate	mg/l	--	--	--	--	--	0.8	--	--
Phosphorus	mg/l	--	--	4.39	0.196	1.68	--	--	--
Sulphate	mg/l	--	500 [5]	87	105	88	81	76	91
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	660	860	930	910	870	1020
Total Organic Carbon	mg/l	--	--	15.8	15.9	13.7	13.9	15.8	13
Total Suspended Solids	mg/l	--	--	--	--	--	--	1780	1430
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.056	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.1	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.042	--	--	--	--
Boron, dissolved	mg/l	5	--	0.15	0.169	0.14	0.02	0.158	0.18
Cadmium, dissolved	mg/l	0.005	--	--	0.01	0.0001	0.0001	--	--
Calcium, dissolved	mg/l	--	--	38.4	47.33	51.7	40.4	39.8	31.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0095	0.01	0.02	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.291	0.14	0.03	0.54	0.811	0.4
Lead, dissolved	mg/l	0.01	--	0.0006	0.1	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	20.4	16.666	30	32	35.5	26.7
Manganese, dissolved	mg/l	--	0.05	0.108	0.176	0.32	0.24	1.41	0.7
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.5	0.864	--	6	6.15	6.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	171	236.1	284	294	353	312
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.15	0.001	0.001	--	--	--

Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 18-Jun-1997	94-6 06-Nov-1997	94-6 05-Jun-1998	94-6 29-Oct-1998	94-6 06-May-1999	94-6 19-Oct-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	454	506	366
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	430	534	336	372	415	300
Ammonia Nitrogen	mg/l	--	--	0.2	0.88	0.07	0.19	0.09	0.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	14	47	37	4	29	92
Chloride	mg/l	--	250	347	176	307	260	326	193
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1880	1870	1720	2080	1770	1240
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.05	5.05	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	309	142	160	161	215	204
Nitrate as N	mg/l	10.0	--	0.1	0.1	1.1	--	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	1.58	1.29	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.02	7.41	--	6.7	6.7	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [5]	74	2.1	95	80	71	93
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	930	1030	859	1030	890	620
Total Organic Carbon	mg/l	--	--	9	15.1	11.8	13.5	13.1	27.5
Total Suspended Solids	mg/l	--	--	953	--	--	--	--	416
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.22	0.14	0.21	0.24	0.15	0.27
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	52.7	25.8	26.7	32.6	37.8	42.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.47	0.66	0.52	0.31	1.72	1.82
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0006
Magnesium, dissolved	mg/l	--	--	42.5	18.6	22.3	19.4	29	23.7
Manganese, dissolved	mg/l	--	0.05	1.57	0.22	0.21	0.93	0.69	0.55
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5.5	2.9	6.4	5.1	1.7	4.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	315	260	337	287	312	220
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.23	0.01	0.01	0.16
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

WCC - Navan Waste Recyling and Disposal Facility
Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 05-May-2000	94-6 24-Oct-2000	94-6 14-Jun-2001	94-6 23-Nov-2001	94-6 23-May-2002	94-6 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	536	617	453	373	462	340
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	39	1	17	1
Alkalinity (Total as CaCO3)	mg/l	--	--	439	506	435	306	407	279
Ammonia Nitrogen	mg/l	--	--	0.01	0.01	0.11	0.08	0.08	0.06
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	--	40	60	46	56
Chloride	mg/l	--	250	315	427	268	182	95.8	330
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1750	2520	1850	1290	1060	2140
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	304	433	308	224	205	233
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	1.16	1.61	1.62	1.47	1.33
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	6.85	6.8	6.91	6.87	7.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.63	0.94	0.59	0.68	0.45
Sulphate	mg/l	--	500 [5]	131	300	170	92	30	190
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	875	1490	1130	860	596	1110
Total Organic Carbon	mg/l	--	--	14	--	17.3	28	20	19.4
Total Suspended Solids	mg/l	--	--	1090	508	700	716	394	348
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.27	0.37	0.2	0.11	0.1	0.3
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	55.1	61.9	66.8	58.1	54.2	52.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.43	1.88	0.46	0.03	0.58	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0007	0.0013
Magnesium, dissolved	mg/l	--	--	40	67.5	34.2	19.1	16.9	24.9
Manganese, dissolved	mg/l	--	0.05	1.43	0.83	1.52	0.13	0.57	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	0.4	5.3	0.4	0.4	2.8	1.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	371	510	301	218	150	299
Zinc, dissolved	mg/l	--	5	0.24	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.077	0.001	0.001	0.001

WCC - Navan Waste Recyling and Disposal Facility
Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 30-May-2003	94-6 09-Oct-2003	94-6 14-May-2004	94-6 19-Nov-2004	94-6 24-May-2005	94-6 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	337	--	545	512	598	259
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	276	408	447	420	490	420
Ammonia Nitrogen	mg/l	--	--	0.06	0.3	0.14	0.22	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	7	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	58	92	64	54	71	49
Chloride	mg/l	--	250	205	357	167	179	149	238
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1440	2150	1560	1670	2200	620
Dissolved Inorganic Carbon	mg/l	--	--	--	109	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	206	259	258	302	287	186
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.2	1	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.79	2.37	1.83	1.64	1.62	1.49
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	7.1	7	6.8	7	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.39	1.93	0.81	0.68	0.65	0.67
Sulphate	mg/l	--	500 [5]	127	146	109	150	75	77
Temperature (Field)	deg c	--	15	--	--	--	--	8	--
Total Dissolved Solids	mg/l	--	500	720	1221	780	835	863	820
Total Organic Carbon	mg/l	--	--	19.6	18	18.8	15	23.8	10.6
Total Suspended Solids	mg/l	--	--	442	3610	656	434	392	352
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.14	0.477	0.394	0.517	0.284	0.15
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	49.6	43.2	48	55.6	49.2	41.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.001	0.001	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.002	0.007	0.006	0.002	0.005
Iron, dissolved	mg/l	--	0.3	0.13	0.846	0.022	0.013	0.029	0.012
Lead, dissolved	mg/l	0.01	--	0.0002	0.0007	0.0008	0.0003	0.0006	0.0003
Magnesium, dissolved	mg/l	--	--	19.9	36.7	33.7	39.6	39.9	20.2
Manganese, dissolved	mg/l	--	0.05	0.02	1.41	0.117	0.081	0.62	0.071
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	2.3	6.2	3.1	2.9	3.8	14.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001
Sodium, dissolved	mg/l	--	200 [6]	237	385	267	242	255	190
Zinc, dissolved	mg/l	--	5	0.01	0.005	0.006	0.005	0.01	0.009
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 30-May-2003	94-6 09-Oct-2003	94-6 14-May-2004	94-6 19-Nov-2004	94-6 24-May-2005	94-6 16-Nov-2005
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 25-May-2006	94-6 21-Nov-2006	94-6 15-May-2007	94-6 30-Nov-2007 [17]	94-6 22-May-2008
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	340	492	452	--	309
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	340	492	452	--	309
Ammonia Nitrogen	mg/l	--	--	0.04	<0.01	<0.01	--	0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	52	59	107	--	65
Chloride	mg/l	--	250	113	155	207	--	71.1
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	800	1150	950	--	625
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	172	275	262	--	105
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.19	1.14	1.99	--	3.09
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.7	7.6	--	7.4
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [5]	62	53	83	--	26
Temperature (Field)	deg c	--	15	5	6	7.9	--	13
Total Dissolved Solids	mg/l	--	500	593	828	881	--	458
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0012	0.0014	--	0.0017
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.107	0.25	0.22	--	0.138
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00004	--	<0.00002
Calcium, dissolved	mg/l	--	--	39.4	57.4	50.3	--	25.2
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	--	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.013	--	<0.005
Copper, dissolved	mg/l	--	1	0.004	0.004	<0.002	--	<0.002
Iron, dissolved	mg/l	--	0.3	0.037	0.057	0.051	--	0.942
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0001	0.00006	--	<0.00002
Magnesium, dissolved	mg/l	--	--	17.8	31.9	33.1	--	10.3
Manganese, dissolved	mg/l	--	0.05	0.368	0.99	0.332	--	1.64
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.9	13.3	10.5	--	28.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	156	222	225	--	108
Zinc, dissolved	mg/l	--	5	0.009	0.021	<0.005	--	0.007
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	--	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 25-May-2006	94-6 21-Nov-2006	94-6 15-May-2007	94-6 30-Nov-2007 [17]	94-6 22-May-2008
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	--	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	--	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005
Styrene	mg/l	--	--	--	--	--	--	<0.0006
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	0.0008	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	--	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 10-Nov-2008	94-6 19-May-2009 G-17	94-6 26-Nov-2009 J-3	94-6 25-May-2010 [26] M-22	94-6 20-Oct-2010 [26] G-25
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	430	453	501	432	538
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	430	453	501	432	538
Ammonia Nitrogen	mg/l	--	--	<0.01	0.04	0.05	0.04	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	64	45	55	40	80
Chloride	mg/l	--	250	220	190	195	161	124
Conductivity	uS/cm	--	--	--	1590	1610	1470	1420
Conductivity (Field)	uS/cm	--	--	1400	1200	1144	1400	1363
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	246	271	282	271	336
Nitrate as N	mg/l	10.0	--	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.79	0.95	0.65	0.61	0.92
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	7.34	7.69	7.40	7.53
pH (Field)	-	--	--	6.6	--	4.87	6.61	7.67
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	2.00	0.55	0.58	0.97
Sulphate	mg/l	--	500 [5]	120	77	56	56	35
Temperature (Field)	deg c	--	15	5	7	6.7	27.1	11.8
Total Dissolved Solids	mg/l	--	500	960	1030	1050	956	923
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0016	0.001	0.001	<0.01	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.378	0.35	0.20	0.27	0.23
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	44.6	54	62	49	77
Chromium, dissolved	mg/l	0.05	--	<0.002	0.006	0.004	0.006	0.008
Cobalt, dissolved	mg/l	--	--	<0.005	0.0022	0.0010	0.0023	0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.003	0.002	0.003
Iron, dissolved	mg/l	--	0.3	0.423	<0.03	0.06	0.62	0.03
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	32.8	33	31	36	35
Manganese, dissolved	mg/l	--	0.05	0.245	1.17	0.75	1.73	0.09
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11.3	10	15	9	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	271	234	208	198	166
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	<0.01	0.01
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 10-Nov-2008	94-6 19-May-2009 G-17	94-6 26-Nov-2009 J-3	94-6 25-May-2010 [26] M-22	94-6 20-Oct-2010 [26] G-25
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	<0.0006	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 24-May-2011 [26] G-37	94-6 29-Nov-2011 [26] 94-6	94-6 31-May-2012 94-6	94-6 29-Nov-2012 [27] 94-6	94-6 29-May-2013 [30] 94-6
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	490	475	370	360	380
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<1.0	<1.0	1.3
Alkalinity (Total as CaCO3)	mg/l	--	--	490	475	370	360	380
Ammonia Nitrogen	mg/l	--	--	0.04	<0.02	<0.050	0.14	0.25
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	60	45	76	58	140
Chloride	mg/l	--	250	160	236	150	160	270
Conductivity	uS/cm	--	--	1500	1740	--	--	--
Conductivity (Field)	uS/cm	--	--	1319	1373	1246	1258	1149
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	332	291	280	340	310
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	1.34	1.17	1.7	2.6	5.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	8.03	7.63	7.42	7.44	7.56
pH (Field)	-	--	--	6.46	6.62	6.86	6.91	7.49
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.59	0.25	0.80	0.96	9.1
Sulphate	mg/l	--	500 [5]	42	89	120	130	130
Temperature (Field)	deg c	--	15	15.0	6.5	11.8	4.1	11.6
Total Dissolved Solids	mg/l	--	500	975	1130	896	936	934
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.0010	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.27	0.40	0.29	0.35	0.27
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	57	54	47	59	52
Chromium, dissolved	mg/l	0.05	--	0.009	0.006	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0027	0.0009	0.00052	0.00073	0.0012
Copper, dissolved	mg/l	--	1	0.004	0.002	0.0025	0.0020	0.0020
Iron, dissolved	mg/l	--	0.3	1.12	0.90	<0.1	1	0.13
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	46	38	40	46	43
Manganese, dissolved	mg/l	--	0.05	1.88	2.25	0.64	2.3	0.67
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7	6	4.7	7.1	4.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	224	244	240	330	180
Zinc, dissolved	mg/l	--	5	0.02	<0.01	<0.0050	0.0055	<0.0050
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	0.0072

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 24-May-2011 [26] G-37	94-6 29-Nov-2011 [26] 94-6	94-6 31-May-2012 94-6	94-6 29-Nov-2012 [27] 94-6	94-6 29-May-2013 [30] 94-6
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	0.0005	<0.0004	<0.00010	<0.00010	<0.00050
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00010	<0.00010	<0.00050
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00010	<0.00010	<0.00050
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00010	<0.00010	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.00050	<0.00050	<0.0025
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00010	<0.00010	<0.00050
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00020	<0.00020	<0.0010
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00020	<0.00020	<0.0010

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 26-Nov-2013 GW-11	94-6 29-May-2014 94-6	94-6 19-Nov-2014 [31] 94-6	94-6 02-Jun-2015 94-6	94-6 26-Nov-2015 94-6
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	360	310	420	483	521
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<1.0	<1.0	<1.0	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	360	310	420	484	522
Ammonia Nitrogen	mg/l	--	--	<0.050	0.099	0.12	0.52	0.58
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	50	70	73	156
Chloride	mg/l	--	250	200	140	260	332	372
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1303	960	1311	1405	1598
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	330	270	320	218	276
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.4	4.7	<2.0 [19]	1.3	5.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	7.31	7.36	7.33	--	--
pH (Field)	-	--	--	7.32	6.77	6.74	6.70	6.91
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.59	0.55	2.0	0.35	6.20
Sulphate	mg/l	--	500 [5]	150	55	62	64	81
Temperature (Field)	deg c	--	15	5.5	12.1	5.6	10.0	7.2
Total Dissolved Solids	mg/l	--	500	902	624	1060	1050	1210
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.31	0.15	0.32	0.142	0.202
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	56	53	58	39.2	47.8
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.00063	0.00050	0.0014	0.0015	0.0009
Copper, dissolved	mg/l	--	1	0.0015	0.0041	0.0010	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	1.3	0.214	0.131
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	46	34	43	29.1	38
Manganese, dissolved	mg/l	--	0.05	1.2	0.61	2.9	1.28	1.29
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.7	4.4	6.5	3.46	3.72
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	290	160	330	147	212
Zinc, dissolved	mg/l	--	5	0.011	0.0065	0.0054	0.006	0.012
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	0.0011	<0.002 [9]	<0.004 [9]

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 26-Nov-2013 GW-11	94-6 29-May-2014 94-6	94-6 19-Nov-2014 [31] 94-6	94-6 02-Jun-2015 94-6	94-6 26-Nov-2015 94-6
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005

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Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6 26-May-2016	94-6 17-Nov-2016	94-6 24-May-2017	94-6 29-Nov-2017	94-6 24-May-2018
				94-6	94-6	94-6	94-6	94-6
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	578	547	436	513	551
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	579	548	424	514	552
Ammonia Nitrogen	mg/l	--	--	0.37	0.27	0.38	0.15	0.43
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	101	63	58	91	100
Chloride	mg/l	--	250	459	428	306	396	382
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1517	1736	1574	1555	1737
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	317	261	364	255	323
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.3	0.9	2.3	1.1	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.19	7.74	7.03	7.39	6.72
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.56	0.35	0.38	0.46	0.43
Sulphate	mg/l	--	500 [5]	70	81	102	101	87
Temperature (Field)	deg c	--	15	12.6	9.2	11.6	5.7	11.7
Total Dissolved Solids	mg/l	--	500	1380	1280	1050	1160	1260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.001	0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.154	0.332	0.185	0.201	0.241
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	65.7	51.9	70.2	53.2	67
Chromium, dissolved	mg/l	0.05	--	<0.001	0.006	0.005	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0027	<0.0005	0.0007	<0.0005	0.0021
Copper, dissolved	mg/l	--	1	0.0018	0.0037	0.0040	0.0019	0.0010
Iron, dissolved	mg/l	--	0.3	0.168	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	37.3	31.9	45.7	29.6	37.7
Manganese, dissolved	mg/l	--	0.05	1.7	0.148	1.4	0.18	2.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.51	3.83	4.03	4.02	4.29
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	160	182	292	166	202
Zinc, dissolved	mg/l	--	5	0.008	0.006	0.006	<0.005	0.007
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.001	<0.002 [11]	<0.002 [11]	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6	94-6	94-6	94-6	94-6
				26-May-2016	17-Nov-2016	24-May-2017	29-Nov-2017	24-May-2018
				94-6	94-6	94-6	94-6	94-6
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6	94-6	94-6
				29-Nov-2018	19-Jun-2019	20-Nov-2019
				94-6	94-6	94-6
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	448	461	516
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	449	463	518
Ammonia Nitrogen	mg/l	--	--	0.04	0.32	0.19
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	62	86	80
Chloride	mg/l	--	250	240	263	460
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1451	1427	1531
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	394	411	390
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	1.8	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	7.58	7.22	6.91
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.77	0.66	0.88
Sulphate	mg/l	--	500 [5]	150	149	112
Temperature (Field)	deg c	--	15	4.3	15.2	6.3
Total Dissolved Solids	mg/l	--	500	948	1070	1400
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Aluminum, dissolved	mg/l	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.42	0.147	0.262
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	78.4	96.6	66.3
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0010	0.0008	0.0007
Copper, dissolved	mg/l	--	1	0.0018	0.0052	0.0076
Iron, dissolved	mg/l	--	0.3	0.918	<0.1	0.64
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	48.1	41.2	54.4
Manganese, dissolved	mg/l	--	0.05	0.899	1.11	1.45
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.01	7.68	9.81
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	316	218	411
Zinc, dissolved	mg/l	--	5	<0.005	0.007	0.006
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	94-6	94-6	94-6
				29-Nov-2018	19-Jun-2019	20-Nov-2019
				94-6	94-6	94-6
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-1 28-Jun-1995	95-1 23-Nov-1995	95-1 12-Oct-1996	95-1 06-Nov-1997	95-1 05-Jun-1998	95-1 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1076	1260	--	--	--	1570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	116	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	882	1220	1280	1060	1050	1290
Ammonia Nitrogen	mg/l	--	--	1.27	7.5	9.15	4.42	6.05	2.83
Chemical Oxygen Demand	mg/l	--	--	700	250	115	56	392	1740
Chloride	mg/l	--	250	615	853	836	784	998	925
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3660	4460	4000	4380	4250	4320
Dissolved Oxygen (Field)	mg/l	--	--	2.66	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	175	194	165	185	170	178
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.4	0.1	3.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	19.5	28.8	--	--	--	24.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	18.23	21.3	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.4	8.77	7.96	8.84	--	8.1
Phosphate	mg/l	--	--	--	54.2	--	--	--	--
Phosphorus	mg/l	--	--	2.86	--	--	--	--	--
Sulphate	mg/l	--	500 [5]	10	19	6	1	162	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1830	2250	2000	2200	2110	2170
Total Organic Carbon	mg/l	--	--	31.8	24.5	20.1	23.9	28	26.5
Total Suspended Solids	mg/l	--	--	--	--	106	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.07	1.22	1.19	1.34	1.59	1.52
Cadmium, dissolved	mg/l	0.005	--	0.0009	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.4	24.3	20.2	22.8	20.5	22.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.04	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	4.05	4.96	5.67	3.58	1.39
Lead, dissolved	mg/l	0.01	--	0.0008	0.0013	0.0002	0.0003	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	26.2	31.8	27.4	30.8	28.5	28.8
Manganese, dissolved	mg/l	--	0.05	0.17	0.18	0.18	0.21	0.15	0.11
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	23.9	21.4	26.1	29.3	29.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	639	871	977	896	1200	1080
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.09	0.04
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-1 24-Oct-2000	95-1 14-Jun-2001	95-1 06-Nov-2002	95-1 30-May-2003	95-1 19-Nov-2004	95-1 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1690	1300	1780	1500	1560	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	102	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1390	1240	1460	1230	1280	1140
Ammonia Nitrogen	mg/l	--	--	1.33	3.15	2.4	2.53	2.33	2.14
Chemical Oxygen Demand	mg/l	--	--	--	56	72	71	81	65
Chloride	mg/l	--	250	890	880	820	879	864	731
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4660	4200	4430	4110	4540	3100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	182	170	211	157	158	170
Nitrate as N	mg/l	10.0	--	0.3	0.1	0.2	1	1	0.7
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.49	3.75	4.17	4.3	3.7	3.88
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.26	8.3	8.1	7.2	8.1	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.81	2.29	0.79	2.43	2.78	1.96
Sulphate	mg/l	--	500 [5]	4.5	1	2	1	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2600	2520	2720	2055	2270	2540
Total Organic Carbon	mg/l	--	--	--	19.8	19.6	19.1	16.2	21.8
Total Suspended Solids	mg/l	--	--	1210	127	184	168	380	35
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	0.003	0.001	0.001
Boron, dissolved	mg/l	5	--	1.5	1.59	1.51	1.42	1.47	1.5
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0002
Calcium, dissolved	mg/l	--	--	20.3	23.2	23.8	20.4	20.6	22.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.33	0.23	0.27	2	0.186	0.251
Lead, dissolved	mg/l	0.01	--	0.022	0.0002	0.0063	0.0004	0.0028	0.0007
Magnesium, dissolved	mg/l	--	--	31.9	27.2	28.5	25.7	26	27.9
Manganese, dissolved	mg/l	--	0.05	0.09	0.08	0.08	0.1	0.066	0.072
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	17.2	16.2	23	24.2	24.2	27.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	0.001
Sodium, dissolved	mg/l	--	200 [6]	1030	997	978	876	1130	1070
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.009
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.024	0.001	0.001	0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-1 15-May-2007	95-1 10-Nov-2008	95-1 26-Nov-2009 [32] M-10	95-1 24-May-2011 [26] G-13	95-1 28-Nov-2012 95-1	95-1 29-May-2014 [31] 95-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1370	1200	1260	1150	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	27	42	19	38
Alkalinity (Total as CaCO3)	mg/l	--	--	1370	1200	1290	1190	1300	1200
Ammonia Nitrogen	mg/l	--	--	2.15	1.07	2.35	1.35	2.7	2.6
Chemical Oxygen Demand	mg/l	--	--	108	47	70	43	73	67
Chloride	mg/l	--	250	782	650	827	626	810	770
Conductivity	uS/cm	--	--	--	--	4690	3970	--	--
Conductivity (Field)	uS/cm	--	--	2500	3300	3930	2624	3795	3830
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	161	205	142	227	160	130
Nitrate as N	mg/l	10.0	--	<0.1	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	0.047
Nitrogen, Total Kjeldahl	mg/l	--	--	4	2.25	3.40	2.42	3.5	4.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.35	8.59	--	8.53
pH (Field)	-	--	--	8.5	8	7.8	8.10	8.29	8.03
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.13	0.85	2.7	2.0
Sulphate	mg/l	--	500 [5]	1	1	4	1	<1	1
Temperature (Field)	deg c	--	15	8.4	6	8.9	13.3	6.5	9.3
Total Dissolved Solids	mg/l	--	500	2660	2200	3050	2580	2690	2650
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0074	0.0033	0.008	<0.01	0.002	0.0024
Boron, dissolved	mg/l	5	--	1.41	1.03	1.6	0.92	1.6	1.2
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	21.4	25.3	19	30	20	16
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.01	<0.005	0.0004	0.0005	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.001	0.003	0.001	0.0028
Iron, dissolved	mg/l	--	0.3	0.361	0.014	0.15	0.28	0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00017	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	26.3	34.4	23	37	26	20
Manganese, dissolved	mg/l	--	0.05	0.078	0.004	0.06	0.06	0.047	0.035
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	27.1	17.5	23	14	22	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	979	754	1140	873	1000	720
Zinc, dissolved	mg/l	--	5	0.006	<0.005	<0.01	0.02	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-1 26-Nov-2015	95-1 24-May-2017	95-1 22-Nov-2018
				95-1	95-1	95-1
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1210	1270	1150
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [24]	<25 [10]	<25 [10]
Alkalinity (Total as CaCO3)	mg/l	--	--	1230	1280	1170
Ammonia Nitrogen	mg/l	--	--	3.78	3.13	3.58
Chemical Oxygen Demand	mg/l	--	--	284	97	306
Chloride	mg/l	--	250	863	873	760
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	3179
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	139	163	215
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [10]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	9.9	4.5	7.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.25	8.21	8.58
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	12.3	4.02	9.90
Sulphate	mg/l	--	500 [5]	1	<1	1
Temperature (Field)	deg c	--	15	6.7	11.6	4.8
Total Dissolved Solids	mg/l	--	500	2880	2700	2440
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.002	0.005	0.002
Boron, dissolved	mg/l	5	--	1.55	0.994	1.53
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	18.5	15.4	33.1
Chromium, dissolved	mg/l	0.05	--	<0.001	0.014	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	<0.0005	0.0008	0.0011
Iron, dissolved	mg/l	--	0.3	0.138	<0.1	0.2
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	22.6	30.2	32
Manganese, dissolved	mg/l	--	0.05	0.053	0.028	0.066
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	20	15.7	27
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	1050	1010	1010
Zinc, dissolved	mg/l	--	5	0.01	<0.005	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [9]	<0.004 [11]	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 28-Jun-1995	95-2 23-Nov-1995	95-2 12-Jun-1996	95-2 12-Oct-1996	95-2 18-Jun-1997	95-2 06-Nov-1997	95-2 05-Jun-1998	95-2 29-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1139	1400	--	--	--	--	--	1340
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	15	--	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	934	1180	1240	1200	1280	1190	1080	1100
Ammonia Nitrogen	mg/l	--	--	0.88	0.63	1.18	1.49	0.01	0.77	0.68	0.8
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	50	18	30	19	62	50	36
Chloride	mg/l	--	250	528	628	636	656	629	632	615	660
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3480	4170	4000	4180	3850	3900	3720	3980
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.2	--	--	--	2.36	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	214	244	247	231	264	265	239	195
Nitrate as N	mg/l	10.0	--	0.1	1.7	0.1	0.1	0.1	0.1	2.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.3	4	--	--	--	--	--	2.14
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.42	3.37	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	8.48	8.08	7.8	8.22	8.5	--	7.7
Phosphate	mg/l	--	--	--	1	--	--	--	--	--	--
Phosphorus	mg/l	--	--	4.39	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [5]	26	8	4	6	3	1	10	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1750	2090	1940	2100	1930	1960	1840	2000
Total Organic Carbon	mg/l	--	--	12.1	14.8	15.5	14.5	16.5	16.7	16.6	17.1
Total Suspended Solids	mg/l	--	--	--	--	1480	780	1910	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.79	0.92	0.965	1.01	1.27	1.07	1.17	1.25
Cadmium, dissolved	mg/l	0.005	--	0.0009	0.0001	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	32.4	30.2	30.1	29	34.4	34.1	28.6	24.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.09	0.2	0.545	0.62	0.62	0.41	0.96	0.45
Lead, dissolved	mg/l	0.01	--	0.0012	0.0002	0.0005	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	32	40.5	41.3	38	42.8	43.1	40.2	32.6
Manganese, dissolved	mg/l	--	0.05	0.13	0.09	0.138	0.14	0.16	0.11	0.12	0.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	19.4	23	19.3	18.5	19.3	18.7	20.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	608	754	777	867	662	789	1000	842
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 06-May-1999	95-2 19-Oct-1999	95-2 05-May-2000	95-2 24-Oct-2000	95-2 14-Jun-2001	95-2 23-Nov-2001	95-2 23-May-2002	95-2 06-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1430	1160	1577	1550	1230	1420	1240	1600
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	91	1	1	67	1	110	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1170	1100	1293	1273	1120	1160	1200	1310
Ammonia Nitrogen	mg/l	--	--	0.12	1.21	0.07	0.2	1.23	0.88	1.2	1.33
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	37	47	--	37	31	43	55
Chloride	mg/l	--	250	690	695	645	703	671	682	675	646
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3720	3860	3750	3970	3600	3620	3100	3690
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	250	239	227	255	232	254	242	233
Nitrate as N	mg/l	10.0	--	--	0.1	0.2	0.9	0.3	0.4	0.1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.67	--	--	1.32	2.3	2.51	2.23	2.47
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.9	8.1	7.9	8.1	8.1	7.55	7.41	8
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.85	0.95	0.94	0.89	0.82
Sulphate	mg/l	--	500 [5]	1	6	3	4	3	3	2	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1870	1130	1875	2230	2060	2200	2170	2160
Total Organic Carbon	mg/l	--	--	19.4	16.8	16.6	--	14.9	18	18	16.1
Total Suspended Solids	mg/l	--	--	--	492	180	90	51	43	51	36
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001	0.002	0.002
Boron, dissolved	mg/l	5	--	1.18	1.29	1.19	1.15	1.11	1.38	1.18	1.18
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	32.2	32.6	30	28.6	32.6	30.8	32.3	28.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.45	1.1	2.3	0.17	0.08	0.11	0.31	0.31
Lead, dissolved	mg/l	0.01	--	0.0002	0.0005	0.0002	0.022	0.0002	0.0002	0.0002	0.0035
Magnesium, dissolved	mg/l	--	--	40.7	37.9	36.5	44.6	36.5	43.1	39.2	39.1
Manganese, dissolved	mg/l	--	0.05	0.11	0.11	0.13	0.11	0.09	0.1	0.12	0.1
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	13.6	18	11.2	19.8	9.1	12.3	18.4	17.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	902	926	798	831	782	898	802	809
Zinc, dissolved	mg/l	--	5	0.01	0.1	0.06	0.01	0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.054	0.001	0.001	0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 30-May-2003	95-2 09-Oct-2003	95-2 14-May-2004	95-2 19-Nov-2004	95-2 24-May-2005	95-2 16-Nov-2005	95-2 25-May-2006	95-2 21-Nov-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1400	--	1379	1410	1450	281	1220	1260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1150	1160	1130	1160	1190	1150	1220	1260
Ammonia Nitrogen	mg/l	--	--	1.34	1.45	1.23	1.04	1.38	1.22	1.18	1.24
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	5	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	52	56	75	51	68	50	51
Chloride	mg/l	--	250	657	639	687	658	619	587	689	673
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2630	3550	3503	3730	3800	3640	3300	3500
Dissolved Inorganic Carbon	mg/l	--	--	--	280	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	215	214	220	216	228	230	213	215
Nitrate as N	mg/l	10.0	--	0.3	0.1	0.2	2	0.3	1.4	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.67	2.48	2.69	2.57	2.9	2.6	2.34	2.42
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.1	7.8	8.2	8	7.4	--	8	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.18	0.89	0.92	2.07	1.34	1.26	--	--
Sulphate	mg/l	--	500 [5]	2	--	3	10	2	3	1	1
Temperature (Field)	deg c	--	15	--	--	--	--	10	--	4.5	6.5
Total Dissolved Solids	mg/l	--	500	1315	2203	1750	1865	2200	2220	2290	2310
Total Organic Carbon	mg/l	--	--	1.2	20	14.1	12.9	15.3	15.8	--	--
Total Suspended Solids	mg/l	--	--	164	46	42	40	431	7	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.001	0.001	<0.001	0.001	<0.001	0.0035
Boron, dissolved	mg/l	5	--	1.03	1.05	1.06	1.11	1.1	1.14	0.984	1.07
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.005	<0.0001
Calcium, dissolved	mg/l	--	--	28.7	27.4	29	28.9	28.9	30.3	27.9	26.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.001	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.002	0.002	0.002	<0.002	0.003	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.49	0.552	0.3	0.391	0.633	0.138	0.253	0.304
Lead, dissolved	mg/l	0.01	--	0.0005	0.0012	0.0013	0.0005	0.0015	0.0011	0.0006	<0.0001
Magnesium, dissolved	mg/l	--	--	34.7	35.5	36	35.1	38	37.4	35	36.1
Manganese, dissolved	mg/l	--	0.05	0.09	0.076	0.097	0.099	0.089	0.099	0.092	0.057
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	16.9	17	17.9	18.7	19.9	20.1	17.4	18.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	0.001	0.001	--	--
Sodium, dissolved	mg/l	--	200 [6]	719	785	761	770	791	860	801	794
Zinc, dissolved	mg/l	--	5	0.01	0.005	0.005	0.005	<0.005	0.01	0.006	0.007
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 30-May-2003	95-2 09-Oct-2003	95-2 14-May-2004	95-2 19-Nov-2004	95-2 24-May-2005	95-2 16-Nov-2005	95-2 25-May-2006	95-2 21-Nov-2006
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 15-May-2007	95-2 30-Nov-2007	95-2 22-May-2008	95-2 10-Nov-2008	95-2 19-May-2009 G-22	95-2 26-Nov-2009 M-13
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1290	1230	1180	1220	1130	1190
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [8]	29
Alkalinity (Total as CaCO3)	mg/l	--	--	1290	1230	1180	1215	1130	1220
Ammonia Nitrogen	mg/l	--	--	1.25	1.12	1.05	2.12	1.25	0.61
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	54	80	52	67	73	45
Chloride	mg/l	--	250	601	679	678	812	598	652
Conductivity	uS/cm	--	--	--	--	--	--	3800	4080
Conductivity (Field)	uS/cm	--	--	2000	3000	3350	4100	3300	3370
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	197	220	214	143	201	176
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	0.3	0.19	0.30
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	0.14
Nitrogen, Total Kjeldahl	mg/l	--	--	2.53	2.27	2.52	3.77	2.26	1.47
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	8.25	8.41
pH (Field)	-	--	--	8.5	8.3	8.1	8.1	--	7.47
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.89	0.81
Sulphate	mg/l	--	500 [5]	1	1	<1	<1	3	4
Temperature (Field)	deg c	--	15	6.7	7	12	6	8	8.6
Total Dissolved Solids	mg/l	--	500	2160	2460	2290	2480	2470	2650
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0047	0.0043	0.0039	0.0047	0.004	0.005
Boron, dissolved	mg/l	5	--	0.962	1.07	1.03	1.18	1.33	1.1
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	26.6	29.9	28.4	18.9	26	21
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0003	0.0004
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.223	0.061	0.317	0.706	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	0.00009	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	31.8	35.4	34.8	23.3	33	30
Manganese, dissolved	mg/l	--	0.05	0.088	0.101	0.087	0.044	0.06	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.3	20.2	17.8	29.1	15	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	707	963	817	861	791	801
Zinc, dissolved	mg/l	--	5	0.006	<0.005	<0.005	<0.005	<0.01	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 15-May-2007	95-2 30-Nov-2007	95-2 22-May-2008	95-2 10-Nov-2008	95-2 19-May-2009 G-22	95-2 26-Nov-2009 M-13
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	<0.0006	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 25-May-2010 M-17	95-2 20-Oct-2010 [26] G-16	95-2 24-May-2011 [26] G-20	95-2 29-Nov-2011 [26] 95-2	95-2 31-May-2012 95-2	95-2 28-Nov-2012 95-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1040	1170	1260	1150	1100	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	22	<2 [8]	50	<2 [8]	24	18
Alkalinity (Total as CaCO3)	mg/l	--	--	1060	1170	1309	1150	1100	1200
Ammonia Nitrogen	mg/l	--	--	1.40	1.14	2.18	1.27	1.4	1.3
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	48	50	50	50	50	54
Chloride	mg/l	--	250	529	607	797	602	550	600
Conductivity	uS/cm	--	--	3660	3890	4840	3800	--	--
Conductivity (Field)	uS/cm	--	--	3920	3857	1476	3506	3330	3229
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	218	234	166	214	180	230
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	0.22	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.41	0.043
Nitrogen, Total Kjeldahl	mg/l	--	--	1.91	2.35	3.32	1.59	2.3	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	0.63	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	8.36	8.28	8.63	8.25	8.36	--
pH (Field)	-	--	--	8.05	8.18	8.06	8.11	8.07	8.15
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.99	0.88	2.17	0.84	0.72	0.79
Sulphate	mg/l	--	500 [5]	5	1	<1	2	<1	<10 [33]
Temperature (Field)	deg c	--	15	19.7	11.5	20.0	7.7	9.9	6.5
Total Dissolved Solids	mg/l	--	500	2380	2530	3150	2470	2230	2270
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	0.0019	<0.01
Boron, dissolved	mg/l	5	--	1.6	1.3	1.4	1.12	0.99	1.3
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.001
Calcium, dissolved	mg/l	--	--	28	31	22	28	22	29
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.05
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0006	0.0004	<0.00050	<0.005
Copper, dissolved	mg/l	--	1	0.002	<0.001	0.003	<0.001	<0.0010	<0.01
Iron, dissolved	mg/l	--	0.3	0.23	0.27	0.16	0.09	0.27	<1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.005
Magnesium, dissolved	mg/l	--	--	36	38	27	35	29	39
Manganese, dissolved	mg/l	--	0.05	0.10	0.09	0.05	0.11	0.061	0.094
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18	17	23	16	14	18
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	750	842	1110	804	690	900
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	0.02	<0.01	<0.0050	<0.05
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 25-May-2010 M-17	95-2 20-Oct-2010 [26] G-16	95-2 24-May-2011 [26] G-20	95-2 29-Nov-2011 [26] 95-2	95-2 31-May-2012 95-2	95-2 28-Nov-2012 95-2
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2	95-2	95-2	95-2	95-2	95-2
				29-May-2013 [28]	26-Nov-2013	29-May-2014	19-Nov-2014	02-Jun-2015	26-Nov-2015
				95-2	GW-8	95-2	95-2	95-2	95-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1100	1200	1200	1200	934	1130
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	26	31	25	<50	<25 [24]
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1200	1200	1200	947	1150
Ammonia Nitrogen	mg/l	--	--	1.6	1.3	1.7	1.7	1.66	1.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	56	58	53	93	104	99
Chloride	mg/l	--	250	650	660	670	640	627	676
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3121	3074	3215	3648	3632	3679
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	220	220	250	148	166
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.57	0.33	0.176	0.055	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.6	5.1	3.3	4.9	2.9	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.66	0.40	0.23	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	8.25	8.37	8.46	8.37	--	--
pH (Field)	-	--	--	7.95	8.14	7.79	8.22	8.16	8.23
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.1	1.4	1.5	5.2	1.75	1.59
Sulphate	mg/l	--	500 [5]	<1	<1	<1	<1	2	3
Temperature (Field)	deg c	--	15	8.9	7.1	8.8	7.3	9.6	7.2
Total Dissolved Solids	mg/l	--	500	2300	2290	2180	2260	2220	2440
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0012	0.0024	0.0018	0.0022	0.001	0.002
Boron, dissolved	mg/l	5	--	1.2	1	1.1	1.2	0.782	1.21
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	30	27	29	32	20.8	25.1
Chromium, dissolved	mg/l	0.05	--	<0.0050	0.0051	0.0057	0.0055	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.00053	0.00053	<0.00050	<0.00050	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0017	0.0013	0.0035	0.0018	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.13	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00056	<0.00050	<0.00050	<0.00050	0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	37	36	37	40	23.2	32.5
Manganese, dissolved	mg/l	--	0.05	0.092	0.031	0.015	0.11	0.048	0.083
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17	16	17	19	11.9	14.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	760	750	740	830	716	83.2
Zinc, dissolved	mg/l	--	5	0.0065	0.0063	<0.0050	0.0066	0.035	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.0018	0.0013	0.0022	0.0022	<0.004 [9]	<0.004 [9]

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2	95-2	95-2	95-2	95-2	95-2
				29-May-2013 [28]	26-Nov-2013	29-May-2014	19-Nov-2014	02-Jun-2015	26-Nov-2015
				95-2	GW-8	95-2	95-2	95-2	95-2
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	0.00070	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005

WCC - Navan Waste Recyling and Disposal Facility
Report of Monitoring Results - Groundwater
Downgradient / Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 26-May-2016	95-2 17-Nov-2016	95-2 24-May-2017	95-2 29-Nov-2017	95-2 24-May-2018	95-2 22-Nov-2018
				95-2	95-2	95-2	95-2	95-2	95-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1020	1090	1120	1040	1050	1220
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [10]	<25 [10]	<25 [10]	<25 [10]	<25 [10]	<25 [10]
Alkalinity (Total as CaCO3)	mg/l	--	--	1030	1100	1140	1050	1060	1240
Ammonia Nitrogen	mg/l	--	--	2.10	1.68	2.61	1.48	1.81	1.39
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	108	89	119	78	97	119
Chloride	mg/l	--	250	685	672	644	719	658	699
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3727	3843	3661	3404	3905	3391
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	184	204	190	215	203	281
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.25 [10]	0.33	0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.2	2.7	3.2	2.9	2.8	2.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.28	7.86	8.14	8.16	8.10	8.39
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.17	2.30	3.53	2.74	2.16	1.78
Sulphate	mg/l	--	500 [5]	3	4	5	4	6	4
Temperature (Field)	deg c	--	15	10.7	9.2	10.0	7.3	10.4	6.3
Total Dissolved Solids	mg/l	--	500	2430	2360	2200	2300	2290	2330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.004	0.005	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.962	1.35	0.919	1.06	1.03	1.16
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	24.5	26.1	25.7	27.4	28.2	36
Chromium, dissolved	mg/l	0.05	--	<0.001	0.014	0.012	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0008	0.0006	0.0008	0.0013	0.0013	0.0050
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	0.106	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	29.8	33.8	30.5	35.5	32.3	46.5
Manganese, dissolved	mg/l	--	0.05	0.081	0.068	0.06	0.049	0.05	0.014
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.8	15.7	15.2	17.2	16.2	20.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	627	767	772	806	718	871
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.011	<0.002 [11]	<0.004 [11]	<0.002 [11]	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 26-May-2016	95-2 17-Nov-2016	95-2 24-May-2017	95-2 29-Nov-2017	95-2 24-May-2018	95-2 22-Nov-2018
				95-2	95-2	95-2	95-2	95-2	95-2
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 19-Jun-2019	95-2 20-Nov-2019
				95-2	95-2
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1060	1130
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [10]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1070	1150
Ammonia Nitrogen	mg/l	--	--	2.07	1.59
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	97	132
Chloride	mg/l	--	250	587	720
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3560	3810
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	245	290
Nitrate as N	mg/l	10.0	--	<0.1	0.7
Nitrite as N	mg/l	1.0	--	0.36	0.07
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	8.02	8.31
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	2.57	2.86
Sulphate	mg/l	--	500 [5]	3	6
Temperature (Field)	deg c	--	15	11.4	7.6
Total Dissolved Solids	mg/l	--	500	2090	2470
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001
Boron, dissolved	mg/l	5	--	0.842	0.864
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	32.5	38.4
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0025	0.0016
Iron, dissolved	mg/l	--	0.3	<0.1	0.261
Lead, dissolved	mg/l	0.01	--	0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	39.7	47.1
Manganese, dissolved	mg/l	--	0.05	0.048	0.062
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.7	25.2
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	720	851
Zinc, dissolved	mg/l	--	5	0.006	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.004 [11]

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-2 19-Jun-2019	95-2 20-Nov-2019
				95-2	95-2
VOCs					
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--
Bromoform	mg/l	--	--	--	--
Bromomethane	mg/l	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--
Chloroform	mg/l	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3 28-Jun-1995	95-3 23-Nov-1995	95-3 12-Jun-1996	95-3 12-Oct-1996	95-3 18-Jun-1997	95-3 06-Nov-1997	95-3 05-Jun-1998	95-3 29-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	700	797	--	--	--	--	--	756
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	574	653	634	651	644	660	650	620
Ammonia Nitrogen	mg/l	--	--	0.14	0.09	0.19	0.57	0.79	0.07	0.18	0.22
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	90	25	23	15	9	17	30	3
Chloride	mg/l	--	250	269	261	294	272	266	262	248	260
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2170	2340	2150	4000	2200	2130	2080	2120
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	7.36	--	--	--	2.36	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	220	264	221	202	262	239	225	186
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	0.1	1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	8.5	0.8	--	--	--	--	--	1.06
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	8.36	0.71	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.03	7.45	7.1	7.96	7.29	7.94	--	6.7
Phosphate	mg/l	--	--	--	0.4	--	--	--	--	--	--
Phosphorus	mg/l	--	--	5.86	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [5]	55	128	119	114	100	52	118	117
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1090	1170	1080	1120	1110	1070	1019	1070
Total Organic Carbon	mg/l	--	--	19.2	7	7.5	6.8	6.9	7	6.8	9.6
Total Suspended Solids	mg/l	--	--	--	--	5070	5530	5010	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.61	0.61	0.618	0.77	0.8	0.74	0.85	0.95
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0001	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.6	36	30.2	28.6	35.5	34	29.5	26.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.03	19.9	0.132	0.25	0.16	0.14	1.46	0.38
Lead, dissolved	mg/l	0.01	--	0.0048	0.0059	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	31.5	41.7	34.8	31.4	38.1	37	36.2	28.9
Manganese, dissolved	mg/l	--	0.05	0.34	0.74	0.477	0.43	0.53	0.5	0.54	0.56
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	15.2	11.3	7.8	7.6	12.9	10.9	10.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	375	422	428	384	347	362	468	414
Zinc, dissolved	mg/l	--	5	0.01	0.05	0.01	0.01	0.01	0.01	0.32	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3	95-3	95-3	95-3	95-3	95-3	95-3	95-3
				06-May-1999	19-Oct-1999	05-May-2000	24-Oct-2000	14-Jun-2001	23-Nov-2001	23-May-2002	06-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	810	813	953	927	753	828	837	1050
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	25	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	664	666	781	760	659	679	686	864
Ammonia Nitrogen	mg/l	--	--	0.16	0.25	0.03	0.1	0.23	0.07	0.27	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	20	11	--	13	13	10	22
Chloride	mg/l	--	250	285	287	245	303	251	279	281	262
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2050	2370	2000	2310	1900	2100	2030	2260
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	218	223	240	237	236	243	248	248
Nitrate as N	mg/l	10.0	--	--	0.1	0.2	0.3	0.1	0.2	0.1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.19	--	--	1.22	0.62	0.7	0.47	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7.8	7	7.01	7	6.68	6.8	7
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	3.39	0.46	0.67	0.47	0.14
Sulphate	mg/l	--	500 [5]	104	101	101	130	112	110	111	114
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1040	1130	1000	1240	1180	1260	1260	1290
Total Organic Carbon	mg/l	--	--	7	6.5	6.1	--	5.8	7	6	5.6
Total Suspended Solids	mg/l	--	--	--	3000	1210	6230	1580	2100	1600	4150
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.68	1.02	0.77	0.84	0.76	1	0.72	0.87
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	29.1	33.8	34	30	36.1	33	35.8	36.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.28	1.2	2.45	0.08	0.02	0.02	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0021	0.0002	0.0002	0.0022	0.0002	0.0002	0.001	0.0013
Magnesium, dissolved	mg/l	--	--	34.8	33.2	37.1	39.3	35.3	39	38.4	38
Manganese, dissolved	mg/l	--	0.05	0.52	0.35	0.54	0.4	0.57	0.19	0.62	0.17
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	2.2	11.1	4.3	12.6	4.3	7.4	6.9	9.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	437	439	432	550	402	448	395	441
Zinc, dissolved	mg/l	--	5	0.01	0.17	0.26	0.01	0.01	0.01	0.02	0.02
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.051	0.001	0.001	0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3 30-May-2003	95-3 09-Oct-2003	95-3 14-May-2004	95-3 19-Nov-2004	95-3 24-May-2005	95-3 16-Nov-2005	95-3 25-May-2006	95-3 21-Nov-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	487	--	802	854	824	172	725	738
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	399	537	657	700	675	705	725	738
Ammonia Nitrogen	mg/l	--	--	0.45	0.12	0.15	0.17	0.06	<0.01	0.18	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	2	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	25	42	57	32	26	32	15	12
Chloride	mg/l	--	250	256	180	242	215	204	190	216	203
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1740	1930	2010	2160	2000	1900	1700	1800
Dissolved Inorganic Carbon	mg/l	--	--	--	147	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	225	170	225	213	228	223	211	213
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.2	1	0.2	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.69	0.57	1.51	0.57	0.49	0.28	1.76	0.28
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.6	7.3	7.2	7.4	7.1	--	7.3	7.7
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.24	1.56	3.21	2.34	1.16	0.09	--	--
Sulphate	mg/l	--	500 [5]	97	131	115	130	126	136	132	134
Temperature (Field)	deg c	--	15	--	--	--	--	13.5	--	4	6
Total Dissolved Solids	mg/l	--	500	870	1073	1005	1080	1180	1290	1260	1260
Total Organic Carbon	mg/l	--	--	6	12	4.5	5.3	4.6	6	--	--
Total Suspended Solids	mg/l	--	--	9680	8180	5720	2200	2810	460	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	0.001
Boron, dissolved	mg/l	5	--	0.62	0.9	0.681	0.867	0.66	0.933	0.711	0.881
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	0.0001	<0.005	0.0002
Calcium, dissolved	mg/l	--	--	32.1	26.3	32.5	32	32.6	33.9	30.3	31.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.008	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.002	0.002	<0.002	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.21	0.35	0.016	0.005	0.027	0.046	<0.005	0.014
Lead, dissolved	mg/l	0.01	--	0.0005	0.0005	0.0008	0.0013	0.0012	0.0005	<0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	35.2	25.4	34.9	32.4	35.7	33.7	32.9	32.5
Manganese, dissolved	mg/l	--	0.05	0.55	0.377	0.63	0.487	0.605	0.298	0.408	0.282
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	8.4	7.9	8.6	8.4	8.9	10.1	8.1	9.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [6]	406	379	412	410	376	470	417	426
Zinc, dissolved	mg/l	--	5	0.01	0.014	0.005	0.005	0.006	0.012	<0.005	0.008
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	<0.001	0.002	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3 30-May-2003	95-3 09-Oct-2003	95-3 14-May-2004	95-3 19-Nov-2004	95-3 24-May-2005	95-3 16-Nov-2005	95-3 25-May-2006	95-3 21-Nov-2006
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3 15-May-2007	95-3 30-Nov-2007	95-3 22-May-2008	95-3 10-Nov-2008	95-3 19-May-2009 G-23	95-3 26-Nov-2009 M-14
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	687	750	680	725	724	740
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	687	750	680	725	724	740
Ammonia Nitrogen	mg/l	--	--	0.05	0.03	<0.01	<0.01	0.07	0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	63	67	18	<5	15	27
Chloride	mg/l	--	250	211	174	187	177	173	174
Conductivity	uS/cm	--	--	--	--	--	--	2020	2040
Conductivity (Field)	uS/cm	--	--	1400	1000	1750	1650	1700	1777
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	229	200	206	188	192	183
Nitrate as N	mg/l	10.0	--	0.1	1.1	0.2	0.2	0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.58	0.67	0.61	0.48	0.29	0.15
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.61	7.70
pH (Field)	-	--	--	8	7.7	7.1	7.1	--	6.85
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.51	0.26
Sulphate	mg/l	--	500 [5]	122	125	122	123	103	101
Temperature (Field)	deg c	--	15	5.8	5	8	8	7	8.3
Total Dissolved Solids	mg/l	--	500	1220	1300	1210	1210	1310	1330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.0008	0.0012	0.0005	0.001	0.001
Boron, dissolved	mg/l	5	--	0.679	0.942	0.736	0.967	1.21	1.0
Cadmium, dissolved	mg/l	0.005	--	0.00024	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	34.7	30.9	31	28.4	29	27
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	0.009	0.007
Cobalt, dissolved	mg/l	--	--	0.009	<0.005	<0.005	<0.005	<0.0002	<0.0002
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	0.004	0.003
Iron, dissolved	mg/l	--	0.3	0.072	0.01	0.011	<0.005	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	0.00012	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	34.7	29.8	31.2	28.5	29	28
Manganese, dissolved	mg/l	--	0.05	0.686	0.107	0.331	0.195	0.02	0.03
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.3	8.8	8.3	8.8	7	8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	396	472	424	409	351	380
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3 15-May-2007	95-3 30-Nov-2007	95-3 22-May-2008	95-3 10-Nov-2008	95-3 19-May-2009 G-23	95-3 26-Nov-2009 M-14
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	<0.0006	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3	95-3	95-3	95-3	95-3	95-3
				25-May-2010	20-Oct-2010	24-May-2011 [34]	29-Nov-2011 [35]	31-May-2012	28-Nov-2012
				M-27	G-17	G-32	95-3	95-3	95-3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	707	737	748	739	710	720
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	2.8	5.4
Alkalinity (Total as CaCO3)	mg/l	--	--	707	737	748	739	720	730
Ammonia Nitrogen	mg/l	--	--	0.11	0.08	0.08	<0.02	<0.050	0.19
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	20	25	20	15	30	31
Chloride	mg/l	--	250	155	158	169	159	140	140
Conductivity	uS/cm	--	--	1990	1990	2030	1940	--	--
Conductivity (Field)	uS/cm	--	--	1756	1972	1533	1798	1745	1753
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	201	197	207	177	190	200
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.42	1.08	0.19	3.57	0.89	0.93
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	7.93	7.77	8.24	8.06	7.61	--
pH (Field)	-	--	--	6.98	7.22	7.03	7.12	7.32	7.10
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.87	1.20	0.68	0.23	0.61	1.4
Sulphate	mg/l	--	500 [5]	99	102	96	89	86	78
Temperature (Field)	deg c	--	15	26.1	11.3	19.5	7.9	9.1	6.5
Total Dissolved Solids	mg/l	--	500	1290	1290	1320	1260	1120	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	0.93	1.3	0.79	1.2	0.87	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	31	31	27	28	29	29
Chromium, dissolved	mg/l	0.05	--	<0.005	0.005	0.008	0.006	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0005	0.0003	0.0004	0.0004	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.003	0.003	0.002	0.0041	0.002
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	<0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	30	29	34	26	30	31
Manganese, dissolved	mg/l	--	0.05	1.16	0.30	0.49	0.51	0.17	0.27
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7	8	7	8	7.1	8.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	368	373	395	358	380	410
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	0.01	<0.01	0.0060	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3	95-3	95-3	95-3	95-3	95-3
				25-May-2010	20-Oct-2010	24-May-2011 [34]	29-Nov-2011 [35]	31-May-2012	28-Nov-2012
				M-27	G-17	G-32	95-3	95-3	95-3
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.004	<0.0008	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.005	<0.001	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.005	<0.001	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.01	<0.001	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.04	<0.0080	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.005	<0.001	<0.00010	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.005	<0.001	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.002	<0.0004	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3 29-May-2013 MW-W	95-3 26-Nov-2013 GW-7	95-3 29-May-2014 95-3	95-3 19-Nov-2014 [36] MW-W	95-3 02-Jun-2015 95-3	95-3 26-Nov-2015 95-3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	710	720	720	740	743	747
Alkalinity, Carbonate as CaCO3	mg/l	--	--	3.7	4.4	5.4	4.4	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	710	730	720	740	747	750
Ammonia Nitrogen	mg/l	--	--	0.35	0.12	0.22	0.33	0.31	0.33
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	81	57	35	150	188	348
Chloride	mg/l	--	250	160	140	150	160	173	162
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1617	1615	1686	1842	1824	1803
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	210	180	190	200	151	154
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.5	3.6	6.4	4.6	2.8	5.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	7.75	7.81	7.90	7.80	--	--
pH (Field)	-	--	--	7.62	7.79	7.43	7.19	7.25	7.35
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	8.0	3.0	3.0	13	4.47	9.07
Sulphate	mg/l	--	500 [5]	83	79	71	83	81	87
Temperature (Field)	deg c	--	15	9.5	6.5	9.6	6.8	7.9	6.2
Total Dissolved Solids	mg/l	--	500	1160	1150	1140	1140	1010	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.85	1	1.1	1.1	0.616	1.19
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31	28	28	30	22.6	24.1
Chromium, dissolved	mg/l	0.05	--	0.0065	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.00066	0.00066	<0.00050	<0.00050	0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0025	0.0023	0.0034	<0.0020	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31	27	29	29	22.9	22.6
Manganese, dissolved	mg/l	--	0.05	0.88	0.45	0.55	0.59	0.637	0.536
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.1	7.6	7.2	8.1	5.43	6.83
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	380	370	370	410	325	426
Zinc, dissolved	mg/l	--	5	<0.0050	0.036	<0.0050	<0.0050	<0.005	0.013
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [9]	<0.002 [9]

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3 29-May-2013 MW-W	95-3 26-Nov-2013 GW-7	95-3 29-May-2014 95-3	95-3 19-Nov-2014 [36] MW-W	95-3 02-Jun-2015 95-3	95-3 26-Nov-2015 95-3
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.0010	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	0.00088	<0.00020	<0.00040	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3 26-May-2016	95-3 17-Nov-2016	95-3 24-May-2017	95-3 29-Nov-2017	95-3 24-May-2018	95-3 22-Nov-2018
				95-3	95-3	95-3	95-3	95-3	95-3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	768	753	785	1030	805	807
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	770	756	789	1040	810	810
Ammonia Nitrogen	mg/l	--	--	0.51	0.35	0.31	0.26	0.27	0.10
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	184	59	289	25	312	183
Chloride	mg/l	--	250	187	162	181	65	191	172
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1892	1917	1962	1609	1988	1662
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	160	185	178	634	140	232
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	2.1	3.4	0.8	1.8	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.87	7.94	7.45	6.84	7.42	7.74
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	6.33	4.88	7.14	0.44	3.13	5.58
Sulphate	mg/l	--	500 [5]	87	89	82	128	84	86
Temperature (Field)	deg c	--	15	10.6	9.4	9.2	8.1	8.6	6.1
Total Dissolved Solids	mg/l	--	500	1170	1080	1140	1140	1190	1050
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.761	1.43	0.826	0.931	0.634	1.12
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25.2	28.5	27	125	24.4	34.4
Chromium, dissolved	mg/l	0.05	--	<0.001	0.008	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0011	0.0025	0.0014	0.0010	0.0037	0.0050
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	1.3	0.171	0.123
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	23.7	27.7	26.8	78.2	19.1	35.4
Manganese, dissolved	mg/l	--	0.05	0.573	0.294	0.658	0.884	0.727	3.41
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.54	7.96	6.93	12.3	4.98	9.36
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	276	399	345	231	249	455
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.002 [11]	<0.001	<0.001	0.003

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3 26-May-2016	95-3 17-Nov-2016	95-3 24-May-2017	95-3 29-Nov-2017	95-3 24-May-2018	95-3 22-Nov-2018
				95-3	95-3	95-3	95-3	95-3	95-3
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3 19-Jun-2019	95-3 20-Nov-2019
				95-3	95-3
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	750	698
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	757	703
Ammonia Nitrogen	mg/l	--	--	0.29	0.11
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	105	111
Chloride	mg/l	--	250	189	164
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1763	1815
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	232	237
Nitrate as N	mg/l	10.0	--	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	1.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.55	7.21
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	2.92	2.97
Sulphate	mg/l	--	500 [5]	85	88
Temperature (Field)	deg c	--	15	10.8	7.1
Total Dissolved Solids	mg/l	--	500	1150	1090
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.831	0.904
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	36.3	36.5
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	0.0016
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	34.3	35.5
Manganese, dissolved	mg/l	--	0.05	0.599	0.444
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.9	11.1
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	375	374
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-3 19-Jun-2019	95-3 20-Nov-2019
				95-3	95-3
VOCs					
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--
Bromoform	mg/l	--	--	--	--
Bromomethane	mg/l	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--
Chloroform	mg/l	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-5 28-Jun-1995	95-5 22-Nov-1995	95-5 12-Oct-1996	95-5 06-Nov-1997	95-5 05-Jun-1998	95-5 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1181	1420	--	--	--	1610
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	968	1160	1250	1250	875	1320
Ammonia Nitrogen	mg/l	--	--	1.59	7.5	4.64	4.65	7.51	4.42
Chemical Oxygen Demand	mg/l	--	--	400	260	148	96	288	61
Chloride	mg/l	--	250	703	1430	1370	1340	1390	1510
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5340	6120	2830	6020	5370	5220
Dissolved Oxygen (Field)	mg/l	--	--	3	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	315	467	337	424	347	369
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	13.8	19.3	--	--	--	37.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	12.21	11.8	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.94	8.33	7.87	8.16	--	7.9
Phosphate	mg/l	--	--	--	41	--	--	--	--
Phosphorus	mg/l	--	--	21	--	--	--	--	--
Sulphate	mg/l	--	500 [5]	14	10	3	9	73	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	268	320	2830	3020	2670	2710
Total Organic Carbon	mg/l	--	--	26.1	19.9	31.8	20.2	27.7	24.5
Total Suspended Solids	mg/l	--	--	--	--	58.8	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.02	1.13	1.28	1.41	1.52	1.62
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	40.4	48.7	35	46.5	35.1	38.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.1	0.01	0.02	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.04	0.01	0.01	0.03	0.01
Iron, dissolved	mg/l	--	0.3	0.04	58.1	0.7	13.3	6.37	0.56
Lead, dissolved	mg/l	0.01	--	0.0008	0.007	0.0002	0.001	0.001	0.0002
Magnesium, dissolved	mg/l	--	--	51.2	82.8	59.8	73.8	62.1	65.3
Manganese, dissolved	mg/l	--	0.05	0.31	1.21	0.18	0.4	0.23	0.13
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.07	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	41.4	32.1	39.3	36.4	41.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	832	1050	1230	1140	1370	1340
Zinc, dissolved	mg/l	--	5	0.01	0.11	0.01	0.04	0.22	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-5 24-Oct-2000	95-5 14-Jun-2001	95-5 06-Nov-2002	95-5 30-May-2003	95-5 19-Nov-2004	95-5 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1620	1290	1680	1460	1550	292
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	85	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1320	1200	1380	1200	1270	1200
Ammonia Nitrogen	mg/l	--	--	2.12	4.14	3.95	3.71	3.89	3.62
Chemical Oxygen Demand	mg/l	--	--	--	52	150	81	315	78
Chloride	mg/l	--	250	1520	1480	1430	1470	1500	1300
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6090	5000	5890	5040	6200	4200
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	417	370	357	327	340	356
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	1	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4.76	5.13	7.66	5.94	4.82	5.18
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.26	8.1	8	7.2	7.9	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.58	1.6	15.3	3.17	9.54	2.19
Sulphate	mg/l	--	500 [5]	1	1	2	1	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3450	3250	3390	3330	3100	3470
Total Organic Carbon	mg/l	--	--	--	17.7	18.1	18.9	16.9	19.7
Total Suspended Solids	mg/l	--	--	1830	323	7160	2590	2850	128
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	0.003	0.001	0.002
Boron, dissolved	mg/l	5	--	1.56	1.69	1.52	1.47	1.53	1.6
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	38.4	43.2	37.1	36.4	37.3	39.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.45	0.4	0.45	0.97	0.324	0.385
Lead, dissolved	mg/l	0.01	--	**0.022**	0.0002	**0.0121**	0.0007	0.0022	0.0017
Magnesium, dissolved	mg/l	--	--	77.9	63.6	64.3	57.3	60.1	62.5
Manganese, dissolved	mg/l	--	0.05	0.12	0.12	0.12	0.1	0.104	0.107
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	30.8	26.7	31.4	33	34.4	38.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [6]	1270	1240	1320	1060	1470	1350
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.01	0.019	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.004	0.029	0.001	0.001	0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-5 15-May-2007	95-5 10-Nov-2008	95-5 26-Nov-2009 [7] M-3	95-5 24-May-2011 [26] G-33	95-5 28-Nov-2012 95-5	95-5 29-May-2014 [28] 95-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1270	1320	1280	1230	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	30	43	14	30
Alkalinity (Total as CaCO3)	mg/l	--	--	1270	1320	1310	1270	1200	1300
Ammonia Nitrogen	mg/l	--	--	3.55	3.52	3.72	3.60	3.9	3.9
Chemical Oxygen Demand	mg/l	--	--	181	84	93	70	77	70
Chloride	mg/l	--	250	1410	1510	1690	1390	1300	1500
Conductivity	uS/cm	--	--	--	--	6570	6570	--	--
Conductivity (Field)	uS/cm	--	--	4400	>5000	>3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	326	320	361	365	360	310
Nitrate as N	mg/l	10.0	--	0.1	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	5.99	5.37	4.84	4.32	90	9.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.39	8.57	--	8.42
pH (Field)	-	--	--	8.5	8	7.42	8.05	8.12	7.51
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.78	1.68	2.0	1.7
Sulphate	mg/l	--	500 [5]	2	1	4	<1	<1	<1
Temperature (Field)	deg c	--	15	10.8	7	9.1	19.2	6.8	9.5
Total Dissolved Solids	mg/l	--	500	3470	3590	4270	4270	3460	3460
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0089	0.0073	<0.01	<0.01	0.002	0.0023 [33]
Boron, dissolved	mg/l	5	--	1.42	1.47	2.1	1.9	1.8	1.5
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	36.7	35.7	39	39	38	33
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.01
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.002	0.0008	0.0006	0.00054
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.01	0.002	0.001	0.0014
Iron, dissolved	mg/l	--	0.3	0.893	0.225	<0.3	0.36	0.2	0.27
Lead, dissolved	mg/l	0.01	--	0.00019	<0.00002	<0.01	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	57	56.2	64	65	64	55
Manganese, dissolved	mg/l	--	0.05	0.107	0.09	<0.1	0.09	0.087	0.085
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	37.1	34.4	33	36	33	29
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	1160	1160	1345	1160	1300	1200
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.1	0.02	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0011
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00020
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	0.00011	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00020
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	0.00018	<0.00020
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.0010
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00020
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00040
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00040

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-5 26-Nov-2015	95-5 24-May-2017	95-5 22-Nov-2018 [37]
				95-5	95-5	95-5
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1170	1210	1230
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [24]	<25 [10]	38
Alkalinity (Total as CaCO3)	mg/l	--	--	1190	1230	1270
Ammonia Nitrogen	mg/l	--	--	4.98	5.58	--
Chemical Oxygen Demand	mg/l	--	--	277	237	--
Chloride	mg/l	--	250	1490	1430	1430
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	317	282	456
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.50 [10]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	9.1	11.0	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.14	8.05	--
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	7.23	12.2	--
Sulphate	mg/l	--	500 [5]	<1	1	6
Temperature (Field)	deg c	--	15	7.1	11.9	--
Total Dissolved Solids	mg/l	--	500	3420	3630	3600
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.002	0.008	0.002
Boron, dissolved	mg/l	5	--	1.46	1.18	1.59
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31.3	33.2	52.4
Chromium, dissolved	mg/l	0.05	--	<0.001	0.021	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0008
Copper, dissolved	mg/l	--	1	<0.0005	0.0010	0.0023
Iron, dissolved	mg/l	--	0.3	0.126	<0.1	0.195
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	58	48.4	79
Manganese, dissolved	mg/l	--	0.05	0.068	0.065	0.098
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.6	30	40.7
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	1110	1140	1140
Zinc, dissolved	mg/l	--	5	0.014	<0.005	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [9]	<0.010 [11]	--
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 28-Jun-1995	95-6 22-Nov-1995	95-6 12-Jun-1996	95-6 12-Oct-1996	95-6 18-Jun-1997	95-6 06-Nov-1997	95-6 05-Jun-1998	95-6 30-Oct-1998	95-6 06-May-1999
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	832	1070	--	--	--	--	--	1090	1130
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	8	--	--	--	--	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	682	886	901	905	914	966	840	892	930
Ammonia Nitrogen	mg/l	--	--	1.14	0.89	1.37	1.46	0.01	0.87	0.79	0.99	0.97
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	115	48	29	25	34	42	64	39	50
Chloride	mg/l	--	250	389	825	839	816	783	952	861	850	890
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3380	4350	4020	4380	3230	4040	4290	4060	3800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.45	--	--	--	1.97	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	255	338	349	320	387	374	336	278	338
Nitrate as N	mg/l	10.0	--	0.1	0.8	0.1	0.1	0.1	0.1	2.1	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.3	3.5	--	--	--	--	--	1.82	2.06
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.16	2.61	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.89	8.09	7.95	7.56	8.02	7.98	--	7.6	7.6
Phosphate	mg/l	--	--	--	0.3	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	6.1	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500[5]	21	11	9	8	5	3	38	4	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1700	2190	2010	2190	1630	2030	2140	2040	2040
Total Organic Carbon	mg/l	--	--	14.1	13.5	14.4	14	15.1	14.6	14	16.8	18.2
Total Suspended Solids	mg/l	--	--	--	--	2910	1490	1320	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.53	0.59	0.678	0.71	0.91	0.79	0.84	0.94	0.84
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0001	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	38.1	43.6	43.3	40.8	52.4	50.3	41.7	38	41.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	3.06	0.5	0.44	0.39	0.28	0.45	0.22	0.21
Lead, dissolved	mg/l	0.01	--	0.0008	0.0001	0.0002	0.0002	0.0002	0.0002	0.0018	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	38.4	54.8	57.7	52.2	61.4	59.6	55.7	44.5	56.1
Manganese, dissolved	mg/l	--	0.05	0.33	0.27	0.213	0.18	0.19	0.19	0.18	0.2	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	20.7	25.4	19.7	19.3	21.9	20.4	21.9	22.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[6]	566	721	753	668	643	786	967	803	835
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.16	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--	--	--

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 19-Oct-1999	95-6 05-May-2000	95-6 24-Oct-2000	95-6 14-Jun-2001	95-6 23-Nov-2001	95-6 23-May-2002	95-6 06-Nov-2002	95-6 30-May-2003	95-6 09-Oct-2003
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	936	1369	1280	923	1050	983	1210	1110	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	55	1	1	62	1	73	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	859	1122	1050	861	860	928	990	910	915
Ammonia Nitrogen	mg/l	--	--	1.23	0.05	0.66	1.62	1.07	1.24	1.37	2.13	1.91
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	3
Chemical Oxygen Demand	mg/l	--	--	45	36	--	41	37	58	54	79	53
Chloride	mg/l	--	250	920	855	900	836	859	870	801	895	876
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3600	3775	4020	3800	3610	3520	3990	3600	3900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	205
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	312	337	353	320	344	337	320	302	311
Nitrate as N	mg/l	10.0	--	0.1	--	0.4	0.2	0.1	0.1	0.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	0.2	1.83	2.57	2.54	2.43	2.57	4.34	2.76
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.8	8	8.01	8	7.55	7.35	7.8	7.2	7.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.01	0.8	0.34	0.51	0.56	2.95	0.57
Sulphate	mg/l	--	500[5]	1	3	3	3	3	2	3	2	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1780	1888	2250	2060	2110	2190	2220	2200	2348
Total Organic Carbon	mg/l	--	--	17.7	16.2	--	14	20	16	14	14.5	30
Total Suspended Solids	mg/l	--	--	520	360	3200	186	174	50	228	2670	228
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	0.001	0.001	0.002	0.002	0.002	0.003	0.004
Boron, dissolved	mg/l	5	--	0.92	0.93	0.82	0.8	0.99	0.85	0.85	0.73	0.784
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	43.8	44.2	41.4	46.5	43.3	45.1	41.6	41.7	41.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.002
Iron, dissolved	mg/l	--	0.3	0.66	1.14	0.06	0.26	0.19	0.3	0.21	0.79	0.386
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	**0.022**	0.0002	0.0002	0.0002	0.0018	0.0009	0.0009
Magnesium, dissolved	mg/l	--	--	48.5	54.3	60.6	49.4	57.4	54.6	52.6	48	50.2
Manganese, dissolved	mg/l	--	0.05	0.17	0.19	0.31	0.2	0.23	0.22	0.2	0.19	0.146
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	19	13.8	19	12.6	14	18.4	18.6	17.9	19.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[6]	926	810	790	750	850	728	760	683	809
Zinc, dissolved	mg/l	--	5	0.06	0.09	0.01	0.01	0.01	0.01	0.02	0.01	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.001	0.024	0.001	0.001	0.001	0.001	0.001

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 14-May-2004	95-6 19-Nov-2004	95-6 24-May-2005	95-6 16-Nov-2005	95-6 25-May-2006	95-6 21-Nov-2006	95-6 15-May-2007	95-6 30-Nov-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1000	1060	1110	222	925	940	980	985
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	820	870	910	910	925	940	980	985
Ammonia Nitrogen	mg/l	--	--	1.38	1.5	1.58	1.3	1.43	1.63	1.52	1.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	52	51	48	52	36	69	64	81
Chloride	mg/l	--	250	831	826	793	805	874	896	804	855
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3750	4310	3400	3200	3400	3600	2900	3200
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	289	270	325	309	293	288	303	315
Nitrate as N	mg/l	10.0	--	0.3	1	<0.1	0.7	0.2	0.2	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.53	2.26	2.54	2.19	2.3	3.15	2.71	2.55
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	7.9	7.3	--	7.9	7	8.5	8.4
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.67	0.48	0.33	0.33	--	--	--	--
Sulphate	mg/l	--	500[5]	2	10	1	2	1	2	1	<1
Temperature (Field)	deg.c	--	15	--	--	10.2	--	6	7	8.9	7.5
Total Dissolved Solids	mg/l	--	500	1875	2155	2180	2260	2260	2280	2210	2500
Total Organic Carbon	mg/l	--	--	13.9	14.1	14	38.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	176	950	97	244	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.001	0.001	<0.001	0.0049	0.0058	0.0049
Boron, dissolved	mg/l	5	--	0.692	0.754	0.763	0.829	0.673	0.72	0.707	0.794
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	40	38	43.1	43.4	40.3	39.1	41.7	44.7
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005	0.012	<0.005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.002	0.002	<0.002	0.004	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.245	0.268	0.696	0.024	0.181	0.037	0.46	0.175
Lead, dissolved	mg/l	0.01	--	0.001	0.0008	0.0024	0.0012	0.0002	0.0001	0.00004	<0.00002
Magnesium, dissolved	mg/l	--	--	45.9	42.6	52.8	48.8	46.9	46.2	48.4	49.4
Manganese, dissolved	mg/l	--	0.05	0.22	0.22	0.207	0.19	0.166	0.14	0.204	0.194
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.9	18.5	20.2	21.6	18.5	18.6	18.7	21.9
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200[6]	689	690	738	810	745	715	704	934
Zinc, dissolved	mg/l	--	5	0.005	0.005	<0.005	0.01	<0.005	0.012	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 14-May-2004	95-6 19-Nov-2004	95-6 24-May-2005	95-6 16-Nov-2005	95-6 25-May-2006	95-6 21-Nov-2006	95-6 15-May-2007	95-6 30-Nov-2007
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 22-May-2008	95-6 10-Nov-2008	95-6 19-May-2009 G-27	95-6 26-Nov-2009[32] J-7	95-6 25-May-2010[26] M-25	95-6 20-Oct-2010[26] G-22
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	950	1010	927	947	920	935
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2[8]	<2[8]	<2[8]	<2[8]
Alkalinity (Total as CaCO3)	mg/l	--	--	950	1010	927	947	920	935
Ammonia Nitrogen	mg/l	--	--	1.22	1.54	1.87	1.48	1.55	1.53
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	53	38	55	45	55
Chloride	mg/l	--	250	919	927	833	814	773	844
Conductivity	uS/cm	--	--	--	--	4190	4230	4210	4200
Conductivity (Field)	uS/cm	--	--	3700	3600	3600	3647	3944	7400
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	292	302	298	353	331	300
Nitrate as N	mg/l	10.0	--	0.1	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.32	2.4	2.33	2.11	2.17	2.35
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.17	8.18	8.27	8.23
pH (Field)	-	--	--	7.9	7.9	--	7.16	7.92	8.32
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.55	0.48	0.51	0.76
Sulphate	mg/l	--	500[5]	1	<1	2	4	<1	<1
Temperature (Field)	deg c	--	15	9.5	8	9	9.0	21.9	9.5
Total Dissolved Solids	mg/l	--	500	2360	2380	2720	2750	2740	2730
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0049	0.0043	0.005	0.007	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.747	0.739	0.96	0.95	0.81	1.1
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	39.6	41.1	40	44	42	41
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	0.007	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0006	0.0008	0.0007	0.0007
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.001	0.001	<0.001	<0.001
Iron, dissolved	mg/l	--	0.3	0.529	0.006	0.52	0.38	0.36	0.40
Lead, dissolved	mg/l	0.01	--	0.00012	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	47	48.4	48	59	55	48
Manganese, dissolved	mg/l	--	0.05	0.159	0.162	0.16	0.17	0.16	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18.4	18.6	16	23	21	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[6]	761	732	819	702	800	781
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01	0.01	<0.01	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 22-May-2008	95-6 10-Nov-2008	95-6 19-May-2009 G-27	95-6 26-Nov-2009[32] J-7	95-6 25-May-2010[26] M-25	95-6 20-Oct-2010[26] G-22
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	<0.0006	<0.0006	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 24-May-2011[26] G-31	95-6 29-Nov-2011[26] 95-6	95-6 31-May-2012 95-6	95-6 28-Nov-2012 95-6	95-6 29-May-2013[28] 95-6	95-6 26-Nov-2013 GW-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	926	957	880	910	910	940
Alkalinity, Carbonate as CaCO3	mg/l	--	--	30	<2[8]	14	13	13	18
Alkalinity (Total as CaCO3)	mg/l	--	--	956	957	900	920	920	960
Ammonia Nitrogen	mg/l	--	--	1.52	1.49	1.7	1.6	2.0	1.9
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	5	53	57	65	80
Chloride	mg/l	--	250	826	854	750	810	850	860
Conductivity	uS/cm	--	--	4300	4270	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3216	3681	3499	3493	3061	3154
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	326	304	290	350	340	270
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.16	<0.10	0.25	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.31	<0.010	0.41	0.035
Nitrogen, Total Kjeldahl	mg/l	--	--	2.26	1.86	2.3	2.3	3.1	7.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	0.47	<0.10	0.65	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	8.54	8.16	8.23	--	8.19	8.31
pH (Field)	-	--	--	7.98	7.92	7.89	8.01	7.60	7.67
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.57	0.47	0.42	0.56	2.0	2.7
Sulphate	mg/l	--	500[5]	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	15.4	8.6	12.2	6.2	10.7	6.4
Total Dissolved Solids	mg/l	--	500	2800	2780	2260	2400	2310	2340
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	0.0017	<0.001	0.0016	0.0030
Boron, dissolved	mg/l	5	--	0.80	0.87	0.82	1	0.91	0.69
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	45	41	40	45	46	36
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.0050	<0.005	<0.0050	0.0057
Cobalt, dissolved	mg/l	--	--	0.0007	0.0007	<0.00050	0.0006	0.00068	0.00073
Copper, dissolved	mg/l	--	1	0.002	0.003	<0.0010	<0.001	<0.0010	0.0013
Iron, dissolved	mg/l	--	0.3	0.22	0.26	0.52	0.19	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	0.00059	<0.00050
Magnesium, dissolved	mg/l	--	--	52	49	47	57	55	45
Manganese, dissolved	mg/l	--	0.05	0.16	0.18	0.14	0.16	0.2	0.14
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16	18	17	20	19	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[6]	682	746	720	840	780	750
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.0050	<0.005	<0.0050	0.0075
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 24-May-2011[26] G-31	95-6 29-Nov-2011[26] 95-6	95-6 31-May-2012 95-6	95-6 28-Nov-2012 95-6	95-6 29-May-2013[28] 95-6	95-6 26-Nov-2013 GW-5
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00010	<0.00010	<0.00025	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.00050	<0.00050	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00020	<0.00020	<0.00050	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00020	<0.00020	<0.00050	<0.00020

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 29-May-2014[31]	95-6 19-Nov-2014	95-6 02-Jun-2015	95-6 26-Nov-2015	95-6 26-May-2016	95-6 17-Nov-2016
				95-6	95-6	95-6	95-6	95-6	95-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	870	890	871	936	940	983
Alkalinity, Carbonate as CaCO3	mg/l	--	--	21	16	17	16	<5	14
Alkalinity (Total as CaCO3)	mg/l	--	--	890	910	888	952	944	997
Ammonia Nitrogen	mg/l	--	--	2.2	1.9	2.15	2.13	2.80	2.08
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	68	77	108	126	131	89
Chloride	mg/l	--	250	830	870	790	875	846	902
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3272	3749	3819	3954	>3999	3999
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	300	320	276	309	276	305
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.050	0.032	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	9.9	3.2	3.4	4.0	3.9	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	8.41	8.27	--	--	--	--
pH (Field)	-	--	--	7.90	8.09	7.87	8.03	8.03	7.81
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	4.6	3.7	2.20	3.85	3.26	3.02
Sulphate	mg/l	--	500[5]	7	<1	2	1	2	1
Temperature (Field)	deg c	--	15	9.9	5.0	10.0	7.8	11.6	9.5
Total Dissolved Solids	mg/l	--	500	2180	2200	2000	2260	2260	2330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0018	0.0025	0.001	0.001	0.001	0.005
Boron, dissolved	mg/l	5	--	0.86	0.95	0.563	0.848	0.754	1.06
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	40	42	34.2	27.1	38.5	41.3
Chromium, dissolved	mg/l	0.05	--	0.0065	<0.01[29]	<0.001	<0.001	<0.001	0.015
Cobalt, dissolved	mg/l	--	--	0.00054	0.00058	0.0005	0.0006	<0.0005	0.0007
Copper, dissolved	mg/l	--	1	0.0024	0.0016	<0.0005	<0.0005	0.0017	0.0007
Iron, dissolved	mg/l	--	0.3	<0.1	0.16	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	48	53	46.4	58.5	43.8	49
Manganese, dissolved	mg/l	--	0.05	0.15	0.22	0.125	0.152	0.089	0.26
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18	19	13.8	16.4	18.9	18.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[6]	630	810	686	865	646	790
Zinc, dissolved	mg/l	--	5	<0.0050	0.0070	<0.005	0.009	<0.005	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.002[9]	<0.002[9]	0.007	<0.002[11]

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 29-May-2014[31]	95-6 19-Nov-2014	95-6 02-Jun-2015	95-6 26-Nov-2015	95-6 26-May-2016	95-6 17-Nov-2016
				95-6	95-6	95-6	95-6	95-6	95-6
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 24-May-2017	95-6 29-Nov-2017	95-6 24-May-2018	95-6 22-Nov-2018	95-6 19-Jun-2019	95-6 20-Nov-2019
				95-6	95-6	95-6	95-6	95-6	95-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	932	1030	1060	1030	931	924
Alkalinity, Carbonate as CaCO3	mg/l	--	--	15	19	20	<25[10]	11	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	948	1050	1070	1040	943	932
Ammonia Nitrogen	mg/l	--	--	2.30	1.99	2.53	2.09	1.48	2.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	106	69	86	154	75	179
Chloride	mg/l	--	250	860	974	899	968	902	994
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3836	3566	>3999	3677	3757	4170
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	261	223	315	399	299	409
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	0.4
Nitrite as N	mg/l	1.0	--	<0.25[10]	0.25	<0.05	<0.05	0.07	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.3	3.1	3.9	3.1	2.0	3.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.99	7.94	7.97	7.92	7.76	8.22
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.57	2.46	3.22	3.10	0.52	5.46
Sulphate	mg/l	--	500[5]	1	1	2	1	1	2
Temperature (Field)	deg c	--	15	10.0	5.9	10.2	6.6	10.8	6.0
Total Dissolved Solids	mg/l	--	500	2200	2340	2450	2390	2370	2620
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.005	0.001	0.001	0.002	0.001	0.002
Boron, dissolved	mg/l	5	--	0.657	0.634	0.843	0.844	0.686	0.614
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.3	29	45.4	51.5	40.6	54.5
Chromium, dissolved	mg/l	0.05	--	0.012	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0005	0.0011	0.0006	0.0007
Copper, dissolved	mg/l	--	1	0.0017	0.0010	0.0014	0.0054	0.0023	0.0011
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.176	0.108	0.124
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	40.2	36.4	49.1	65.7	47.9	66.2
Manganese, dissolved	mg/l	--	0.05	0.096	0.129	0.12	0.132	0.111	0.201
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.8	14.4	19	24	17	28.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[6]	733	597	752	839	591	882
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.002[11]	<0.002[11]	<0.001	<0.001	<0.001	<0.002[11]

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Parameter	Unit	ODWQS (169/03) Health[1]	ODWQS AO[2]	95-6 24-May-2017	95-6 29-Nov-2017	95-6 24-May-2018	95-6 22-Nov-2018	95-6 19-Jun-2019	95-6 20-Nov-2019
				95-6	95-6	95-6	95-6	95-6	95-6
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 28-Jun-1995	95-7 22-Nov-1995	95-7 13-Oct-1996	95-7 18-Jun-1997	95-7 06-Nov-1997	95-7 05-Jun-1998	95-7 29-Oct-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	583	649	--	--	--	--	644
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	478	538	536	537	440	530	528
Ammonia Nitrogen	mg/l	--	--	0.58	0.38	0.55	0.52	0.35	0.43	0.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	100	55	39	23	29	40	15
Chloride	mg/l	--	250	402	413	420	407	384	399	420
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2210	2380	--	2330	1900	2160	2130
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.42	--	--	2.72	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	202	231	192	243	208	211	172
Nitrate as N	mg/l	10.0	--	0.1	0.7	0.1	0.1	0.1	1.4	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	16.8	5.95	--	--	--	--	1.12
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	16.22	5.57	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.34	7.65	--	7.75	7.81	--	7.1
Phosphate	mg/l	--	--	--	0.5	--	--	--	--	--
Phosphorus	mg/l	--	--	3.21	--	--	--	--	--	--
Sulphate	mg/l	--	500 [5]	4	3	7	5	12	41	9
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1110	1280	--	1170	950	1080	1070
Total Organic Carbon	mg/l	--	--	14	13.6	14.5	12.3	13.2	13	16.2
Total Suspended Solids	mg/l	--	--	--	--	656	993	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.34	0.31	0.42	0.44	0.42	0.44	0.57
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	31.3	33.6	28.7	37.2	31.6	29.8	26.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.28	0.63	1.09	0.65	1.33	0.52
Lead, dissolved	mg/l	0.01	--	0.0007	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	29.7	35.2	28.9	36	30.6	32.8	25.6
Manganese, dissolved	mg/l	--	0.05	1.86	2.21	1.82	2.14	1.98	2	2.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	10.4	6.5	8.5	7.2	15.3	10.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	366	426	366	338	335	454	400
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.16	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 06-May-1999	95-7 19-Oct-1999	95-7 05-May-2000	95-7 24-Oct-2000	95-7 14-Jun-2001	95-7 23-Nov-2001	95-7 23-May-2002
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	610	732	684	573	540	584	488
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	32	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	500	600	561	552	497	479	400
Ammonia Nitrogen	mg/l	--	--	0.12	0.52	0.01	0.14	0.63	0.27	0.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	26	25	26	--	27	37	20
Chloride	mg/l	--	250	432	314	365	440	420	398	382
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2040	2040	2000	2220	1900	1930	1940
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	222	204	240	199	206	202	207
Nitrate as N	mg/l	10.0	--	--	2.5	0.3	0.5	0.4	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.23	--	--	0.95	1.45	1.52	0.84
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	7.5	7.4	7.44	7.3	7.02	6.97
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.87	0.67	1.94	0.4
Sulphate	mg/l	--	500 [5]	6	14	11	15	13	21	16
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1010	1020	1000	1120	1160	1190	1020
Total Organic Carbon	mg/l	--	--	14.2	15.1	12.7	--	12.8	19	13
Total Suspended Solids	mg/l	--	--	--	624	536	916	528	928	348
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.003	0.001	0.001	0.002
Boron, dissolved	mg/l	5	--	0.38	0.59	0.45	0.47	0.42	0.57	0.4
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	31.6	32.9	36.6	28.3	34.1	29.6	32.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.11	2.82	5.2	0.24	0.39	0.07	0.76
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0022	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	34.3	29.3	35.6	31.2	29.3	31	30.6
Manganese, dissolved	mg/l	--	0.05	2.15	1.78	2	2.07	2.19	2.18	2.26
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	4.1	11.1	6.1	9.7	5.2	5.6	8.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	393	417	410	486	377	402	357
Zinc, dissolved	mg/l	--	5	0.01	0.11	0.17	0.01	0.01	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.011	0.001	0.001

WCC - Navan Waste Recyling and Disposal Facility
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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 06-Nov-2002	95-7 30-May-2003	95-7 09-Oct-2003	95-7 14-May-2004	95-7 19-Nov-2004	95-7 24-May-2005	95-7 16-Nov-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	662	586	--	531	655	593	132
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	543	480	324	435	537	486	540
Ammonia Nitrogen	mg/l	--	--	0.66	0.47	0.33	0.57	0.65	0.46	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	2	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	2	58	59	351	7	58
Chloride	mg/l	--	250	428	382	298	413	448	369	364
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2240	1970	1620	2090	2290	2500	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	71	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	194	195	176	198	209	230	211
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.2	0.3	1	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.43	1.06	1.49	2.02	1.44	1.63	1.26
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	6.9	7.2	7.3	7.8	7.3	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.66	0.36	0.51	0.91	4.95	0.5	1.86
Sulphate	mg/l	--	500 [5]	17	17	31	13	20	10	28
Temperature (Field)	deg c	--	15	--	--	--	--	--	9.9	--
Total Dissolved Solids	mg/l	--	500	1260	1150	859	1045	1145	1120	1220
Total Organic Carbon	mg/l	--	--	14	13.4	31	17.4	23.5	20.2	23.8
Total Suspended Solids	mg/l	--	--	460	188	417	276	1250	233	319
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003	0.001	0.001	0.001	<0.001	0.001
Boron, dissolved	mg/l	5	--	0.51	0.36	0.512	0.362	0.449	0.363	0.478
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	33.1	30.2	29.9	31.5	32.9	34.9	33.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.016	0.002	0.002	<0.002	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.011	0.006	0.005	<0.002	0.008
Iron, dissolved	mg/l	--	0.3	0.08	0.79	5.78	0.048	0.072	0.097	0.068
Lead, dissolved	mg/l	0.01	--	0.0012	0.0003	0.0007	0.0007	0.0006	0.0011	0.0007
Magnesium, dissolved	mg/l	--	--	29	29	24.6	29	30.8	34.8	31
Manganese, dissolved	mg/l	--	0.05	1.92	2.21	1.13	1.48	1.38	1.59	1.4
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	7.6	7.8	9.2	7.4	8.2	8.4	9.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001	0.001
Sodium, dissolved	mg/l	--	200 [6]	425	368	265	379	405	379	441
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.016	0.005	0.005	0.007	0.008
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 06-Nov-2002	95-7 30-May-2003	95-7 09-Oct-2003	95-7 14-May-2004	95-7 19-Nov-2004	95-7 24-May-2005	95-7 16-Nov-2005
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 25-May-2006	95-7 21-Nov-2006	95-7 15-May-2007	95-7 30-Nov-2007	95-7 22-May-2008	95-7 10-Nov-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	545	615	573	603	540	615
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	545	615	573	603	540	615
Ammonia Nitrogen	mg/l	--	--	0.52	<0.01	0.15	<0.01	0.23	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	54	91	127	59	45
Chloride	mg/l	--	250	430	456	362	439	413	483
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1800	2150	1600	1750	1300	2100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	211	233	230	221	214	225
Nitrate as N	mg/l	10.0	--	0.3	0.5	0.2	0.5	0.1	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.12	0.93	1.28	2.24	1.93	0.85
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.9	7.6	8.2	7.9	7.5	7.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [5]	21	9	11	19	21	10
Temperature (Field)	deg c	--	15	12.5	7	9.7	4.5	9.5	6
Total Dissolved Solids	mg/l	--	500	1250	1370	1190	1420	1250	1400
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0027	0.0033	0.0069	0.0038	0.0044
Boron, dissolved	mg/l	5	--	0.352	0.466	0.352	0.46	0.37	0.476
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00006	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	32.3	36.2	35.6	35.3	33.6	35.8
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.008	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.003	0.005	0.003	0.004	<0.002	0.003
Iron, dissolved	mg/l	--	0.3	0.089	0.067	0.18	0.084	0.717	0.205
Lead, dissolved	mg/l	0.01	--	0.0004	<0.0001	0.00011	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	31.6	34.7	34.2	32.4	31.8	33
Manganese, dissolved	mg/l	--	0.05	1.72	1.56	2	1.6	2.25	0.938
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.8	9.5	8	10	7.8	9.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	401	452	388	519	417	460
Zinc, dissolved	mg/l	--	5	0.012	0.009	<0.005	<0.005	0.008	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 25-May-2006	95-7 21-Nov-2006	95-7 15-May-2007	95-7 30-Nov-2007	95-7 22-May-2008	95-7 10-Nov-2008
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	<0.0006	<0.0006
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 19-May-2009 G-19	95-7 26-Nov-2009 J-12	95-7 25-May-2010 [26] M-19	95-7 20-Oct-2010 [26] G-21	95-7 24-May-2011 [26] G-29
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	560	599	552	593	575
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	14
Alkalinity (Total as CaCO3)	mg/l	--	--	560	599	552	593	589
Ammonia Nitrogen	mg/l	--	--	0.21	0.07	0.52	<0.02	0.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	70	55	55	50
Chloride	mg/l	--	250	397	447	383	450	400
Conductivity	uS/cm	--	--	2320	2490	2350	2460	2420
Conductivity (Field)	uS/cm	--	--	1900	2149	2310	2405	2191
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	221	214	234	235	258
Nitrate as N	mg/l	10.0	--	<0.10	0.37	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.81	0.64	1.14	0.96	0.76
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	7.89	8.20	8.12	8.07	8.42
pH (Field)	-	--	--	--	7.21	7.51	7.66	7.40
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.87	1.71	3.58	1.19	0.67
Sulphate	mg/l	--	500 [5]	15	16	15	8	10
Temperature (Field)	deg c	--	15	9	8.5	15.7	12.3	13.5
Total Dissolved Solids	mg/l	--	500	1510	1620	1530	1600	1570
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.003	0.004	<0.01	<0.001	<0.01
Boron, dissolved	mg/l	5	--	0.49	0.49	0.46	0.56	0.48
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	34	33	36	38	39
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	0.009	<0.005
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0008	0.0009	0.0010
Copper, dissolved	mg/l	--	1	0.006	0.004	0.003	0.002	0.003
Iron, dissolved	mg/l	--	0.3	0.11	<0.03	0.52	0.12	0.38
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	33	32	35	34	39
Manganese, dissolved	mg/l	--	0.05	0.63	0.31	2.16	1.89	2.15
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7	10	9	9	9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	373	420	368	445	361
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	<0.01	0.01
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 19-May-2009 G-19	95-7 26-Nov-2009 J-12	95-7 25-May-2010 [26] M-19	95-7 20-Oct-2010 [26] G-21	95-7 24-May-2011 [26] G-29
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 29-Nov-2011 [38]	95-7 31-May-2012 [27]	95-7 28-Nov-2012	95-7 29-May-2013 [28]	95-7 26-Nov-2013
				95-7	95-7	95-7	95-7	GW-3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	579	570	580	560	570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	11	4.9	7.0	4.3	8.1
Alkalinity (Total as CaCO3)	mg/l	--	--	590	570	590	560	580
Ammonia Nitrogen	mg/l	--	--	<0.02	0.33	0.10	0.59	<0.050
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	60	50	59	64	55
Chloride	mg/l	--	250	430	390	410	420	430
Conductivity	uS/cm	--	--	2430	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2272	2020	2146	1975	2066
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	219	180	240	240	230
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	0.12	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	0.036	<0.010	0.092	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.82	1.4	1.1	1.9	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.10	0.21	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	8.31	7.96	--	7.92	8.18
pH (Field)	-	--	--	7.68	7.62	7.71	7.75	7.77
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.06	0.66	0.88	2.8	2.0
Sulphate	mg/l	--	500 [5]	9	<1	<1	1	2
Temperature (Field)	deg c	--	15	7.9	12.0	6.2	11.0	6.6
Total Dissolved Solids	mg/l	--	500	1580	1280	1360	1340	1370
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.0028	0.001	0.0011	0.0018
Boron, dissolved	mg/l	5	--	0.52	0.36	0.58	0.45	0.49
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	35	28	36	37	35
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.005	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0006	0.0012	0.0011	0.00088	0.00096
Copper, dissolved	mg/l	--	1	0.003	0.0026	0.002	0.0041	0.0040
Iron, dissolved	mg/l	--	0.3	<0.03	0.86	0.15	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	0.00090	<0.0005	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	32	26	35	35	34
Manganese, dissolved	mg/l	--	0.05	0.83	5.2	2.8	2.2	1.8
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8	6.3	9.4	7.9	9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	392	320	470	410	450
Zinc, dissolved	mg/l	--	5	<0.01	<0.0050	<0.005	<0.0050	0.039
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 29-Nov-2011 [38] 95-7	95-7 31-May-2012 [27] 95-7	95-7 28-Nov-2012 95-7	95-7 29-May-2013 [28] 95-7	95-7 26-Nov-2013 GW-3
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0008	<0.00010	<0.00010	<0.00025	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.001	<0.00010	<0.00010	<0.00025	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.001	<0.00010	<0.00010	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.00010	<0.00010	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0080	0.00070	<0.00050	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.001	<0.00010	<0.00010	<0.00025	<0.00010
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.001	<0.00020	<0.00020	<0.00050	0.00078
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0004	<0.00020	<0.00020	<0.00050	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 29-May-2014	95-7 19-Nov-2014	95-7 02-Jun-2015	95-7 26-Nov-2015	95-7 26-May-2016
				95-7	95-7	95-7	95-7	95-7
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	560	570	609	593	614
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6.8	6.4	5	5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	570	580	614	598	617
Ammonia Nitrogen	mg/l	--	--	0.53	0.084	0.46	0.02	0.75
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	66	57	93	83	94
Chloride	mg/l	--	250	420	460	463	433	463
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2046	2362	2292	2362	2385
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	200	240	158	210	160
Nitrate as N	mg/l	10.0	--	<0.10	0.22	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.019	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	1.4	1.4	0.9	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.22	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	8.11	8.08	--	--	--
pH (Field)	-	--	--	7.29	7.67	7.61	7.75	7.86
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.5	2.2	1.08	0.73	1.17
Sulphate	mg/l	--	500 [5]	1	1	10	10	11
Temperature (Field)	deg c	--	15	10.2	6.7	10.4	7.4	11.1
Total Dissolved Solids	mg/l	--	500	1300	1310	1330	1350	1400
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.0013	0.0018	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.4	0.52	0.172	0.504	0.305
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31	36	24.8	24.7	25
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	0.00074	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0051	0.0036	0.0005	0.0016	0.0020
Iron, dissolved	mg/l	--	0.3	0.2	<0.1	0.509	<0.1	0.376
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	30	36	23.4	36	23.8
Manganese, dissolved	mg/l	--	0.05	1.3	1.6	1.05	0.117	0.951
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.7	9.1	4.81	7.45	5.96
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	360	470	322	500	266
Zinc, dissolved	mg/l	--	5	0.015	<0.0050	<0.005	0.008	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.001	<0.001	0.005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 29-May-2014	95-7 19-Nov-2014	95-7 02-Jun-2015	95-7 26-Nov-2015	95-7 26-May-2016
				95-7	95-7	95-7	95-7	95-7
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 17-Nov-2016	95-7 24-May-2017	95-7 29-Nov-2017	95-7 24-May-2018	95-7 22-Nov-2018
				95-7	95-7	95-7	95-7	95-7
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	618	643	626	657	667
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	7	5	6
Alkalinity (Total as CaCO3)	mg/l	--	--	622	646	633	662	673
Ammonia Nitrogen	mg/l	--	--	0.11	0.60	0.07	0.63	0.10
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	72	61	82	96	105
Chloride	mg/l	--	250	463	480	498	462	460
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1257	2322	2145	2436	2112
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	228	255	192	167	287
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.3
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.4	1.0	1.7	1.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.05	7.48	8.03	7.64	8.2
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.07	0.88	1.12	1.30	1.44
Sulphate	mg/l	--	500 [5]	8	9	11	10	8
Temperature (Field)	deg c	--	15	9.6	12.4	6.7	10.1	5.4
Total Dissolved Solids	mg/l	--	500	1340	1400	1330	1410	1340
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.644	0.361	0.459	0.316	0.558
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	35.7	33.9	29.6	28	42.9
Chromium, dissolved	mg/l	0.05	--	0.008	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0006	<0.0005	0.0007
Copper, dissolved	mg/l	--	1	0.0021	0.0018	0.0026	0.0030	0.0106
Iron, dissolved	mg/l	--	0.3	<0.1	0.442	<0.1	0.555	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	33.7	41.3	28.8	23.6	43.8
Manganese, dissolved	mg/l	--	0.05	1.75	2.23	2.1	1.65	0.567
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.24	6.42	7.89	5.98	11.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	473	464	387	304	536
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.015	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.002 [11]	<0.001	<0.001	0.007

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 17-Nov-2016	95-7 24-May-2017	95-7 29-Nov-2017	95-7 24-May-2018	95-7 22-Nov-2018
				95-7	95-7	95-7	95-7	95-7
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 19-Jun-2019	95-7 20-Nov-2019
				95-7	95-7
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	610	588
Alkalinity, Carbonate as CaCO3	mg/l	--	--	8	9
Alkalinity (Total as CaCO3)	mg/l	--	--	618	597
Ammonia Nitrogen	mg/l	--	--	0.75	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	73	85
Chloride	mg/l	--	250	458	483
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2213	2390
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	268	292
Nitrate as N	mg/l	10.0	--	0.1	0.5
Nitrite as N	mg/l	1.0	--	0.07	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.3	1.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.34	7.82
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	0.86	1.59
Sulphate	mg/l	--	500 [5]	10	13
Temperature (Field)	deg c	--	15	13.2	7.1
Total Dissolved Solids	mg/l	--	500	1410	1340
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002
Boron, dissolved	mg/l	5	--	0.303	0.432
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	41.5	44.7
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0008	0.0006
Copper, dissolved	mg/l	--	1	0.0023	0.0075
Iron, dissolved	mg/l	--	0.3	0.321	0.383
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	39.9	43.8
Manganese, dissolved	mg/l	--	0.05	4.25	0.626
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.46	13
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	457	455
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.002

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-7 19-Jun-2019 95-7	95-7 20-Nov-2019 95-7
VOCs					
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--
Bromoform	mg/l	--	--	--	--
Bromomethane	mg/l	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--
Chloroform	mg/l	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-9 28-Jun-1995	95-9 22-Nov-1995	95-9 12-Oct-1996	95-9 06-Nov-1997	95-9 05-Jun-1998	95-9 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	834	912	--	--	--	862
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	23	--	--	--	54
Alkalinity (Total as CaCO3)	mg/l	--	--	716	785	--	770	663	796
Ammonia Nitrogen	mg/l	--	--	1.6	5	--	0.86	0.9	2
Chemical Oxygen Demand	mg/l	--	--	850	850	--	23	42	15
Chloride	mg/l	--	250	380	405	--	358	366	382
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2440	2600	2650	2540	2430	2600
Dissolved Oxygen (Field)	mg/l	--	--	1.26	1.26	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	59	71	--	55	57	47
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	0.1	1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	30.3	50	--	--	--	13.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	28.7	45	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.51	8.81	8.38	8.9	--	8.4
Phosphate	mg/l	--	--	--	2.4	--	--	--	--
Phosphorus	mg/l	--	--	1.63	--	--	--	--	--
Sulphate	mg/l	--	500 [5]	5	10	--	1	44	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1230	1230	1330	1270	1192	1360
Total Organic Carbon	mg/l	--	--	37.1	37.1	--	10.5	8.9	11.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.91	0.91	--	1.02	1.1	1.13
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	7.97	7.7	--	5.73	7.38	4.65
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	--	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.03	0.03	--	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.06	0.06	--	3.05	3.25	1
Lead, dissolved	mg/l	0.01	--	0.0009	0.0009	--	0.0002	0.0002	0.0017
Magnesium, dissolved	mg/l	--	--	9.3	12.4	--	9.66	9.24	8.46
Manganese, dissolved	mg/l	--	0.05	0.03	0.03	--	0.06	0.06	0.03
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	18.6	--	14.4	22.4	20.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	484	556	--	478	644	573
Zinc, dissolved	mg/l	--	5	0.01	0.01	--	0.01	0.04	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	--	--	--	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-9 24-Oct-2000	95-9 14-Jun-2001	95-9 06-Nov-2002	95-9 30-May-2003	95-9 19-Nov-2004	95-9 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1080	837	1040	897	1030	200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	40	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	887	753	855	735	845	820
Ammonia Nitrogen	mg/l	--	--	1.16	1.94	1.7	1.5	1.59	1.61
Chemical Oxygen Demand	mg/l	--	--	--	23	49	41	30	43
Chloride	mg/l	--	250	442	373	355	305	410	320
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2550	2250	2280	2000	2870	2100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	48	36	39	130	44	48
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	<1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.12	3.65	2.33	2.57	2.03	2.43
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.66	8.7	8.6	7.6	8.4	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	5.86	7.94	2.11	3.05	0.98	2.84
Sulphate	mg/l	--	500 [5]	1	1	2	1	10	<1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1440	1420	1410	1310	1435	1500
Total Organic Carbon	mg/l	--	--	--	9.3	8.6	10.4	9.3	9.3
Total Suspended Solids	mg/l	--	--	4940	5210	1900	2990	4200	1460
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	1.16	1.05	1.02	0.98	1.13	1.12
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	4.28	2.76	4.77	31.2	3.62	4.4
Chromium, dissolved	mg/l	0.05	--	--	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.16	0.06	0.06	5.07	0.144	0.1
Lead, dissolved	mg/l	0.01	--	0.022	0.0002	0.0021	0.0029	0.0006	0.0017
Magnesium, dissolved	mg/l	--	--	9.05	7.13	7.67	12.6	8.45	9.08
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.18	0.006	0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	18.1	7.5	13.3	13.8	14.8	16.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [6]	634	535	577	494	567	672
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.02	0.005	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.063	0.001	0.001	0.001	<0.001

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-9	95-9	95-9	95-9	95-9	95-9
				15-May-2007	10-Nov-2008	26-Nov-2009	24-May-2011 [26]	28-Nov-2012	29-May-2014 [31]
						J-9	G-30	95-9	95-9
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	815	820	760	756	760	770
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	29	46	22	36
Alkalinity (Total as CaCO3)	mg/l	--	--	815	820	789	802	780	800
Ammonia Nitrogen	mg/l	--	--	1.78	1.6	1.52	1.59	2.0	2.1
Chemical Oxygen Demand	mg/l	--	--	94	28	38	30	35	39
Chloride	mg/l	--	250	355	397	337	344	410	490
Conductivity	uS/cm	--	--	--	--	2490	2620	--	--
Conductivity (Field)	uS/cm	--	--	1800	2100	2294	2266	2245	2276
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	39	40	34	43	52	44
Nitrate as N	mg/l	10.0	--	<0.1	0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.78	2.47	1.78	1.98	2.9	3.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.61	8.81	--	8.70
pH (Field)	-	--	--	8.8	8.6	8.25	8.67	8.74	8.47
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	1.36	1.54	1.6	1.6
Sulphate	mg/l	--	500 [5]	<1	<1	<1	<1	1	<1
Temperature (Field)	deg c	--	15	11.4	7	8.8	19.3	6.7	10.4
Total Dissolved Solids	mg/l	--	500	1390	1470	1620	1700	1720	1560
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0015	0.0012	0.002	<0.01	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	0.988	1.01	0.99	1.3	1.2	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	2.92	3.25	2	4	5	3.8
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.0002	0.0003	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.001	0.002	<0.001	0.0020
Iron, dissolved	mg/l	--	0.3	0.173	0.044	0.04	0.04	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00013	0.00012	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	7.61	7.82	7	8	9.6	8.5
Manganese, dissolved	mg/l	--	0.05	0.005	0.003	<0.01	<0.01	0.005	0.0033
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.3	14.1	11	14	15	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	519	548	501	596	700	490
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.01	0.01	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	0.00015	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	0.00031	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	95-9 26-Nov-2015	95-9 24-May-2017	95-9 22-Nov-2018
				95-9	95-9	95-9
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	798	802	824
Alkalinity, Carbonate as CaCO3	mg/l	--	--	23	21	25
Alkalinity (Total as CaCO3)	mg/l	--	--	821	823	849
Ammonia Nitrogen	mg/l	--	--	2.03	1.85	1.51
Chemical Oxygen Demand	mg/l	--	--	53	78	39
Chloride	mg/l	--	250	502	406	429
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2670	2770	2238
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	37.3	43	66
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	2.9	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.78	8.62	8.81
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.72	1.21	0.71
Sulphate	mg/l	--	500 [5]	<1	<1	<1
Temperature (Field)	deg c	--	15	7.4	11.9	6.4
Total Dissolved Solids	mg/l	--	500	1670	1490	1560
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	<0.001
Boron, dissolved	mg/l	5	--	1.09	1.15	1.19
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3.32	3.39	10.6
Chromium, dissolved	mg/l	0.05	--	<0.001	0.011	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0021
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	7.04	8.42	9.58
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.3	14.4	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [6]	637	584	614
Zinc, dissolved	mg/l	--	5	0.009	<0.005	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.002 [11]	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	09-1A 12-Feb-2010 [3] A	09-1A 26-Jan-2011 [3] 09-1A	09-1A 18-Jan-2012 [3] 1A	09-1A 12-Feb-2013 [3] 09-1A	09-1A 27-Aug-2014 MW 09-1A	09-1A 25-Aug-2015 MW09-1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	820	853
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	22	26
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	--	--	840	880
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	1.4	1.26
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	39	27
Chloride	mg/l	--	250	--	--	--	--	410	433
Conductivity (Field)	uS/cm	--	--	--	--	--	--	2658	2694
Hardness, Calcium Carbonate	mg/l	--	--	--	--	--	--	36	33.7
Nitrate as N	mg/l	10.0	--	--	--	--	--	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	4.7	1.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--
pH	-	--	--	--	--	--	--	8.45	--
pH (Field)	-	--	--	--	--	--	--	8.6	9.48
Phosphorus	mg/l	--	--	--	--	--	--	0.56	0.14
Sulphate	mg/l	--	500 [5]	--	--	--	--	2	<1
Temperature (Field)	deg c	--	15	--	--	--	--	10.0	10.3
Total Dissolved Solids	mg/l	--	500	--	--	--	--	1640	1710
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	--	--	--	--	1.1	1.01
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	--	--	--	--	3.2	1.89
Chromium, dissolved	mg/l	0.05	--	--	--	--	--	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	--	--	--	--	<0.0050	<0.0005
Iron, dissolved	mg/l	--	0.3	--	--	--	--	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	--	--	--	--	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	--	--	--	--	6.8	7.03
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	0.0059	0.006
Potassium, dissolved	mg/l	--	--	--	--	--	--	9.9	11.4
Sodium, dissolved	mg/l	--	200 [6]	--	--	--	--	640	628
Zinc, dissolved	mg/l	--	5	--	--	--	--	0.0063	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	<0.0010	0.002
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.00010	<0.0005
Benzene	mg/l	0.001	--	--	--	--	--	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.00050	<0.0050
o-Xylene	mg/l	--	--	--	--	--	--	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.00020	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	09-1A 18-Aug-2016 09-1A	09-1A 28-Aug-2017 [4] 09-1A	09-1A 29-Nov-2017 [3] 09-1A	09-1A 30-Aug-2018 09-1A	09-1A 20-Nov-2019 [3] 09-1A
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	865	--	--	911	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	17	--	--	19	--
Alkalinity (Total as CaCO3)	mg/l	--	--	882	--	--	930	--
Ammonia Nitrogen	mg/l	--	--	1.26	--	--	1.47	--
Chemical Oxygen Demand	mg/l	--	--	67	--	--	38	--
Chloride	mg/l	--	250	438	--	--	445	--
Conductivity (Field)	uS/cm	--	--	2649	--	--	2630	--
Hardness, Calcium Carbonate	mg/l	--	--	34	--	--	47	--
Nitrate as N	mg/l	10.0	--	<0.1	--	--	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.05	--	--	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.9	--	--	2.1	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.59	--	--	8.44	--
Phosphorus	mg/l	--	--	0.34	--	--	0.13	--
Sulphate	mg/l	--	500 [5]	<1	--	--	3	--
Temperature (Field)	deg c	--	15	11.8	--	--	10.1	--
Total Dissolved Solids	mg/l	--	500	1630	--	--	1560	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	--	--	<0.001	--
Boron, dissolved	mg/l	5	--	1.08	--	--	0.942	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	--	<0.0001	--
Calcium, dissolved	mg/l	--	--	2.59	--	--	6.04	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--	--	<0.001	--
Cobalt, dissolved	mg/l	--	--	<0.0005	--	--	<0.0005	--
Copper, dissolved	mg/l	--	1	<0.0005	--	--	0.0008	--
Iron, dissolved	mg/l	--	0.3	<0.1	--	--	<0.1	--
Lead, dissolved	mg/l	0.01	--	<0.0001	--	--	<0.0001	--
Magnesium, dissolved	mg/l	--	--	6.67	--	--	7.8	--
Manganese, dissolved	mg/l	--	0.05	0.006	--	--	0.011	--
Potassium, dissolved	mg/l	--	--	11.6	--	--	11.5	--
Sodium, dissolved	mg/l	--	200 [6]	597	--	--	647	--
Zinc, dissolved	mg/l	--	5	<0.005	--	--	0.006	--
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--	<0.001	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	--	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--	--	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--	--	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--	--	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	--	--	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	--	<0.0005	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	09-1B 12-Feb-2010 [7] 1B	09-1B 26-Jan-2011 [3] 09-1B	09-1B 18-Jan-2012 [3] 1B	09-1B 12-Feb-2013 [3] 091B	09-1B 27-Aug-2014 MW 09-1B	09-1B 25-Aug-2015 MW09-1B
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1270	--	--	--	1200	1170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	--	--	--	19	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1270	--	--	--	1300	1180
Ammonia Nitrogen	mg/l	--	--	4.01	--	--	--	4.2	3.94
Chemical Oxygen Demand	mg/l	--	--	110	--	--	--	81	136
Chloride	mg/l	--	250	1350	--	--	--	1500	1420
Conductivity	uS/cm	--	--	6500	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>5000	--	--	--	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	296	--	--	--	290	276
Nitrate as N	mg/l	10.0	--	<0.10	--	--	--	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	--	--	--	0.041	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.85	--	--	--	8.9	6.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--
pH	-	--	--	8.13	--	--	--	8.20	--
pH (Field)	-	--	--	8.29	--	--	--	7.95	9.66
Phosphorus	mg/l	--	--	2.72	--	--	--	3.3	4.00
Sulphate	mg/l	--	500 [5]	23	--	--	--	<1	6
Temperature (Field)	deg c	--	15	3.1	--	--	--	10.9	11.6
Total Dissolved Solids	mg/l	--	500	4220	--	--	--	3530	3580
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.02	--	--	--	0.0064	0.007
Boron, dissolved	mg/l	5	--	1.7	--	--	--	1.8	1.82
Cadmium, dissolved	mg/l	0.005	--	<0.001	--	--	--	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	31	--	--	--	32	28.7
Chromium, dissolved	mg/l	0.05	--	<0.005	--	--	--	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	<0.002	--	--	--	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.01	--	--	--	<0.0050	<0.0005
Iron, dissolved	mg/l	--	0.3	2.2	--	--	--	0.93	0.763
Lead, dissolved	mg/l	0.01	--	<0.01	--	--	--	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	53	--	--	--	50	49.5
Manganese, dissolved	mg/l	--	0.05	0.2	--	--	--	0.076	0.079
Potassium, dissolved	mg/l	--	--	32	--	--	--	32	30.2
Sodium, dissolved	mg/l	--	200 [6]	1340	--	--	--	1400	1170
Zinc, dissolved	mg/l	--	5	<0.1	--	--	--	0.0084	0.023
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--	--	<0.0010	<0.020 [9]
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	--	--	--	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	--	--	--	0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	--	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	--	--	--	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	--	--	--	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	--	--	--	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	--	--	--	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	--	--	<0.00020	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	09-1B 18-Aug-2016	09-1B 28-Aug-2017 [4]	09-1B 29-Nov-2017	09-1B 30-Aug-2018	09-1B 28-Aug-2019 [40]	09-1B 20-Nov-2019
				09-1B	09-1B	09-1B	09-1B	09-1B	09-1B
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1100	--	1120	1070	--	1260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	--	<25 [10]	<25 [10]	--	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1110	--	1130	1090	--	1270
Ammonia Nitrogen	mg/l	--	--	4.47	--	4.58	4.46	--	3.97
Chemical Oxygen Demand	mg/l	--	--	152	--	101	122	--	88
Chloride	mg/l	--	250	1540	--	1620	1500	--	1570
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	--	3999	>3999	--	6430
Hardness, Calcium Carbonate	mg/l	--	--	283	--	308	363	--	363
Nitrate as N	mg/l	10.0	--	<0.1	--	<0.1	<0.1	--	<0.1
Nitrite as N	mg/l	1.0	--	<0.50 [10]	--	<0.05	<0.05	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	7.1	--	7.8	6.0	--	4.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	9.06	--	8.06	8.04	--	8.18
Phosphorus	mg/l	--	--	6.45	--	8.13	2.79	--	2.19
Sulphate	mg/l	--	500 [5]	5	--	1	6	--	2
Temperature (Field)	deg c	--	15	11.3	--	6.3	9.5	--	6.6
Total Dissolved Solids	mg/l	--	500	3740	--	3740	3550	--	3690
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.005	--	0.005	0.003	--	0.004
Boron, dissolved	mg/l	5	--	1.82	--	1.87	1.3	--	1.78
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	<0.0001	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	--	--	29.7	--	37.4	42	--	41
Chromium, dissolved	mg/l	0.05	--	<0.001	--	<0.001	<0.001	--	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	--	0.0013	<0.0005	--	0.0011
Copper, dissolved	mg/l	--	1	<0.0005	--	0.0029	0.0010	--	0.0011
Iron, dissolved	mg/l	--	0.3	<0.1	--	<0.1	0.743	--	0.486
Lead, dissolved	mg/l	0.01	--	<0.0001	--	<0.0001	<0.0001	--	<0.0001
Magnesium, dissolved	mg/l	--	--	50.7	--	52.2	62.7	--	63.2
Manganese, dissolved	mg/l	--	0.05	0.063	--	0.066	0.082	--	0.09
Potassium, dissolved	mg/l	--	--	32.6	--	34.9	33.8	--	36.8
Sodium, dissolved	mg/l	--	200 [6]	1280	--	1320	1340	--	1220
Zinc, dissolved	mg/l	--	5	<0.005	--	<0.005	0.009	--	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.004	--	<0.002 [11]	<0.001	--	<0.004 [11]
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	--	<0.0050	<0.0050	--	<0.0050
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	09-1C 12-Feb-2010 1C	09-1C 26-Jan-2011 [12] S-2	09-1C 18-Jan-2012 [3] 1C	09-1C 12-Feb-2013 [3] 09-1C	09-1C 27-Aug-2014 MW 09-1C	09-1C 25-Aug-2015 MW09-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	804	914	--	--	880	892
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	--	--	9.8	9
Alkalinity (Total as CaCO3)	mg/l	--	--	804	914	--	--	890	901
Ammonia Nitrogen	mg/l	--	--	2.15	1.54	--	--	2.7	2.14
Chemical Oxygen Demand	mg/l	--	--	43	150	--	--	280	221
Chloride	mg/l	--	250	624	710	--	--	780	799
Conductivity	uS/cm	--	--	3570	3910	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3240	3000	--	--	3545	3931
Hardness, Calcium Carbonate	mg/l	--	--	271	275	--	--	260	232
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	--	--	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	--	--	0.044	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.59	2.47	--	--	27	6.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--
pH	-	--	--	7.97	7.88	--	--	8.07	--
pH (Field)	-	--	--	7.99	6.28	--	--	7.66	9.42
Phosphorus	mg/l	--	--	18.6	14.2	--	--	19	8.92
Sulphate	mg/l	--	500 [5]	41	20	--	--	<1	8
Temperature (Field)	deg c	--	15	3.5	4.2	--	--	9.8	10.7
Total Dissolved Solids	mg/l	--	500	2320	2540	--	--	1960	1980
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.006	<0.01	--	--	0.0036	0.004
Boron, dissolved	mg/l	5	--	0.70	0.91	--	--	0.8	0.755
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	--	--	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	41	41	--	--	37	30
Chromium, dissolved	mg/l	0.05	--	<0.005	0.020	--	--	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0014	0.0014	--	--	0.00082	0.0008
Copper, dissolved	mg/l	--	1	0.002	0.002	--	--	<0.0050	<0.0005
Iron, dissolved	mg/l	--	0.3	0.70	1.52	--	--	0.23	0.181
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	41	42	--	--	40	38.2
Manganese, dissolved	mg/l	--	0.05	0.77	0.92	--	--	0.71	0.971
Potassium, dissolved	mg/l	--	--	15	13	--	--	13	11.5
Sodium, dissolved	mg/l	--	200 [6]	657	910	--	--	670	552
Zinc, dissolved	mg/l	--	5	0.02	0.02	--	--	0.0062	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	--	--	<0.0010	0.005
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0008	--	--	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.001	--	--	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.001	--	--	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0020	--	--	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0080	--	--	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.001	--	--	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.001	--	--	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0004	--	--	<0.00020	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	09-1C 18-Aug-2016	09-1C 28-Aug-2017 [4]	09-1C 29-Nov-2017	09-1C 30-Aug-2018	09-1C 28-Aug-2019 [40]	09-1C 20-Nov-2019
				09-1C	09-1C	09-1C	09-1C	09-1C	09-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	979	--	1010	1000	--	937
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5	--	18	9	--	10
Alkalinity (Total as CaCO3)	mg/l	--	--	984	--	1030	1010	--	947
Ammonia Nitrogen	mg/l	--	--	2.47	--	2.15	1.55	--	1.49
Chemical Oxygen Demand	mg/l	--	--	414	--	103	277	--	80
Chloride	mg/l	--	250	875	--	900	830	--	788
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3268	--	3394	3639	--	3730
Hardness, Calcium Carbonate	mg/l	--	--	265	--	278	257	--	375
Nitrate as N	mg/l	10.0	--	<0.1	--	<0.1	<0.1	--	0.6
Nitrite as N	mg/l	1.0	--	<0.50 [10]	--	<0.05	<0.05	--	0.25
Nitrogen, Total Kjeldahl	mg/l	--	--	8.0	--	4.2	3.8	--	2.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.22	--	7.97	7.96	--	7.9
Phosphorus	mg/l	--	--	11.8	--	7.18	2.82	--	1.64
Sulphate	mg/l	--	500 [5]	6	--	5	5	--	2
Temperature (Field)	deg c	--	15	12.1	--	6.4	9.4	--	7.1
Total Dissolved Solids	mg/l	--	500	2330	--	2290	2230	--	2250
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	--	0.004	0.003	--	0.003
Boron, dissolved	mg/l	5	--	0.748	--	0.785	0.629	--	0.672
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	<0.0001	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	--	--	36.4	--	39.7	38.1	--	52.3
Chromium, dissolved	mg/l	0.05	--	<0.001	--	<0.001	<0.001	--	<0.001
Cobalt, dissolved	mg/l	--	--	0.0007	--	0.0007	0.0008	--	0.0010
Copper, dissolved	mg/l	--	1	<0.0005	--	0.0018	0.0042	--	0.0061
Iron, dissolved	mg/l	--	0.3	0.262	--	0.118	0.115	--	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	--	<0.0001	0.0002	--	0.0002
Magnesium, dissolved	mg/l	--	--	42.2	--	43.4	39.4	--	59.3
Manganese, dissolved	mg/l	--	0.05	0.746	--	0.437	0.828	--	0.837
Potassium, dissolved	mg/l	--	--	14.8	--	13.9	12.8	--	20.1
Sodium, dissolved	mg/l	--	200 [6]	623	--	654	577	--	717
Zinc, dissolved	mg/l	--	5	<0.005	--	<0.005	0.01	--	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	--	<0.002 [11]	<0.001	--	0.004
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	--	<0.0050	<0.0050	--	<0.0050
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	09-1D 12-Feb-2010 [13] 1D	09-1D 26-Jan-2011 [14] S-1	09-1D 18-Jan-2012 [15] 09-1B	09-1D 12-Feb-2013 [16] 09-1B	09-1D 27-Aug-2014 [17] 09-1D
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	155	86	105	90	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<1.0	--
Alkalinity (Total as CaCO3)	mg/l	--	--	155	86	105	90	--
Ammonia Nitrogen	mg/l	--	--	1.15	0.97	1.26	1.4	--
Chemical Oxygen Demand	mg/l	--	--	1980	1020	85	140	--
Chloride	mg/l	--	250	99	83	97	84	--
Conductivity	uS/cm	--	--	619	437	517	--	--
Conductivity (Field)	uS/cm	--	--	325	-- [18]	745	586	--
Hardness, Calcium Carbonate	mg/l	--	--	96	42	46	27	--
Nitrate as N	mg/l	10.0	--	<1	<0.10	<1.0	<1.0	--
Nitrite as N	mg/l	1.0	--	<1	<0.10	<1.0	<0.10	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.81	4.80	2.55	4.6	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<1.0	--
pH	-	--	--	7.32	7.06	6.89	7.12	--
pH (Field)	-	--	--	7.68	-- [18]	7.51	7.20	--
Phosphorus	mg/l	--	--	0.19	0.45	0.03	<0.40 [19]	--
Sulphate	mg/l	--	500 [5]	<1	<1	<1	<1	--
Temperature (Field)	deg c	--	15	0.4	-- [18]	0.4	2.8	--
Total Dissolved Solids	mg/l	--	500	402	284	336	320	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	--
Boron, dissolved	mg/l	5	--	0.07	0.06	0.06	0.027	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	22	7	7	4.8	--
Chromium, dissolved	mg/l	0.05	--	0.004	0.004	0.002	<0.005	--
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0005	<0.0005	--
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	0.003	--
Iron, dissolved	mg/l	--	0.3	0.86	1.29	1.24	0.65	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.0005	--
Magnesium, dissolved	mg/l	--	--	10	6	7	3.7	--
Manganese, dissolved	mg/l	--	0.05	0.19	0.14	0.15	0.091	--
Potassium, dissolved	mg/l	--	--	4	2	2	1.5	--
Sodium, dissolved	mg/l	--	200 [6]	101	67	86	41	--
Zinc, dissolved	mg/l	--	5	0.02	<0.01	0.02	0.015	--
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	<0.001	<0.0010	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0008	<0.0004	<0.00010	--
Benzene	mg/l	0.001	--	<0.0005	<0.001	<0.0005	<0.00010	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.001	<0.0005	<0.00010	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0020	<0.0005	<0.00010	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0080	<0.0040	<0.00050	--
o-Xylene	mg/l	--	--	<0.0005	<0.001	<0.0005	<0.00010	--
Toluene	mg/l	0.06	0.024	0.0007	<0.001	<0.0005	<0.00020	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0004	<0.0002	<0.00020	--

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Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	09-1D 25-Aug-2015 MW09-1D	09-1D 18-Aug-2016 [17] 91D	09-1D 28-Aug-2017 09-1D	09-1D 30-Aug-2018 [17] 09-1D	09-1D 28-Aug-2019 [40] 09-1D	09-1D 21-Nov-2019 09-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	64	--	50	--	--	72
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	--	<5	--	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	64	--	50	--	--	72
Ammonia Nitrogen	mg/l	--	--	1.46	--	0.94	--	--	1.19
Chemical Oxygen Demand	mg/l	--	--	232	--	441	--	--	1400
Chloride	mg/l	--	250	70	--	62	--	--	74
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	519	--	313	--	--	506
Hardness, Calcium Carbonate	mg/l	--	--	24.8	--	42	--	--	35.4
Nitrate as N	mg/l	10.0	--	<0.1	--	<0.1	--	--	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	--	<0.05	--	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	7.8	--	6.2	--	--	12.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.55	--	6.80	--	--	6.82
Phosphorus	mg/l	--	--	0.86	--	0.23	--	--	0.62
Sulphate	mg/l	--	500 [5]	<1	--	<1	--	--	2
Temperature (Field)	deg c	--	15	18.6	--	18.1	--	--	4.9
Total Dissolved Solids	mg/l	--	500	196	--	212	--	--	238
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	--	<0.001	--	--	<0.001
Boron, dissolved	mg/l	5	--	0.037	--	0.064	--	--	0.044
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	<0.0001	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	4.07	--	6.48	--	--	5.97
Chromium, dissolved	mg/l	0.05	--	<0.001	--	<0.001	--	--	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	--	<0.0005	--	--	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	--	<0.0005	--	--	0.0014
Iron, dissolved	mg/l	--	0.3	0.682	--	0.984	--	--	0.679
Lead, dissolved	mg/l	0.01	--	<0.0001	--	0.0001	--	--	0.0002
Magnesium, dissolved	mg/l	--	--	3.55	--	6.31	--	--	4.97
Manganese, dissolved	mg/l	--	0.05	0.089	--	0.14	--	--	0.098
Potassium, dissolved	mg/l	--	--	1.6	--	2.2	--	--	2.86
Sodium, dissolved	mg/l	--	200 [6]	40.8	--	71.4	--	--	63.2
Zinc, dissolved	mg/l	--	5	0.024	--	<0.005	--	--	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.005	--	<0.001	--	--	0.008
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	<0.0005	--	--	<0.0005
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	--	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	--	<0.0005	--	--	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	--	<0.0050	--	--	<0.0050
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	--	--	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	--	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	<0.0005	--	--	<0.0005

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2018).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised June 2006).
(3)	Monitoring location was frozen during this sampling event. No sample was collected.
(4)	Monitoring location could not be located during this sampling event.
(5)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(6)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(7)	Metals MRL elevated due to matrix interference.
(8)	pH < 8.3. Calculations not available.
(9)	Elevated Reporting Limit due to matrix interference.
(10)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(11)	Elevated Reporting Limit due to matrix interference.
(12)	Due to matrix interference 2 X dilution factor required for VOCs. Arsenic MRL elevated due to matrix interference.
(13)	N-NO2,N-NO3 MRL elevated due to matrix interference.
(14)	Due to matrix interference 2 X dilution factor required for VOCs. TP MRL elevated due to insufficient sample volume.
(15)	N-NO2,N-NO3 MRL elevated due to matrix interference. Sediment was not included in Metals Analysis.
(16)	Nitrite/Nitrate: Due to colour interferences, sample required dilution. Detection limits were adjusted accordingly.
(17)	Monitoring location was dry during this sampling event. No sample was collected.
(18)	Insufficient sample volume was collected for analysis.
(19)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
(20)	TKN MRL elevated due to matrix interference. Metals MRL elevated due to matrix interference.
(21)	Arsenic MRL elevated due to matrix interference. Due to matrix interference 10x dilution factor required for VOCs.
(22)	Metal Analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
(23)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(24)	Elevated detection limit due to dilution required because of high target analyte concentration.
(25)	INOG6 Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions.
(26)	Arsenic MRL elevated due to matrix interference.

(27) Elevated ion balance result was confirmed by re-analysis.
(28) VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(29) Metal Analysis:Detection Limit was raised due to matrix interferences.
(30) VOC Analysis: Due to high concentrations of non-target analytes, sample required dilution. Detection limits were adjusted accordingly.
(31) Elevated ion balance was confirmed by re-analysis.
(32) TKN results may be biased low due to elevated dissolved salt content.
(33) Detection Limit was raised due to matrix interferences.
(34) Due to matrix interference 10x dilution factor required for VOCs.
(35) Due to matrix interference 2x dilution factor required for VOCs.
(36) VOC Analysis: Due to high sediment in vials resulting in smaller amounts of sample available for analysis, the sample required dilution. The detection limits were adjusted accordingly.
(37) Insufficient sample volume was collected for analysis. Field Parameters were not measured.
(38) Due to matrix interference 2x dilution factor required for VOCs. Arsenic MRL elevated due to matrix interference.
(39) Inadvertently, no sample was collected at this location.
(40) Due to dry conditions, sampling was not completed at this location.

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1 01-Apr-1984	S1 01-May-1987	S1 01-Oct-1987	S1 19-Jun-1990	S1 27-Jun-1990	S1 04-Oct-1990	S1 06-Nov-1990
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	192000	194000	184000	134000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	80	220	150	100	750	180
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	2000	5000	1000	1000
Chemical Oxygen Demand	ug/l	--	--	--	--	39000	135000	135000	73000
Chloride	ug/l	--	--	173800	158500	57000	326000	113000	45000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	300	996	895	590	1152	849	431
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	980	74000	74000	33000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	6850	6850	9400
Hardness, Calcium Carbonate	ug/l	--	--	--	--	231000	335000	282000	157000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	1140	940
Nitrite as N	ug/l	--	--	--	--	--	--	100	20
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	980	4000	1460	740
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	330	330	710	560
pH (Field)	-	8.5	--	7.34	7.59	7.96	8.06	8.16	8.11
Phosphate	ug/l	--	--	--	--	100	430	170	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	67900	59300	1600	52000	62000	36000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	150000	500000	450000	295000	575000	425000	216000
Total Organic Carbon	ug/l	--	--	--	--	1100	19000	19000	18000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	100	20	20	50	50	50
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	--	84700	77900	71000	105000	93000	48000
Chromium	ug/l	-- [13]	--	**100**	**10**	--	--	**50**	**50**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	--	**1800**	**500**	**430**	**2390**	**210**	**630**
Iron	ug/l	300	--	40	30	30	70	50	50
Lead	ug/l	-- [14]	--	**200**	**130**	**100**	**320**	**90**	**180**
Magnesium	ug/l	--	--	19200	16100	13000	17000	12000	9000
Manganese	ug/l	--	--	100	20	--	--	50	50
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	**50**	**70**	**40**	**50**	**80**	**50**
Potassium	ug/l	--	--	--	--	5000	13000	23000	7000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	--	--	--	31000	157000	102000	32000
Zinc	ug/l	30 [11]	--	--	--	--	--	--	--
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	--	**2**	**2**

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Parameter	Unit	PWQO [1]	S1 27-Nov-1990	S1 24-Apr-1991	S1 06-Sep-1992	S1 08-Jun-1993	S1 04-Nov-1993	S1 15-Jun-1994	S1 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	114000	132000	134000	115000	134000	202000	51000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	750	240	<100	100	100	100	130
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	3000	<1000	2000	2100	1800	4000
Chemical Oxygen Demand	ug/l	--	95000	116000	265000	17000	62200	35000	69000
Chloride	ug/l	--	46000	114000	107000	102000	85000	128000	40000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	663	622	744	350	651	908	423
Cyanide	ug/l	5 [6]	--	--	<5	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	27000	31000	27300	32200	37400	--	12000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12300	9300	15900	--	10100	8030	12010
Hardness, Calcium Carbonate	ug/l	--	156000	169000	231650	179000	207000	242000	117000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	770	6800	600	2900	7840	960	4500
Nitrite as N	ug/l	--	1	160	<100	100	<100	--	100
Nitrogen, Total Kjeldahl	ug/l	--	1560	1600	840	560	1490	5320	6160
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	810	1360	740	460	1390	5220	6030
pH (Field)	-	8.5	7.9	8.03	7.51	8.38	7.67	7.67	7.8
Phosphate	ug/l	--	100	100	260	80	260	10	440
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	30000	72000	55000	52900	57000	48000	52000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	332000	311000	440000	425000	356000	456000	212000
Total Organic Carbon	ug/l	--	9000	19000	10300	8800	13700	16200	15300
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	64000
Metals									
Arsenic	ug/l	100 [11]	--	--	<1	--	--	--	--
Barium	ug/l	--	--	--	5	--	--	--	--
Boron	ug/l	200 [12]	50	60	--	--	--	--	**380**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	0.1
Calcium	ug/l	--	51000	48000	67800	49000	60000	73900	32000
Chromium	ug/l	-- [13]	**50**	**50**	**<20**	**74**	**<10**	**15**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	**2550**	**800**	<10	**12**	3	**6.8**	4.1
Iron	ug/l	300	50	50	**1000**	**4906**	**793**	**835**	**1402**
Lead	ug/l	-- [14]	**290**	**180**	**10**	4.7	**6.6**	1	1.2
Magnesium	ug/l	--	7000	12000	15100	14000	14000	14000	8900
Manganese	ug/l	--	50	50	50	114	89	124	75
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	**80**	**50**	<20	20	<20	20	20
Potassium	ug/l	--	6000	5000	4300	11000	8100	6300	9900
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	78000	55000	66300	51000	45000	78000	23000
Zinc	ug/l	30 [11]	--	--	30	30	**36**	**37**	18
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**18**	**5**	**5**	**2**	**3**	**5**	1

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Parameter	Unit	PWQO [1]	S1 28-Jun-1995	S1 14-Nov-1995	S1 12-Jun-1996	S1 12-Oct-1996	S1 17-Jun-1997	S1 05-Nov-1997	S1 05-Jun-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	280000	144000	195000	193000	179000	216000	208000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	50	110	40	70	10	60	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	4000	1000	3000	1000	3000
Chemical Oxygen Demand	ug/l	--	496000	38000	18000	30000	28000	17000	10000
Chloride	ug/l	--	195000	71500	139000	89000	137000	242000	138000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1118	690	850	750	815	1200	900
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	100000	33100	39800	38200	33700	40600	39100
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	8080	13340	6790	10880	6010	9830	10430
Hardness, Calcium Carbonate	ug/l	--	749000	205000	241000	255000	279000	294000	249000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	1600	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	670	1660	650	990	900	1050	3120
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	620	1550	610	--	--	--	--
pH (Field)	-	8.5	6.88	7.7	7.18	7.36	7.07	7.8	--
Phosphate	ug/l	--	200	110	100	120	90	90	40
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	74000	60000	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	714000	350000	430000	370000	409000	600000	451000
Total Organic Carbon	ug/l	--	11800	14700	9000	12400	11100	10000	5900
Total Suspended Solids	ug/l	--	38000	37000	35000	3000	17000	45000	21000
Metals									
Arsenic	ug/l	100 [11]	100	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	53	30	32	30	70	60	30
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--
Calcium	ug/l	--	102000	58800	68700	73600	89500	92600	75700
Chromium	ug/l	-- [13]	**12**	**10**	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	**7**	2.6	**50.8**	1.7	0.5	**12.4**	3.2
Iron	ug/l	300	**400**	**1220**	**1220**	**700**	**1320**	**1310**	**590**
Lead	ug/l	-- [14]	2	0.4	0.4	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	23800	14000	16600	16900	13200	15100	14500
Manganese	ug/l	--	446	90	100	110	330	220	80
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20
Potassium	ug/l	--	13000	12200	9930	13900	3800	5600	1200
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	78900	61800	93600	58300	73900	97200	89700
Zinc	ug/l	30 [11]	16	20	10	10	10	30	20
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**4**	**2**	1

Parameter	Unit	PWQO [1]	S1 26-Aug-1998	S1 30-Oct-1998	S1 30-Jun-1999	S1 19-Oct-1999	S1 03-May-2000	S1 25-Oct-2000	S1 13-Jun-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	100000	168000	208000	324000	195000	267000	196000
Ammonia, unionized	ug/l	20	--	10	--	--	10	--	<20
Ammonia Nitrogen	ug/l	--	50	50	10	170	70	10	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	6000	1000	1000	--	2000
Chemical Oxygen Demand	ug/l	--	36000	42000	81000	23000	30000	--	31000
Chloride	ug/l	--	38100	82200	201000	143000	240000	295000	347000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	360	643	1080	1300	1250	1540	1250
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	17400	39200	27100	84900	31400	--	30200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	7560	9560	13110	7650	11330	7560	10900
Hardness, Calcium Carbonate	ug/l	--	147000	229000	271000	581000	309000	407000	318000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	10	600
Nitrite as N	ug/l	--	--	--	--	--	--	1900	--
Nitrogen, Total Kjeldahl	ug/l	--	1240	940	800	570	890	660	770
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.69	7.3	8.3	7.2	7.22	7.22	7.5
Phosphate	ug/l	--	320	80	60	50	20	130	70
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	103000	76000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	180000	323000	540000	640000	625000	858000	846000
Total Organic Carbon	ug/l	--	11000	14000	13600	8900	9200	--	11800
Total Suspended Solids	ug/l	--	55000	9000	24000	22000	24000	113000	37000
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	60	50	30	110	40	730	110
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	47500	64600	89200	174000	94600	116000	92900
Chromium	ug/l	-- [13]	--	--	--	--	--	20	10
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	3.3	2.6	2.5	2	8.4	13.2	5.5
Iron	ug/l	300	1810	800	390	3010	350	5620	1780
Lead	ug/l	-- [14]	0.3	0.2	0.2	0.2	0.2	0.2	1.2
Magnesium	ug/l	--	6870	16300	11400	35100	17400	28500	20900
Manganese	ug/l	--	70	80	50	1100	330	440	470
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	40	20
Potassium	ug/l	--	5200	9100	2800	8700	4900	5700	4500
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	26400	55400	114000	91800	131000	149000	187000
Zinc	ug/l	30 [11]	250	10	20	340	240	330	130
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	19	1	1	1	5	2	15

Parameter	Unit	PWQO [1]	S1 27-Sep-2001	S1 21-Nov-2001	S1 22-May-2002	S1 08-Nov-2002	S1 31-May-2003	S1 03-Jul-2003	S1 22-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	239000	169000	130000	234000	152000	158000	143000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	30	30	50	10	150	70	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	1000	2000	2000
Chemical Oxygen Demand	ug/l	--	14000	30000	40000	32000	49000	56000	68000
Chloride	ug/l	--	280000	116000	144000	361000	105000	308000	97300
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1290	670	780	1400	740	1310	760
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	52900	23700	26000	64000	39000	58000	34000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	9180	11380	9450	11600	7160	5030	10500
Hardness, Calcium Carbonate	ug/l	--	403000	241000	273000	384000	209000	324000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	700	1000	700	1200	900	22700	1300
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	520	690	670	620	1040	1460	5650
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.94	6.63	6.75	7	7.6	7.37	7.73
Phosphate	ug/l	--	50	40	50	60	40	430	500
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	126000	76000	49000	102000	43000	70000	74000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	868000	496000	492000	700000	397000	1000000	412000
Total Organic Carbon	ug/l	--	8300	15000	9000	10000	22000	13000	16000
Total Suspended Solids	ug/l	--	18000	10000	6000	18000	3000	218000	60000
Metals									
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	50	40	50	60	30	54	47
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	124000	72100	59000	123000	63100	103000	69500
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	3	**12**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	3.6	2.3	<1	3.1	3	2	**20**
Iron	ug/l	300	**1280**	**460**	**670**	**1360**	**460**	**4020**	**3460**
Lead	ug/l	-- [14]	0.2	0.2	<1	1.3	0.5	3.7	**5.4**
Magnesium	ug/l	--	22600	14900	15300	18700	12400	16300	12100
Manganese	ug/l	--	130	60	150	190	50	251	152
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10
Potassium	ug/l	--	7100	7600	8700	11000	5000	7500	8700
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	149000	68700	88700	194000	67400	184000	64000
Zinc	ug/l	30 [11]	**100**	30	**70**	**150**	20	**270**	**122**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S1 17-May-2004	S1 21-Aug-2004	S1 18-Nov-2004	S1 25-May-2005	S1 09-Sep-2005	S1 09-Nov-2005	S1 24-May-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	268000	334000	273000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	<5000	<5000	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	228000	282000	230000	220000	274000	224000	153000
Ammonia, unionized	ug/l	20	<10	<10	<10	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	60	60	110	30	40	30	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	2000	1000	<3000	<3000	6000	<3000
Chemical Oxygen Demand	ug/l	--	42000	32000	29000	35000	27000	23000	40000
Chloride	ug/l	--	312000	281000	195000	167000	273000	195000	121000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1370	1270	1180	1200	1500	730	485
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	38300	36200	25300	57200	68500	48600	40200
Dissolved Organic Carbon	ug/l	--	--	--	--	10800	79400	9800	17800
Dissolved Oxygen (Field)	ug/l	-- [7]	9000	7000	6800	6380	6400	10900	9660
Hardness, Calcium Carbonate	ug/l	--	340000	351000	306000	298000	390000	342000	207000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	<10	<10	<10	--
Nitrate as N	ug/l	--	400	300	1200	600	200	1800	900
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2680	570	720	750	490	820	850
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.4	7.6	6.9	7.3	7.6	7.7	7.8
Phosphate	ug/l	--	80	30	30	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**40**	20	**70**	**40**
Sulphate	ug/l	--	63000	83000	80000	62000	93000	97000	47000
Temperature (Field)	deg c	-- [10]	--	--	--	16.8	17.2	1	9
Total Dissolved Solids	ug/l	--	685000	635000	590000	580000	863000	696000	413000
Total Organic Carbon	ug/l	--	9700	9400	8700	--	--	--	--
Total Suspended Solids	ug/l	--	24000	3000	5000	<3000	3000	25000	3000
Metals									
Arsenic	ug/l	100 [11]	2	1	1	<1	1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	48	84	45	61	85	56	31
Cadmium	ug/l	0.2 [11]	--	--	--	<0.3	<0.1	<0.5	<0.1
Calcium	ug/l	--	107000	111000	95000	90400	126000	107000	63100
Chromium	ug/l	-- [13]	2	1	2	<2	2	4	<2
Cobalt	ug/l	0.9	--	--	--	**30**	**1.1**	0.6	0.3
Copper	ug/l	5	**16**	2	2	<2	<2	4	<2
Iron	ug/l	300	**1760**	**455**	**375**	**543**	**1360**	**1650**	**384**
Lead	ug/l	-- [14]	0.5	3.5	0.6	<0.6	<0.5	1	0.6
Magnesium	ug/l	--	17400	17500	16600	17600	17900	18400	11800
Manganese	ug/l	--	358	162	135	137	191	129	69
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	<0.05	<0.06	<0.06	--
Molybdenum	ug/l	40	--	--	--	5.1	1.4	<5	--
Nickel	ug/l	25	20	10	10	<10	<10	<10	--
Potassium	ug/l	--	7000	6900	7500	6200	8200	9000	4800
Selenium	ug/l	100	--	--	--	<1	<1	<1	--
Sodium	ug/l	--	190000	196000	124000	109000	186000	137000	73700
Zinc	ug/l	30 [11]	**129**	**70**	**40**	**39**	**82**	**79**	17
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S1 15-Aug-2006	S1 16-Nov-2006	S1 08-May-2007	S1 22-Aug-2007	S1 20-Nov-2007	S1 23-May-2008	S1 12-Aug-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	219000	110000	208000	234000	190000	160000	220000
Ammonia, unionized	ug/l	20	<20	--	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	80	40	<10	90	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	3000	4000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	38000	45000	35000	45000	42000	48000	29000
Chloride	ug/l	--	284000	28700	228000	340000	203000	127000	335000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1370	260	900	1250	750	650	1500
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	52600	28600	52000	58700	51300	39500	55200
Dissolved Organic Carbon	ug/l	--	12100	14600	9200	9400	12000	12500	9600
Dissolved Oxygen (Field)	ug/l	-- [7]	**1200**	8280	10340	6140	9690	11500	7320
Hardness, Calcium Carbonate	ug/l	--	295000	86000	273000	283000	277000	178000	265000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	1000	600	200	1400	500	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	470	1140	570	1060	880	950	520
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.7	--	8.1	7.4	8.2	8	**8.7**
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	**210**	**40**	**200**	**100**	**50**	20
Sulphate	ug/l	--	82000	33000	67000	70000	87000	33000	73000
Temperature (Field)	deg c	-- [10]	20	8.2	17.2	16.4	1.6	13.8	21.3
Total Dissolved Solids	ug/l	--	790000	201000	683000	878000	649000	408000	935000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	21000	57000	5000	99000	34000	<3000	3000
Metals									
Arsenic	ug/l	100 [11]	1.2	1	1.2	2.5	1.3	2.1	1.6
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	64	39	55	63	43	24	50
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	90600	23900	83300	84900	89300	54100	83100
Chromium	ug/l	-- [13]	2	**12**	<2	3	4	<2	<2
Cobalt	ug/l	0.9	0.6	0.9	<0.5	**1**	**1.2**	<0.5	<0.5
Copper	ug/l	5	4	**40**	**22**	5	4	<2	**7**
Iron	ug/l	300	**978**	**613**	**646**	**1720**	**1840**	**499**	274
Lead	ug/l	-- [14]	0.8	3	0.3	1.7	2.8	<0.1	1.2
Magnesium	ug/l	--	16600	6420	15600	17100	13200	10500	14000
Manganese	ug/l	--	79	102	143	145	140	64	423
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	6500	4800	6600	8200	8400	4300	9700
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	183000	32700	154000	214000	123000	80300	285000
Zinc	ug/l	30 [11]	28	**36**	29	**76**	**75**	8	30
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S1	S1	S1	S1	S1	S1	S1
			06-Nov-2008	13-May-2009	25-Aug-2009	27-Nov-2009	18-May-2010	18-Aug-2010 [2]	14-Oct-2010
				S-3	A-8	S-11	S-8	S-9	S-9
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	218000	172000	197000	306000	303000	316000	331000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	10	50	200	130	<20	<20	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<1000	1000	2000	<1000	<1000	1000
Chemical Oxygen Demand	ug/l	--	19000	48000	48000	38000	30000	30000	35000
Chloride	ug/l	--	163000	130000	258000	234000	254000	202000	174000
Conductivity	uS/cm	--	--	900	2010	1980	1860	1860	1660
Conductivity (Field)	uS/cm	--	900	750	1596	958	1948	1680	1357
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	52400	41400	47100	74400	66800	66400	74700
Dissolved Organic Carbon	ug/l	--	6600	17600	11200	13600	12600	14100	14300
Dissolved Oxygen (Field)	ug/l	-- [7]	9880	9940	9350	12430	**4210**	7560	14300
Hardness, Calcium Carbonate	ug/l	--	294000	230000	525000	598000	559000	620000	516000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1200	650	140	1260	<100	<100	<100
Nitrite as N	ug/l	--	--	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	610	1050	700	840	440	570	430
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	8	8	7.69	**8.67**	7.74	6.96	7.73
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	**140**	**50**	**90**	20	30	**40**
Sulphate	ug/l	--	98000	63000	420000	397000	296000	370000	275000
Temperature (Field)	deg c	-- [10]	9.8	20.7	20.9	5.9	18.2	20.6	12.8
Total Dissolved Solids	ug/l	--	619000	585000	1410000	1390000	1210000	1300000	1080000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	4000	32000	15000	18000	5000	5000	6000
Metals									
Arsenic	ug/l	100 [11]	<0.5	1	2	1	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	39	40	190	160	120	**230**	140
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	92400	69000	174000	180000	171000	197000	157000
Chromium	ug/l	-- [13]	<2	5	6	6	6	7	7
Cobalt	ug/l	0.9	<0.5	0.5	**1.1**	**1.5**	**1.0**	0.8	0.8
Copper	ug/l	5	3	3	2	5	2	3	2
Iron	ug/l	300	**374**	**710**	**1050**	**560**	**420**	**380**	**660**
Lead	ug/l	-- [14]	<0.1	2	<1	<1	<1	<1	<1
Magnesium	ug/l	--	15300	14000	22000	36000	32000	31000	30000
Manganese	ug/l	--	87	110	460	320	320	280	430
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	7900	6000	28000	23000	14000	17000	14000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	106000	96000	208000	199000	182000	175000	146000
Zinc	ug/l	30 [11]	**31**	**60**	20	20	<10	<10	<10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	**2**	<1	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1	S1	S1	S1	S1	S1
			19-May-2011 [2]	16-Aug-2011 [2]	30-Nov-2011 [3]	30-May-2012	22-Aug-2012	29-Nov-2012 [4]
			W-11	N-9	S1	S 1	S-1	S-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	270000	372000	198000	310000	360000	360000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	50	30	130	<50	<50	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<1000	6000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	55000	35000	65000	53000	47000	39000
Chloride	ug/l	--	231000	270000	106000	280000	240000	250000
Conductivity	uS/cm	--	1670	1860	1160	--	--	--
Conductivity (Field)	uS/cm	--	1562	1482	1062	1699	1526	1769
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	63400	88300	25900	76000	60000	82000
Dissolved Organic Carbon	ug/l	--	12300	14000	7100	17000	86000	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	7270	5960	10950	7310	8160	13250
Hardness, Calcium Carbonate	ug/l	--	547000	477000	385000	520000	520000	550000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	830	<100	<100	170
Nitrite as N	ug/l	--	<100	<100	<100	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	1180	550	1010	1100	1000	1200
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	<100	<100	170
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.89	7.92	7.93	7.71	7.93	8.02
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	30	**470**	**85**	**120**	**50**
Sulphate	ug/l	--	243000	197000	201000	220000	220000	270000
Temperature (Field)	deg c	-- [10]	16.5	22.4	5.1	24.6	24.3	0.2
Total Dissolved Solids	ug/l	--	1090000	1210000	754000	1170000	1170000	1250000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	76000	8000	372000	19000	14000	23000
Metals								
Arsenic	ug/l	100 [11]	<10	<10	<50	1.4	1.0	<1.0
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	150	130	100	190	200	150
Cadmium	ug/l	0.2 [11]	0.1	<0.1	<10	**0.21**	<0.10	<0.10
Calcium	ug/l	--	163000	148000	103000	170000	160000	200000
Chromium	ug/l	-- [13]	**9**	**9**	**<50**	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	**1.5**	0.5	<10	**1.3**	0.63	<0.50
Copper	ug/l	5	**8**	2	**30**	**6.6**	3.0	2.7
Iron	ug/l	300	**1480**	**380**	**13200**	**1500**	**1000**	<100
Lead	ug/l	-- [14]	5	<1	30	0.89	0.61	<0.50
Magnesium	ug/l	--	34000	26000	31000	36000	31000	37000
Manganese	ug/l	--	370	200	570	670	320	120
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	14000	14000	10000	15000	18000	18000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	160000	184000	90000	210000	220000	230000
Zinc	ug/l	30 [11]	**40**	<10	**140**	21	16	14
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	**1.2**	<1.0	<1.0

Parameter	Unit	PWQO [1]	S1	S1	S1	S1	S1	S1	S1
			28-May-2013	15-Aug-2013	21-Nov-2013	28-May-2014	26-Aug-2014	13-Nov-2014	27-May-2015
			S1	S-1	SA-1	S1	S1	S-1	S-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	320000	350000	370000	340000	390000	370000	373000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	92	50	<50	<50	120	95	190
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	2000	<2000	<2000	<2000	5000
Chemical Oxygen Demand	ug/l	--	38000	38000	36000	36000	46000	38000	61000
Chloride	ug/l	--	260000	250000	200000	310000	270000	210000	266000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1732	1739	1581	1785	1992	1407	1752
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	71000	83000	92000	78000	98000	88000	76000
Dissolved Organic Carbon	ug/l	--	14000	16000	13000	14000	14000	13000	16400
Dissolved Oxygen (Field)	ug/l	-- [7]	**3060**	**150**	10580	14290	**360**	9660	7740
Hardness, Calcium Carbonate	ug/l	--	670000	550000	580000	650000	590000	560000	579000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	190	<100	<100	100	<100
Nitrite as N	ug/l	--	<10	<10	<10	<10	<10	12	<50
Nitrogen, Total Kjeldahl	ug/l	--	810	1000	690	860	950	1900	9800
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	<100	190	<100	<100	110	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.29	7.93	7.78	7.68	7.72	7.35	7.10
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**53**	**48**	28	24	**57**	**88**	**1690**
Sulphate	ug/l	--	310000	230000	270000	270000	250000	220000	224000
Temperature (Field)	deg c	-- [10]	19.8	21.7	3.1	17.1	21.3	4.9	20.7
Total Dissolved Solids	ug/l	--	1350000	1280000	1210000	1440000	1320000	1070000	1110000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	8000	<1000	7000	12000	7000	88000	266000
Metals									
Arsenic	ug/l	100 [11]	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	160	**210**	160	180	200	160	**201**
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	**1.8**	<0.10	<0.10	<0.10	<0.1
Calcium	ug/l	--	210000	180000	180000	200000	180000	170000	174000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	2
Cobalt	ug/l	0.9	0.59	<0.50	<0.50	0.50	<0.50	0.69	**1.4**
Copper	ug/l	5	2.6	2.6	2.5	1.9	1.7	2.9	3.1
Iron	ug/l	300	**450**	**380**	230	**320**	210	**460**	**3480**
Lead	ug/l	-- [14]	<0.50	0.64	0.52	0.51	<0.50	1.6	**9.0**
Magnesium	ug/l	--	40000	30000	40000	42000	32000	34000	35100
Manganese	ug/l	--	200	83	93	120	210	140	638
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	19000	16000	15000	17000	16000	13000	13800
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	210000	200000	170000	210000	220000	160000	154000
Zinc	ug/l	30 [11]	9.6	6.5	15	16	9.6	30	**33**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	**1.4**	<1.0	<1.0	**1.7**	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1	S1	S1	S1	S1	S1	S1
			25-Aug-2015	25-Nov-2015	24-May-2016	18-Aug-2016	16-Nov-2016	18-May-2017	28-Aug-2017
			S-1	S-1	S-1	S-1	S-1	S-1	S-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	364000	418000	364000	332000	360000	384000	450000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	30	100	50	50	60	60	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	15000	<2000	<2000	4000	3000	<2000	3000
Chemical Oxygen Demand	ug/l	--	29000	41000	37000	34000	33000	32000	36000
Chloride	ug/l	--	254000	260000	344000	213000	224000	342000	443000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1630	1824	1784	1604	1660	1921	1811
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	79900	83800	76000	65200	63000	49000	85400
Dissolved Organic Carbon	ug/l	--	14800	12600	13200	27400	11600	25500	14200
Dissolved Oxygen (Field)	ug/l	-- [7]	**4380**	11330	5570	**4540**	9380	8480	**3010**
Hardness, Calcium Carbonate	ug/l	--	408000	838000	582000	520000	539000	561000	652000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<250 [18]
Nitrogen, Total Kjeldahl	ug/l	--	500	900	700	600	800	600	600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	**8.66**	7.93	7.88	7.46	7.6	7.77	7.54
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**50**	**80**	30	**60**	20	<10	30
Sulphate	ug/l	--	211000	221000	200000	305000	211000	215000	200000
Temperature (Field)	deg c	-- [10]	18.9	0.6	18.6	22.9	7.9	22.5	18.2
Total Dissolved Solids	ug/l	--	1060000	1080000	1240000	1100000	988000	1330000	1520000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	38000	30000	29000	9000	2000	30000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<5 [17]	<1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	199	149	146	**250**	161	174	196
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1
Calcium	ug/l	--	120000	253000	168000	148000	164000	158000	204000
Chromium	ug/l	-- [13]	<1	3	1	<1	<1	<5 [17]	1
Cobalt	ug/l	0.9	0.5	0.7	<0.5	<0.5	0.8	<2.5 [17]	0.5
Copper	ug/l	5	<0.5	0.9	2.4	2.4	3.5	**5.7**	<0.5
Iron	ug/l	300	234	**965**	200	282	199	<500 [17]	**495**
Lead	ug/l	-- [14]	<0.1	1.1	0.3	0.3	2.5	<0.5 [17]	0.6
Magnesium	ug/l	--	26500	50000	39200	36300	31700	40600	34800
Manganese	ug/l	--	206	153	42	160	106	170	518
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	12500	12200	12500	17000	14400	14000	14900
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	148000	228000	198000	155000	149000	176000	266000
Zinc	ug/l	30 [11]	13	23	9	7	**35**	<25 [17]	7
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	<1	**8**	**3**	**6**	<1	<1

Parameter	Unit	PWQO [1]	S1	S1	S1	S1	S1	S1	S1
			28-Nov-2017	23-May-2018	30-Aug-2018	28-Nov-2018	20-Jun-2019	28-Aug-2019	21-Nov-2019
			S-1	S-1	S-1	S-1	S-1	S-1	S-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	464000	395000	466000	429000	398000	167000	409000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	140	30	70	170	120	40	130
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	4000	2000	<2000	2000	<2000
Chemical Oxygen Demand	ug/l	--	29000	35000	49000	56000	36000	53000	34000
Chloride	ug/l	--	275000	328000	442000	269000	338000	251000	383000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1702	1875	2095	1549	1819	1232	2350
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	76000	80900	87700	80400	79300	52800	<500
Dissolved Organic Carbon	ug/l	--	9600	11600	17400	13100	10200	14800	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	11590	11180	**3680**	13120	7020	6270	13560
Hardness, Calcium Carbonate	ug/l	--	539000	466000	599000	563000	556000	325000	660000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	<100	<100	400	200	100	200
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	700	700	2400	1300	800	700	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	8.00	7.88	7.71	7.72	7.51	7.53	8.03
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	10	20	**310**	**140**	10	**110**	30
Sulphate	ug/l	--	202000	166000	133000	157000	168000	151000	220000
Temperature (Field)	deg c	-- [10]	0.4	20.1	17.7	1.1	16.5	19.2	0.6
Total Dissolved Solids	ug/l	--	1110000	1150000	1280000	1050000	1140000	794000	1180000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	21000	4000	91000	43000	<2000	68000	<2000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	1	<1	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	171	189	166	118	172	130	124
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	154000	141000	186000	152000	160000	104000	189000
Chromium	ug/l	-- [13]	<1	<1	4	**12**	<1	8	1
Cobalt	ug/l	0.9	0.5	<0.5	**1.4**	**2.8**	<0.5	**1.8**	0.6
Copper	ug/l	5	2.0	2.0	**5.2**	**10.7**	2.6	**6.8**	4.0
Iron	ug/l	300	**313**	101	**1960**	**3540**	201	**2690**	295
Lead	ug/l	-- [14]	0.5	0.3	**5.4**	4.6	0.2	3.2	0.3
Magnesium	ug/l	--	37400	27700	32800	44700	37800	16200	45600
Manganese	ug/l	--	308	49	676	340	222	202	409
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	10300	10700	16200	14100	13300	10100	14100
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	157000	180000	255000	195000	197000	142000	261000
Zinc	ug/l	30 [11]	14	6	18	**31**	11	25	11
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	**5**	<1	<1	**5**	<1

Parameter	Unit	PWQO [1]	S3 01-May-1981	S3 01-Apr-1984	S3 01-May-1987	S3 01-Oct-1987	S3 06-Sep-1992	S3 08-Jun-1993	S3 15-Nov-1993
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	--	122000	217000	184000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	80	30	610	100	100	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	--	2000	3000	1800
Chemical Oxygen Demand	ug/l	--	24000	1600	162000	93000	129000	45000	53900
Chloride	ug/l	--	22000	42000	123000	255300	43000	123000	301000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	330	600	761	1794	488	1004	1204
Cyanide	ug/l	5 [6]	--	--	--	--	**15**	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	--	24900	59100	50100
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	12800	--	10300
Hardness, Calcium Carbonate	ug/l	--	96000	--	910000	534000	207670	328000	329000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	840	900	6060
Nitrite as N	ug/l	--	--	--	--	--	100	100	100
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	--	3920	930	1770
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	3820	830	1670
pH (Field)	-	8.5	7.9	--	8.15	7.82	6.4	8.32	7.84
Phosphate	ug/l	--	--	--	--	--	420	100	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	53000	--	39900	305400	41000	112000	93000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	170000	300000	380000	900000	328000	728000	724000
Total Organic Carbon	ug/l	--	--	--	--	--	10100	23700	8400
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	1	--	--
Barium	ug/l	--	--	--	--	--	80	--	--
Boron	ug/l	200 [12]	--	--	--	--	10	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	--	--	252700	100000	50800	81000	102000
Chromium	ug/l	-- [13]	2	--	**100**	**30**	**20**	**51**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	--	--	**100**	**10**	**10**	**6**	4
Iron	ug/l	300	200	--	**700**	**400**	**21330**	**1334**	**2204**
Lead	ug/l	-- [14]	3	--	**10**	**10**	**50**	**7.4**	**9.3**
Magnesium	ug/l	--	--	--	56900	56800	19600	31000	18100
Manganese	ug/l	--	--	--	40	140	5600	36	294
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	1	--	10	**40**	20	20	20
Potassium	ug/l	--	--	--	--	--	2900	23000	10100
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	--	--	--	--	20600	54000	119000
Zinc	ug/l	30 [11]	3	--	10	**210**	**60**	10	**39**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	**17**	**2**	**2**

Parameter	Unit	PWQO [1]	S3 15-Jun-1994	S3 02-Nov-1994	S3 28-Jun-1995	S3 14-Nov-1995	S3 12-Jun-1996	S3 12-Oct-1996	S3 17-Jun-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	326000	114000	226000	210000	235000	239000	193000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	140	10	120	90	60	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1900	2000	1000	2000	2000	1000	1000
Chemical Oxygen Demand	ug/l	--	25000	45000	58000	28000	24000	18000	24000
Chloride	ug/l	--	196000	101000	195000	172000	177000	188000	136000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1261	739	792	1240	1060	1250	854
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	27000	68200	49200	46700	46300	36100
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	8970	11460	10660	11870	7300	8630	6970
Hardness, Calcium Carbonate	ug/l	--	285000	197000	402000	320000	299000	347000	276000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	2500	100	2200	--	--	--
Nitrite as N	ug/l	--	100	100	100	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	3920	5320	630	2100	560	850	860
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	1670	5180	620	1980	470	--	--
pH (Field)	-	8.5	8.15	7.95	7.56	7.68	7.44	7.11	7.24
Phosphate	ug/l	--	190	240	200	90	0.1	100	110
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	56000	70000	166000	106000	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	632000	371000	824000	620000	528000	630	428000
Total Organic Carbon	ug/l	--	18100	10600	14900	9200	10300	9500	11900
Total Suspended Solids	ug/l	--	--	--	9000	5000	8000	5000	1000
Metals									
Arsenic	ug/l	100 [11]	--	--	100	--	--	--	--
Barium	ug/l	--	--	--	87	--	--	--	--
Boron	ug/l	200 [12]	58	48	200	10	35	50	100
Cadmium	ug/l	0.2 [11]	--	0.1	0.1	0.1	--	--	--
Calcium	ug/l	--	76000	61000	131000	94300	90200	108000	87000
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	3	3.9	4	2	4.4	1.8	4
Iron	ug/l	300	**776**	**1002**	240	210	**326**	**380**	**340**
Lead	ug/l	-- [14]	0.5	1.7	1.1	0.4	0.3	3	0.2
Magnesium	ug/l	--	23000	11100	32100	20100	17700	18500	14000
Manganese	ug/l	--	70	129	62	130	305	210	180
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20
Potassium	ug/l	--	9100	11100	27700	12400	11700	12300	8400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	121000	51000	65400	126000	109000	112000	82200
Zinc	ug/l	30 [11]	28	27	10	**50**	10	20	10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	**10**	1	--	**2**	--	**24**

Parameter	Unit	PWQO [1]	S3 05-Nov-1997	S3 05-Jun-1998	S3 28-Aug-1998	S3 30-Oct-1998	S3 19-Oct-1999	S3 03-May-2000	S3 25-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	220000	285000	240000	256000	238000	244000	300000
Ammonia, unionized	ug/l	20	--	--	--	10	--	10	--
Ammonia Nitrogen	ug/l	--	30	30	30	10	30	20	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	3000	1000	3000	1000	2000	--
Chemical Oxygen Demand	ug/l	--	14000	40000	29000	35000	30000	21000	--
Chloride	ug/l	--	226000	183000	229000	112000	323000	215000	244000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1375	1343	1290	1480	1520	1290	1400
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	42600	57900	49900	61200	62700	38200	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12100	9580	8050	9390	9510	11660	8730
Hardness, Calcium Carbonate	ug/l	--	336000	524000	513000	402000	419000	360000	525000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--	10
Nitrite as N	ug/l	--	--	--	--	--	--	--	200
Nitrogen, Total Kjeldahl	ug/l	--	830	1630	1600	610	680	510	6180
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.9	--	8.04	7.4	7.6	7.46	6.81
Phosphate	ug/l	--	50	120	90	30	40	20	2210
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--	89000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	689000	673000	650000	740000	760000	650000	772000
Total Organic Carbon	ug/l	--	9800	10700	11000	10300	10100	8800	--
Total Suspended Solids	ug/l	--	22000	64000	9000	1000	14000	32000	570000
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	80	80	100	80	90	50	**600**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	105000	160000	172000	122000	133000	111000	143000
Chromium	ug/l	-- [13]	--	--	--	--	--	--	**120**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	**10.9**	**5.3**	2.8	2.7	3.2	**7.3**	**62.7**
Iron	ug/l	300	260	**1700**	**340**	290	**530**	**320**	**6240**
Lead	ug/l	-- [14]	0.2	0.2	0.2	0.2	0.2	0.2	**39.6**
Magnesium	ug/l	--	17700	30100	20000	23200	20700	19900	40900
Manganese	ug/l	--	100	1070	120	100	260	150	5460
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	**80**
Potassium	ug/l	--	11000	8800	10500	6800	15400	8600	12000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	108000	102000	127000	168000	174000	126000	122000
Zinc	ug/l	30 [11]	10	30	**960**	10	10	10	**410**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**4**	1	1	**2**	**4**

Parameter	Unit	PWQO [1]	S3 13-Jun-2001	S3 27-Sep-2001	S3 21-Nov-2001	S3 22-May-2002	S3 08-Nov-2002	S3 31-May-2003	S3 03-Jul-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	272000	215000	212000	238000	216000	209000	240000
Ammonia, unionized	ug/l	20	<20	<20	<20	--	--	--	--
Ammonia Nitrogen	ug/l	--	10	20	10	20	120	90	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	2000	1000	2000
Chemical Oxygen Demand	ug/l	--	27000	9000	18000	26000	44000	26000	24000
Chloride	ug/l	--	212000	342000	290000	220000	261000	205000	283000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1050	1520	1200	1110	1300	1220	1400
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	46400	40900	29700	29000	60000	55000	61000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	11200	8260	11130	10030	12800	9660	6040
Hardness, Calcium Carbonate	ug/l	--	366000	463000	359000	345000	408000	293000	393000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	600	900	1400	900	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	530	520	420	400	1500	580	600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.8	7.99	7.13	7.16	7	7.8	7.94
Phosphate	ug/l	--	30	50	30	20	400	30	70
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	53000	199000	85000	77000	126000	74000	99000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	708000	1030000	791000	696000	650000	657000	913000
Total Organic Carbon	ug/l	--	12600	9900	11000	8000	11000	10000	16000
Total Suspended Solids	ug/l	--	63000	1000	9000	7000	244000	6000	90000
Metals									
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	120	90	70	70	100	50	91
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	108000	147000	114000	109000	126000	93600	120000
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	**10**	2
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	2	2.9	4.8	<1	**25.9**	4	2
Iron	ug/l	300	**320**	200	80	100	**5210**	290	**488**
Lead	ug/l	-- [14]	0.5	0.2	0.2	<1	**11.9**	0.5	1.4
Magnesium	ug/l	--	23300	23400	18000	17800	22600	14500	22600
Manganese	ug/l	--	150	110	30	90	420	220	139
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	10
Potassium	ug/l	--	4800	5500	8400	8300	13100	8000	11500
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	113000	169000	154000	136000	154000	132000	158000
Zinc	ug/l	30 [11]	**70**	**50**	10	20	**60**	10	18
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**90**	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S3 22-Oct-2003	S3 17-May-2004	S3 21-Aug-2004	S3 18-Nov-2004	S3 25-May-2005	S3 09-Sep-2005 [19]	S3 09-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	285000	--	325000
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	<5000	--	<5000
Alkalinity (Total as CaCO3)	ug/l	-- [5]	194000	201000	264000	250000	234000	--	266000
Ammonia, unionized	ug/l	20	--	<10	<10	<10	<20	--	<20
Ammonia Nitrogen	ug/l	--	180	20	10	10	<10	--	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	1000	1000	<3000	--	<3000
Chemical Oxygen Demand	ug/l	--	29000	38000	29000	26000	21000	--	24000
Chloride	ug/l	--	244000	249000	280000	344000	267000	--	326000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1300	1270	1320	1300	1650	--	980
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	48000	37200	29200	36000	58500	--	56500
Dissolved Organic Carbon	ug/l	--	--	--	--	--	9200	--	9100
Dissolved Oxygen (Field)	ug/l	-- [7]	10400	8600	7400	9760	9540	--	8900
Hardness, Calcium Carbonate	ug/l	--	--	329000	400000	374000	367000	--	405000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	<10	--	<10
Nitrate as N	ug/l	--	600	300	100	600	200	--	500
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	710	900	420	360	550	--	460
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	8.08	7.9	7.6	6.9	7.6	--	7.2
Phosphate	ug/l	--	60	70	20	30	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	20	--	20
Sulphate	ug/l	--	86000	76000	83000	95000	75000	--	106000
Temperature (Field)	deg c	-- [10]	--	--	--	--	18.8	--	1
Total Dissolved Solids	ug/l	--	710000	635000	660000	650000	799000	--	945000
Total Organic Carbon	ug/l	--	19000	8200	9000	7200	--	--	--
Total Suspended Solids	ug/l	--	11000	29000	40000	14000	5000	--	2000000
Metals									
Arsenic	ug/l	100 [11]	1	1	1	1	<1	--	<1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	52	70	82	53	76	--	70
Cadmium	ug/l	0.2 [11]	--	--	--	--	<0.5	--	<0.5
Calcium	ug/l	--	96900	101000	119000	114000	113000	--	126000
Chromium	ug/l	-- [13]	6	1	2	2	<2	--	<2
Cobalt	ug/l	0.9	--	--	--	--	**69**	--	**1**
Copper	ug/l	5	**27**	3	3	2	<2	--	<2
Iron	ug/l	300	231	**894**	128	**828**	239	--	**341**
Lead	ug/l	-- [14]	2	0.8	1.3	0.7	1	--	1.5
Magnesium	ug/l	--	14200	18400	25000	21700	20600	--	21900
Manganese	ug/l	--	80	368	210	250	233	--	153
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	<0.05	--	<0.06
Molybdenum	ug/l	40	--	--	--	--	4	--	<5
Nickel	ug/l	25	10	10	10	10	<10	--	<10
Potassium	ug/l	--	9400	10200	10200	9600	10500	--	10200
Selenium	ug/l	100	--	--	--	--	<1	--	<1
Sodium	ug/l	--	149000	143000	182000	183000	181000	--	203000
Zinc	ug/l	30 [11]	16	21	**64**	15	**35**	--	9
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	<1	--	<1

Parameter	Unit	PWQO [1]	S3 24-May-2006	S3 15-Aug-2006	S3 16-Nov-2006	S3 08-May-2007	S3 22-Aug-2007 [19]	S3 20-Nov-2007	S3 23-May-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	233000	302000	171000	232000	--	170000	244000
Ammonia, unionized	ug/l	20	<20	<20	--	<20	--	<20	<20
Ammonia Nitrogen	ug/l	--	10	<10	80	<10	--	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	<3000	--	<3000	<3000
Chemical Oxygen Demand	ug/l	--	23000	30000	19000	31000	--	29000	26000
Chloride	ug/l	--	212000	295000	88600	207000	--	194000	199000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	725	1470	490	900	--	750	1050
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	59600	72500	42800	58000	--	44200	57300
Dissolved Organic Carbon	ug/l	--	12000	16200	8800	7600	--	10400	5000
Dissolved Oxygen (Field)	ug/l	-- [7]	9330	**1600**	8270	8010	--	10890	10590
Hardness, Calcium Carbonate	ug/l	--	311000	403000	232000	297000	--	264000	269000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	500	100	700	200	--	500	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	430	460	820	330	--	580	550
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.9	7.8	--	8.1	--	8.1	8
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	20	**140**	<10	--	**150**	30
Sulphate	ug/l	--	70000	93000	48000	65000	--	74000	54000
Temperature (Field)	deg c	-- [10]	9.5	16	8.3	15.5	--	2.1	13.3
Total Dissolved Solids	ug/l	--	686000	895000	407000	663000	--	594000	642000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	<3000	58000	<3000	--	46000	<3000
Metals									
Arsenic	ug/l	100 [11]	<1	1.1	<1	0.7	--	1.2	1.8
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	54	102	41	66	--	45	40
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5	<0.1	--	<0.1	<0.1
Calcium	ug/l	--	99300	125000	72800	92000	--	83900	87000
Chromium	ug/l	-- [13]	<2	<2	8	<2	--	4	<2
Cobalt	ug/l	0.9	0.5	0.4	**1**	<0.5	--	**1.5**	<0.5
Copper	ug/l	5	<2	2	**38**	**16**	--	5	<2
Iron	ug/l	300	161	191	**2130**	252	--	**2120**	**355**
Lead	ug/l	-- [14]	0.9	0.5	**6**	0.2	--	**10**	<0.1
Magnesium	ug/l	--	15200	22000	12100	16300	--	13200	12400
Manganese	ug/l	--	99	170	238	273	--	267	258
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	7500	10300	8800	8100	--	8000	6100
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	148000	177000	68800	134000	--	111000	135000
Zinc	ug/l	30 [11]	8	10	**42**	19	--	**36**	6
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S3	S3	S3	S3	S3	S3	S3
			12-Aug-2008 [19]	06-Nov-2008	13-May-2009	25-Aug-2009	27-Nov-2009 [27]	18-May-2010	18-Aug-2010
					S-12	A-7	S-10	S-1	S-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	276000	262000	417000	250000	343000	363000
Ammonia, unionized	ug/l	20	--	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	--	<10	90	190	80	140	150
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	<3000	<1000	<1000	2000	2000	1000
Chemical Oxygen Demand	ug/l	--	--	14000	25000	58000	25000	30000	35000
Chloride	ug/l	--	--	259000	174000	211000	162000	186000	170000
Conductivity	uS/cm	--	--	--	1170	1590	1160	1350	1580
Conductivity (Field)	uS/cm	--	--	1200	1000	1234	1014	1452	1429
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	66800	64900	107000	61200	73500	79500
Dissolved Organic Carbon	ug/l	--	--	3700	10200	13300	8900	11800	12400
Dissolved Oxygen (Field)	ug/l	-- [7]	--	8540	9390	9160	12410	11000	9000
Hardness, Calcium Carbonate	ug/l	--	--	346000	313000	422000	326000	357000	541000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	200	300	<100	600	<100	<100
Nitrite as N	ug/l	--	--	--	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	--	470	560	670	380	590	360
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	--	7.5	7.6	7.37	7.13	7.37	7.14
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	30	**60**	30	**90**	20	20
Sulphate	ug/l	--	--	75000	53000	82000	78000	81000	214000
Temperature (Field)	deg c	-- [10]	--	10.5	17.9	18	5.5	12.9	16.8
Total Dissolved Solids	ug/l	--	--	800000	761000	1030000	754000	878000	1030000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	3000	16000	7000	24000	8000	4000
Metals									
Arsenic	ug/l	100 [11]	--	0.8	<1	1	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	63	70	90	60	90	110
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	--	110000	99000	131000	104000	110000	172000
Chromium	ug/l	-- [13]	--	<2	5	6	4	5	4
Cobalt	ug/l	0.9	--	0.7	0.8	**1.4**	0.7	**1.2**	0.8
Copper	ug/l	5	--	<2	2	2	2	2	3
Iron	ug/l	300	--	**1150**	**1310**	**3050**	**1190**	**3840**	**3320**
Lead	ug/l	-- [14]	--	<0.1	<1	<1	<1	<1	<1
Magnesium	ug/l	--	--	17100	16000	23000	16000	20000	27000
Manganese	ug/l	--	--	420	440	1210	490	1290	1020
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	--	8000	7000	8000	8000	7000	10000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	--	163000	127000	150000	119000	143000	153000
Zinc	ug/l	30 [11]	--	<5	<10	<10	<10	<10	<10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S3	S3	S3	S3	S3	S3	S3
			14-Oct-2010	19-May-2011	16-Aug-2011 [2]	30-Nov-2011 [21]	30-May-2012	22-Aug-2012	29-Nov-2012
			S-12	W-2	N-8	S3	S 3	S-3	S3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	320000	232000	407000	228000	360000	450000	340000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	70	50	280	30	110	350	330
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	<1000	1000	2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	30000	25000	40000	20000	41000	50000	29000
Chloride	ug/l	--	197000	112000	186000	128000	170000	200000	210000
Conductivity	uS/cm	--	1500	914	1630	1080	--	--	--
Conductivity (Field)	uS/cm	--	610	879	1313	985	1356	1613	1520
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	89000	55100	90700	28800	91000	93000	76000
Dissolved Organic Carbon	ug/l	--	11400	9500	14500	7800	15000	<200	10000
Dissolved Oxygen (Field)	ug/l	-- [7]	13000	6210	6150	7780	5410	5500	**1990**
Hardness, Calcium Carbonate	ug/l	--	438000	275000	518000	315000	460000	670000	480000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	300	<100	600	<100	<100	420
Nitrite as N	ug/l	--	<100	<100	<100	<100	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	580	840	880	880	1600	1400	1500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	<100	<100	420
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.81	7.61	7.28	7.76	7.20	7.26	7.48
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	**40**	20	**40**	**59**	**69**	**42**
Sulphate	ug/l	--	155000	71000	158000	111000	130000	270000	160000
Temperature (Field)	deg c	-- [10]	10.9	13.1	18.3	6.1	22.0	17.6	0.2
Total Dissolved Solids	ug/l	--	975000	594000	1060000	702000	854000	1290000	994000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	4000	13000	6000	38000	31000	8000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	<10	<50	<1.0	<1.0	<1.0
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	70	60	100	200	100	160	80
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<10	<0.10	<0.10	<0.10
Calcium	ug/l	--	139000	87000	158000	93000	150000	220000	170000
Chromium	ug/l	-- [13]	5	4	6	**<50**	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.6	0.4	0.8	<10	**1.1**	**0.94**	0.53
Copper	ug/l	5	3	2	2	<10	3.8	3.9	2.4
Iron	ug/l	300	**1510**	**740**	**4660**	**1300**	**8600**	**7200**	**3300**
Lead	ug/l	-- [14]	<1	<1	<1	<10	0.57	0.54	<0.50
Magnesium	ug/l	--	22000	14000	30000	20000	27000	43000	32000
Manganese	ug/l	--	520	280	1440	370	1500	1500	1300
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	9000	6000	10000	8000	9600	16000	9300
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	141000	81000	142000	89000	150000	180000	180000
Zinc	ug/l	30 [11]	<10	<10	<10	<50	20	<5.0	<5.0
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1.0	<1.0	<1.0

Parameter	Unit	PWQO [1]	S3	S3	S3	S3	S3	S3	S3
			28-May-2013	15-Aug-2013	21-Nov-2013	28-May-2014	26-Aug-2014	13-Nov-2014	27-May-2015
			S15	S3	SA-11	S3	S3	S-3	S-3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	320000	510000	330000	340000	440000	330000	327000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	290	1300	63	230	750	140	320
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	2000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	27000	64000	24000	29000	47000	25000	29000
Chloride	ug/l	--	190000	180000	210000	200000	230000	230000	265000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1322	1695	1396	1299	1694	1237	1501
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	73000	130000	84000	77000	120000	79000	70500
Dissolved Organic Carbon	ug/l	--	12000	20000	10000	11000	14000	9500	14400
Dissolved Oxygen (Field)	ug/l	-- [7]	9370	**210**	**2090**	**5630**	**1400**	**2930**	5670
Hardness, Calcium Carbonate	ug/l	--	470000	580000	460000	440000	530000	430000	398000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	400	100	840	360	130	480	200
Nitrite as N	ug/l	--	<10	<10	<10	<10	<10	18	<50
Nitrogen, Total Kjeldahl	ug/l	--	1100	2100	780	1300	1600	620	900
Nitrogen, Nitrate-Nitrite	ug/l	--	400	100	840	360	130	500	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.04	6.97	7.71	7.40	6.96	7.31	7.71
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**35**	**100**	19	**97**	**32**	21	**60**
Sulphate	ug/l	--	120000	140000	140000	100000	100000	88000	97000
Temperature (Field)	deg c	-- [10]	14.9	15.0	1.8	14.2	17.8	4.9	18.7
Total Dissolved Solids	ug/l	--	832000	1130000	996000	926000	1040000	860000	856000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	8000	<5000	7000	9000	22000	8000	2000
Metals									
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	77	110	97	76	96	76	96
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Calcium	ug/l	--	140000	210000	150000	140000	160000	140000	120000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1
Cobalt	ug/l	0.9	0.61	**1.7**	<0.50	0.71	**1.2**	0.57	0.6
Copper	ug/l	5	2.0	1.4	2.1	1.8	1.4	1.6	<0.5
Iron	ug/l	300	**3000**	**22000**	**1300**	**4000**	**11000**	**2000**	**2990**
Lead	ug/l	-- [14]	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.1
Magnesium	ug/l	--	26000	47000	31000	26000	35000	24000	23600
Manganese	ug/l	--	900	4800	550	1100	2800	760	1050
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	9300	11000	9300	9100	10000	9200	9020
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	150000	170000	140000	160000	150000	147000
Zinc	ug/l	30 [11]	<5.0	9.7	<5.0	5.1	13	<5.0	<5
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	<1.0	**1.2**	<1

Parameter	Unit	PWQO [1]	S3	S3	S3	S3	S3	S3	S3
			25-Aug-2015	25-Nov-2015	24-May-2016	18-Aug-2016	16-Nov-2016	18-May-2017	28-Aug-2017
			S-3	S-3	S-3	S-3	S-3	S-3	S-3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	547000	352000	367000	595000	351000	302000	425000
Ammonia, unionized	ug/l	20	**36.7**	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	900	130	410	1830	160	170	410
Biochemical Oxygen Demand, 5 Day	ug/l	--	13000	<2000	2000	<2000	3000	<2000	4000
Chemical Oxygen Demand	ug/l	--	48000	34000	37000	59000	25000	31000	30000
Chloride	ug/l	--	240000	328000	227000	198000	339000	198000	227000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1737	1682	1375	1743	1914	1201	1196
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	134000	70500	74700	111000	64900	40300	77600
Dissolved Organic Carbon	ug/l	--	15500	9800	12600	37900	9000	21900	14600
Dissolved Oxygen (Field)	ug/l	-- [7]	**570**	**550**	5890	**240**	**1140**	5960	**5350**
Hardness, Calcium Carbonate	ug/l	--	474000	610000	592000	523000	475000	331000	445000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	500	<100	100	<100	200	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1800	700	1000	2800	600	700	600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	8.14	7.77	7.34	7.32	7.53	7.71	7.41
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	20	10	**110**	30	30	20
Sulphate	ug/l	--	117000	127000	106000	212000	140000	81000	98000
Temperature (Field)	deg c	-- [10]	16.6	0.7	17.4	18.9	7.5	18.4	14.8
Total Dissolved Solids	ug/l	--	1060000	961000	872000	1250000	1130000	742000	950000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	47000	8000	13000	70000	6000	9000	12000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<5 [17]	<1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	102	85	109	147	101	**444**	95
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1
Calcium	ug/l	--	132000	204000	173000	145000	147000	99700	139000
Chromium	ug/l	-- [13]	1	<1	2	<1	<1	<5 [17]	<1
Cobalt	ug/l	0.9	**1.1**	<0.5	**1.6**	**1.3**	0.6	<2.5 [17]	0.7
Copper	ug/l	5	<0.5	<0.5	1.6	2.7	1.0	4.2	<0.5
Iron	ug/l	300	**12700**	**1500**	**19200**	**13200**	**1350**	**4320**	**4860**
Lead	ug/l	-- [14]	0.2	<0.1	0.4	<0.1	<0.1	<0.5 [17]	0.1
Magnesium	ug/l	--	34600	24300	38800	39300	26300	19800	23900
Manganese	ug/l	--	2780	565	2970	2220	616	520	1210
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	10800	8450	10300	14700	10800	7920	7790
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	199000	149000	147000	187000	106000	138000
Zinc	ug/l	30 [11]	10	5	9	8	6	<25 [17]	<5
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	<1	**4**	**5**	**2**	<1	<1

Parameter	Unit	PWQO [1]	S3	S3	S3	S3	S3	S3	S3
			28-Nov-2017	23-May-2018	30-Aug-2018	28-Nov-2018	20-Jun-2019	28-Aug-2019	21-Nov-2019
			S-3	S-3	S-3	S-3	S-3	S-3	S-3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	317000	330000	784000	358000	318000	208000	311000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	170	220	3490	80	170	250	170
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	6000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	23000	27000	68000	26000	28000	52000	24000
Chloride	ug/l	--	223000	194000	203000	370000	160000	234000	322000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1241	1265	1831	1617	1213	1132	1828
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	51300	69100	134000	54600	67200	70900	655
Dissolved Organic Carbon	ug/l	--	8400	10100	29400	24900	7400	18600	8400
Dissolved Oxygen (Field)	ug/l	-- [7]	**4740**	**4480**	**1400**	11190	**2070**	**1330**	**4540**
Hardness, Calcium Carbonate	ug/l	--	362000	347000	733000	445000	315000	322000	528000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	100	100	900	800	200	500
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	700	700	5400	900	700	1000	600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	8.20	7.07	6.73	7.56	7.61	7.46	7.71
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	10	20	30	**50**	30	**70**	20
Sulphate	ug/l	--	75000	60000	31000	97000	146000	117000	120000
Temperature (Field)	deg c	-- [10]	1.1	16.9	15.7	3.1	16.1	17	1.2
Total Dissolved Solids	ug/l	--	758000	704000	1100000	978000	764000	762000	926000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	4000	116000	2000	4000	10000	2000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	90	105	54	92	100	76	74
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	110000	107000	197000	128000	85500	98300	155000
Chromium	ug/l	-- [13]	<1	<1	2	1	2	1	<1
Cobalt	ug/l	0.9	0.6	0.5	**2.6**	0.5	0.6	0.6	0.7
Copper	ug/l	5	1.5	0.7	0.9	4.3	3.0	3.5	1.9
Iron	ug/l	300	**1150**	**1650**	**44700**	**935**	**1870**	**2020**	**2270**
Lead	ug/l	-- [14]	0.1	<0.1	<0.1	0.2	0.2	0.3	0.1
Magnesium	ug/l	--	21200	19200	58800	30300	24700	18600	34300
Manganese	ug/l	--	653	831	6550	269	438	738	885
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	8030	7440	14100	11300	9230	9830	12400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	137000	119000	125000	251000	128000	126000	171000
Zinc	ug/l	30 [11]	7	6	6	11	<5	10	8
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	**5**	<1	<1	**5**	<1

Parameter	Unit	PWQO [1]	S5 19-Jun-1989	S5 24-Jul-1989	S5 17-Nov-1989	S5 27-Mar-1990	S5 16-Apr-1990	S5 18-May-1990	S5 27-Jun-1990	S5 04-Oct-1990
General Chemistry										
Alkalinity (Total as CaCO3)	ug/l	-- [5]	892000	1029000	980000	1330000	1254000	1048000	955000	973000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4500	1830	3460	10000	530	660	6100	4100
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	6000	5000	27000	14000	6000	35000	2000
Chemical Oxygen Demand	ug/l	--	82000	65000	105000	287000	209000	202000	332000	218000
Chloride	ug/l	--	136000	148000	177000	245000	239000	202000	234000	199000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2199	2203	2200	3207	2614	2570	2213	2323
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	4760	193000	211000	395000	302000	323000	331000	238000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	<1000	500	6600	450	3440
Hardness, Calcium Carbonate	ug/l	--	860000	414000	816000	1669000	1521000	1078000	958000	1045000
Nitrate as N	ug/l	--	<100	<100	6580	4000	7300	2900	<100	<100
Nitrite as N	ug/l	--	<100	<100	250	<1000	<100	800	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	4760	1870	6470	12690	14000	12000	13000	6050
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	260	40	3010	2690	13470	11340	6900	1950
pH (Field)	-	8.5	7.64	7.63	7.2	7.9	7.28	7.81	8.18	8.01
Phosphate	ug/l	--	<100	<100	250	100	930	160	470	130
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	30000	25000	96000	156000	166000	47000	51000	70000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1100000	1100000	1100000	1600000	1300000	1280000	1100000	1160000
Total Organic Carbon	ug/l	--	800	--	33900	65000	63000	44000	73000	41000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--
Calcium	ug/l	--	277000	83000	238000	526000	453000	309000	243000	281000
Chromium	ug/l	-- [13]	**20**	**240**	**<10**	**<50**	**<50**	**<50**	**<50**	**<50**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--
Copper	ug/l	5	<100	<100	**30**	<50	<50	<50	<50	<50
Iron	ug/l	300	**14900**	**8990**	**9900**	**16970**	**7600**	**10000**	**30010**	**510**
Lead	ug/l	-- [14]	**30**	**80**	**70**	**170**	<50	<50	**90**	<50
Magnesium	ug/l	--	41000	56000	53600	86000	84000	74000	85000	83000
Manganese	ug/l	--	2370	2030	2460	3120	2300	1700	1800	1930
Nickel	ug/l	25	<100	<100	**30**	<50	<50	<50	<50	<50
Potassium	ug/l	--	19000	31000	24900	51000	43000	14500	32000	46000
Sodium	ug/l	--	127000	176000	173000	217000	235000	192000	215000	291000
Zinc	ug/l	30 [11]	**260**	**120**	**40**	**270**	<50	**70**	**130**	<50
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	<2	**8**	**10**	**75**	**17**	**8**	<2	<2

Parameter	Unit	PWQO [1]	S5 06-Nov-1990	S5 27-Nov-1990	S5 02-Nov-1991	S5 24-Nov-1991	S5 09-Jun-1992	S5 15-Nov-1993	S5 15-Jun-1994
General Chemistry									
Alkalinity (Total as CaCO3)	ug/l	-- [5]	1008000	718000	1296000	1256000	712000	320000	468000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4000	4600	29000	9290	2630	100	1430
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	7000	16000	6000	1700	4000	1600
Chemical Oxygen Demand	ug/l	--	235000	141000	278000	300000	148000	106000	47000
Chloride	ug/l	--	193000	80000	389000	244000	182000	241000	83000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2196	2384	6500	2792	2274	2030	1711
Cyanide	ug/l	5 [6]	--	--	--	--	**107**	--	--
Dissolved Inorganic Carbon	ug/l	--	291000	270000	--	351000	165700	97200	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4650	4890	4800	6900	2500	4900	5910
Hardness, Calcium Carbonate	ug/l	--	1027000	915000	1068000	1194000	774150	938000	603000
Nitrate as N	ug/l	--	<100	<100	--	7700	600	3350	240
Nitrite as N	ug/l	--	30	<10	--	140	<100	100	--
Nitrogen, Total Kjeldahl	ug/l	--	5590	6610	31500	13900	7650	3580	5040
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	1530	--	--	--	--
Nitrogen, Organic	ug/l	--	1590	2010	2500	4610	5020	3480	3610
pH (Field)	-	8.5	8.08	7.8	7.2	7.62	7.46	7.09	7.19
Phosphate	ug/l	--	240	<100	700	400	<100	200	10
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	45000	36000	12000	121000	240000	796000	184000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1100000	1200000	3250000	1400000	1384000	1692000	857000
Total Organic Carbon	ug/l	--	39000	42000	--	50000	28200	17200	20000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	<1	--	--
Barium	ug/l	--	--	--	--	--	160	--	--
Boron	ug/l	200 [12]	--	--	--	--	**3860**	--	**2372**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	284000	244000	269300	341000	179100	244000	150000
Chromium	ug/l	-- [13]	**<50**	**<50**	**<10**	**<50**	**<20**	**10**	**11**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	<50	<50	**20**	<50	**10**	**6**	3.1
Iron	ug/l	300	**8430**	**14210**	**450**	**8900**	**22000**	**19170**	**7648**
Lead	ug/l	-- [14]	<50	<50	<1	<50	**100**	**20.9**	0.5
Magnesium	ug/l	--	77000	74000	96000	83000	79300	79900	55300
Manganese	ug/l	--	2480	2720	1400	3300	2620	3347	1348
Nickel	ug/l	25	<50	<50	**50**	<50	<20	**37**	20
Potassium	ug/l	--	26000	25000	76000	49000	17100	20700	14900
Sodium	ug/l	--	224000	241000	270000	259000	195800	194000	134000
Zinc	ug/l	30 [11]	<50	<50	20	<50	**230**	**2334**	**53**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<2	**15**	**9**	**16**	<2	**2**	**12**

Parameter	Unit	PWQO [1]	S5 02-Nov-1994	S5 12-Jun-1996	S5 26-Aug-1998	S5 25-May-2005 [19]	S5 09-Sep-2005 [19]	S5 09-Nov-2005 [19]
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	-- [5]	113000	616000	88000	--	--	--
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	100	500	260	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	4200	7000	2000	--	--	--
Chemical Oxygen Demand	ug/l	--	62000	51000	19000	--	--	--
Chloride	ug/l	--	36000	72000	15500	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	756	1640	306	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	27000	101000	17000	--	--	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12050	5880	6290	--	--	--
Hardness, Calcium Carbonate	ug/l	--	247000	718000	175000	--	--	--
Nitrate as N	ug/l	--	100	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	4760	1750	820	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	4660	1250	--	--	--	--
pH (Field)	-	8.5	8.18	5.92	7.68	--	--	--
Phosphate	ug/l	--	460	1340	960	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	194000	--	80	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	349000	820000	154000	--	--	--
Total Organic Carbon	ug/l	--	9100	16300	6000	--	--	--
Total Suspended Solids	ug/l	--	--	67000	244000	--	--	--
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1081**	**1630**	**350**	--	--	--
Cadmium	ug/l	0.2 [11]	**0.3**	--	--	--	--	--
Calcium	ug/l	--	67000	167000	37200	--	--	--
Chromium	ug/l	-- [13]	**10**	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	**13.6**	**5.7**	**13.2**	--	--	--
Iron	ug/l	300	**15040**	**2740**	**18600**	--	--	--
Lead	ug/l	-- [14]	3.6	1	0.6	--	--	--
Magnesium	ug/l	--	19200	72300	19600	--	--	--
Manganese	ug/l	--	352	2480	240	--	--	--
Nickel	ug/l	25	20	20	**50**	--	--	--
Potassium	ug/l	--	11800	7420	3500	--	--	--
Sodium	ug/l	--	44000	128000	19000	--	--	--
Zinc	ug/l	30 [11]	**150**	19	**70**	--	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	**163**	**5**	--	--	--

Parameter	Unit	PWQO [1]	S5 24-May-2006 [19]	S5 15-Aug-2006 [19]	S5 16-Nov-2006	S5 08-May-2007 [19]	S5 22-Aug-2007 [19]	S5 20-Nov-2007 [19]
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	458000	--	--	--
Ammonia, unionized	ug/l	20	--	--	<20	--	--	--
Ammonia Nitrogen	ug/l	--	--	--	200	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	6000	--	--	--
Chemical Oxygen Demand	ug/l	--	--	--	105000	--	--	--
Chloride	ug/l	--	--	--	49700	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	750	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	119000	--	--	--
Dissolved Organic Carbon	ug/l	--	--	--	31700	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	**4990**	--	--	--
Hardness, Calcium Carbonate	ug/l	--	--	--	491000	--	--	--
Nitrate as N	ug/l	--	--	--	200	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	--	--	3760	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	--	--	6.7	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	**590**	--	--	--
Sulphate	ug/l	--	--	--	101000	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	7.3	--	--	--
Total Dissolved Solids	ug/l	--	--	--	706000	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	114000	--	--	--
Metals								
Arsenic	ug/l	100 [11]	--	--	<1	--	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	**526**	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	<0.5	--	--	--
Calcium	ug/l	--	--	--	129000	--	--	--
Chromium	ug/l	-- [13]	--	--	**14**	--	--	--
Cobalt	ug/l	0.9	--	--	**3**	--	--	--
Copper	ug/l	5	--	--	**52**	--	--	--
Iron	ug/l	300	--	--	**3960**	--	--	--
Lead	ug/l	-- [14]	--	--	**10**	--	--	--
Magnesium	ug/l	--	--	--	40900	--	--	--
Manganese	ug/l	--	--	--	237	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	--	43000	--	--	--
Sodium	ug/l	--	--	--	62600	--	--	--
Zinc	ug/l	30 [11]	--	--	**60**	--	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	<1	--	--	--

Parameter	Unit	PWQO [1]	S5	S5	S5	S5	S5	S5
			23-May-2008 [19]	12-Aug-2008 [19]	06-Nov-2008 [19]	13-May-2009	25-Aug-2009 [19]	27-Nov-2009
						S-4	S5	S-3
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	610000	--	417000
Ammonia, unionized	ug/l	20	--	--	--	<20	--	<20
Ammonia Nitrogen	ug/l	--	--	--	--	120	--	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	<1000	--	4000
Chemical Oxygen Demand	ug/l	--	--	--	--	33000	--	75000
Chloride	ug/l	--	--	--	--	37000	--	53000
Conductivity	uS/cm	--	--	--	--	1290	--	1120
Conductivity (Field)	uS/cm	--	--	--	--	1025	--	992
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	133000	--	129000
Dissolved Organic Carbon	ug/l	--	--	--	--	11400	--	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	**2140**	--	**4160**
Hardness, Calcium Carbonate	ug/l	--	--	--	--	573000	--	408000
Nitrate as N	ug/l	--	--	--	--	<100	--	300
Nitrite as N	ug/l	--	--	--	--	<100	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	1050	--	650
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	--	--	--	7.2	--	6.33
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**130**	--	**340**
Sulphate	ug/l	--	--	--	--	78000	--	123000
Temperature (Field)	deg c	-- [10]	--	--	--	8.8	--	4.8
Total Dissolved Solids	ug/l	--	--	--	--	839000	--	728000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	--	6000	--	36000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	1	--	<50
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	**880**	--	**700**
Cadmium	ug/l	0.2 [11]	--	--	--	<0.1	--	<10
Calcium	ug/l	--	--	--	--	142000	--	104000
Chromium	ug/l	-- [13]	--	--	--	6	--	**<20**
Cobalt	ug/l	0.9	--	--	--	**1.0**	--	<5
Copper	ug/l	5	--	--	--	2	--	**20**
Iron	ug/l	300	--	--	--	**770**	--	**2400**
Lead	ug/l	-- [14]	--	--	--	<1	--	<10
Magnesium	ug/l	--	--	--	--	53000	--	36000
Manganese	ug/l	--	--	--	--	420	--	190
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	11000	--	16000
Sodium	ug/l	--	--	--	--	78000	--	68000
Zinc	ug/l	30 [11]	--	--	--	<10	--	<50
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	<1	--	<1

Parameter	Unit	PWQO [1]	S5	S5	S5	S5	S5	S5
			18-May-2010 [36]	18-Aug-2010 [2]	14-Oct-2010 [2]	19-May-2011 [2]	16-Aug-2011 [19]	30-Nov-2011 [19]
			S5	S-2	S-10	W-14	S-5	S5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	220000	566000	669000	--	--
Ammonia, unionized	ug/l	20	--	<20	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	--	130	110	170	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	3000	2000	1000	--	--
Chemical Oxygen Demand	ug/l	--	--	30000	35000	35000	--	--
Chloride	ug/l	--	--	64000	40000	24000	--	--
Conductivity	uS/cm	--	--	919	1280	1260	--	--
Conductivity (Field)	uS/cm	--	--	855	1070	1181	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	50600	141000	166000	--	--
Dissolved Organic Carbon	ug/l	--	--	15500	11300	12200	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	**2920**	**5480**	**2050**	--	--
Hardness, Calcium Carbonate	ug/l	--	--	305000	632000	615000	--	--
Nitrate as N	ug/l	--	--	180	<100	<100	--	--
Nitrite as N	ug/l	--	--	<100	<100	<100	--	--
Nitrogen, Total Kjeldahl	ug/l	--	--	1280	760	810	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	--	6.27	7.19	7.12	--	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**260**	**200**	**140**	--	--
Sulphate	ug/l	--	--	159000	107000	41000	--	--
Temperature (Field)	deg c	-- [10]	--	16.8	10.1	9.7	--	--
Total Dissolved Solids	ug/l	--	--	597000	832000	819000	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	21000	27000	23000	--	--
Metals								
Arsenic	ug/l	100 [11]	--	<1	<1	<10	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	**300**	**560**	**520**	--	--
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	<0.1	--	--
Calcium	ug/l	--	--	86000	179000	149000	--	--
Chromium	ug/l	-- [13]	--	4	4	4	--	--
Cobalt	ug/l	0.9	--	0.4	**1.5**	**1.1**	--	--
Copper	ug/l	5	--	5	2	1	--	--
Iron	ug/l	300	--	260	**1300**	**1280**	--	--
Lead	ug/l	-- [14]	--	<1	<1	<1	--	--
Magnesium	ug/l	--	--	22000	45000	59000	--	--
Manganese	ug/l	--	--	70	760	510	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	17000	15000	10000	--	--
Sodium	ug/l	--	--	73000	64000	60000	--	--
Zinc	ug/l	30 [11]	--	<10	<10	<10	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	<1	--	--

Parameter	Unit	PWQO [1]	S5	S5	S5	S5	S5	S5
			30-May-2012 [19]	22-Aug-2012 [19]	29-Nov-2012 [19]	28-May-2013	15-Aug-2013 [19]	21-Nov-2013 [19]
			S5	S-5	S5	S5	S5	S-5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	540000	--	--
Ammonia, unionized	ug/l	20	--	--	--	<20	--	--
Ammonia Nitrogen	ug/l	--	--	--	--	330	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	3000	--	--
Chemical Oxygen Demand	ug/l	--	--	--	--	48000	--	--
Chloride	ug/l	--	--	--	--	49000	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	1107	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	110000	--	--
Dissolved Organic Carbon	ug/l	--	--	--	--	17000	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	**1740**	--	--
Hardness, Calcium Carbonate	ug/l	--	--	--	--	600000	--	--
Nitrate as N	ug/l	--	--	--	--	<100	--	--
Nitrite as N	ug/l	--	--	--	--	<10	--	--
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	2100	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	<100	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	--	--	--	6.37	--	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**530**	--	--
Sulphate	ug/l	--	--	--	--	75000	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	10.9	--	--
Total Dissolved Solids	ug/l	--	--	--	--	748000	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	--	12000	--	--
Metals								
Arsenic	ug/l	100 [11]	--	--	--	1.7	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	**790**	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	<0.10	--	--
Calcium	ug/l	--	--	--	--	170000	--	--
Chromium	ug/l	-- [13]	--	--	--	<5.0	--	--
Cobalt	ug/l	0.9	--	--	--	**1.7**	--	--
Copper	ug/l	5	--	--	--	3.9	--	--
Iron	ug/l	300	--	--	--	**2300**	--	--
Lead	ug/l	-- [14]	--	--	--	1.2	--	--
Magnesium	ug/l	--	--	--	--	56000	--	--
Manganese	ug/l	--	--	--	--	900	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	15000	--	--
Sodium	ug/l	--	--	--	--	77000	--	--
Zinc	ug/l	30 [11]	--	--	--	21	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	<1.0	--	--

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S5	S5	S5	S5	S5	S5
			28-May-2014	26-Aug-2014 [19]	13-Nov-2014	27-May-2015 [19]	25-Aug-2015 [19]	25-Nov-2015 [19]
			S5	S5	S-5	S-5	S-5	S5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	-- [5]	470000	--	600000	--	--	--
Ammonia, unionized	ug/l	20	<20	--	<20	--	--	--
Ammonia Nitrogen	ug/l	--	290	--	78	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	<2000	--	--	--
Chemical Oxygen Demand	ug/l	--	42000	--	26000	--	--	--
Chloride	ug/l	--	32000	--	35000	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	994	--	1150	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	100000	--	140000	--	--	--
Dissolved Organic Carbon	ug/l	--	15000	--	9500	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**1160**	--	**3540**	--	--	--
Hardness, Calcium Carbonate	ug/l	--	510000	--	640000	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	--	--	--
Nitrite as N	ug/l	--	17	--	13	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1700	--	910	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	<100	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.81	--	6.29	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**230**	--	**130**	--	--	--
Sulphate	ug/l	--	110000	--	160000	--	--	--
Temperature (Field)	deg c	-- [10]	13.3	--	5.7	--	--	--
Total Dissolved Solids	ug/l	--	718000	--	836000	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	--	5000	--	--	--
Metals								
Arsenic	ug/l	100 [11]	1.9	--	<1.0	--	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**710**	--	**870**	--	--	--
Cadmium	ug/l	0.2 [11]	<0.10	--	<0.10	--	--	--
Calcium	ug/l	--	140000	--	190000	--	--	--
Chromium	ug/l	-- [13]	<5.0	--	<5.0	--	--	--
Cobalt	ug/l	0.9	**1.0**	--	**1.6**	--	--	--
Copper	ug/l	5	1.5	--	1.7	--	--	--
Iron	ug/l	300	**710**	--	**1000**	--	--	--
Lead	ug/l	-- [14]	<0.50	--	<0.50	--	--	--
Magnesium	ug/l	--	43000	--	59000	--	--	--
Manganese	ug/l	--	860	--	640	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	17000	--	17000	--	--	--
Sodium	ug/l	--	69000	--	79000	--	--	--
Zinc	ug/l	30 [11]	<5.0	--	6.1	--	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	--	**3.0**	--	--	--

Parameter	Unit	PWQO [1]	S5	S5	S5	S5	S5	S5
			24-May-2016 [19]	18-Aug-2016 [19]	16-Nov-2016 [19]	18-May-2017	28-Aug-2017 [19]	28-Nov-2017
			S-5	S5	S5	S-5	S5	S-5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	557000	--	724000
Ammonia, unionized	ug/l	20	--	--	--	<20	--	<20
Ammonia Nitrogen	ug/l	--	--	--	--	60	--	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	2000	--	<2000
Chemical Oxygen Demand	ug/l	--	--	--	--	41000	--	28000
Chloride	ug/l	--	--	--	--	24000	--	34000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	1139	--	1036
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	73000	--	76000
Dissolved Organic Carbon	ug/l	--	--	--	--	28400	--	66100
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	**3070**	--	**3620**
Hardness, Calcium Carbonate	ug/l	--	--	--	--	609000	--	730000
Nitrate as N	ug/l	--	--	--	--	<100	--	<100
Nitrite as N	ug/l	--	--	--	--	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	900	--	600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	--	--	--	7.32	--	6.66
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**70**	--	**60**
Sulphate	ug/l	--	--	--	--	111000	--	163000
Temperature (Field)	deg c	-- [10]	--	--	--	16.4	--	0.2
Total Dissolved Solids	ug/l	--	--	--	--	740000	--	888000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	--	235000	--	32000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	<5 [17]	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	**774**	--	**519**
Cadmium	ug/l	0.2 [11]	--	--	--	<0.5 [17]	--	<0.1
Calcium	ug/l	--	--	--	--	149000	--	183000
Chromium	ug/l	-- [13]	--	--	--	<5 [17]	--	6
Cobalt	ug/l	0.9	--	--	--	<2.5 [17]	--	**1.2**
Copper	ug/l	5	--	--	--	4.2	--	2.6
Iron	ug/l	300	--	--	--	<500 [17]	--	**1070**
Lead	ug/l	-- [14]	--	--	--	<0.5 [17]	--	0.8
Magnesium	ug/l	--	--	--	--	57600	--	66600
Manganese	ug/l	--	--	--	--	370	--	377
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	11800	--	12000
Sodium	ug/l	--	--	--	--	58300	--	66600
Zinc	ug/l	30 [11]	--	--	--	<25 [17]	--	11
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	<1	--	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S5	S5	S5	S5	S5	S5
			23-May-2018	30-Aug-2018 [19]	28-Nov-2018	20-Jun-2019 [19]	28-Aug-2019 [19]	21-Nov-2019 [19]
			S-5	S-5	S-5	S-5	S-5	S-5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	-- [5]	823000	--	320000	--	--	--
Ammonia, unionized	ug/l	20	<20	--	<20	--	--	--
Ammonia Nitrogen	ug/l	--	80	--	40	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	4000	--	--	--
Chemical Oxygen Demand	ug/l	--	33000	--	42000	--	--	--
Chloride	ug/l	--	23000	--	58000	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1373	--	842	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	157000	--	60500	--	--	--
Dissolved Organic Carbon	ug/l	--	11400	--	15400	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**2450**	--	8240	--	--	--
Hardness, Calcium Carbonate	ug/l	--	579000	--	423000	--	--	--
Nitrate as N	ug/l	--	<100	--	500	--	--	--
Nitrite as N	ug/l	--	<50	--	<50	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	800	--	1500	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.16	--	7.01	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	--	**190**	--	--	--
Sulphate	ug/l	--	40000	--	153000	--	--	--
Temperature (Field)	deg c	-- [10]	12.2	--	0.4	--	--	--
Total Dissolved Solids	ug/l	--	818000	--	558000	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	4000	--	11000	--	--	--
Metals								
Arsenic	ug/l	100 [11]	<1	--	1	--	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**706**	--	**399**	--	--	--
Cadmium	ug/l	0.2 [11]	**0.3**	--	<0.1	--	--	--
Calcium	ug/l	--	146000	--	118000	--	--	--
Chromium	ug/l	-- [13]	<1	--	2	--	--	--
Cobalt	ug/l	0.9	0.6	--	0.5	--	--	--
Copper	ug/l	5	<0.5	--	**8.8**	--	--	--
Iron	ug/l	300	**337**	--	284	--	--	--
Lead	ug/l	-- [14]	0.1	--	0.5	--	--	--
Magnesium	ug/l	--	51900	--	31400	--	--	--
Manganese	ug/l	--	308	--	16	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	8670	--	17800	--	--	--
Sodium	ug/l	--	54600	--	59200	--	--	--
Zinc	ug/l	30 [11]	7	--	13	--	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	--	--	--

Parameter	Unit	PWQO [1]	S8 18-May-1990	S8 27-Jun-1990	S8 04-Oct-1990	S8 06-Nov-1990	S8 27-Nov-1990	S8 25-Apr-1991	S8 08-Jun-1992
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	442000	720000	304000	235000	328000	360000	760000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	<100	<100	680	440	2000	2110	950
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	6000	1000	1000	2000	6000	1900
Chemical Oxygen Demand	ug/l	--	107000	336000	137000	116000	92000	164000	230000
Chloride	ug/l	--	200000	299000	161000	92000	50000	170000	268000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1888	1980	1302	687	1199	1482	2941
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	**143**
Dissolved Inorganic Carbon	ug/l	--	103000	255000	74000	43000	84000	95000	168200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12000	9950	500	8900	10080	10000	6900
Hardness, Calcium Carbonate	ug/l	--	565000	731000	374000	224000	344000	510000	797630
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	11000	960	1970	2730	2740	8500	240
Nitrite as N	ug/l	--	<100	1000	<100	50	<10	20	<100
Nitrogen, Total Kjeldahl	ug/l	--	6700	6900	1950	1210	3820	4800	5180
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	6600	6800	1270	770	1820	2690	4230
pH (Field)	-	8.5	8.24	8.19	8.45	8.04	8.1	8.06	7.93
Phosphate	ug/l	--	410	300	190	160	<100	<100	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	167000	133000	119000	48000	98000	173000	398000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	--	--	650000	340000	600000	740000	1936000
Total Organic Carbon	ug/l	--	40000	80000	22000	17000	21000	29000	28200
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	<1
Barium	ug/l	--	--	--	--	--	--	--	80
Boron	ug/l	200 [12]	--	--	--	--	--	--	**5300**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	127000	139000	95000	60000	85000	130000	144700
Chromium	ug/l	-- [13]	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**	**<20**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	<50	<50	<50	<50	<50	<50	<10
Iron	ug/l	300	**670**	**13640**	190	**910**	**2410**	**630**	**1500**
Lead	ug/l	-- [14]	<50	<50	<50	<50	<50	<50	**70**
Magnesium	ug/l	--	60000	93000	33000	18000	32000	46000	105900
Manganese	ug/l	--	300	980	80	170	580	290	920
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	<50	<50	<50	<50	<50	<50	<20
Potassium	ug/l	--	35500	52000	35000	15000	18000	1161000	35300
Selenium	ug/l	100	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--
Sodium	ug/l	--	202000	335000	188000	76000	132000	161000	329800
Zinc	ug/l	30 [11]	<50	**90**	<50	<50	<50	<50	<20
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<2	<2	<2	<2	**2**	**8**	<2

Parameter	Unit	PWQO [1]	S8 15-Nov-1993	S8 15-Jun-1994	S8 02-Nov-1994	S8 12-Jun-1996	S8 12-Oct-1996	S8 17-Jun-1997	S8 05-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	202000	326000	226000	260000	235000	229000	278000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	100	100	100	30	190	50	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1800	1900	2100	2000	1000	5000	1000
Chemical Oxygen Demand	ug/l	--	60100	38000	51000	31000	49000	63000	34000
Chloride	ug/l	--	288000	129000	56000	114000	147000	174000	210000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	890	1117	973	930	960	1415	2750
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	56000	--	54000	52300	46600	46600	43500
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10700	7780	12800	2000	7530	6090	7100
Hardness, Calcium Carbonate	ug/l	--	285000	285000	240000	269000	295000	348000	967000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	3980	100	1600	--	--	--	--
Nitrite as N	ug/l	--	20	--	10	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1030	3920	5320	960	750	2060	1210
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	930	3820	5220	930	--	--	--
pH (Field)	-	8.5	7.04	7.67	7.93	7.46	7.11	7.26	7.04
Phosphate	ug/l	--	180	190	320	120	140	220	110
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	96000	56000	156000	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	584000	559000	488000	470000	480000	710000	1400000
Total Organic Carbon	ug/l	--	10200	18100	8900	15300	11800	23400	14700
Total Suspended Solids	ug/l	--	--	--	--	3000	4000	42000	26000
Metals									
Aluminum, dissolved	ug/l	-- [39]	--	--	**2450**	--	--	--	--
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	58	142	136	90	**1360**	**2800**
Cadmium	ug/l	0.2 [11]	--	--	0.1	--	--	--	--
Calcium	ug/l	--	80000	76000	55000	70800	81700	85100	234000
Chromium	ug/l	-- [13]	**10**	**10**	**10**	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	3	3	**13.7**	4	3.9	0.5	**19**
Iron	ug/l	300	**1688**	**776**	**3717**	**360**	**460**	**1690**	**410**
Lead	ug/l	-- [14]	**8.2**	0.5	2.5	0.2	0.5	0.2	0.8
Magnesium	ug/l	--	21000	23000	24700	22100	21900	32400	91700
Manganese	ug/l	--	93	70	216	610	30	160	100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	**40**
Potassium	ug/l	--	10100	9100	10000	10100	13500	10200	20300
Selenium	ug/l	100	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	**3.4**	--	--	--	--
Sodium	ug/l	--	103000	121000	97000	100000	97100	163000	306000
Zinc	ug/l	30 [11]	21	28	10	10	10	10	**40**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	**2**	1	1	--	**43**	1

Parameter	Unit	PWQO [1]	S8 30-Oct-1998	S8 30-Jun-1999	S8 19-Oct-1999	S8 03-May-2000	S8 25-Oct-2000	S8 13-Jun-2001	S8 27-Sep-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	358000	662000	208000	537000	1090000	705000	375000
Ammonia, unionized	ug/l	20	10	--	--	10	--	<20	<20
Ammonia Nitrogen	ug/l	--	20	340	30	190	120	160	400
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	7000	1000	5000	--	1000	1000
Chemical Oxygen Demand	ug/l	--	40000	97000	38000	38000	--	38000	33000
Chloride	ug/l	--	165000	109000	171000	158000	326000	200000	259000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1390	499	1280	1590	2600	1650	2400
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	87400	101000	83200	74500	--	69100	91000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	8340	8150	7480	7250	3040	2600	4190
Hardness, Calcium Carbonate	ug/l	--	410000	387000	308000	438000	774000	480000	852000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	120	100	100
Nitrite as N	ug/l	--	--	--	--	--	100	--	--
Nitrogen, Total Kjeldahl	ug/l	--	840	2030	830	1100	1520	1210	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.1	8.2	7.5	7.28	7.51	7.4	7.39
Phosphate	ug/l	--	100	100	70	100	180	140	90
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	65000	87000	895000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	693000	251000	640000	800000	1480000	1110000	1930000
Total Organic Carbon	ug/l	--	12600	33500	18800	11000	--	17900	14000
Total Suspended Solids	ug/l	--	29000	19000	10000	56000	128000	53000	18000
Metals									
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	--	--	--	--	1	1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1010**	**2200**	**400**	**450**	**2500**	**1010**	**1400**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	99500	71400	79600	102000	152000	99300	194000
Chromium	ug/l	-- [13]	--	--	--	--	**10**	**10**	**20**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	3.4	3.3	0.5	**6.2**	**7.7**	2.5	**19**
Iron	ug/l	300	**2390**	**1110**	**340**	**2860**	**3870**	**2090**	**490**
Lead	ug/l	-- [14]	0.2	0.2	0.2	0.6	0.2	1.3	0.2
Magnesium	ug/l	--	38800	50000	26100	43900	95700	56400	89300
Manganese	ug/l	--	320	760	100	450	4940	1230	310
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20
Potassium	ug/l	--	11700	15700	12900	10000	14200	7600	14300
Selenium	ug/l	100	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--
Sodium	ug/l	--	184000	284000	177000	187000	367000	259000	360000
Zinc	ug/l	30 [11]	10	10	10	10	10	10	10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	**3**	1	**5**	**6**	**19**	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S8 21-Nov-2001	S8 22-May-2002	S8 12-Nov-2002	S8 31-May-2003	S8 03-Jul-2003	S8 22-Oct-2003	S8 17-May-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	342000	396000	228000	411000	612000	387000	470000
Ammonia, unionized	ug/l	20	<20	--	--	--	--	--	<10
Ammonia Nitrogen	ug/l	--	10	30	150	100	10	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	1000	1000	12000
Chemical Oxygen Demand	ug/l	--	23000	23000	42000	53000	67000	46000	86000
Chloride	ug/l	--	179000	110000	169000	122000	145000	131000	157000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1090	970	--	1250	1410	1310	1360
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	47900	46000	57000	112000	157000	98000	114000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	7200	10770	--	3610	940	7600	8200
Hardness, Calcium Carbonate	ug/l	--	327000	331000	292000	323000	350000	--	388000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	100	100	100	200	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	490	440	750	960	1220	830	2800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.84	7.04	--	7.7	7.55	7.99	7.4
Phosphate	ug/l	--	30	20	60	30	100	100	340
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	140000	77000	197000	90000	71000	143000	78000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	772000	642000	750000	750000	1020000	790000	680000
Total Organic Carbon	ug/l	--	12000	8000	18000	22000	34000	22000	13000
Total Suspended Solids	ug/l	--	14000	4000	4000	10000	3000	16000	112000
Metals									
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**320**	**370**	**290**	**340**	**422**	**421**	**298**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	76800	81900	71200	75900	79800	68600	91800
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	2	**10**	1
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	2.5	<1	**5.6**	5	2	**30**	5
Iron	ug/l	300	230	90	150	**320**	132	**1520**	278
Lead	ug/l	-- [14]	0.2	<1000	0.7	0.5	0.5	1.7	0.4
Magnesium	ug/l	--	32900	30600	27700	32400	36700	34800	38500
Manganese	ug/l	--	10	20	10	30	147	161	293
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	10	10	10
Potassium	ug/l	--	8300	9600	10100	10300	8500	13500	13100
Selenium	ug/l	100	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--
Sodium	ug/l	--	200000	152000	169000	166000	246000	178000	184000
Zinc	ug/l	30 [11]	10	10	10	10	5	13	5
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S8 21-Aug-2004	S8 18-Nov-2004	S8 25-May-2005	S8 09-Sep-2005 [19]	S8 09-Nov-2005	S8 24-May-2006	S8 15-Aug-2006 [19]
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	573000	--	500000	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	<5000	--	<5000	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	726000	462000	470000	--	410000	436000	--
Ammonia, unionized	ug/l	20	<10	<10	<20	--	<20	<20	--
Ammonia Nitrogen	ug/l	--	20	10	<10	--	30	50	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	2000	<3000	--	<3000	<3000	--
Chemical Oxygen Demand	ug/l	--	54000	31000	36000	--	25000	38000	--
Chloride	ug/l	--	166000	207000	161000	--	283000	102000	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1430	1260	1700	--	2700	625	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	127800	32300	122000	--	84800	93400	--
Dissolved Organic Carbon	ug/l	--	--	--	13600	--	12000	19200	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3200	--	6430	--	10100	11300	--
Hardness, Calcium Carbonate	ug/l	--	432000	375000	354000	--	470000	371000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	<10	--	**20**	--	--
Nitrate as N	ug/l	--	100	200	100	--	400	100	--
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	950	590	880	--	630	1070	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.4	7.1	7.3	--	7.6	7.2	--
Phosphate	ug/l	--	90	90	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	**90**	--	**90**	**210**	--
Sulphate	ug/l	--	21000	61000	28000	--	119000	69000	--
Temperature (Field)	deg c	-- [10]	--	--	12.9	--	0	5.5	--
Total Dissolved Solids	ug/l	--	715000	630000	771000	--	1060000	712000	--
Total Organic Carbon	ug/l	--	17200	9700	--	--	--	--	--
Total Suspended Solids	ug/l	--	19000	68000	11000	--	98000	122000	--
Metals									
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	2	1	<1	--	<1	<1	--
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**388**	155	**225**	--	181	**284**	--
Cadmium	ug/l	0.2 [11]	--	--	<0.1	--	<0.5	<0.1	--
Calcium	ug/l	--	101000	87600	86200	--	123000	89500	--
Chromium	ug/l	-- [13]	4	7	6	--	**17**	**30**	--
Cobalt	ug/l	0.9	--	--	**14**	--	**5**	**4.9**	--
Copper	ug/l	5	**81**	**57**	5	--	**12**	**25**	--
Iron	ug/l	300	**1030**	**3010**	**2330**	--	**7270**	**14300**	--
Lead	ug/l	-- [14]	3.2	0.8	0.3	--	3.5	**5.7**	--
Magnesium	ug/l	--	43600	38100	33800	--	39900	35800	--
Manganese	ug/l	--	62	430	335	--	458	782	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	<0.05	--	<0.06	--	--
Molybdenum	ug/l	40	--	--	1.1	--	<5	--	--
Nickel	ug/l	25	**60**	10	<10	--	<10	--	--
Potassium	ug/l	--	11300	10400	15100	--	18800	17900	--
Selenium	ug/l	100	--	--	<1	--	<1	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--
Sodium	ug/l	--	286000	203000	178000	--	252000	138000	--
Zinc	ug/l	30 [11]	**195**	**31**	7	--	23	**52**	--
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	<1	--	<1	<1	--

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Parameter	Unit	PWQO [1]	S8 16-Nov-2006	S8 08-May-2007	S8 22-Aug-2007 [19]	S8 20-Nov-2007	S8 23-May-2008	S8 12-Aug-2008 [19]	S8 06-Nov-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	338000	486000	--	310000	260000	--	320000
Ammonia, unionized	ug/l	20	<20	<20	--	<20	<20	--	<20
Ammonia Nitrogen	ug/l	--	<10	20	--	<10	<10	--	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	--	3000	<3000	--	<3000
Chemical Oxygen Demand	ug/l	--	32000	80000	--	31000	40000	--	27000
Chloride	ug/l	--	39600	95900	--	206000	109000	--	172000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	600	800	--	900	800	--	925
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	84500	122000	--	80600	61500	--	73700
Dissolved Organic Carbon	ug/l	--	12700	11100	--	13900	8900	--	6300
Dissolved Oxygen (Field)	ug/l	-- [7]	8300	5760	--	11090	8410	--	8660
Hardness, Calcium Carbonate	ug/l	--	307000	361000	--	329000	232000	--	321000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	500	200	--	100	100	--	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	910	840	--	600	1140	--	550
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.9	7.8	--	8.3	7.8	--	8.1
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**140**	**810**	--	**130**	**140**	--	**70**
Sulphate	ug/l	--	98000	37000	--	119000	46000	--	84000
Temperature (Field)	deg c	-- [10]	7.1	10.5	--	0.4	10.5	--	5.4
Total Dissolved Solids	ug/l	--	554000	734000	--	802000	501000	--	713000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	47000	236000	--	8000	<3000	--	10000
Metals									
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	2	--	1.3	1.7	--	1.2
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**319**	**218**	--	121	97	--	120
Cadmium	ug/l	0.2 [11]	<0.5	0.1	--	<0.1	<0.1	--	<0.1
Calcium	ug/l	--	80000	85300	--	82800	63500	--	87400
Chromium	ug/l	-- [13]	**12**	**22**	--	<2	<2	--	4
Cobalt	ug/l	0.9	**1**	**6.1**	--	0.9	<0.5	--	**2.2**
Copper	ug/l	5	**47**	**37**	--	**10**	4	--	5
Iron	ug/l	300	**2240**	**14400**	--	**1020**	**390**	--	**1350**
Lead	ug/l	-- [14]	2	**5.8**	--	1.8	<0.1	--	0.7
Magnesium	ug/l	--	26000	35900	--	29800	17800	--	25000
Manganese	ug/l	--	170	2320	--	54	21	--	39
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	13700	14900	--	13100	7000	--	9500
Selenium	ug/l	100	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--
Sodium	ug/l	--	89300	156000	--	164000	100000	--	140000
Zinc	ug/l	30 [11]	27	**58**	--	19	<5	--	<5
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	--	<1	<1	--	<1

Parameter	Unit	PWQO [1]	S8	S8	S8	S8	S8	S8
			13-May-2009	25-Aug-2009 [19]	27-Nov-2009	18-May-2010 [19]	18-Aug-2010 [19]	14-Oct-2010
			S-1	S8	S-1	S8	-	S-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	290000	--	333000	--	--	455000
Ammonia, unionized	ug/l	20	<20	--	<20	--	--	<20
Ammonia Nitrogen	ug/l	--	<20	--	20	--	--	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	--	<1000	--	--	1000
Chemical Oxygen Demand	ug/l	--	33000	--	28000	--	--	30000
Chloride	ug/l	--	101000	--	54000	--	--	121000
Conductivity	uS/cm	--	943	--	1040	--	--	1380
Conductivity (Field)	uS/cm	--	750	--	912	--	--	1342
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	70100	--	102000	--	--	109000
Dissolved Organic Carbon	ug/l	--	12700	--	11800	--	--	13100
Dissolved Oxygen (Field)	ug/l	-- [7]	8130	--	10100	--	--	12590
Hardness, Calcium Carbonate	ug/l	--	266000	--	235000	--	--	367000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	--	--	<100
Nitrite as N	ug/l	--	<100	--	<100	--	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	570	--	530	--	--	530
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.5	--	7.9	--	--	6.73
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	--	50	--	--	90
Sulphate	ug/l	--	48000	--	64000	--	--	114000
Temperature (Field)	deg c	-- [10]	10	--	5.1	--	--	8.1
Total Dissolved Solids	ug/l	--	613000	--	676000	--	--	897000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	4000	--	11000	--	--	8000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	<1	--	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	110	--	150	--	--	220
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.1	--	--	<0.1
Calcium	ug/l	--	72000	--	61000	--	--	96000
Chromium	ug/l	-- [13]	4	--	6	--	--	7
Cobalt	ug/l	0.9	0.3	--	0.5	--	--	0.4
Copper	ug/l	5	3	--	4	--	--	4
Iron	ug/l	300	220	--	530	--	--	330
Lead	ug/l	-- [14]	<1	--	<1	--	--	<1
Magnesium	ug/l	--	21000	--	20000	--	--	31000
Manganese	ug/l	--	10	--	80	--	--	40
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	8000	--	8000	--	--	10000
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	107000	--	109000	--	--	139000
Zinc	ug/l	30 [11]	<10	--	<10	--	--	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	--	--	<1

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Parameter	Unit	PWQO [1]	S8	S8	S8	S8	S8	S8
			19-May-2011	16-Aug-2011 [19]	30-Nov-2011 [21]	30-May-2012	22-Aug-2012 [19]	29-Nov-2012 [37]
			W-3	S-8	S8	S 8	S-8	S8
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	422000	--	134000	460000	--	--
Ammonia, unionized	ug/l	20	<20	--	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	<20	--	<20	<50	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	--	2000	3000	--	--
Chemical Oxygen Demand	ug/l	--	35000	--	25000	61000	--	--
Chloride	ug/l	--	62000	--	58000	83000	--	--
Conductivity	uS/cm	--	1020	--	737	--	--	--
Conductivity (Field)	uS/cm	--	982	--	722	1080	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	95800	--	27600	110000	--	--
Dissolved Organic Carbon	ug/l	--	15000	--	7800	17000	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**3000**	--	8990	**2220**	--	--
Hardness, Calcium Carbonate	ug/l	--	323000	--	210000	320000	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	890	<100	--	--
Nitrite as N	ug/l	--	<100	--	<100	<10	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1100	--	480	1800	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	<100	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.72	--	7.59	7.10	--	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	--	**80**	**300**	--	--
Sulphate	ug/l	--	47000	--	124000	54000	--	--
Temperature (Field)	deg c	-- [10]	12.8	--	5.5	16.2	--	--
Total Dissolved Solids	ug/l	--	663000	--	479000	664000	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	25000	--	24000	78000	--	--
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	<50	1.2	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**210**	--	100	**280**	--	--
Cadmium	ug/l	0.2 [11]	<0.1	--	<10	<0.10	--	--
Calcium	ug/l	--	80000	--	56000	87000	--	--
Chromium	ug/l	-- [13]	4	--	**<50**	8.1	--	--
Cobalt	ug/l	0.9	0.5	--	<10	**2.3**	--	--
Copper	ug/l	5	4	--	<10	**9.5**	--	--
Iron	ug/l	300	**440**	--	**2000**	**3300**	--	--
Lead	ug/l	-- [14]	<1	--	<10	1.3	--	--
Magnesium	ug/l	--	30000	--	17000	31000	--	--
Manganese	ug/l	--	30	--	30	1800	--	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	10000	--	10000	11000	--	--
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	107000	--	69000	150000	--	--
Zinc	ug/l	30 [11]	<10	--	<50	16	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1.0	--	--

Parameter	Unit	PWQO [1]	S8	S8	S8	S8	S8	S8	S8
			28-May-2013	15-Aug-2013 [19]	21-Nov-2013	28-May-2014	26-Aug-2014 [19]	13-Nov-2014	27-May-2015
			S8	S8	SA-7	S8	S8	S-8	S-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	360000	--	280000	410000	--	400000	455000
Ammonia, unionized	ug/l	20	<20	--	<20	<20	--	<20	<20
Ammonia Nitrogen	ug/l	--	110	--	<50	<50	--	<50	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	2000	<2000	--	<2000	<2000
Chemical Oxygen Demand	ug/l	--	52000	--	66000	42000	--	31000	28000
Chloride	ug/l	--	120000	--	140000	130000	--	130000	129000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1015	--	1254	1143	--	1222	1244
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	81000	--	70000	95000	--	93000	110000
Dissolved Organic Carbon	ug/l	--	13000	--	10000	13000	--	10000	16700
Dissolved Oxygen (Field)	ug/l	-- [7]	**5500**	--	11100	**2570**	--	10220	**2950**
Hardness, Calcium Carbonate	ug/l	--	290000	--	340000	320000	--	330000	263000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	<100	<100
Nitrite as N	ug/l	--	<10	--	<10	<10	--	<10	<50
Nitrogen, Total Kjeldahl	ug/l	--	1600	--	2200	1700	--	720	900
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	<100	<100	--	<100	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.26	--	6.48	6.06	--	6.36	7.98
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**210**	--	**290**	**210**	--	**93**	**90**
Sulphate	ug/l	--	38000	--	180000	49000	--	68000	47000
Temperature (Field)	deg c	-- [10]	9.3	--	0.2	13.2	--	2.7	16.2
Total Dissolved Solids	ug/l	--	632000	--	818000	720000	--	698000	698000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	500000	--	130000	9000	--	4000	9000
Metals									
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	1.3	--	<1.0	<1.0	--	<1.0	<1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	140	--	150	**210**	--	140	**235**
Cadmium	ug/l	0.2 [11]	<0.10	--	<0.10	<0.10	--	<0.10	<0.1
Calcium	ug/l	--	81000	--	94000	86000	--	87000	61800
Chromium	ug/l	-- [13]	**11**	--	<5.0	<5.0	--	<5.0	<1
Cobalt	ug/l	0.9	**3.6**	--	<0.50	<0.50	--	<0.50	<0.5
Copper	ug/l	5	**25**	--	**5.1**	3.7	--	3.6	<0.5
Iron	ug/l	300	**5800**	--	**670**	**410**	--	**590**	<100
Lead	ug/l	-- [14]	3.1	--	<0.50	<0.50	--	<0.50	<0.1
Magnesium	ug/l	--	29000	--	34000	30000	--	34000	26400
Manganese	ug/l	--	1700	--	110	120	--	46	40
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	10000	--	9600	10000	--	9600	9220
Selenium	ug/l	100	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--
Sodium	ug/l	--	140000	--	150000	160000	--	150000	149000
Zinc	ug/l	30 [11]	**33**	--	5.2	<5.0	--	6.3	<5
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	--	<1.0	<1.0	--	**1.8**	<1

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Parameter	Unit	PWQO [1]	S8 25-Aug-2015 [19] S-8	S8 25-Nov-2015 [19] S8	S8 24-May-2016 S-8	S8 18-Aug-2016 [19] S8	S8 16-Nov-2016 S-8	S8 18-May-2017 S-8
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	457000	--	304000	408000
Ammonia, unionized	ug/l	20	--	--	<20	--	<20	<20
Ammonia Nitrogen	ug/l	--	--	--	160	--	80	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	64000	--	7000	15000
Chemical Oxygen Demand	ug/l	--	--	--	321000	--	39000	105000
Chloride	ug/l	--	--	--	120000	--	133000	94000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1180	--	1283	1076
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	88200	--	55000	53600
Dissolved Organic Carbon	ug/l	--	--	--	23400	--	15600	29000
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	**2170**	--	8240	**2090**
Hardness, Calcium Carbonate	ug/l	--	--	--	369000	--	278000	319000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	<100	--	<100	<100
Nitrite as N	ug/l	--	--	--	<50	--	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	--	--	8100	--	800	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	--	--	7.16	--	7.75	7.10
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	**1190**	--	**270**	**180**
Sulphate	ug/l	--	--	--	62000	--	149000	63000
Temperature (Field)	deg c	-- [10]	--	--	12.5	--	4.6	17.6
Total Dissolved Solids	ug/l	--	--	--	754000	--	716000	626000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	674000	--	112000	159000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	--	2	--	<1	<5 [17]
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	**316**	--	**208**	**357**
Cadmium	ug/l	0.2 [11]	--	--	0.2	--	<0.1	<0.5 [17]
Calcium	ug/l	--	--	--	87200	--	68700	76400
Chromium	ug/l	-- [13]	--	--	**26**	--	2	<5 [17]
Cobalt	ug/l	0.9	--	--	**6.2**	--	<0.5	<2.5 [17]
Copper	ug/l	5	--	--	**24.9**	--	**5.6**	**6.4**
Iron	ug/l	300	--	--	**10900**	--	**308**	**686**
Lead	ug/l	-- [14]	--	--	**5.2**	--	0.2	<0.5 [17]
Magnesium	ug/l	--	--	--	36700	--	25900	31300
Manganese	ug/l	--	--	--	3160	--	66	168
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	--	11900	--	11000	10900
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	--	--	168000	--	149000	102000
Zinc	ug/l	30 [11]	--	--	**84**	--	10	<25 [17]
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	**13**	--	**12**	<1

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Parameter	Unit	PWQO [1]	S8	S8	S8	S8	S8	S8
			28-Aug-2017 [19]	28-Nov-2017 [38]	23-May-2018	30-Aug-2018 [19]	28-Nov-2018	20-Jun-2019
			S8	S-8	S-8	S-8	S-8	S-8
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	482000	--	377000	395000
Ammonia, unionized	ug/l	20	--	--	<20	--	<20	<20
Ammonia Nitrogen	ug/l	--	--	--	40	--	50	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	<2000	--	2000	5000
Chemical Oxygen Demand	ug/l	--	--	--	67000	--	31000	78000
Chloride	ug/l	--	--	--	85000	--	91000	105000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1048	--	955	1003
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	98000	--	72700	78600
Dissolved Organic Carbon	ug/l	--	--	--	12700	--	12100	11200
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	**2650**	--	14740	**1510**
Hardness, Calcium Carbonate	ug/l	--	--	--	286000	--	327000	347000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	<100	--	400	<100
Nitrite as N	ug/l	--	--	--	<50	--	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	--	--	900	--	700	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	--	--	7.53	--	6.91	6.14
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	**100**	--	**140**	**230**
Sulphate	ug/l	--	--	--	25000	--	99000	24000
Temperature (Field)	deg c	-- [10]	--	--	11.8	--	2.9	17.4
Total Dissolved Solids	ug/l	--	--	--	598000	--	596000	560000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	27000	--	4000	9000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	--	<1	--	<1	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	**261**	--	136	143
Cadmium	ug/l	0.2 [11]	--	--	<0.1	--	<0.1	<0.1
Calcium	ug/l	--	--	--	71200	--	73700	88100
Chromium	ug/l	-- [13]	--	--	<1	--	1	<1
Cobalt	ug/l	0.9	--	--	<0.5	--	<0.5	0.8
Copper	ug/l	5	--	--	1.4	--	**5.3**	2.4
Iron	ug/l	300	--	--	109	--	248	108
Lead	ug/l	-- [14]	--	--	0.1	--	0.1	<0.1
Magnesium	ug/l	--	--	--	26300	--	34800	30700
Manganese	ug/l	--	--	--	387	--	13	3890
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	--	7670	--	11200	9440
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	--	--	115000	--	122000	122000
Zinc	ug/l	30 [11]	--	--	5	--	10	<5
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	<1	--	<1	<1

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Parameter	Unit	PWQO [1]	S8	S8
			28-Aug-2019 [19]	21-Nov-2019
			S-8	S-8
General Chemistry				
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	229000
Ammonia, unionized	ug/l	20	--	<20
Ammonia Nitrogen	ug/l	--	--	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	<30000 [25]
Chemical Oxygen Demand	ug/l	--	--	122000
Chloride	ug/l	--	--	176000
Conductivity	uS/cm	--	--	--
Conductivity (Field)	uS/cm	--	--	1271
Cyanide	ug/l	5 [6]	--	--
Dissolved Inorganic Carbon	ug/l	--	--	<500
Dissolved Organic Carbon	ug/l	--	--	10500
Dissolved Oxygen (Field)	ug/l	-- [7]	--	7540
Hardness, Calcium Carbonate	ug/l	--	--	351000
Hydrogen Sulfide	ug/l	2 [8]	--	--
Nitrate as N	ug/l	--	--	<100
Nitrite as N	ug/l	--	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	--	1400
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--
Nitrogen, Organic	ug/l	--	--	--
pH (Field)	-	8.5	--	7.33
Phosphate	ug/l	--	--	--
Phosphorus	ug/l	-- [9]	--	**240**
Sulphate	ug/l	--	--	139000
Temperature (Field)	deg c	-- [10]	--	8.3
Total Dissolved Solids	ug/l	--	--	650000
Total Organic Carbon	ug/l	--	--	--
Total Suspended Solids	ug/l	--	--	245000
Metals				
Aluminum, dissolved	ug/l	-- [39]	--	--
Arsenic	ug/l	100 [11]	--	<1
Barium	ug/l	--	--	--
Boron	ug/l	200 [12]	--	93
Cadmium	ug/l	0.2 [11]	--	<0.1
Calcium	ug/l	--	--	83800
Chromium	ug/l	-- [13]	--	**10**
Cobalt	ug/l	0.9	--	**4.0**
Copper	ug/l	5	--	**10.5**
Iron	ug/l	300	--	**3790**
Lead	ug/l	-- [14]	--	1.9
Magnesium	ug/l	--	--	34400
Manganese	ug/l	--	--	3180
Mercury, dissolved	ug/l	0.2 [15]	--	--
Molybdenum	ug/l	40	--	--
Nickel	ug/l	25	--	--
Potassium	ug/l	--	--	9730
Selenium	ug/l	100	--	--
Silver	ug/l	0.1	--	--
Sodium	ug/l	--	--	120000
Zinc	ug/l	30 [11]	--	25
Phenols				
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1

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Parameter	Unit	PWQO [1]	S9 27-Mar-1990	S9 16-Apr-1990	S9 27-Jun-1990	S9 31-Jul-1990	S9 27-Aug-1990	S9 04-Oct-1990	S9 06-Nov-1990
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	608000	294000	532000	561000	594000	215000	154000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4090	2200	100	4550	3130	800	320
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	3000	4000	3000	4000	2000	2000
Chemical Oxygen Demand	ug/l	--	112000	62000	287000	95000	160000	67000	137000
Chloride	ug/l	--	123000	83000	163000	204000	216000	81000	43000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1528	951	858	1877	1699	814	457
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	137000	421000	199000	185000	132000	53000	56000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3000	7400	5050	6150	6160	8840	10300
Hardness, Calcium Carbonate	ug/l	--	774000	424000	626000	625000	505000	293000	168000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	4160	11000	2000	1650	5160	3000	3620
Nitrite as N	ug/l	--	330	100	2900	100	100	100	50
Nitrogen, Total Kjeldahl	ug/l	--	5030	5700	270	4720	4970	2340	2420
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	940	3500	170	170	1840	1540	2100
pH (Field)	-	8.5	7.9	7.47	7.92	7.93	8.05	8.2	7.82
Phosphate	ug/l	--	390	280	180	120	400	160	200
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	160000	86000	70000	97000	63000	72000	42000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	--	--	--	--	850000	400000	250000
Total Organic Carbon	ug/l	--	28000	20000	39000	35000	31000	18000	17000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	247000	135000	181000	176000	128000	86000	44000
Chromium	ug/l	-- [13]	**50**	**50**	**50**	**50**	**50**	**50**	**50**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	**50**	**50**	**50**	**50**	**50**	**50**	**50**
Iron	ug/l	300	**1720**	**1300**	**1280**	**1340**	**3860**	**720**	**4380**
Lead	ug/l	-- [14]	**170**	**50**	**50**	**70**	**50**	**50**	**50**
Magnesium	ug/l	--	38000	21000	42000	45000	45000	19000	14000
Manganese	ug/l	--	920	400	660	740	530	50	170
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	**50**	**50**	**50**	**50**	**50**	**50**	**50**
Potassium	ug/l	--	23000	13000	23000	24000	24000	23000	12000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	101000	60000	136000	168000	155000	97000	32000
Zinc	ug/l	30 [11]	**130**	**50**	**50**	**50**	**50**	**50**	**50**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**20**	**2**	**2**	**14**	**2**	**2**	**2**

Parameter	Unit	PWQO [1]	S9 17-Nov-1990	S9 27-Nov-1990	S9 24-Apr-1991	S9 29-Nov-1991	S9 08-Jun-1992	S9 08-Jun-1993	S9 04-Nov-1993
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	1134000	234000	420000	266000	1124000	151000	485000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	1380	1300	3440	300	13940	100	3200
Biochemical Oxygen Demand, 5 Day	ug/l	--	9000	2000	5000	6000	4800	2000	3700
Chemical Oxygen Demand	ug/l	--	76000	56000	94000	30000	180000	26000	108000
Chloride	ug/l	--	186000	69000	196000	224000	243000	220000	221000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	48.2	1090	1304	1145	2850	929	1378
Cyanide	ug/l	5 [6]	--	--	--	--	**123**	--	--
Dissolved Inorganic Carbon	ug/l	--	194000	62000	118000	--	259700	41000	126000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	9300	7000	6600	10000	9500
Hardness, Calcium Carbonate	ug/l	--	7940	278000	450000	349000	853220	198000	474000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	16340	2200	26100	--	240	660	7690
Nitrite as N	ug/l	--	100	10	1700	--	100	100	100
Nitrogen, Total Kjeldahl	ug/l	--	7080	1960	6500	1400	19710	750	5690
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	2090	--	--	--
Nitrogen, Organic	ug/l	--	5700	660	3060	1100	5770	650	2490
pH (Field)	-	8.5	7.48	8.1	7.86	7.8	7.72	**8.57**	7.74
Phosphate	ug/l	--	260	100	100	200	100	120	180
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	115000	47000	213000	128000	130000	55900	86000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	--	550000	650000	--	1853000	560000	816000
Total Organic Carbon	ug/l	--	51100	16000	25000	--	48100	11800	26200
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	1	--	--
Barium	ug/l	--	--	--	--	--	210	--	--
Boron	ug/l	200 [12]	--	--	--	--	**7450**	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	234000	80000	147000	100400	210400	51000	124000
Chromium	ug/l	-- [13]	**10**	**50**	**50**	**10**	**20**	**59**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	**140**	**50**	**50**	**30**	**10**	5	**6**
Iron	ug/l	300	**3900**	**3930**	**1200**	**310**	**3900**	**2111**	**2734**
Lead	ug/l	-- [14]	**9**	**50**	**50**	2	**70**	**19**	**10.8**
Magnesium	ug/l	--	50800	19000	20000	23800	79500	17000	39800
Manganese	ug/l	--	1450	320	410	170	1790	76	429
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	7	**50**	**50**	**50**	20	20	20
Potassium	ug/l	--	35500	12000	108000	9400	42800	10000	18900
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	179000	129000	108000	114000	263800	106000	128000
Zinc	ug/l	30 [11]	**110**	**50**	**50**	10	**40**	18	**49**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**9**	**2**	**33**	**2**	**17**	**2**	**3**

Parameter	Unit	PWQO [1]	S9 15-Jun-1994	S9 02-Nov-1994	S9 28-Jun-1995	S9 14-Nov-1995	S9 12-Jun-1996	S9 12-Oct-1996	S9 17-Jun-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	861000	84000	1380000	229000	464000	395000	187000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	290	10	1010	40	940	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	10200	4100	2000	5000	2000	11000	3000
Chemical Oxygen Demand	ug/l	--	131000	64000	172000	50000	26000	63000	28000
Chloride	ug/l	--	107000	43000	94500	157000	99000	140000	115000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2440	478	792	910	780	1270	7.76
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	20000	321000	6400	44000	87800	35100
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	11280	12150	10660	--	10390	9410	8920
Hardness, Calcium Carbonate	ug/l	--	628000	141000	1070000	277000	230000	441000	236000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	340	4000	100	1500	--	--	--
Nitrite as N	ug/l	--	--	100	100	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	12900	4480	17000	5500	710	3980	1170
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	12900	4190	16990	4490	670	--	--
pH (Field)	-	8.5	8.09	7.96	7.56	7.92	7.25	7.63	7.71
Phosphate	ug/l	--	120	500	100	200	120	170	260
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	100000	56000	64000	77600	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1230000	240000	474000	460000	390000	640000	389000
Total Organic Carbon	ug/l	--	43800	15000	70000	66200	12400	24200	14300
Total Suspended Solids	ug/l	--	--	--	--	116000	36000	20000	126000
Metals									
Arsenic	ug/l	100 [11]	--	--	100	--	--	--	--
Barium	ug/l	--	--	--	43	--	--	--	--
Boron	ug/l	200 [12]	**4509**	**213**	11	**770**	200	**2360**	**320**
Cadmium	ug/l	0.2 [11]	--	0.1	0.1	0.1	--	--	--
Calcium	ug/l	--	145000	37000	70000	73200	63600	108000	53800
Chromium	ug/l	-- [13]	**10**	**10**	**14**	**10**	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	**16.6**	4.8	4.2	5	**6.1**	2.8	0.5
Iron	ug/l	300	**1815**	**1211**	**659**	**2650**	**1080**	**1030**	**3970**
Lead	ug/l	-- [14]	1.6	1.2	0.8	0.8	0.2	0.3	0.2
Magnesium	ug/l	--	64500	11500	20400	22500	17100	41200	18400
Manganese	ug/l	--	242	74	36	210	54	140	150
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	**30**	20
Potassium	ug/l	--	39800	9500	10800	15700	11000	16000	5400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	240000	29000	46000	82200	78000	130000	83700
Zinc	ug/l	30 [11]	**44**	14	10	20	10	10	20
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	**10**	1	--	1	--	**4**

Parameter	Unit	PWQO [1]	S9 05-Nov-1997	S9 05-Jun-1998	S9 28-Aug-1998	S9 30-Oct-1998	S9 30-Jun-1999	S9 19-Oct-1999	S9 03-May-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	254000	688000	114000	254000	370000	256000	293000
Ammonia, unionized	ug/l	20	--	--	--	10	--	--	10
Ammonia Nitrogen	ug/l	--	10	70	60	10	20	10	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	3000	3000	1000	1000	1000	3000
Chemical Oxygen Demand	ug/l	--	19000	142000	36000	39000	71000	32000	32000
Chloride	ug/l	--	172000	362000	37300	114000	219000	198000	162000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1310	2350	390	890	1410	1310	1100
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	51000	137000	23900	46900	47700	68900	31300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12360	12460	8520	13440	11360	11620	19920
Hardness, Calcium Carbonate	ug/l	--	302000	618000	132000	325000	354000	350000	286000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	770	3950	1180	860	1150	580	780
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	8.03	--	7.88	7.8	8.1	8.2	7.98
Phosphate	ug/l	--	50	120	380	60	70	40	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	650000	1166000	200000	450000	710000	650000	650000
Total Organic Carbon	ug/l	--	11400	39200	10000	14700	22300	10300	10000
Total Suspended Solids	ug/l	--	24000	15000	180000	5000	6000	16000	22000
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**400**	**5210**	**390**	**760**	**2370**	**570**	**380**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	80400	114000	36700	70000	77300	92500	73300
Chromium	ug/l	-- [13]	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	**12.4**	**5.9**	4.2	3.1	2.4	0.5	**8.2**
Iron	ug/l	300	**450**	**380**	**2450**	**790**	220	**640**	**310**
Lead	ug/l	-- [14]	0.2	0.2	0.5	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	24300	80800	9670	36100	38700	28500	24600
Manganese	ug/l	--	40	40	50	20	40	30	130
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	**30**	20	20	20	10	20	20
Potassium	ug/l	--	8900	19600	4900	6500	14500	13300	7800
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	124000	305000	37800	97400	198000	162000	124000
Zinc	ug/l	30 [11]	10	**80**	**80**	10	**60**	20	10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	1	1	1	1	1	**4**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 25-Oct-2000	S9 13-Jun-2001	S9 27-Sep-2001	S9 21-Nov-2001	S9 22-May-2002	S9 08-Nov-2002	S9 31-May-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	370000	245000	126000	179000	183000	243000	162000
Ammonia, unionized	ug/l	20	--	<20	<20	<20	--	--	--
Ammonia Nitrogen	ug/l	--	10	10	40	10	40	10	200
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	1000	1000	1000	1000	1000	1000
Chemical Oxygen Demand	ug/l	--	--	32000	11000	29000	34000	26000	43000
Chloride	ug/l	--	248000	239000	82500	104000	110000	305000	77000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1550	1300	1160	610	620	1450	660
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	31900	30200	25100	24000	64000	37000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10300	13200	9930	13350	10230	9200	8220
Hardness, Calcium Carbonate	ug/l	--	417000	334000	439000	248000	261000	402000	195000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	10	100	1600	700	200	300	300
Nitrite as N	ug/l	--	500	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	740	760	640	670	640	640	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.81	8.4	8.1	7.53	7.39	--	7.7
Phosphate	ug/l	--	70	30	90	40	20	90	40
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	116000	173000	435000	85000	51000	116000	64000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	858000	798000	910000	492000	416000	725000	389000
Total Organic Carbon	ug/l	--	--	13100	7800	14000	9000	10000	17000
Total Suspended Solids	ug/l	--	49000	5000	29000	17000	4000	56000	3000
Metals									
Arsenic	ug/l	100 [11]	--	1	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1430**	**760**	**940**	80	90	80	70
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	95700	77700	112000	71800	76500	119000	53200
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	**11**	3	**7**	2.9	<1	**5.7**	3
Iron	ug/l	300	**2340**	120	20	**530**	200	**1910**	290
Lead	ug/l	-- [14]	0.2	0.8	0.2	0.2	<1	3.1	0.5
Magnesium	ug/l	--	43300	34100	38700	16600	17100	25500	13800
Manganese	ug/l	--	120	20	970	10	30	60	10
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20
Potassium	ug/l	--	8900	6200	10000	5200	3300	9000	5400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	159000	180000	123000	65900	75300	173000	61700
Zinc	ug/l	30 [11]	10	10	10	10	10	20	10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	**15**	1	1	1	1	1

Parameter	Unit	PWQO [1]	S9 03-Jul-2003	S9 22-Oct-2003	S9 17-May-2004	S9 21-Aug-2004	S9 18-Nov-2004	S9 25-May-2005	S9 09-Sep-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	276000	343000
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	<5000	<5000
Alkalinity (Total as CaCO3)	ug/l	-- [5]	237000	142000	241000	291000	240000	226000	281000
Ammonia, unionized	ug/l	20	--	--	<10	<10	<10	<20	<20
Ammonia Nitrogen	ug/l	--	10	30	10	10	10	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	1000	1000	1000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	22000	31000	42000	30000	21000	35000	33000
Chloride	ug/l	--	124000	84600	176000	198000	152000	128000	191000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1600	820	1030	1070	820	1200	860
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	56000	34000	55500	30500	22300	54200	67400
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	11700	79400
Dissolved Oxygen (Field)	ug/l	-- [7]	6880	9100	8800	10800	7200	11800	8400
Hardness, Calcium Carbonate	ug/l	--	809000	--	299000	330000	261000	264000	354000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	<10	<10
Nitrate as N	ug/l	--	100	800	100	100	300	600	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	650	1720	640	540	350	690	570
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.6	8.1	7.7	8.3	7.5	7.7	8.1
Phosphate	ug/l	--	40	110	30	40	30	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	**40**	20
Sulphate	ug/l	--	840000	173000	49000	50000	95000	53000	53000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	21.9	20
Total Dissolved Solids	ug/l	--	1630000	503000	515000	535000	410000	509000	656000
Total Organic Carbon	ug/l	--	14000	15000	10500	9700	6800	--	--
Total Suspended Solids	ug/l	--	8000	21000	7000	6000	4000	6000	<3000
Metals									
Arsenic	ug/l	100 [11]	1	1	1	1	1	<1	2
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**292**	67	84	166	127	94	113
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.3	<0.1
Calcium	ug/l	--	229000	77200	86100	97800	73100	74600	104000
Chromium	ug/l	-- [13]	2	8	2	2	2	<2	<2
Cobalt	ug/l	0.9	--	--	--	--	--	**30**	0.5
Copper	ug/l	5	2	**35**	3	3	3	2	3
Iron	ug/l	300	**378**	**1190**	291	**543**	**630**	**337**	128
Lead	ug/l	-- [14]	0.5	1.9	0.3	0.3	0.6	<0.6	<0.5
Magnesium	ug/l	--	57500	18700	20400	20900	19000	18800	22900
Manganese	ug/l	--	22	28	63	22	48	17	4
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	<0.05	<0.06
Molybdenum	ug/l	40	--	--	--	--	--	20	2
Nickel	ug/l	25	10	10	10	10	10	<10	<10
Potassium	ug/l	--	17600	9300	5600	6700	6500	6400	8900
Selenium	ug/l	100	--	--	--	--	--	<1	1
Sodium	ug/l	--	182000	59100	115000	154000	117000	95800	117000
Zinc	ug/l	30 [11]	5	9	5	5	5	**33**	15
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	<1	<1

Parameter	Unit	PWQO [1]	S9 09-Nov-2005	S9 24-May-2006	S9 15-Aug-2006	S9 16-Nov-2006	S9 08-May-2007	S9 22-Aug-2007	S9 20-Nov-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	339000	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	<5000	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	278000	168000	274000	130000	226000	366000	250000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	20	10	<10	90	<10	730	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	<3000	<3000	5000	9000
Chemical Oxygen Demand	ug/l	--	35000	41000	34000	23000	29000	51000	25000
Chloride	ug/l	--	140000	101000	233000	25000	140000	200000	173000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	500	480	1270	310	800	1250	800
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	56500	35800	65800	32500	54200	87600	168000
Dissolved Organic Carbon	ug/l	--	9500	16200	16500	12200	9000	19400	10300
Dissolved Oxygen (Field)	ug/l	-- [7]	9100	11340	**1800**	9270	12680	**990**	9650
Hardness, Calcium Carbonate	ug/l	--	448000	216000	332000	101000	273000	310000	304000
Hydrogen Sulfide	ug/l	2 [8]	**30**	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	500	100	1100	<100	100	500
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1210	830	610	1260	600	2240	850
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.3	8.3	7.2	7.2	8.4	7.3	8
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**360**	**60**	**60**	**600**	30	**280**	**110**
Sulphate	ug/l	--	147000	58000	56000	52000	85000	40000	76000
Temperature (Field)	deg c	-- [10]	1	12	20.5	7.6	20.4	14.1	0.3
Total Dissolved Solids	ug/l	--	717000	406000	734000	246000	571000	743000	636000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	208000	10000	14000	332000	10000	75000	19000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	2.1	<1	0.9	3.2	1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	200	51	80	63	88	181	85
Cadmium	ug/l	0.2 [11]	<0.5	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1
Calcium	ug/l	--	109000	63100	99400	24900	73100	78400	88500
Chromium	ug/l	-- [13]	**90**	2	<2	**30**	<2	7	3
Cobalt	ug/l	0.9	**10**	0.4	**1**	**6.6**	<0.5	**1.9**	0.7
Copper	ug/l	5	**38**	3	**45**	**56**	**17**	3	2
Iron	ug/l	300	**35700**	**869**	**718**	**2710**	**350**	**2880**	**1060**
Lead	ug/l	-- [14]	**5.5**	0.5	0.8	**6**	0.2	1	<0.1
Magnesium	ug/l	--	42700	14100	20300	9330	21900	27600	20200
Manganese	ug/l	--	710	69	113	243	74	213	152
Mercury, dissolved	ug/l	0.2 [15]	<0.06	--	--	--	--	--	--
Molybdenum	ug/l	40	<5	--	--	--	--	--	--
Nickel	ug/l	25	**50**	--	--	--	--	--	--
Potassium	ug/l	--	20600	5500	7500	8200	7200	17700	9500
Selenium	ug/l	100	<1	--	--	--	--	--	--
Sodium	ug/l	--	110000	66500	160000	41100	108000	156000	115000
Zinc	ug/l	30 [11]	**121**	11	26	**65**	**49**	22	16
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	**3**

Parameter	Unit	PWQO [1]	S9	S9	S9	S9	S9	S9	S9
			23-May-2008	12-Aug-2008	06-Nov-2008	13-May-2009	25-Aug-2009	27-Nov-2009	18-May-2010
						S-5	A-3	S-4	S-3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	180000	200000	226000	197000	256000	211000	306000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	<10	<10	<20	30	40	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	1000	<1000	2000	2000
Chemical Oxygen Demand	ug/l	--	44000	26000	15000	38000	63000	33000	35000
Chloride	ug/l	--	100000	156000	139000	99000	141000	57000	142000
Conductivity	uS/cm	--	--	--	--	847	1270	786	1240
Conductivity (Field)	uS/cm	--	650	900	800	700	1088	709	1337
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	40100	50800	54800	46700	62800	51600	63800
Dissolved Organic Carbon	ug/l	--	11700	8800	6100	15300	15200	11500	14900
Dissolved Oxygen (Field)	ug/l	-- [7]	13980	5310	**6210**	17710	5900	9730	**5080**
Hardness, Calcium Carbonate	ug/l	--	209000	226000	279000	242000	344000	231000	375000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	200	1400	<100	<100	1040	<100
Nitrite as N	ug/l	--	--	--	--	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	890	470	710	810	1060	760	1070
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	8.5	8.1	7.9	6.8	6.97	7.31	7.40
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**90**	**80**	**60**	**70**	**200**	**110**
Sulphate	ug/l	--	59000	54000	82000	76000	163000	100000	119000
Temperature (Field)	deg c	-- [10]	14.1	19.9	8.2	20	19.9	5.0	12.2
Total Dissolved Solids	ug/l	--	420000	527000	571000	551000	825000	511000	806000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	7000	16000	42000	8000	15000	47000	24000
Metals									
Arsenic	ug/l	100 [11]	2	1	0.5	<1	2	<50	2
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	82	61	54	70	140	<100	150
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<0.1
Calcium	ug/l	--	59700	64900	82200	69000	103000	61000	104000
Chromium	ug/l	-- [13]	<2	4	5	4	4	**<20**	7
Cobalt	ug/l	0.9	<0.5	0.8	**1.2**	0.5	0.5	<5	**1.4**
Copper	ug/l	5	3	3	5	4	3	**20**	4
Iron	ug/l	300	**1060**	**1930**	**2230**	**550**	**440**	**4800**	**1690**
Lead	ug/l	-- [14]	<0.1	0.8	0.7	<1	<1	<10	<1
Magnesium	ug/l	--	14500	15600	17800	17000	21000	19000	28000
Manganese	ug/l	--	123	57	46	50	110	110	980
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	5900	5400	7600	7000	17000	8000	12000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	72800	109000	97600	84000	119000	67000	118000
Zinc	ug/l	30 [11]	7	7	10	<10	10	**100**	10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S9	S9	S9	S9	S9	S9
			18-Aug-2010 [28]	14-Oct-2010	19-May-2011 [40]	16-Aug-2011 [2]	30-Nov-2011 [41]	30-May-2012
			S-4	S-3	W-7	N-3	S9	S 9
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	183000	265000	203000	204000	132000	260000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	110	<20	<20	30	50	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	2000	2000	2000	3000	<2000
Chemical Oxygen Demand	ug/l	--	35000	35000	45000	35000	28000	46000
Chloride	ug/l	--	43000	94000	47000	93000	33000	130000
Conductivity	uS/cm	--	896	1030	665	907	594	--
Conductivity (Field)	uS/cm	--	826	856	634	758	557	969
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	40000	61100	49800	46500	26900	63000
Dissolved Organic Carbon	ug/l	--	16800	13600	13700	11500	7300	17000
Dissolved Oxygen (Field)	ug/l	-- [7]	**610**	7970	6250	**4060**	9040	**2880**
Hardness, Calcium Carbonate	ug/l	--	256000	327000	219000	263000	177000	320000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	1030	480	200	<100	1950	<100
Nitrite as N	ug/l	--	330	<100	<100	<100	<100	<10
Nitrogen, Total Kjeldahl	ug/l	--	1290	600	400	570	790	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.58	6.82	8.20	7.41	7.95	7.54
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**310**	**120**	**120**	**170**	**440**	**92**
Sulphate	ug/l	--	199000	118000	69000	106000	101000	84000
Temperature (Field)	deg c	-- [10]	18.8	9.5	15.2	20.7	6.2	20.7
Total Dissolved Solids	ug/l	--	582000	670000	432000	590000	386000	618000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	46000	14000	86000	78000	80000	31000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	<50	<10	<50	1.7
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**250**	90	<100	110	100	130
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<10	<0.1	<10	<0.10
Calcium	ug/l	--	71000	98000	58000	79000	46000	92000
Chromium	ug/l	-- [13]	6	6	**<50**	6	**<50**	5.4
Cobalt	ug/l	0.9	**1.3**	0.9	<10	**1.1**	<10	**1.2**
Copper	ug/l	5	**6**	4	<10	5	**10**	**6.4**
Iron	ug/l	300	**1420**	**770**	**4900**	**1250**	**7000**	**1800**
Lead	ug/l	-- [14]	1	<1	<10	1	<10	0.75
Magnesium	ug/l	--	19000	20000	18000	16000	15000	24000
Manganese	ug/l	--	210	90	160	110	140	220
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	30000	10000	8000	9000	12000	9400
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	81000	80000	58000	65000	49000	100000
Zinc	ug/l	30 [11]	<10	10	<50	<10	<50	15
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	<1	<1	<1	<1.0

Parameter	Unit	PWQO [1]	S9	S9	S9	S9	S9	S9	S9
			22-Aug-2012	29-Nov-2012	28-May-2013	15-Aug-2013	21-Nov-2013	28-May-2014	26-Aug-2014
			S-9	S9	S9	S9	SA-4	S9	S9
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	290000	330000	200000	220000	220000	240000	220000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<50	120	130	62	<50	<50	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	6000	<2000	3000	<2000	2000	2000
Chemical Oxygen Demand	ug/l	--	41000	46000	42000	47000	32000	38000	41000
Chloride	ug/l	--	150000	90000	83000	120000	90000	140000	120000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1218	1030	670	993	808	885	915
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	66000	74000	45000	52000	54000	55000	57000
Dissolved Organic Carbon	ug/l	--	16000	14000	17000	17000	11000	15000	12000
Dissolved Oxygen (Field)	ug/l	-- [7]	**4920**	**6460**	**3400**	**5050**	12960	7060	**2950**
Hardness, Calcium Carbonate	ug/l	--	460000	360000	250000	300000	290000	300000	250000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	270	<100	<100	440	<100	<100
Nitrite as N	ug/l	--	<10	<10	<10	<10	10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	960	1800	1400	1200	740	1400	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	270	<100	<100	450	<100	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.13	7.41	6.99	7.35	7.13	7.00	7.40
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**110**	**160**	**72**	**150**	**72**	**74**	**79**
Sulphate	ug/l	--	220000	120000	55000	130000	110000	64000	79000
Temperature (Field)	deg c	-- [10]	19.4	0.1	15.8	19.4	1.1	15.2	22.8
Total Dissolved Solids	ug/l	--	942000	660000	426000	646000	562000	614000	544000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	39000	83000	8000	<1000	14000	13000	11000
Metals									
Arsenic	ug/l	100 [11]	1.4	<1.0	1.2	<1.0	<1.0	1.2	1.1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**240**	120	58	180	85	82	130
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	**0.33**	<0.10	<0.10	<0.10
Calcium	ug/l	--	130000	110000	74000	87000	84000	79000	69000
Chromium	ug/l	-- [13]	<5.0	**11**	<5.0	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	**1.4**	**2.3**	0.69	<0.50	0.60	0.66	<0.50
Copper	ug/l	5	**7.9**	**7.0**	**6.0**	**14**	3.4	3.5	2.5
Iron	ug/l	300	**1800**	**4500**	**1100**	**570**	**1000**	**1200**	**580**
Lead	ug/l	-- [14]	1.1	1.5	<0.50	<0.50	0.58	<0.50	<0.50
Magnesium	ug/l	--	37000	37000	20000	29000	23000	22000	19000
Manganese	ug/l	--	95	310	110	120	63	130	98
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	16000	14000	6800	15000	11000	7900	8500
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	110000	74000	110000	75000	110000	100000
Zinc	ug/l	30 [11]	12	17	8.0	<5.0	9.7	9.1	8.3
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	**24**	<1.0	<1.0	<1.0	<1.0	<1.0

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9	S9	S9	S9	S9	S9	S9
			13-Nov-2014	27-May-2015	25-Aug-2015	25-Nov-2015	24-May-2016	18-Aug-2016	16-Nov-2016
			S-9	S-9	S-9	S-9	S-9	S-9	S-9
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	240000	295000	258000	250000	308000	179000	236000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<50	110	40	60	70	50	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	<2000	2000	3000	<2000
Chemical Oxygen Demand	ug/l	--	28000	27000	63000	45000	42000	37000	20000
Chloride	ug/l	--	81000	189000	131000	164000	137000	135000	162000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	803	1443	1179	250	1062	974	1148
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	60000	70800	53300	54800	64400	13900	47500
Dissolved Organic Carbon	ug/l	--	11000	11600	14300	11900	14100	42000	6600
Dissolved Oxygen (Field)	ug/l	-- [7]	**5630**	**270**	**3570**	**7740**	**2420**	**4580**	9810
Hardness, Calcium Carbonate	ug/l	--	300000	316000	278000	368000	335000	247000	292000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	300	<100	100	<100	<100	1200
Nitrite as N	ug/l	--	<10	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	650	500	1000	800	800	900	500
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.84	**8.55**	7.72	7.63	7.56	6.64	7.40
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**52**	**80**	**120**	**80**	**80**	**130**	30
Sulphate	ug/l	--	110000	206000	220000	102000	115000	151000	106000
Temperature (Field)	deg c	-- [10]	4.2	18.9	18.4	0	18.0	21.9	5.7
Total Dissolved Solids	ug/l	--	548000	858000	772000	648000	680000	620000	638000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	12000	3000	7000	31000	7000	8000	7000
Metals									
Arsenic	ug/l	100 [11]	<1.0	1	1	<1	1	3	<1
Barium	ug/l	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	110	**255**	**423**	92	144	185	109
Cadmium	ug/l	0.2 [11]	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	88000	67400	64800	114000	84700	63600	86700
Chromium	ug/l	-- [13]	<5.0	1	1	4	2	2	<1
Cobalt	ug/l	0.9	<0.50	<0.5	<0.5	0.8	0.6	<0.5	<0.5
Copper	ug/l	5	2.5	<0.5	<0.5	0.8	2.3	1.2	0.8
Iron	ug/l	300	**600**	**598**	**670**	**1510**	**879**	**677**	298
Lead	ug/l	-- [14]	<0.50	0.3	<0.1	0.6	0.4	0.4	0.1
Magnesium	ug/l	--	27000	35800	28300	20400	30000	21400	18300
Manganese	ug/l	--	110	234	341	88	791	164	59
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	10000	12300	11700	8970	8170	9180	5270
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	82000	190000	111000	135000	135000	110000	114000
Zinc	ug/l	30 [11]	9.9	14	7	16	7	8	6
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**11**	<1	**3**	<1	**9**	**4**	**4**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9	S9	S9	S9	S9	S9
			18-May-2017	28-Aug-2017	28-Nov-2017	23-May-2018	30-Aug-2018 [19]	28-Nov-2018
			S-9	S-9	S-9	S-9	S-9	S-9
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	210000	337000	253000	320000	--	209000
Ammonia, unionized	ug/l	20	<20	<20	<20	42.92	--	<20
Ammonia Nitrogen	ug/l	--	50	90	270	3700	--	120
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	2000	<2000	--	3000
Chemical Oxygen Demand	ug/l	--	42000	30000	41000	67000	--	34000
Chloride	ug/l	--	140000	114000	101000	230000	--	141000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	837	872	140	1285	--	462
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	24500	66800	17400	72500	--	37500
Dissolved Organic Carbon	ug/l	--	24600	11500	44600	17900	--	12800
Dissolved Oxygen (Field)	ug/l	-- [7]	**2400**	**4510**	14070	9540	--	**4570**
Hardness, Calcium Carbonate	ug/l	--	238000	331000	340000	373000	--	279000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	700	<100	--	900
Nitrite as N	ug/l	--	<50	<50	<50	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	800	900	1100	4500	--	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.83	7.29	7.19	7.63	--	6.93
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**50**	**110**	**40**	**50**	--	**130**
Sulphate	ug/l	--	57000	126000	74000	55000	--	105000
Temperature (Field)	deg c	-- [10]	21.8	13.5	0	15.1	--	0.2
Total Dissolved Solids	ug/l	--	516000	712000	514000	756000	--	544000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	14000	43000	16000	<2000	--	8000
Metals								
Arsenic	ug/l	100 [11]	<5 [17]	<1	<1	1	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**220**	127	**231**	13	--	118
Cadmium	ug/l	0.2 [11]	<0.5 [17]	<0.1	<0.1	<0.1	--	<0.1
Calcium	ug/l	--	66100	93300	93600	102000	--	76700
Chromium	ug/l	-- [13]	<5 [17]	2	3	2	--	4
Cobalt	ug/l	0.9	<2.5 [17]	<0.5	**1.2**	**1.2**	--	0.9
Copper	ug/l	5	4.8	0.7	3.3	1.4	--	**6.3**
Iron	ug/l	300	**861**	**732**	**1070**	**909**	--	**1020**
Lead	ug/l	-- [14]	<0.5 [17]	0.4	0.5	0.2	--	0.6
Magnesium	ug/l	--	17800	23800	25700	29000	--	21400
Manganese	ug/l	--	177	189	155	292	--	91
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	6190	7710	8390	11600	--	10700
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	98800	94900	84300	155000	--	116000
Zinc	ug/l	30 [11]	<25 [17]	6	12	5	--	15
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	--	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 20-Jun-2019 S-9	S9 28-Aug-2019 [38] S-9	S9 21-Nov-2019 S-9
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	259000	--	252000
Ammonia, unionized	ug/l	20	<20	--	<20
Ammonia Nitrogen	ug/l	--	110	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	4000
Chemical Oxygen Demand	ug/l	--	32000	--	41000
Chloride	ug/l	--	208000	--	185000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	1150	--	1405
Cyanide	ug/l	5 [6]	--	--	--
Dissolved Inorganic Carbon	ug/l	--	53900	--	<500
Dissolved Organic Carbon	ug/l	--	12000	--	9100
Dissolved Oxygen (Field)	ug/l	-- [7]	**4750**	--	14560
Hardness, Calcium Carbonate	ug/l	--	306000	--	386000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	200	--	<100
Nitrite as N	ug/l	--	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	--	800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	8.5	6.93	--	7.71
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	--	**60**
Sulphate	ug/l	--	86000	--	159000
Temperature (Field)	deg c	-- [10]	18.2	--	0
Total Dissolved Solids	ug/l	--	692000	--	690000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	2000	--	12000
Metals					
Arsenic	ug/l	100 [11]	1	--	<1
Barium	ug/l	--	--	--	--
Boron	ug/l	200 [12]	**391**	--	200
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.1
Calcium	ug/l	--	82100	--	103000
Chromium	ug/l	-- [13]	2	--	2
Cobalt	ug/l	0.9	0.7	--	0.5
Copper	ug/l	5	3.2	--	3.3
Iron	ug/l	300	**781**	--	**511**
Lead	ug/l	-- [14]	0.3	--	0.2
Magnesium	ug/l	--	24400	--	31100
Manganese	ug/l	--	294	--	88
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	8520	--	10900
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	133000	--	129000
Zinc	ug/l	30 [11]	7	--	8
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1

Parameter	Unit	PWQO [1]	S10 28-Jun-1995	S10 14-Nov-1995	S10 13-Jun-1996	S10 12-Oct-1996	S10 17-Jun-1997	S10 05-Nov-1997	S10 05-Jun-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	237000	312000	212000	193000	145000	8000	100000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	10	60	20	130	10	10	70
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	7000	2000	1000	10000	1000	14000
Chemical Oxygen Demand	ug/l	--	291000	120000	75000	67000	51000	43000	232000
Chloride	ug/l	--	121000	118000	43000	68000	19400	58000	25400
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1026	1230	520	640	431	950	360
Dissolved Inorganic Carbon	ug/l	--	87700	18200	46300	39400	31000	1000	32600
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3950	--	4780	3840	2800	6390	6220
Hardness, Calcium Carbonate, dissolved	ug/l	--	--	--	--	--	--	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1250	12000	980	830	2050	1280	4370
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	1240	11940	--	--	--	--	--
pH (Field)	-	8.5	6.79	7.08	7.55	6.56	6.85	6.89	--
Phosphate	ug/l	--	900	540	380	150	180	90	590
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	13000	91200	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	636000	620000	260000	320000	216000	480000	183000
Total Organic Carbon	ug/l	--	31500	92400	24100	21200	37800	16600	41600
Total Suspended Solids	ug/l	--	39000	165000	11000	4000	18000	14000	234000
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**2000**	**1630**	**1060**	**1300**	**1360**	**1120**	**790**
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--
Calcium	ug/l	--	66800	50900	35200	37500	27400	76800	22300
Chromium	ug/l	-- [13]	**11**	**10**	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	1.7	3.2	1.9	1.5	0.5	**10.6**	4.2
Iron	ug/l	300	**570**	**5840**	**503**	**2890**	**660**	**600**	**5330**
Lead	ug/l	-- [14]	1.3	1.8	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	28100	31100	14300	20100	10500	22700	7710
Manganese	ug/l	--	740	680	217	580	310	780	850
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20
Potassium	ug/l	--	15200	16600	7730	1300	800	10800	400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	87100	182000	64800	94000	53300	47700	36100
Zinc	ug/l	30 [11]	10	20	10	10	10	**120**	30
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**2**	**2**	1

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Parameter	Unit	PWQO [1]	S10 26-Aug-1998	S10 30-Oct-1998	S10 30-Jun-1999	S10 19-Oct-1999	S10 03-May-2000	S10 25-Oct-2000	S10 13-Jun-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	67000	202000	94000	38000	98000	151000	166000
Ammonia, unionized	ug/l	20	--	10	--	--	10	--	<20
Ammonia Nitrogen	ug/l	--	60	20	410	40	20	1	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	1000	24000	5000	3000	--	5000
Chemical Oxygen Demand	ug/l	--	106000	100000	280000	80000	43000	--	84000
Chloride	ug/l	--	33800	87900	86000	57500	24100	112000	59000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	371	659	199.1	650	383	667	500
Dissolved Inorganic Carbon	ug/l	--	16700	52000	23100	61000	18100	--	28900
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6250	8070	4910	6880	6600	2100	3400
Hardness, Calcium Carbonate, dissolved	ug/l	--	--	--	--	--	--	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1600	1320	10500	1510	250	17700	1720
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.33	7.2	6.1	7.2	6.62	7.4	7
Phosphate	ug/l	--	180	100	1440	110	30	--	270
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	42000	12000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	191000	331000	98900	320000	190000	414000	326000
Total Organic Carbon	ug/l	--	20000	31400	50100	19200	16300	--	28100
Total Suspended Solids	ug/l	--	30000	16000	22000	14000	22000	352000	198000
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	1
Boron	ug/l	200 [12]	**1120**	**800**	**750**	**1240**	**460**	**1230**	**590**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	46800	46000	30100	51600	25000	45800	35900
Chromium	ug/l	-- [13]	--	--	--	--	--	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	1.5	0.6	**13.4**	3.1	0.5	**11**	1.5
Iron	ug/l	300	**2160**	**1050**	**13600**	**4790**	300	**26200**	**3330**
Lead	ug/l	-- [14]	0.2	0.2	6.6	0.2	0.2	2.2	1.1
Magnesium	ug/l	--	9590	18700	7130	17100	8700	15600	12600
Manganese	ug/l	--	120	110	740	450	40	2700	420
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	**30**	20	20	20	20	20	20
Potassium	ug/l	--	1500	14500	800	3400	4600	9700	4700
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	43400	78400	18300	69000	39700	69800	61100
Zinc	ug/l	30 [11]	**460**	10	30	10	10	30	10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**19**	1	1	1	**9**	**15**	**35**

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Parameter	Unit	PWQO [1]	S10 27-Sep-2001	S10 21-Nov-2001	S10 22-May-2002	S10 12-Nov-2002	S10 31-May-2003	S10 03-Jul-2003	S10 22-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	54000	78000	181000	29000	104000	136000	47000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	40	10	40	60	240	110	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	7000	3000	9000	7000
Chemical Oxygen Demand	ug/l	--	71000	84000	55000	190000	75000	138000	245000
Chloride	ug/l	--	87300	93400	29300	26700	97000	25500	56000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	680	650	370	--	500	400	820
Dissolved Inorganic Carbon	ug/l	--	10100	10900	2000	4000	24000	35000	12000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	5060	2030	6370	--	7400	1930	9100
Hardness, Calcium Carbonate, dissolved	ug/l	--	--	--	--	--	--	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	100	200	100	100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2020	1550	2470	5960	1700	5880	6040
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.66	5.94	7.02	--	7.5	6.69	8.1
Phosphate	ug/l	--	260	260	300	720	160	1320	880
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	188000	188000	60000	180000	92000	28000	106000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	540000	538000	276000	360000	297000	315000	289000
Total Organic Carbon	ug/l	--	25500	27000	13000	23000	27000	46000	25000
Total Suspended Solids	ug/l	--	7000	90000	14000	251000	25000	224000	294000
Metals									
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1
Boron	ug/l	200 [12]	**1330**	**1450**	**620**	**510**	**580**	**645**	**631**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	42000	34000	36400	49400	29800	19600	33800
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	5	**9**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	4.4	3.8	<1	5	3	2	**20**
Iron	ug/l	300	**3060**	**12100**	**390**	**3560**	**1280**	**6170**	270
Lead	ug/l	-- [14]	0.2	0.6	<1	4.3	0.5	3.7	0.5
Magnesium	ug/l	--	13500	17000	14000	13700	12200	8860	10800
Manganese	ug/l	--	670	240	40	500	70	1030	4
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10
Potassium	ug/l	--	4500	5500	7500	4900	5600	1100	8000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	93400	120000	54200	35500	54300	55300	53100
Zinc	ug/l	30 [11]	10	10	10	**60**	10	12	**45**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S10 17-May-2004	S10 21-Aug-2004	S10 18-Nov-2004	S10 25-May-2005	S10 09-Sep-2005 [19]	S10 09-Nov-2005	S10 24-May-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	168000	--	77000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	<5000	--	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	175000	156000	180000	140000	--	63000	123000
Ammonia, unionized	ug/l	20	<10	<10	<10	<20	--	<20	<20
Ammonia Nitrogen	ug/l	--	20	30	10	<10	--	40	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	8000	20000	<3000	--	9000	3000
Chemical Oxygen Demand	ug/l	--	132000	230000	891000	77000	--	227000	52000
Chloride	ug/l	--	48100	40400	69000	41900	--	52600	28200
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	470	380	550	400	--	380	280
Dissolved Inorganic Carbon	ug/l	--	39300	37200	36500	43400	--	20600	23900
Dissolved Organic Carbon	ug/l	--	--	--	--	23200	--	26000	20700
Dissolved Oxygen (Field)	ug/l	-- [7]	2400	1800	--	**4200**	--	**3950**	11450
Hardness, Calcium Carbonate, dissolved	ug/l	--	--	--	--	--	--	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	**20**	--	**400**	--
Nitrate as N	ug/l	--	100	100	100	300	--	100	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	3930	4970	7090	1200	--	5500	960
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.2	6.7	7	7.2	--	6.9	7.8
Phosphate	ug/l	--	770	900	1440	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**100**	--	**810**	**80**
Sulphate	ug/l	--	31000	15000	54000	13000	--	152000	42000
Temperature (Field)	deg c	-- [10]	--	--	--	10	--	1	4.5
Total Dissolved Solids	ug/l	--	235000	190000	275000	225000	--	371000	225000
Total Organic Carbon	ug/l	--	21100	24800	17300	--	--	--	--
Total Suspended Solids	ug/l	--	84000	156000	1630000	13000	--	320000	34000
Metals									
Arsenic	ug/l	100 [11]	1	1	3	<1	--	1	<1
Boron	ug/l	200 [12]	**248**	**413**	**374**	**237**	--	**513**	192
Cadmium	ug/l	0.2 [11]	--	--	--	<0.1	--	<0.5	<0.1
Calcium	ug/l	--	39500	33900	41700	31200	--	35200	35300
Chromium	ug/l	-- [13]	1	3	**48**	<2	--	**11**	<2
Cobalt	ug/l	0.9	--	--	--	**4**	--	**3**	0.4
Copper	ug/l	5	**17**	**58**	**103**	<2	--	**17**	2
Iron	ug/l	300	**2050**	**502**	**593**	**816**	--	**2610**	**1360**
Lead	ug/l	-- [14]	0.6	3	2.6	0.2	--	**6**	0.8
Magnesium	ug/l	--	12000	11700	15000	10500	--	13100	9930
Manganese	ug/l	--	258	1750	4710	39	--	1080	392
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	<0.05	--	<0.06	--
Molybdenum	ug/l	40	--	--	--	<0.5	--	<5	--
Nickel	ug/l	25	20	**50**	**40**	<10	--	<10	--
Potassium	ug/l	--	7800	3200	4800	7400	--	4100	5000
Selenium	ug/l	100	--	--	--	<1	--	<1	--
Sodium	ug/l	--	62300	50200	76500	43900	--	79200	33500
Zinc	ug/l	30 [11]	**46**	**153**	**154**	<5	--	**64**	7
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**3**	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S10 15-Aug-2006	S10 16-Nov-2006	S10 08-May-2007	S10 22-Aug-2007	S10 20-Nov-2007	S10 23-May-2008	S10 12-Aug-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	127000	158000	107000	56000	103000	174000	160000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	30	<10	<10	90	60	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	21000	<3000	<3000	13000	13000	4000	3000
Chemical Oxygen Demand	ug/l	--	361000	52000	66000	342000	308000	88000	71000
Chloride	ug/l	--	22000	29400	20000	8200	60200	45700	64800
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	520	320	300	425	390	480	500
Dissolved Inorganic Carbon	ug/l	--	39400	41100	26800	15100	26800	38400	42200
Dissolved Organic Carbon	ug/l	--	35800	20700	14300	28100	19400	20300	21700
Dissolved Oxygen (Field)	ug/l	-- [7]	**2200**	**6290**	--	**2340**	**2950**	**3840**	**960**
Hardness, Calcium Carbonate, dissolved	ug/l	--	--	--	--	--	--	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	<100	100	<100	200	<100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	7980	1450	1650	11200	6620	1620	1610
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	5.9	6.6	8.3	7.3	8.1	7.3	7
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1470**	**100**	**180**	**310**	**1120**	**150**	**320**
Sulphate	ug/l	--	17000	37000	8000	9000	72000	20000	12000
Temperature (Field)	deg c	-- [10]	16	6.5	5.4	11.3	0.2	9.1	15.6
Total Dissolved Solids	ug/l	--	189000	279000	161000	84600	316000	277000	308000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	345000	11000	32000	476000	320000	20000	45000
Metals									
Arsenic	ug/l	100 [11]	0.9	<1	0.6	2.7	1.6	1.2	0.7
Boron	ug/l	200 [12]	**232**	**223**	105	76	162	200	124
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	21600	45100	25400	8370	40800	40500	48500
Chromium	ug/l	-- [13]	**21**	8	<2	**26**	8	<2	<2
Cobalt	ug/l	0.9	**3.3**	<0.5	0.6	**6.5**	**2.5**	<0.5	<0.5
Copper	ug/l	5	**46**	**44**	**11**	**17**	**8**	<2	**6**
Iron	ug/l	300	**1190**	**793**	**1630**	**2310**	**7560**	**658**	**4390**
Lead	ug/l	-- [14]	4.5	0.9	1.4	**8**	3.4	<0.1	1
Magnesium	ug/l	--	12600	13400	7980	2820	13100	11900	11200
Manganese	ug/l	--	1470	27	141	725	704	184	441
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	4800	16300	5200	1000	7200	5900	4100
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	36700	42200	28000	18700	51900	47200	64600
Zinc	ug/l	30 [11]	**76**	26	23	**103**	**36**	8	**38**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S10 06-Nov-2008	S10 13-May-2009 S-6	S10 25-Aug-2009 A-1	S10 27-Nov-2009 S-2	S10 18-May-2010 S-7	S10 18-Aug-2010 [2] S-1	S10 14-Oct-2010 S-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	140000	176000	230000	158000	266000	135000	178000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	<20	30	20	20	<20	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<1000	3000	1000	3000	2000	1000
Chemical Oxygen Demand	ug/l	--	98000	48000	99000	53000	60000	70000	40000
Chloride	ug/l	--	80600	54000	61000	57000	41000	36000	42000
Conductivity	uS/cm	--	--	587	635	610	622	568	605
Conductivity (Field)	uS/cm	--	500	500	510	550	702	528	530
Dissolved Inorganic Carbon	ug/l	--	35600	44600	60400	39800	57000	29100	43900
Dissolved Organic Carbon	ug/l	--	13000	18800	26900	13800	25900	27500	14900
Dissolved Oxygen (Field)	ug/l	-- [7]	**6240**	**3480**	**5770**	**5820**	**5420**	**1610**	9070
Hardness, Calcium Carbonate, dissolved	ug/l	--	--	--	--	--	--	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	110	<100
Nitrite as N	ug/l	--	--	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1280	1050	1370	160	2620	1310	1020
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.5	7.5	6.59	6.84	6.93	6.26	6.86
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**130**	**40**	**970**	30	**750**	**80**	**170**
Sulphate	ug/l	--	69000	36000	2000	63000	<1000	90000	61000
Temperature (Field)	deg c	-- [10]	5	10	15.6	4.3	11.0	15.5	7.2
Total Dissolved Solids	ug/l	--	367000	382000	413000	397000	404000	369000	393000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	3000	38000	4000	43000	8000	12000
Metals									
Arsenic	ug/l	100 [11]	0.5	<1	2	<1	2	<1	<1
Boron	ug/l	200 [12]	113	130	90	110	170	**330**	110
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	45600	46000	55000	42000	51000	47000	50000
Chromium	ug/l	-- [13]	<2	2	3	3	3	3	3
Cobalt	ug/l	0.9	<0.5	<0.2	0.7	<0.2	**1.1**	0.4	0.5
Copper	ug/l	5	<2	<1	<1	1	1	1	1
Iron	ug/l	300	192	170	**4660**	220	**8840**	**930**	**1610**
Lead	ug/l	-- [14]	<0.1	<1	<1	<1	<1	<1	<1
Magnesium	ug/l	--	13400	14000	13000	13000	16000	14000	14000
Manganese	ug/l	--	22	40	780	50	2080	470	580
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	8800	6000	9000	8000	8000	7000	10000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	65000	57000	53000	50000	59000	50000	45000
Zinc	ug/l	30 [11]	<5	<10	<10	<10	<10	<10	<10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	**2**	<1	<1

Parameter	Unit	PWQO [1]	S10	S10	S10	S10	S10	S10	S10
			19-May-2011	16-Aug-2011 [20]	30-Nov-2011 [21]	30-May-2012	22-Aug-2012	29-Nov-2012	28-May-2013
			W-1	N-2	S10	S 10	S-10	S10	S10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	167000	145000	90000	230000	44000	250000	150000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	30	30	<20	<50	<50	180	97
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	3000	2000	7000	<2000	4000	<2000
Chemical Oxygen Demand	ug/l	--	50000	95000	40000	130000	160000	600000	79000
Chloride	ug/l	--	30000	19000	39000	33000	43000	83000	48000
Conductivity	uS/cm	--	477	354	432	--	--	--	--
Conductivity (Field)	uS/cm	--	464	349	428	518	759	894	524
Dissolved Inorganic Carbon	ug/l	--	41600	37900	17800	56000	9200	52000	33000
Dissolved Organic Carbon	ug/l	--	18500	33600	14700	35000	27000	22000	23000
Dissolved Oxygen (Field)	ug/l	-- [7]	**2260**	**4250**	**5740**	**2250**	**560**	**1410**	**2770**
Hardness, Calcium Carbonate, dissolved	ug/l	--	--	--	--	--	--	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<100	<100	<100	<10	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	1060	1820	590	2400	4000	16000	2300
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	<100	<100	<100	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.37	6.66	7.54	6.91	5.87	6.66	6.41
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**70**	**80**	<10	**330**	**390**	**1900**	**270**
Sulphate	ug/l	--	31000	12000	56000	<1000	280000	100000	41000
Temperature (Field)	deg c	-- [10]	14.0	18.3	5.3	16.4	15.2	0	9.0
Total Dissolved Solids	ug/l	--	310000	230000	281000	328000	628000	560000	352000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	52000	18000	<2000	62000	57000	380000	160000
Metals									
Arsenic	ug/l	100 [11]	<1	<50	<50	2.0	2.3	5.2	<1.0
Boron	ug/l	200 [12]	100	100	200	130	**340**	160	170
Cadmium	ug/l	0.2 [11]	<0.1	<10	<10	<0.10	<0.10	0.12	<0.10
Calcium	ug/l	--	43000	36000	30000	58000	82000	87000	44000
Chromium	ug/l	-- [13]	2	**<50**	**<50**	<5.0	<5.0	**17**	<5.0
Cobalt	ug/l	0.9	<0.2	<10	<10	**1.1**	**2.0**	**4.5**	<0.50
Copper	ug/l	5	<1	<10	<10	2.6	2.9	**17**	<1.0
Iron	ug/l	300	200	**1600**	100	**5100**	**12000**	**43000**	**1900**
Lead	ug/l	-- [14]	<1	<10	<10	<0.50	0.66	**6.6**	<0.50
Magnesium	ug/l	--	14000	9000	10000	15000	23000	29000	14000
Manganese	ug/l	--	40	320	30	1900	730	1500	280
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	5000	<1000	5000	5300	4100	7400	6600
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	39000	26000	38000	46000	73000	87000	62000
Zinc	ug/l	30 [11]	<10	<50	<50	7.9	12	**51**	<5.0
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	**3.0**	<1.0	<1.0	<1.0

Parameter	Unit	PWQO [1]	S10	S10	S10	S10	S10	S10	S10
			15-Aug-2013	21-Nov-2013	28-May-2014 [22]	26-Aug-2014 [23]	13-Nov-2014	27-May-2015	25-Aug-2015
			S10	SA-6	S10 (SW-W)	S10	S-10	S-10	S-10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	160000	210000	200000	180000	204000	199000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	210	<50	<50	160	<50	100	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	<2000	2000	4000	6000	<20000 [24]	<30000 [24]
Chemical Oxygen Demand	ug/l	--	690000	150000	190000	410000	180000	115000	171000
Chloride	ug/l	--	42000	78000	55000	58000	62000	77000	75000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	548	725	571	603	558	619	602
Dissolved Inorganic Carbon	ug/l	--	57000	43000	48000	52000	43000	45900	38300
Dissolved Organic Carbon	ug/l	--	31000	18000	22000	23000	21000	38100	38900
Dissolved Oxygen (Field)	ug/l	-- [7]	**1050**	**7580**	**680**	**600**	**3660**	**930**	**1380**
Hardness, Calcium Carbonate, dissolved	ug/l	--	--	--	--	--	--	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<500	<500	<100	<100	<100
Nitrite as N	ug/l	--	<10	<10	<50	<50	<10	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	16000	2400	11000	12000	7400	2400	2300
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	<100	<500	<500	<100	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.23	6.86	6.87	6.57	6.61	7.63	7.13
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**4200**	**240**	**1100**	**1200**	**680**	**390**	**420**
Sulphate	ug/l	--	<1000	100000	29000	31000	21000	12000	3000
Temperature (Field)	deg c	-- [10]	14	0.2	13.1	17.9	2.1	17.0	15.5
Total Dissolved Solids	ug/l	--	378000	476000	408000	440000	334000	358000	397000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	380000	120000	120000	280000	93000	97000	46000
Metals									
Arsenic	ug/l	100 [11]	5.9	<1.0	2.6	3.0	1.3	<1	1
Boron	ug/l	200 [12]	190	190	160	170	160	32	199
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Calcium	ug/l	--	63000	60000	60000	56000	47000	13000	34300
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	8.0	<5.0	<1	1
Cobalt	ug/l	0.9	**2.3**	0.55	**1.2**	**2.6**	**1.3**	<0.5	0.6
Copper	ug/l	5	**7.2**	3.3	3.0	**7.3**	2.8	<0.5	<0.5
Iron	ug/l	300	**59000**	**4400**	**10000**	**23000**	**7500**	**801**	**9020**
Lead	ug/l	-- [14]	6.3	2.2	2.4	4.8	1.3	0.2	0.1
Magnesium	ug/l	--	17000	20000	16000	16000	15000	2560	12500
Manganese	ug/l	--	1100	220	1100	1300	1100	179	683
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	2900	8700	11000	4300	9000	1180	3050
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	59000	76000	59000	57000	60000	13000	61700
Zinc	ug/l	30 [11]	**42**	11	25	30	19	<5	10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	**1.6**	**11**	<1	**5**

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Parameter	Unit	PWQO [1]	S10 25-Nov-2015 S-10	S10 24-May-2016 S-10	S10 18-Aug-2016 S-10	S10 16-Nov-2016 S-10	S10 18-May-2017 S-10	S10 28-Aug-2017 S-10	S10 28-Nov-2017 S-10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	183000	163000	21000	147000	192000	179000	189000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	30	150	80	70	30	40	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	74000	12000	4000	4000	35000	<100000 [25]
Chemical Oxygen Demand	ug/l	--	126000	671000	100000	52000	64000	153000	526000
Chloride	ug/l	--	108000	43000	33000	117000	75000	63000	64000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	39	458	864	942	673	520	656
Dissolved Inorganic Carbon	ug/l	--	43300	20200	900	29800	11000	36300	8800
Dissolved Organic Carbon	ug/l	--	19900	50500	25400	12800	42000	21400	43800
Dissolved Oxygen (Field)	ug/l	-- [7]	**1940**	**1700**	**1310**	9270	**1660**	**2850**	**5580**
Hardness, Calcium Carbonate, dissolved	ug/l	--	--	--	--	--	--	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2900	17400	4100	900	2300	4500	1700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.56	7.38	6.43	7.71	7.52	6.83	6.51
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**420**	**2500**	**650**	**120**	**260**	**540**	**480**
Sulphate	ug/l	--	87000	10000	398000	130000	51000	37000	67000
Temperature (Field)	deg c	-- [10]	0	10.8	17.9	3.7	16.3	12.3	0.4
Total Dissolved Solids	ug/l	--	488000	324000	668000	518000	408000	360000	390000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	129000	1160000	96000	36000	49000	410000	1000000
Metals									
Arsenic	ug/l	100 [11]	<1	6	4	<1	<5 [17]	<1	2
Boron	ug/l	200 [12]	174	182	**489**	124	**255**	161	162
Cadmium	ug/l	0.2 [11]	<0.1	0.2	<0.1	<0.1	<0.5 [17]	<0.1	**0.3**
Calcium	ug/l	--	71000	56300	91300	61900	55400	57600	66300
Chromium	ug/l	-- [13]	2	**9**	2	<1	<5 [17]	2	**11**
Cobalt	ug/l	0.9	<0.5	**6.3**	**3.4**	<0.5	<2.5 [17]	0.6	**3.6**
Copper	ug/l	5	<0.5	**8.7**	3.3	<0.5	<2.5 [17]	0.7	**13.1**
Iron	ug/l	300	**3000**	**43300**	**4450**	**2580**	**1880**	**4090**	**17900**
Lead	ug/l	-- [14]	0.8	**11.7**	1.9	0.2	0.5	1.0	4.9
Magnesium	ug/l	--	18900	12800	25200	18000	16900	14200	17500
Manganese	ug/l	--	179	7530	1080	52	984	400	648
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	4830	8370	9080	5850	8190	3670	6080
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	106000	52200	57000	88700	66000	57500	52400
Zinc	ug/l	30 [11]	13	**86**	**82**	18	<25 [17]	14	**70**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**29**	**10**	**7**	<1	<1	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S10	S10	S10	S10	S10	S10
			23-May-2018	30-Aug-2018	28-Nov-2018	20-Jun-2019	28-Aug-2019 [19]	21-Nov-2019
			S-10	S-10	S-10	S-10	S-10	S-10
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	243000	267000	175000	218000	--	89000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	--	<20
Ammonia Nitrogen	ug/l	--	30	40	30	30	--	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	18000	4000	<12000 [25]	--	<20000 [25]
Chemical Oxygen Demand	ug/l	--	106000	280000	66000	91000	--	178000
Chloride	ug/l	--	32000	118000	89000	62000	--	113000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	510	799	649	560	--	1091
Dissolved Inorganic Carbon	ug/l	--	50800	43000	32000	47100	--	<500
Dissolved Organic Carbon	ug/l	--	21500	37600	22400	23100	--	21800
Dissolved Oxygen (Field)	ug/l	-- [7]	**1920**	**1170**	13250	**1010**	--	**2980**
Hardness, Calcium Carbonate, dissolved	ug/l	--	--	--	--		--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	--	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	2300	9900	900	1600	--	3200
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.20	6.60	6.9	6.69	--	6.51
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1190**	**1220**	**90**	**110**	--	**430**
Sulphate	ug/l	--	4000	3000	73000	1000	--	243000
Temperature (Field)	deg c	-- [10]	12.3	17.3	0.9	17.6	--	0.2
Total Dissolved Solids	ug/l	--	314000	484000	424000	352000	--	612000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	47000	346000	13000	16000	--	106000
Metals								
Arsenic	ug/l	100 [11]	1	2	<1	1	--	1
Boron	ug/l	200 [12]	141	**222**	124	197	--	**246**
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	--	<0.1
Calcium	ug/l	--	47200	64700	55300	59400	--	85000
Chromium	ug/l	-- [13]	<1	3	<1	1	--	2
Cobalt	ug/l	0.9	0.8	**1.2**	<0.5	**2.3**	--	**2.1**
Copper	ug/l	5	<0.5	3.8	1.1	1.4	--	2.9
Iron	ug/l	300	**11200**	**15500**	**2070**	**13500**	--	**8400**
Lead	ug/l	-- [14]	0.6	2.0	0.3	2.3	--	1.3
Magnesium	ug/l	--	14400	16600	17800	16600	--	28200
Manganese	ug/l	--	1400	773	476	2990	--	1600
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	5600	3290	6910	4480	--	10700
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	42500	86700	79100	65900	--	90200
Zinc	ug/l	30 [11]	9	19	11	18	--	20
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**6**	<1	<1	--	**5**

Parameter	Unit	PWQO [1]	S11 28-Jun-1995	S11 14-Nov-1995	S11 13-Jun-1996	S11 12-Oct-1996	S11 17-Jun-1997	S11 05-Nov-1997	S11 05-Jun-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	300000	57000	78000	82000	71000	32000	72000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	18000	330	50	190	10	10	730
Biochemical Oxygen Demand, 5 Day	ug/l	--	15000	15000	5000	1000	3000	2000	5000
Chemical Oxygen Demand	ug/l	--	620000	130000	94000	50000	82000	51000	69000
Chloride	ug/l	--	75000	56500	42000	61000	68300	51000	120000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	790	500	320	710	706	770	1347
Dissolved Inorganic Carbon	ug/l	--	96800	7300	19100	16100	37000	6000	11400
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4800	--	7700	4850	4700	4500	10520
Hardness, Calcium Carbonate	ug/l	--	234000	113000	70000	224000	190000	182000	397000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	19500	25800	1720	1660	2120	1080	1840
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	1500	25470	--	--	--	--	--
pH (Field)	-	8.5	6.73	6.93	5.05	6.25	6.44	7.27	--
Phosphate	ug/l	--	5920	1070	200	210	150	80	170
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	7000	46000	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	400000	250000	160000	350	354000	380000	673000
Total Organic Carbon	ug/l	--	56100	36700	29700	16500	36800	19800	22800
Total Suspended Solids	ug/l	--	--	625000	26000	16000	8000	12000	40000
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1450**	**570**	**652**	**1270**	**2350**	**1340**	**3350**
Cadmium	ug/l	0.2 [11]	**1.3**	**0.4**	--	--	--	--	--
Calcium	ug/l	--	57590	27600	18600	56500	52000	47300	102000
Chromium	ug/l	-- [13]	**90**	**20**	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	**14**	**11.1**	3.5	4.2	0.5	**10.8**	2
Iron	ug/l	300	**24210**	**14500**	**1860**	**2060**	**1650**	150	**3040**
Lead	ug/l	-- [14]	**37.6**	**16.5**	0.6	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	21200	10600	5520	19800	14300	15400	34600
Manganese	ug/l	--	650	270	111	280	100	70	450
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	**30**	20	22	20	20	20	20
Potassium	ug/l	--	10430	7500	792	2900	400	1700	400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	74380	63200	45400	72800	81800	46400	153000
Zinc	ug/l	30 [11]	**120**	**80**	10	20	10	20	30
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**2**	**6**	1

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Parameter	Unit	PWQO [1]	S11 26-Aug-1998	S11 30-Oct-1998	S11 19-Oct-1999	S11 03-May-2000	S11 25-Oct-2000	S11 13-Jun-2001	S11 21-Nov-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	88000	218000	46000	67000	210000	198000	80000
Ammonia, unionized	ug/l	20	--	10	--	10	--	<20	<20
Ammonia Nitrogen	ug/l	--	90	30	70	50	--	30	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	16000	1000	4000	4000	--	3000	2000
Chemical Oxygen Demand	ug/l	--	116000	96000	118000	72000	--	66000	60000
Chloride	ug/l	--	63400	120000	70600	30400	149000	90400	79600
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	522	830	520	339	861	650	420
Dissolved Inorganic Carbon	ug/l	--	23300	65700	21300	13800	--	38300	11200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	5580	7860	6400	8740	2270	2000	6110
Hardness, Calcium Carbonate	ug/l	--	135000	223000	133000	67000	291000	192000	166000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1640	1320	1460	1140	20800	1520	1200
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.6	6.4	7.7	6.76	7.19	6.9	6.15
Phosphate	ug/l	--	360	100	200	140	--	410	140
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	61000	53000	107000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	261000	410000	260000	170000	258000	438000	380000
Total Organic Carbon	ug/l	--	23000	32700	24700	20100	--	22700	15000
Total Suspended Solids	ug/l	--	28000	5000	29000	30000	1340000	43000	106000
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	5	1	1
Boron	ug/l	200 [12]	**1100**	**810**	**880**	**280**	**1430**	**550**	**690**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	34400	52100	34800	17700	70400	49100	43700
Chromium	ug/l	-- [13]	--	--	--	--	**80**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	3.2	0.7	0.5	0.5	**53**	0.5	3.5
Iron	ug/l	300	**1210**	**740**	**2620**	**1260**	**37200**	**1990**	**5340**
Lead	ug/l	-- [14]	0.2	0.2	0.3	0.2	**51**	5	0.3
Magnesium	ug/l	--	11700	22300	11100	5370	28000	16900	13700
Manganese	ug/l	--	90	80	290	390	2420	540	430
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	**50**	20	20
Potassium	ug/l	--	7600	17000	8000	8500	9600	2200	5700
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	57800	103000	60600	30800	95900	85600	62300
Zinc	ug/l	30 [11]	10	10	20	10	**320**	20	10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**31**	**17**	**7**	**43**	1

Parameter	Unit	PWQO [1]	S11 22-May-2002	S11 12-Nov-2002	S11 31-May-2003	S11 22-Oct-2003	S11 17-May-2004	S11 21-Aug-2004	S11 18-Nov-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	135000	44000	89000	42000	155000	183000	250000
Ammonia, unionized	ug/l	20	--	--	--	--	<10	<10	<10
Ammonia Nitrogen	ug/l	--	30	40	120	20	10	40	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	13000	9000	3000	8000	7000	84000
Chemical Oxygen Demand	ug/l	--	49000	355000	150000	84000	76000	187000	2850000
Chloride	ug/l	--	70700	89200	43200	80800	86500	72300	109000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	410	--	600	600	550	500	740
Dissolved Inorganic Carbon	ug/l	--	21000	9000	19000	10000	42300	38800	54100
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6380	--	5000	5000	3900	5800	--
Hardness, Calcium Carbonate	ug/l	--	186000	295000	98000	--	189000	164000	273000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	200	100	500	100	200	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	740	8700	3460	1360	2040	4330	48400
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.02	--	8.15	8.15	7.2	7	7
Phosphate	ug/l	--	40	970	530	170	260	640	11800
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	36000	300000	44000	110000	30000	28000	79000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	340000	672000	196000	333000	275000	250000	370000
Total Organic Carbon	ug/l	--	11000	28000	35000	23000	17700	19200	17200
Total Suspended Solids	ug/l	--	4000	427000	232000	28000	40000	172000	10400000
Metals									
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	9
Boron	ug/l	200 [12]	110	**1260**	**260**	**455**	109	**223**	**410**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	48800	77400	25900	34600	53600	44200	74500
Chromium	ug/l	-- [13]	**10**	**10**	**10**	8	2	7	**462**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	<1	**10.9**	5	**21**	**17**	**96**	**370**
Iron	ug/l	300	220	**4940**	**2860**	**922**	**922**	297	**1260**
Lead	ug/l	-- [14]	<1	8.3	1.3	1.9	1.8	4.9	**22.5**
Magnesium	ug/l	--	12800	24800	8010	11600	13400	12900	21200
Manganese	ug/l	--	20	530	790	153	196	799	5760
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	10	20	**80**	**300**
Potassium	ug/l	--	4800	7800	4400	10600	6400	7700	9400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	51300	95400	44100	67700	73600	81100	100000
Zinc	ug/l	30 [11]	10	**110**	**40**	18	**42**	**244**	**1080**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	**7**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S11 25-May-2005	S11 09-Sep-2005 [19]	S11 09-Nov-2005	S11 24-May-2006	S11 15-Aug-2006	S11 16-Nov-2006	S11 08-May-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	149000	--	110000	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	<5000	--	<5000	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	120000	--	90000	82000	191000	63000	138000
Ammonia, unionized	ug/l	20	<20	--	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	--	50	<10	20	30	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	10000	--	15000	13000	6000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	64000	--	372000	264000	95000	48000	55000
Chloride	ug/l	--	62700	--	61200	39700	99300	19200	53200
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	480	--	220	220	750	190	400
Dissolved Inorganic Carbon	ug/l	--	38400	--	36800	29100	47800	17000	34500
Dissolved Organic Carbon	ug/l	--	20100	--	22800	56800	29200	18900	13100
Dissolved Oxygen (Field)	ug/l	-- [7]	**4800**	--	**7300**	10510	**1200**	**4340**	**5150**
Hardness, Calcium Carbonate	ug/l	--	121000	--	203000	40000	194000	32000	155000
Hydrogen Sulfide	ug/l	2 [8]	**20**	--	**700**	--	--	--	--
Nitrate as N	ug/l	--	200	--	100	<100	100	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1180	--	7720	5460	2480	990	1500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.2	--	7.2	7.3	6.9	7.6	7.8
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	--	**1440**	**900**	**1180**	**130**	**180**
Sulphate	ug/l	--	20000	--	174000	17000	20000	28000	25000
Temperature (Field)	deg c	-- [10]	12.5	--	0.5	5	16	7.2	10.4
Total Dissolved Solids	ug/l	--	252000	--	439000	175000	375000	139000	271000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	14000	--	1790000	253000	248000	67000	30000
Metals									
Arsenic	ug/l	100 [11]	<1	--	1	<1	1.1	<1	0.9
Boron	ug/l	200 [12]	181	--	**758**	164	107	104	53
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.5	0.2	<0.1	<0.5	<0.1
Calcium	ug/l	--	32000	--	52600	7280	45400	7250	41900
Chromium	ug/l	-- [13]	<2	--	**45**	7	**33**	**13**	<2
Cobalt	ug/l	0.9	**2**	--	**15**	**1.6**	**4.6**	0.9	0.8
Copper	ug/l	5	<2	--	**42**	**41**	**50**	**38**	**21**
Iron	ug/l	300	**724**	--	**1390**	**1670**	**1110**	**1730**	**1300**
Lead	ug/l	-- [14]	<0.2	--	**28**	4.7	**5.8**	1	0.8
Magnesium	ug/l	--	10100	--	17400	5200	19600	3490	12300
Manganese	ug/l	--	69	--	1720	652	736	88	136
Mercury, dissolved	ug/l	0.2 [15]	<0.05	--	<0.06	--	--	--	--
Molybdenum	ug/l	40	<0.5	--	<5	--	--	--	--
Nickel	ug/l	25	<10	--	**40**	--	--	--	--
Potassium	ug/l	--	6200	--	5600	2000	7600	3600	5200
Selenium	ug/l	100	<1	--	<1	--	--	--	--
Sodium	ug/l	--	52500	--	77400	54900	73500	36900	48100
Zinc	ug/l	30 [11]	9	--	**145**	**46**	**78**	**31**	21
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S11	S11	S11	S11	S11	S11	S11
			22-Aug-2007 [19]	20-Nov-2007	23-May-2008	12-Aug-2008	06-Nov-2008	13-May-2009	25-Aug-2009 [26]
								S-7	A-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	182000	80000	170000	150000	181000	202000
Ammonia, unionized	ug/l	20	--	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	--	60	<10	200	20	<20	190
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	14000	<3000	10000	<3000	<1000	14000
Chemical Oxygen Demand	ug/l	--	--	366000	115000	222000	42000	45000	95000
Chloride	ug/l	--	--	131000	56800	69200	104000	77000	79000
Conductivity	uS/cm	--	--	--	--	--	--	710	734
Conductivity (Field)	uS/cm	--	--	600	370	500	600	600	640
Dissolved Inorganic Carbon	ug/l	--	--	49100	20000	42600	38700	44500	53400
Dissolved Organic Carbon	ug/l	--	--	18100	8700	26200	13400	17200	26100
Dissolved Oxygen (Field)	ug/l	-- [7]	--	**2750**	**2330**	**460**	**2430**	6570	**4160**
Hardness, Calcium Carbonate	ug/l	--	--	215000	70000	116000	181000	192000	188000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	100	100	100	<100	<100	<100
Nitrite as N	ug/l	--	--	--	--	--	--	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	--	7620	2150	7340	1020	860	2910
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	--	7.8	7.2	7.1	7.6	7.4	6.70
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**2330**	**210**	**2510**	**140**	**60**	**1210**
Sulphate	ug/l	--	--	118000	16000	2000	71000	55000	44000
Temperature (Field)	deg c	-- [10]	--	0.3	11.3	16.5	7.8	17.5	17.1
Total Dissolved Solids	ug/l	--	--	575000	201000	283000	417000	462000	477000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	2020000	11000	93000	3000	5000	398000
Metals									
Arsenic	ug/l	100 [11]	--	4.1	1.7	1.4	0.9	<1	<50
Boron	ug/l	200 [12]	--	**205**	167	125	81	60	<100
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	<0.1	<0.1	<0.1	<10
Calcium	ug/l	--	--	53100	18200	25800	46900	54000	52000
Chromium	ug/l	-- [13]	--	**86**	<2	5	<2	3	**<50**
Cobalt	ug/l	0.9	--	**21.7**	<0.5	**1.8**	0.9	0.3	<10
Copper	ug/l	5	--	**42**	<2	**8**	<2	3	**20**
Iron	ug/l	300	--	**40600**	**1020**	**979**	**676**	**470**	**18900**
Lead	ug/l	-- [14]	--	**14.8**	<0.1	2.1	<0.1	<1	<10
Magnesium	ug/l	--	--	19900	5950	12500	15400	14000	14000
Manganese	ug/l	--	--	1040	156	1110	191	40	560
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	--	8000	3300	5000	9100	6000	11000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	--	92800	51100	64500	78200	65000	64000
Zinc	ug/l	30 [11]	--	**161**	6	**44**	<5	<10	**60**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	<1	<1	<1	**2**

Parameter	Unit	PWQO [1]	S11 27-Nov-2009 [27] S-5	S11 18-May-2010 S-6	S11 18-Aug-2010 [28] S-3	S11 14-Oct-2010 S-6	S11 19-May-2011 [29] W-5	S11 16-Aug-2011 [2] N-6
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	157000	234000	139000	134000	140000	197000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	60	30	170	30	<20	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	16000	2000	8000	5000	3000	68000
Chemical Oxygen Demand	ug/l	--	60000	58000	53000	83000	60000	175000
Chloride	ug/l	--	66000	66000	46000	37000	34000	45000
Conductivity	uS/cm	--	654	708	754	461	452	637
Conductivity (Field)	uS/cm	--	--	767	709	205	447	543
Dissolved Inorganic Carbon	ug/l	--	38600	48900	31000	33900	34900	47700
Dissolved Organic Carbon	ug/l	--	20100	23800	21500	28000	18900	25300
Dissolved Oxygen (Field)	ug/l	-- [7]	**700**	**3630**	**5780**	**3780**	**1990**	**1760**
Hardness, Calcium Carbonate	ug/l	--	187000	212000	201000	140000	138000	198000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	220	<100	<100	100	<100	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1070	1450	1870	920	1760	3300
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	**8.68**	7.25	6.55	6.83	7.26	7.23
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**250**	**120**	**250**	**160**	**110**	**290**
Sulphate	ug/l	--	68000	27000	163000	37000	34000	57000
Temperature (Field)	deg c	-- [10]	4.9	12.9	15.88	9	15.4	19.3
Total Dissolved Solids	ug/l	--	425000	460000	490000	300000	294000	414000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	112000	14000	69000	17000	33000	517000
Metals								
Arsenic	ug/l	100 [11]	<50	1	<1	<1	<50	<10
Boron	ug/l	200 [12]	<100	100	**270**	60	<100	190
Cadmium	ug/l	0.2 [11]	<10	<0.1	<0.1	<0.1	<10	<0.1
Calcium	ug/l	--	50000	57000	54000	38000	37000	53000
Chromium	ug/l	-- [13]	**<20**	3	5	7	**<50**	4
Cobalt	ug/l	0.9	<5	0.5	0.7	**1.4**	<10	0.6
Copper	ug/l	5	**10**	1	3	5	<10	1
Iron	ug/l	300	**3800**	**990**	**1660**	**2540**	**2000**	**1860**
Lead	ug/l	-- [14]	<10	<1	1	<1	<10	<1
Magnesium	ug/l	--	15000	17000	16000	11000	11000	16000
Manganese	ug/l	--	110	170	250	80	100	370
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	12000	8000	13000	7000	5000	6000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	56000	67000	67000	33000	36000	56000
Zinc	ug/l	30 [11]	<50	<10	<10	<10	<50	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**4**	<1	<1	<1	<5	<1

Parameter	Unit	PWQO [1]	S11	S11	S11	S11	S11	S11	S11
			30-Nov-2011 [21]	30-May-2012	22-Aug-2012	29-Nov-2012	28-May-2013	15-Aug-2013	21-Nov-2013
			S11	S 11	S-11	S11	S11	S11	SA-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	110000	190000	1400000	250000	160000	190000	180000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<20	120	<50	150	98	130	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	6000	<2000	4000	<2000	2000	5000
Chemical Oxygen Demand	ug/l	--	40000	160000	47000	180000	50000	140000	73000
Chloride	ug/l	--	44000	46000	62000	99000	66000	56000	82000
Conductivity	uS/cm	--	562	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	537	498	1111	998	590	563	770
Dissolved Inorganic Carbon	ug/l	--	22300	44000	10000	56000	35000	50000	46000
Dissolved Organic Carbon	ug/l	--	10300	32000	13000	24000	20000	23000	15000
Dissolved Oxygen (Field)	ug/l	-- [7]	6740	**300**	**2280**	**1550**	**3680**	**1260**	**4510**
Hardness, Calcium Carbonate	ug/l	--	146000	150000	530000	340000	190000	170000	220000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1290	<100	<100	160	<100	<100	<100
Nitrite as N	ug/l	--	<100	<10	<10	<10	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	660	3200	1300	6200	1100	2700	1500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	<100	<100	160	<100	<100	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.40	7.13	6.15	6.62	6.94	6.77	6.90
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	**340**	**140**	**1600**	**58**	**900**	**270**
Sulphate	ug/l	--	91000	<1000	480000	170000	58000	23000	110000
Temperature (Field)	deg c	-- [10]	6.3	17.4	15.5	0	13.1	15.6	1.1
Total Dissolved Solids	ug/l	--	365000	320000	990000	678000	390000	368000	544000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	65000	60000	10000	460000	<1000	120000	40000
Metals									
Arsenic	ug/l	100 [11]	<50	1.3	<1.0	4.5	<1.0	2.0	<1.0
Boron	ug/l	200 [12]	100	150	**650**	150	88	**220**	120
Cadmium	ug/l	0.2 [11]	<10	<0.10	<0.10	**0.24**	<0.10	0.10	<0.10
Calcium	ug/l	--	37000	42000	150000	96000	49000	54000	63000
Chromium	ug/l	-- [13]	**<50**	<5.0	<5.0	**29**	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	<10	0.53	<0.50	**12**	<0.50	**2.4**	<0.50
Copper	ug/l	5	<10	2.6	1.8	**14**	1.6	5.0	2.0
Iron	ug/l	300	**4400**	**2200**	**640**	**34000**	**550**	**12000**	**1200**
Lead	ug/l	-- [14]	<10	0.79	<0.50	**9.3**	<0.50	1.8	0.65
Magnesium	ug/l	--	13000	13000	41000	35000	16000	17000	23000
Manganese	ug/l	--	130	230	110	3400	42	3400	210
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	10000	6800	8800	10000	5900	9200	10000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	55000	52000	88000	99000	65000	57000	88000
Zinc	ug/l	30 [11]	<50	<5.0	9.8	**53**	<5.0	20	5.8
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	1.0	<1.0	**2.6**	<1.0	<1.0	**1.8**

Parameter	Unit	PWQO [1]	S11	S11	S11	S11	S11	S11	S11
			28-May-2014 [22]	26-Aug-2014 [23]	13-Nov-2014	27-May-2015	25-Aug-2015	25-Nov-2015	24-May-2016
			S11 (SW-C)	S11	S-11	S-11	S-11	S-11	S-11
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	120000	150000	140000	120000	136000	186000	136000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<50	96	<50	120	30	80	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	3000	<2000	<6000 [24]	<6000 [24]	<10000 [24]	10000
Chemical Oxygen Demand	ug/l	--	79000	81000	50000	79000	64000	107000	122000
Chloride	ug/l	--	59000	57000	60000	78000	100000	134000	99000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	439	508	478	498	750	62	579
Dissolved Inorganic Carbon	ug/l	--	28000	40000	34000	30700	29900	42800	31300
Dissolved Organic Carbon	ug/l	--	22000	21000	19000	27300	22300	20400	20600
Dissolved Oxygen (Field)	ug/l	-- [7]	**2430**	**300**	**3130**	**560**	**1560**	**3080**	**3520**
Hardness, Calcium Carbonate	ug/l	--	120000	130000	130000	22900	176000	270000	137000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<500	<500	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	11	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2200	2000	880	2100	1000	1300	2500
Nitrogen, Nitrate-Nitrite	ug/l	--	<500	<500	<100	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.44	7.13	7.00	7.61	7.12	7.49	7.47
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**310**	**300**	**55**	**240**	**100**	**160**	**490**
Sulphate	ug/l	--	23000	16000	20000	17000	117000	75000	31000
Temperature (Field)	deg c	-- [10]	14.0	19.9	3.7	19.8	17.0	0	14.3
Total Dissolved Solids	ug/l	--	320000	330000	282000	178000	461000	510000	382000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	90000	38000	3000	4000	8000	31000	159000
Metals									
Arsenic	ug/l	100 [11]	1.4	1.7	<1.0	<1	<1	<1	2
Boron	ug/l	200 [12]	81	97	74	23	134	85	**207**
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	27000	35000	32000	5910	42600	79300	36100
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<1	1	3	**10**
Cobalt	ug/l	0.9	0.72	0.77	<0.50	<0.5	<0.5	<0.5	**1.5**
Copper	ug/l	5	1.7	2.0	1.0	<0.5	<0.5	<0.5	3.2
Iron	ug/l	300	**2500**	**4300**	**990**	216	**772**	**1210**	**5170**
Lead	ug/l	-- [14]	1.7	1.7	<0.50	0.1	<0.1	0.7	4.4
Magnesium	ug/l	--	9700	12000	12000	1970	16800	17500	11500
Manganese	ug/l	--	130	260	87	44	157	90	342
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	4600	6700	5200	859	5860	7960	5020
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	54000	55000	55000	12900	76600	121000	85600
Zinc	ug/l	30 [11]	<5.0	7.3	6.6	<5	6	9	**33**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	**7.3**	<1	**2**	<1	**13**

Parameter	Unit	PWQO [1]	S11	S11	S11	S11	S11	S11	S11
			18-Aug-2016	16-Nov-2016	18-May-2017	28-Aug-2017	28-Nov-2017	23-May-2018	30-Aug-2018
			S-11	S-11	S-11	S-11	S-11	S-11	S-11
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	32000	136000	150000	159000	110000	121000	249000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	50	70	40	160	100	30	140
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	3000	2000	34000	4000	3000	<40000 [25]
Chemical Oxygen Demand	ug/l	--	45000	38000	69000	128000	49000	76000	355000
Chloride	ug/l	--	95000	125000	97000	62000	51000	81000	112000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1354	974	648	414	228	530	771
Dissolved Inorganic Carbon	ug/l	--	6600	27900	8400	28400	8400	32100	41000
Dissolved Organic Carbon	ug/l	--	15400	11000	34700	48700	32300	21200	37600
Dissolved Oxygen (Field)	ug/l	-- [7]	**1650**	**2950**	**930**	**640**	**3090**	**1800**	**1630**
Hardness, Calcium Carbonate	ug/l	--	510000	229000	167000	180000	89000	88000	212000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1100	600	900	3200	2500	1600	12600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.05	7.47	7.55	7.00	6.94	7.42	7.08
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**170**	**80**	**80**	**330**	**480**	**140**	**1570**
Sulphate	ug/l	--	630000	147000	51000	15000	37000	24000	38000
Temperature (Field)	deg c	-- [10]	19.3	5.6	20.1	12.0	0.3	13.9	16.6
Total Dissolved Solids	ug/l	--	1090000	540000	394000	348000	268000	298000	500000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	23000	5000	11000	208000	466000	22000	138000
Metals									
Arsenic	ug/l	100 [11]	2	<1	<5 [17]	1	<1	<1	3
Boron	ug/l	200 [12]	**542**	109	**201**	**230**	92	109	**435**
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	**0.6**
Calcium	ug/l	--	139000	60100	43400	52400	22200	21400	59900
Chromium	ug/l	-- [13]	2	<1	<5 [17]	5	6	1	8
Cobalt	ug/l	0.9	**1.5**	<0.5	<2.5 [17]	**1.7**	**1.1**	<0.5	**2.9**
Copper	ug/l	5	1.3	<0.5	<2.5 [17]	**7.7**	2.8	<0.5	4.7
Iron	ug/l	300	**821**	**778**	**1310**	**3450**	**2650**	**1040**	**5120**
Lead	ug/l	-- [14]	2.0	0.3	0.5	1.4	1.8	0.2	2.8
Magnesium	ug/l	--	39800	19200	14200	12000	8250	8300	15100
Manganese	ug/l	--	1000	121	194	525	304	250	2850
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	9180	6630	5510	4650	3290	2500	13500
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	106000	92400	78500	67500	50400	60300	70700
Zinc	ug/l	30 [11]	**33**	<5	<25 [17]	18	13	7	17
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**8**	**5**	<1	<1	<1	<1	**6**

Parameter	Unit	PWQO [1]	S11	S11	S11	S11
			28-Nov-2018	20-Jun-2019	28-Aug-2019 [19]	21-Nov-2019
			S-11	S-11	S-11	S-11
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	65000	117000	--	66000
Ammonia, unionized	ug/l	20	<20	<20	--	<20
Ammonia Nitrogen	ug/l	--	50	50	--	180
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	12000	--	<60000 [25]
Chemical Oxygen Demand	ug/l	--	83000	78000	--	137000
Chloride	ug/l	--	62000	75000	--	121000
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	462	502	--	1317
Dissolved Inorganic Carbon	ug/l	--	7100	24700	--	<500
Dissolved Organic Carbon	ug/l	--	26200	19600	--	22500
Dissolved Oxygen (Field)	ug/l	-- [7]	**4570**	**1310**	--	**2040**
Hardness, Calcium Carbonate	ug/l	--	116000	111000	--	404000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	--	<100
Nitrite as N	ug/l	--	<50	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	1600	1800	--	6500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--
pH (Field)	-	8.5	6.93	6.87	--	6.49
Phosphate	ug/l	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**160**	**130**	--	**1270**
Sulphate	ug/l	--	84000	19000	--	371000
Temperature (Field)	deg c	-- [10]	0.2	18.1	--	0.2
Total Dissolved Solids	ug/l	--	308000	282000	--	720000
Total Organic Carbon	ug/l	--	--	--	--	--
Total Suspended Solids	ug/l	--	41000	38000	--	394000
Metals						
Arsenic	ug/l	100 [11]	<1	<1	--	2
Boron	ug/l	200 [12]	115	111	--	**238**
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	--	0.1
Calcium	ug/l	--	27000	28400	--	108000
Chromium	ug/l	-- [13]	2	1	--	**13**
Cobalt	ug/l	0.9	0.9	<0.5	--	**7.7**
Copper	ug/l	5	2.3	0.8	--	**6.4**
Iron	ug/l	300	**1360**	**706**	--	**11800**
Lead	ug/l	-- [14]	0.7	0.1	--	4.5
Magnesium	ug/l	--	11900	9840	--	32600
Manganese	ug/l	--	213	195	--	2650
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--
Nickel	ug/l	25	--	--	--	--
Potassium	ug/l	--	5200	2650	--	10900
Selenium	ug/l	100	--	--	--	--
Sodium	ug/l	--	57200	61700	--	89900
Zinc	ug/l	30 [11]	13	6	--	**37**
Phenols						
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	--	**5**

Parameter	Unit	PWQO [1]	S12 28-Jun-1995	S12 14-Nov-1995	S12 13-Jun-1996	S12 12-Oct-1996	S12 17-Jun-1997	S12 05-Nov-1997	S12 05-Jun-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	735000	186000	67000	288000	231000	232000	576000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	840	810	40	570	10	100	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	4000	3000	7000	23000	2000	5000
Chemical Oxygen Demand	ug/l	--	167000	70000	65000	75000	90000	41000	122000
Chloride	ug/l	--	157000	60000	37000	113000	127000	181000	317000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1276	890	530	920	793	1350	1920
Dissolved Inorganic Carbon	ug/l	--	166000	6600	15700	66800	43600	46300	118000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	5750	--	9750	9580	10590	7850	17570
Hardness, Calcium Carbonate	ug/l	--	449000	203000	133000	328000	235000	326000	507000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	400	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	3000	10000	1910	2650	6160	1420	4140
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	2160	9190	--	--	--	--	--
pH (Field)	-	8.5	7.07	7.63	7.09	7.34	7.74	7.52	--
Phosphorus	ug/l	-- [9]	**300**	**140**	**320**	**180**	**970**	**130**	**150**
Sulphate	ug/l	--	45000	51000	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	736000	450000	270000	460000	398000	680000	950000
Total Organic Carbon	ug/l	--	50300	64200	20100	28000	30200	17100	42900
Total Suspended Solids	ug/l	--	38000	79000	7000	26000	116000	48000	22000
Metals									
Arsenic	ug/l	100 [11]	100	--	--	--	--	--	--
Boron	ug/l	200 [12]	**2600**	**710**	**678**	**1600**	**1870**	**1180**	**4480**
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--
Calcium	ug/l	--	78200	53000	32900	81100	53400	82100	93800
Chromium	ug/l	-- [13]	**24**	**10**	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	3.6	2.4	**4300**	2.6	0.5	**10.4**	4.6
Iron	ug/l	300	**1300**	**1550**	**1240**	**1510**	**6090**	**910**	**390**
Lead	ug/l	-- [14]	1	0.3	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	35100	17000	12300	29900	24200	28900	66100
Manganese	ug/l	--	425	150	114	110	480	160	20
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**34**	20	20	20	**30**
Potassium	ug/l	--	26800	17600	10100	16800	11800	12900	21100
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	103000	66000	51900	92700	107000	131000	268000
Zinc	ug/l	30 [11]	10	20	10	10	20	**80**	20
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**14**	1	1

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Parameter	Unit	PWQO [1]	S12 30-Jun-1998	S12 26-Aug-1998	S12 30-Oct-1998	S12 19-Oct-1999	S12 03-May-2000	S12 25-Oct-2000	S12 13-Jun-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	436000	102000	62000	24000	98000	145000	137000
Ammonia, unionized	ug/l	20	--	--	10	--	10	--	<20
Ammonia Nitrogen	ug/l	--	70	470	40	130	60	--	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	6000	6000	5000	3000	--	8000
Chemical Oxygen Demand	ug/l	--	170000	10000	202000	120000	84000	--	66000
Chloride	ug/l	--	242000	28900	45800	55000	45500	82000	61600
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1530	341	342	410	319	487	500
Dissolved Inorganic Carbon	ug/l	--	61400	23800	43200	20500	16600	--	21500
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	9570	6520	5080	7710	5830	1720	4500
Hardness, Calcium Carbonate	ug/l	--	295000	150000	84000	89000	53000	192000	141000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2280	1220	3690	2210	620	20800	1300
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.9	7.88	6.5	7.2	6.9	7.15	7.3
Phosphorus	ug/l	-- [9]	**250**	**450**	**2850**	**770**	**50**	--	**370**
Sulphate	ug/l	--	--	--	--	--	--	20000	33000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	770000	171000	172000	200000	160000	318000	314000
Total Organic Carbon	ug/l	--	38600	8000	41600	31100	23600	--	25500
Total Suspended Solids	ug/l	--	21000	103000	19000	13000	34000	1580000	67000
Metals									
Arsenic	ug/l	100 [11]	--	--	--	--	--	7	1
Boron	ug/l	200 [12]	**3900**	**390**	120	**260**	40	**920**	**300**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	44800	44900	18600	22500	11900	49000	36400
Chromium	ug/l	-- [13]	--	--	--	--	--	**50**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	1.8	**5.8**	2.3	0.5	**5.5**	**39**	1
Iron	ug/l	300	**550**	**3680**	**6860**	**1990**	**440**	**97300**	**1520**
Lead	ug/l	-- [14]	0.2	0.6	0.2	0.8	0.2	**19**	0.9
Magnesium	ug/l	--	43800	8960	8990	7960	5590	16900	12200
Manganese	ug/l	--	640	70	430	810	20	2790	150
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**30**	20	20	20	20
Potassium	ug/l	--	23900	5300	12000	14100	4000	5600	1900
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	238000	33000	41000	45800	48000	48400	59000
Zinc	ug/l	30 [11]	10	**330**	**50**	30	10	**250**	10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**7**	1	**17**	**13**	**37**

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Parameter	Unit	PWQO [1]	S12 27-Sep-2001	S12 21-Nov-2001	S12 22-May-2002	S12 12-Nov-2002	S12 31-May-2003	S12 03-Jul-2003	S12 22-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	38000	112000	131000	52000	122000	176000	78000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	50	10	20	20	160	20	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	3000	1000	2000	3000
Chemical Oxygen Demand	ug/l	--	46000	38000	45000	71000	52000	87000	56000
Chloride	ug/l	--	119000	89200	34200	78200	53600	29100	70200
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	960	500	250	--	540	450	520
Dissolved Inorganic Carbon	ug/l	--	5200	16000	16000	11000	26000	43000	18000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3570	7540	7330	--	6200	2660	5800
Hardness, Calcium Carbonate	ug/l	--	373000	176000	109000	281000	169000	138000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	100	100	100	100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1060	770	760	1700	1020	1660	820
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.9	6.56	7.03	--	7.4	6.79	6.8
Phosphorus	ug/l	-- [9]	**160**	**100**	**50**	**330**	**70**	**210**	**110**
Sulphate	ug/l	--	355000	105000	19000	225000	88000	15000	58000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	830000	391000	212000	528000	338000	340000	275000
Total Organic Carbon	ug/l	--	17000	19000	13000	22000	21000	38000	22000
Total Suspended Solids	ug/l	--	5000	58000	4000	62000	5000	12000	84000
Metals									
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1
Boron	ug/l	200 [12]	**790**	**280**	110	**450**	130	**319**	195
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	101000	46400	30900	77400	46600	36600	33700
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	4	8
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	3.5	2.1	<1	4.3	2	2	**15**
Iron	ug/l	300	**740**	**2470**	**380**	**1890**	**540**	**2270**	**617**
Lead	ug/l	-- [14]	0.2	0.2	<1	1.7	0.5	1.2	1.3
Magnesium	ug/l	--	29300	14600	7650	21200	12800	11400	10700
Manganese	ug/l	--	230	90	10	120	50	394	41
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10
Potassium	ug/l	--	13400	5300	4800	8500	5700	1600	13200
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	95800	65200	29700	59900	49600	49600	54000
Zinc	ug/l	30 [11]	10	10	10	**40**	10	5	11
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S12 17-May-2004	S12 21-Aug-2004	S12 18-Nov-2004	S12 25-May-2005	S12 09-Sep-2005 [19]	S12 09-Nov-2005	S12 24-May-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	134000	--	116000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	<5000	--	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	137000	153000	111000	110000	--	95000	114000
Ammonia, unionized	ug/l	20	<10	<10	<10	<20	--	<20	<20
Ammonia Nitrogen	ug/l	--	10	40	10	<10	--	40	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	13000	16000	8000	--	10000	6000
Chemical Oxygen Demand	ug/l	--	66000	253000	517000	74000	--	245000	72000
Chloride	ug/l	--	44500	41600	56600	51300	--	63700	34300
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	350	360	330	440	--	100	407
Dissolved Inorganic Carbon	ug/l	--	33800	48000	23300	34100	--	26500	27100
Dissolved Organic Carbon	ug/l	--	--	--	--	17500	--	37400	18100
Dissolved Oxygen (Field)	ug/l	-- [7]	9400	3400	--	6500	--	11200	9400
Hardness, Calcium Carbonate	ug/l	--	118000	121000	102000	131000	--	101000	103000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	**80**	--	<300	--
Nitrate as N	ug/l	--	100	100	200	200	--	100	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1150	5420	9630	1530	--	3520	2040
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.4	7.5	7.1	7.3	--	7	7.9
Phosphorus	ug/l	-- [9]	**90**	**4700**	**4720**	**250**	--	**1280**	**470**
Sulphate	ug/l	--	12000	3000	17000	24000	--	51000	41000
Temperature (Field)	deg c	-- [10]	--	--	--	10	--	0	5
Total Dissolved Solids	ug/l	--	175000	180000	165000	234000	--	270000	218000
Total Organic Carbon	ug/l	--	18200	22000	16800	--	--	--	--
Total Suspended Solids	ug/l	--	10000	346000	1660000	121000	--	400000	390000
Metals									
Arsenic	ug/l	100 [11]	1	10	10	<1	--	1	<1
Boron	ug/l	200 [12]	121	**241**	**240**	106	--	158	72
Cadmium	ug/l	0.2 [11]	--	--	--	<0.1	--	<0.5	0.2
Calcium	ug/l	--	32100	31900	26100	35300	--	25800	18200
Chromium	ug/l	-- [13]	2	**9**	**100**	4	--	**9**	**22**
Cobalt	ug/l	0.9	--	--	--	**2**	--	**5**	**6.7**
Copper	ug/l	5	**15**	**86**	**111**	<2	--	**18**	**225**
Iron	ug/l	300	**1110**	**2700**	**2480**	**3660**	--	**1390**	228
Lead	ug/l	-- [14]	0.2	**9.6**	**6.7**	0.7	--	5	**10.5**
Magnesium	ug/l	--	9210	10100	8850	10500	--	8790	13900
Manganese	ug/l	--	137	9	15800	151	--	894	3550
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	<0.05	--	<0.06	--
Molybdenum	ug/l	40	--	--	--	<0.5	--	<5	--
Nickel	ug/l	25	20	**50**	**50**	<10	--	<10	--
Potassium	ug/l	--	5600	3800	6600	4500	--	5400	7000
Selenium	ug/l	100	--	--	--	<1	--	<1	--
Sodium	ug/l	--	50200	51000	40700	42000	--	62000	38400
Zinc	ug/l	30 [11]	26	**190**	**278**	16	--	**128**	**146**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**3**	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S12 15-Aug-2006	S12 16-Nov-2006	S12 08-May-2007	S12 22-Aug-2007 [19]	S12 20-Nov-2007	S12 23-May-2008	S12 12-Aug-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	172000	65000	89000	--	89000	97000	110000
Ammonia, unionized	ug/l	20	<20	<20	<20	--	<20	<20	<20
Ammonia Nitrogen	ug/l	--	20	30	<10	--	20	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	17000	<3000	<3000	--	5000	<3000	4000
Chemical Oxygen Demand	ug/l	--	367000	42000	49000	--	234000	44000	108000
Chloride	ug/l	--	35300	18000	34900	--	48900	38600	27900
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	670	170	300	--	290	335	315
Dissolved Inorganic Carbon	ug/l	--	43000	17600	22300	--	24000	24300	33300
Dissolved Organic Carbon	ug/l	--	29400	14600	14200	--	32900	17900	32900
Dissolved Oxygen (Field)	ug/l	-- [7]	**1600**	7360	**5330**	--	**7620**	6990	**110**
Hardness, Calcium Carbonate	ug/l	--	116000	35000	103000	--	91000	94000	73000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	<100	<100	--	1000	<100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	7190	980	640	--	5400	800	1870
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.7	6.9	7.6	--	7.8	7.3	7.1
Phosphorus	ug/l	-- [9]	**8350**	**170**	**50**	--	**1160**	**70**	**1750**
Sulphate	ug/l	--	2000	19000	18000	--	28000	16000	1000
Temperature (Field)	deg c	-- [10]	15.5	7	12.6	--	0	10.9	17
Total Dissolved Solids	ug/l	--	229000	122000	185000	--	216000	183000	170000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	645000	81000	4000	--	196000	<3000	55000
Metals									
Arsenic	ug/l	100 [11]	6.9	1	0.6	--	3.4	1.3	2.7
Boron	ug/l	200 [12]	139	47	48	--	77	42	89
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	<0.1	--	<0.1	<0.1	<0.1
Calcium	ug/l	--	27500	8550	28500	--	17600	26400	16800
Chromium	ug/l	-- [13]	**10**	6	<2	--	**18**	<2	<2
Cobalt	ug/l	0.9	**5.5**	<0.5	<0.5	--	**5.2**	<0.5	**1.8**
Copper	ug/l	5	**35**	**38**	**19**	--	**17**	<2	**6**
Iron	ug/l	300	**2620**	**860**	**800**	--	**812**	**497**	**2690**
Lead	ug/l	-- [14]	2.8	0.6	0.3	--	**5.9**	<0.1	0.7
Magnesium	ug/l	--	11600	3320	7700	--	11400	6720	7530
Manganese	ug/l	--	4150	45	26	--	803	13	1200
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	4000	3600	3600	--	7800	3700	2800
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	42100	28900	37500	--	42900	33400	42700
Zinc	ug/l	30 [11]	**50**	20	16	--	**65**	<5	**32**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	--	<1	<1	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12	S12	S12	S12	S12	S12	S12
			06-Nov-2008	13-May-2009	25-Aug-2009 [26]	27-Nov-2009	18-May-2010	18-Aug-2010 [30]	14-Oct-2010
				S-9	A-5	S-12	S-4	S-6	S-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	84000	108000	146000	81000	117000	107000	94000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	30	<20	150	20	30	30	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	2000	12000	2000	3000	4000	6000
Chemical Oxygen Demand	ug/l	--	67000	50000	133000	118000	58000	88000	450000
Chloride	ug/l	--	47500	41000	28000	37000	28000	28000	24000
Conductivity	uS/cm	--	--	373	373	324	316	336	274
Conductivity (Field)	uS/cm	--	385	340	405	246	355	318	530
Dissolved Inorganic Carbon	ug/l	--	22500	27300	43300	20900	26600	24000	19600
Dissolved Organic Carbon	ug/l	--	21700	19800	35900	17900	21400	38000	21100
Dissolved Oxygen (Field)	ug/l	-- [7]	**2490**	**4870**	**330**	**4660**	**4330**	**2680**	8740
Hardness, Calcium Carbonate	ug/l	--	103000	100000	105000	72000	91000	96000	80000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	--	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1740	870	2740	1700	2710	2700	5620
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.8	8.1	6.64	6.76	7.27	6.92	7.13
Phosphorus	ug/l	-- [9]	**380**	**160**	**1720**	**690**	**840**	**600**	**4210**
Sulphate	ug/l	--	28000	12000	1000	16000	1000	16000	4000
Temperature (Field)	deg c	-- [10]	7	15.3	18.9	4.7	11.1	16.1	8.5
Total Dissolved Solids	ug/l	--	207000	242000	242000	211000	205000	218000	178000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	23000	50000	69000	111000	62000	54000	408000
Metals									
Arsenic	ug/l	100 [11]	1.2	1	<50	<50	<1	<50	<50
Boron	ug/l	200 [12]	157	50	100	<100	70	200	100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<10	<10	<0.1	<10	<10
Calcium	ug/l	--	25800	27000	29000	19000	25000	27000	22000
Chromium	ug/l	-- [13]	2	2	**<50**	**20**	2	**<50**	**<50**
Cobalt	ug/l	0.9	**2**	0.7	<10	<5	0.6	<10	<10
Copper	ug/l	5	<2	3	<10	**20**	1	<10	<10
Iron	ug/l	300	**2500**	**1260**	**22000**	**9300**	**3380**	**15200**	**30900**
Lead	ug/l	-- [14]	<0.1	4	<10	<10	<1	<10	<10
Magnesium	ug/l	--	9280	8000	8000	6000	7000	7000	6000
Manganese	ug/l	--	871	80	890	220	240	400	1090
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	2400	5000	6000	5000	5000	4000	4000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	40300	38000	31000	29000	29000	31000	21000
Zinc	ug/l	30 [11]	6	**40**	<50	**60**	<10	**800**	<50
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	<1	<1	<1	<1	<1	1

Parameter	Unit	PWQO [1]	S12	S12	S12	S12	S12	S12
			19-May-2011 [31]	16-Aug-2011 [19]	30-Nov-2011 [21]	30-May-2012	22-Aug-2012 [19]	29-Nov-2012 [19]
			W-9	S-12	S12	S12	S-12	S12
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	105000	--	81000	140000	--	--
Ammonia, unionized	ug/l	20	<20	--	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	<20	--	<20	<50	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	--	2000	10000	--	--
Chemical Oxygen Demand	ug/l	--	50000	--	63000	270000	--	--
Chloride	ug/l	--	21000	--	33000	22000	--	--
Conductivity	uS/cm	--	269	--	330	--	--	--
Conductivity (Field)	uS/cm	--	285	--	325	328	--	--
Dissolved Inorganic Carbon	ug/l	--	26300	--	14500	30000	--	--
Dissolved Organic Carbon	ug/l	--	21900	--	17400	42000	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**2990**	--	**6790**	**3910**	--	--
Hardness, Calcium Carbonate	ug/l	--	86000	--	86000	120000	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	--
Nitrite as N	ug/l	--	<100	--	<100	<10	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1180	--	710	5000	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	<100	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.33	--	7.40	6.92	--	--
Phosphorus	ug/l	-- [9]	**60**	--	**40**	**1500**	--	--
Sulphate	ug/l	--	2000	--	26000	<1000	--	--
Temperature (Field)	deg c	-- [10]	14.8	--	6.0	19.3	--	--
Total Dissolved Solids	ug/l	--	175000	--	214000	272000	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	--	72000	120000	--	--
Metals								
Arsenic	ug/l	100 [11]	<1	--	<50	3.7	--	--
Boron	ug/l	200 [12]	50	--	<100	96	--	--
Cadmium	ug/l	0.2 [11]	<0.1	--	<10	<0.10	--	--
Calcium	ug/l	--	23000	--	23000	36000	--	--
Chromium	ug/l	-- [13]	2	--	**<50**	5.6	--	--
Cobalt	ug/l	0.9	<0.2	--	<10	**5.3**	--	--
Copper	ug/l	5	<1	--	<10	4.1	--	--
Iron	ug/l	300	**530**	--	**2600**	**22000**	--	--
Lead	ug/l	-- [14]	<1	--	<10	1.7	--	--
Magnesium	ug/l	--	7000	--	7000	9300	--	--
Manganese	ug/l	--	30	--	80	2200	--	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	4000	--	4000	3500	--	--
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	23000	--	29000	29000	--	--
Zinc	ug/l	30 [11]	<10	--	<50	15	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<5	--	<1	**1.6**	--	--

Parameter	Unit	PWQO [1]	S12 28-May-2013 S12	S12 15-Aug-2013 [19] S12	S12 21-Nov-2013 SA-9	S12 28-May-2014 [22] S12 (SW-E)	S12 26-Aug-2014 [23] S12	S12 13-Nov-2014 [23] S-12
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	90000	--	73000	120000	140000	61000
Ammonia, unionized	ug/l	20	<20	--	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	100	--	<50	62	150	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	2000	2000	6000	<2000
Chemical Oxygen Demand	ug/l	--	74000	--	210000	130000	200000	91000
Chloride	ug/l	--	29000	--	31000	46000	32000	27000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	274	--	295	393	396	240
Dissolved Inorganic Carbon	ug/l	--	20000	--	21000	29000	39000	14000
Dissolved Organic Carbon	ug/l	--	22000	--	31000	20000	29000	30000
Dissolved Oxygen (Field)	ug/l	-- [7]	**3510**	--	**5240**	**4180**	**1080**	9290
Hardness, Calcium Carbonate	ug/l	--	87000	--	80000	110000	120000	63000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<500	<500	<500
Nitrite as N	ug/l	--	<10	--	<10	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2000	--	5200	13000	3800	920
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	<100	<500	<500	<500
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.27	--	7.45	7.29	7.02	7.39
Phosphorus	ug/l	-- [9]	**360**	--	**480**	**780**	**2400**	**520**
Sulphate	ug/l	--	<1000	--	13000	<1000	<1000	<1000
Temperature (Field)	deg c	-- [10]	12.9	--	0.3	13.0	18.0	2.9
Total Dissolved Solids	ug/l	--	166000	--	244000	284000	262000	148000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	44000	--	150000	23000	250000	33000
Metals								
Arsenic	ug/l	100 [11]	1.3	--	1.4	1.2	3.0	<1.0
Boron	ug/l	200 [12]	62	--	56	52	65	46
Cadmium	ug/l	0.2 [11]	<0.10	--	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	23000	--	25000	32000	35000	18000
Chromium	ug/l	-- [13]	<5.0	--	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	**1.3**	--	**1.7**	**1.3**	**5.1**	0.77
Copper	ug/l	5	1.4	--	2.9	1.5	1.9	1.1
Iron	ug/l	300	**4500**	--	**6000**	**3800**	**19000**	**4300**
Lead	ug/l	-- [14]	<0.50	--	1.4	0.56	0.97	<0.50
Magnesium	ug/l	--	7100	--	8400	9400	10000	6100
Manganese	ug/l	--	500	--	320	460	2600	260
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	4100	--	4600	5000	1700	2900
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	30000	--	29000	43000	36000	23000
Zinc	ug/l	30 [11]	7.4	--	12	11	13	5.6
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	--	**2.2**	<1.0	<1.0	**9.5**

Parameter	Unit	PWQO [1]	S12 27-May-2015 S-12	S12 25-Aug-2015 S-12	S12 25-Nov-2015 S-12	S12 24-May-2016 S-12	S12 18-Aug-2016 S-12	S12 16-Nov-2016 S-12	S12 18-May-2017 S-12
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	104000	116000	103000	123000	65000	158000	139000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	110	20	30	90	90	80	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<20000 [24]	<75000 [24]	2000	13000	18000	4000	20000
Chemical Oxygen Demand	ug/l	--	143000	321000	83000	192000	120000	59000	76000
Chloride	ug/l	--	54000	52000	58000	66000	74000	100000	48000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	362	399	191	439	686	811	434
Dissolved Inorganic Carbon	ug/l	--	18500	4500	27100	9600	12800	31300	2300
Dissolved Organic Carbon	ug/l	--	37500	59500	27800	46500	30400	16200	40300
Dissolved Oxygen (Field)	ug/l	-- [7]	**2680**	**1060**	**4250**	**710**	**3500**	**3610**	**810**
Hardness, Calcium Carbonate	ug/l	--	17600	116000	289000	144000	161000	214000	138000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2800	6200	1100	4400	3000	800	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.65	8.18	7.26	7.50	6.86	7.57	7.67
Phosphorus	ug/l	-- [9]	**960**	**3130**	**90**	**2000**	**1110**	**130**	**130**
Sulphate	ug/l	--	4000	<1000	19000	5000	168000	72000	20000
Temperature (Field)	deg c	-- [10]	18.3	15.9	0	11.5	19	5.6	17.5
Total Dissolved Solids	ug/l	--	222000	275000	266000	306000	482000	458000	268000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	114000	220000	39000	272000	49000	15000	62000
Metals									
Arsenic	ug/l	100 [11]	<1	6	<1	3	3	<1	<5 [17]
Boron	ug/l	200 [12]	16	95	54	63	**354**	117	154
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]
Calcium	ug/l	--	4760	30400	18500	41900	42700	58300	38800
Chromium	ug/l	-- [13]	<1	8	2	5	4	2	<5 [17]
Cobalt	ug/l	0.9	0.7	**4.4**	<0.5	**2.5**	**1.3**	<0.5	<2.5 [17]
Copper	ug/l	5	<0.5	<0.5	<0.5	3.2	3.4	0.7	3.2
Iron	ug/l	300	**1610**	**59200**	**845**	**47000**	**7760**	**1050**	**2810**
Lead	ug/l	-- [14]	0.5	4.3	0.2	2.7	1.2	1.0	0.6
Magnesium	ug/l	--	1400	9720	8850	9620	13100	16600	10000
Manganese	ug/l	--	278	1330	39	824	404	111	371
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	643	2070	4380	4480	8380	6040	4600
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	8050	41300	49400	49400	64300	86400	42800
Zinc	ug/l	30 [11]	5	28	6	24	**34**	27	<25 [17]
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**6**	<1	**23**	**9**	**9**	<1

Parameter	Unit	PWQO [1]	S12 28-Aug-2017 S-12	S12 28-Nov-2017 S-12	S12 23-May-2018 S-12	S12 30-Aug-2018 [19] S-12	S12 28-Nov-2018 S-12	S12 20-Jun-2019 S-12
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	115000	139000	118000	--	51000	164000
Ammonia, unionized	ug/l	20	<20	<20	<20	--	<20	<20
Ammonia Nitrogen	ug/l	--	20	60	30	--	100	130
Biochemical Oxygen Demand, 5 Day	ug/l	--	<200000 [25]	3000	<2000	--	4000	203000
Chemical Oxygen Demand	ug/l	--	1120000	53000	52000	--	107000	807000
Chloride	ug/l	--	35000	57000	67000	--	40000	54000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	264	62	446	--	161	482
Dissolved Inorganic Carbon	ug/l	--	<500	12000	28700	--	5500	34400
Dissolved Organic Carbon	ug/l	--	94900	35700	17400	--	15700	24800
Dissolved Oxygen (Field)	ug/l	-- [7]	**1710**	**2330**	**4900**	--	**6430**	**4610**
Hardness, Calcium Carbonate	ug/l	--	163000	139000	92000	--	75000	124000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	--	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	--	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	7100	2100	1200	--	2200	10900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	8.5	6.90	7.23	7.37	--	7.51	6.96
Phosphorus	ug/l	-- [9]	**7620**	**750**	**140**	--	**530**	**8390**
Sulphate	ug/l	--	2000	38000	9000	--	13000	2000
Temperature (Field)	deg c	-- [10]	13.1	0	11.8	--	0	15.7
Total Dissolved Solids	ug/l	--	212000	306000	258000	--	144000	328000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	2020000	508000	18000	--	198000	1110000
Metals								
Arsenic	ug/l	100 [11]	3	2	<1	--	1	9
Boron	ug/l	200 [12]	83	69	86	--	46	109
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	--	0.2	0.2
Calcium	ug/l	--	49400	37800	25900	--	21300	34200
Chromium	ug/l	-- [13]	3	4	<1	--	**20**	6
Cobalt	ug/l	0.9	**4.3**	**1.9**	<0.5	--	**2.1**	**9.3**
Copper	ug/l	5	1.8	1.9	<0.5	--	**6.4**	**17.8**
Iron	ug/l	300	**52400**	**12000**	**604**	--	**6530**	**132000**
Lead	ug/l	-- [14]	1.2	1.1	<0.1	--	**6.6**	**5.6**
Magnesium	ug/l	--	9560	10900	6750	--	5160	9310
Manganese	ug/l	--	1860	706	30	--	165	3240
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	1240	4400	3580	--	3290	2240
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	39000	43000	43400	--	30600	51500
Zinc	ug/l	30 [11]	19	9	7	--	23	**40**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<10 [32]	<1	<1	--	**2**	<1

Parameter	Unit	PWQO [1]	S12	S12
			28-Aug-2019	21-Nov-2019
			S-12	S-12
General Chemistry				
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	10000	85000
Ammonia, unionized	ug/l	20	<20	<20
Ammonia Nitrogen	ug/l	--	30	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	<20000 [25]
Chemical Oxygen Demand	ug/l	--	73000	101000
Chloride	ug/l	--	3000	92000
Conductivity	uS/cm	--	--	--
Conductivity (Field)	uS/cm	--	84	767
Dissolved Inorganic Carbon	ug/l	--	<500	<500
Dissolved Organic Carbon	ug/l	--	9300	15400
Dissolved Oxygen (Field)	ug/l	-- [7]	5570	9800
Hardness, Calcium Carbonate	ug/l	--	30600	215000
Hydrogen Sulfide	ug/l	2 [8]	--	--
Nitrate as N	ug/l	--	<100	<100
Nitrite as N	ug/l	--	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1100	1500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--
Nitrogen, Organic	ug/l	--	--	--
pH (Field)	-	8.5	6.22	6.63
Phosphorus	ug/l	-- [9]	**300**	**370**
Sulphate	ug/l	--	17000	127000
Temperature (Field)	deg c	-- [10]	18.7	0.1
Total Dissolved Solids	ug/l	--	50000	384000
Total Organic Carbon	ug/l	--	--	--
Total Suspended Solids	ug/l	--	113000	189000
Metals				
Arsenic	ug/l	100 [11]	<1	1
Boron	ug/l	200 [12]	63	127
Cadmium	ug/l	0.2 [11]	<0.1	<0.1
Calcium	ug/l	--	8860	56600
Chromium	ug/l	-- [13]	**12**	3
Cobalt	ug/l	0.9	**1.2**	0.8
Copper	ug/l	5	4.4	2.4
Iron	ug/l	300	**3630**	**5020**
Lead	ug/l	-- [14]	**4.0**	0.8
Magnesium	ug/l	--	2070	17900
Manganese	ug/l	--	55	313
Mercury, dissolved	ug/l	0.2 [15]	--	--
Molybdenum	ug/l	40	--	--
Nickel	ug/l	25	--	--
Potassium	ug/l	--	1620	5410
Selenium	ug/l	100	--	--
Sodium	ug/l	--	8130	75500
Zinc	ug/l	30 [11]	22	13
Phenols				
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	**4**

Parameter	Unit	PWQO [1]	S15 13-Jun-2001	S15 27-Sep-2001	S15 21-Nov-2001	S15 22-May-2002	S15 08-Nov-2002	S15 31-May-2003	S15 03-Jul-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	241000	189000	177000	199000	225000	168000	253000
Ammonia, unionized	ug/l	20	<20	<20	<20	--	--	--	--
Ammonia Nitrogen	ug/l	--	30	30	20	20	30	240	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	1000	1000	2000
Chemical Oxygen Demand	ug/l	--	30000	27000	26000	28000	35000	48000	27000
Chloride	ug/l	--	200000	282000	191000	173000	275000	146000	232000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1000	1340	910	860	1400	880	1240
Dissolved Inorganic Carbon	ug/l	--	37800	45900	24800	7000	63000	18000	63000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12800	9600	12190	11110	9700	9160	6630
Hardness, Calcium Carbonate	ug/l	--	312000	428000	263000	298000	427000	228000	362000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	300	200	1300	600	1000	700	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	810	760	610	560	1170	1090	620
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	8	7.96	7.23	7.22	7.1	7.9	7.92
Phosphate	ug/l	--	90	80	30	40	160	70	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	40000	157000	80000	56000	140000	58000	68000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	594000	904000	600000	558000	700000	495000	810000
Total Organic Carbon	ug/l	--	12200	11800	15000	9000	12000	42000	18000
Total Suspended Solids	ug/l	--	40000	7000	13000	9000	75000	8000	3000
Metals									
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1
Boron	ug/l	200 [12]	100	90	60	60	90	40	71
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	90500	131000	81200	91800	130000	70200	108000
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	**10**	2
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	3.5	3.5	2	<1	**6.4**	4	2
Iron	ug/l	300	**1600**	250	200	**380**	**1690**	**400**	147
Lead	ug/l	-- [14]	1.2	0.2	0.2	<1	3.9	0.5	0.5
Magnesium	ug/l	--	21000	24400	14700	16700	24800	12900	22500
Manganese	ug/l	--	160	160	90	140	380	100	161
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	10
Potassium	ug/l	--	8400	19700	9500	12000	18300	11200	14400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	107000	145000	96000	107000	152000	85300	138000
Zinc	ug/l	30 [11]	10	10	10	20	30	10	5
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**50**	1	1	1	1	1	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S15 22-Oct-2003	S15 17-May-2004	S15 21-Aug-2004	S15 18-Nov-2004	S15 25-May-2005	S15 09-Sep-2005	S15 09-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	332000	913000	366000
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	<5000	<5000	<5000
Alkalinity (Total as CaCO3)	ug/l	-- [5]	189000	214000	336000	250000	272000	748000	300000
Ammonia, unionized	ug/l	20	--	<10	<10	<10	**25.03**	**222.59**	<20
Ammonia Nitrogen	ug/l	--	250	10	60	60	2160	8300	150
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	1000	1000	21000	9000	<3000
Chemical Oxygen Demand	ug/l	--	58000	37000	32000	32000	94000	212000	25000
Chloride	ug/l	--	221000	203000	207000	252000	194000	171000	341000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1280	1140	1160	1070	1550	1800	970
Dissolved Inorganic Carbon	ug/l	--	45000	33700	28500	25400	73400	180000	61400
Dissolved Organic Carbon	ug/l	--	--	--	--	--	19800	99200	10600
Dissolved Oxygen (Field)	ug/l	-- [7]	10400	9800	8700	8270	**4690**	**2700**	10100
Hardness, Calcium Carbonate	ug/l	--	--	308000	410000	337000	363000	604000	453000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	<10	<300	**10**
Nitrate as N	ug/l	--	1300	300	200	700	100	3400	800
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1740	700	830	730	5380	15600	760
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.98	7.9	8	7.2	7.5	7.9	7
Phosphate	ug/l	--	220	30	20	40	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	**710**	**1130**	30
Sulphate	ug/l	--	75000	56000	67000	80000	45000	45000	101000
Temperature (Field)	deg c	-- [10]	--	--	--	--	19.1	18.2	0
Total Dissolved Solids	ug/l	--	672000	570000	580000	535000	665000	1050000	1020000
Total Organic Carbon	ug/l	--	24000	10100	10000	9800	--	--	--
Total Suspended Solids	ug/l	--	40000	18000	5000	13000	10000	12000	16000
Metals									
Arsenic	ug/l	100 [11]	1	1	1	1	<1	2	<1
Boron	ug/l	200 [12]	54	53	78	48	65	109	65
Cadmium	ug/l	0.2 [11]	--	--	--	--	<0.1	0.2	<0.5
Calcium	ug/l	--	92500	92300	119000	99800	110000	154000	136000
Chromium	ug/l	-- [13]	**10**	1	1	3	<2	3	<2
Cobalt	ug/l	0.9	--	--	--	--	**24**	**4.3**	**1**
Copper	ug/l	5	**15**	3	3	3	<2	**13**	<2
Iron	ug/l	300	**1810**	**344**	283	**1070**	**1730**	**5190**	**525**
Lead	ug/l	-- [14]	2.3	0.3	1.6	0.6	0.3	1.8	0.5
Magnesium	ug/l	--	15900	18800	27200	21200	21300	53300	27400
Manganese	ug/l	--	194	199	402	271	734	2120	517
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	<0.05	<0.06	<0.06
Molybdenum	ug/l	40	--	--	--	--	5.1	0.9	<5
Nickel	ug/l	25	10	10	10	10	<10	<10	<10
Potassium	ug/l	--	24200	11200	11100	14000	28200	151000	15800
Selenium	ug/l	100	--	--	--	--	<1	<1	<1
Sodium	ug/l	--	146000	125000	146000	144000	125000	143000	231000
Zinc	ug/l	30 [11]	25	5	12	8	**127**	**49**	<5
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	**14**	<1	<1

Parameter	Unit	PWQO [1]	S15 24-May-2006	S15 15-Aug-2006	S15 16-Nov-2006	S15 08-May-2007	S15 22-Aug-2007 [19]	S15 20-Nov-2007	S15 23-May-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	95000	354000	121000	236000	--	202000	180000
Ammonia, unionized	ug/l	20	<20	<20	--	<20	--	<20	<20
Ammonia Nitrogen	ug/l	--	30	<10	80	<10	--	50	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	<3000	--	3000	<3000
Chemical Oxygen Demand	ug/l	--	44000	29000	41000	30000	--	21000	38000
Chloride	ug/l	--	61000	281000	48300	181000	--	201000	111000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	290	1550	320	800	--	750	625
Dissolved Inorganic Carbon	ug/l	--	25400	85000	30300	56600	--	56600	42500
Dissolved Organic Carbon	ug/l	--	21800	18600	15100	10100	--	12400	11300
Dissolved Oxygen (Field)	ug/l	-- [7]	8900	**1800**	9600	9990	--	10820	11190
Hardness, Calcium Carbonate	ug/l	--	129000	410000	93000	290000	--	281000	193000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	300	300	500	400	--	600	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	870	580	1020	560	--	710	800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.8	7.5	--	8.3	--	7.8	8.1
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	30	**180**	10	--	**150**	**40**
Sulphate	ug/l	--	31000	80000	34000	57000	--	75000	33000
Temperature (Field)	deg c	-- [10]	11	17	8	17.6	--	1.5	14.2
Total Dissolved Solids	ug/l	--	234000	904000	244000	614000	--	635000	396000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	9000	58000	3000	--	58000	<3000
Metals									
Arsenic	ug/l	100 [11]	<1	1.1	1	0.9	--	1.3	1.3
Boron	ug/l	200 [12]	27	73	32	52	--	44	29
Cadmium	ug/l	0.2 [11]	0.2	<0.1	<0.5	<0.1	--	<0.1	<0.1
Calcium	ug/l	--	38800	120000	26800	84700	--	85100	58500
Chromium	ug/l	-- [13]	<2	<2	8	<2	--	8	<2
Cobalt	ug/l	0.9	0.5	0.4	**1**	0.5	--	**2.1**	<0.5
Copper	ug/l	5	<2	2	**40**	**20**	--	**6**	<2
Iron	ug/l	300	**790**	200	**1270**	**362**	--	**3420**	**664**
Lead	ug/l	-- [14]	0.8	0.5	5	0.2	--	**7.8**	<0.1
Magnesium	ug/l	--	7770	26800	6390	19000	--	16500	11400
Manganese	ug/l	--	102	246	185	336	--	506	234
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	4100	11600	7000	8900	--	9500	6100
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	36800	183000	44900	120000	--	120000	68900
Zinc	ug/l	30 [11]	8	<5	**48**	13	--	28	<5
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S15	S15	S15	S15	S15	S15	S15
			12-Aug-2008	06-Nov-2008	13-May-2009	25-Aug-2009	27-Nov-2009	18-May-2010	18-Aug-2010
					S-2	A-6	S-8	S-2	S-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	339000	252000	212000	437000	177000	378000	422000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	70	50	50	80	100	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	2000	<1000	2000	<1000	2000
Chemical Oxygen Demand	ug/l	--	42000	23000	40000	60000	38000	30000	40000
Chloride	ug/l	--	262000	193000	139000	199000	85000	209000	169000
Conductivity	uS/cm	--	--	--	930	1520	719	1430	1560
Conductivity (Field)	uS/cm	--	1500	1000	800	1226	697	1515	1401
Dissolved Inorganic Carbon	ug/l	--	82000	60900	51300	108000	42800	77900	93200
Dissolved Organic Carbon	ug/l	--	14000	6400	14500	15600	12600	13700	16100
Dissolved Oxygen (Field)	ug/l	-- [7]	8730	6920	11130	9150	13530	12740	8830
Hardness, Calcium Carbonate	ug/l	--	346000	306000	257000	417000	192000	393000	527000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	400	480	290	290	240	260
Nitrite as N	ug/l	--	--	--	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	710	740	720	580	680	680	520
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	8.5	8.1	7.9	7.83	8.16	7.60	6.93
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	10	20	**40**	30	**130**	<10	20
Sulphate	ug/l	--	49000	66000	40000	58000	49000	52000	157000
Temperature (Field)	deg c	-- [10]	22.6	9.7	19.1	18.8	5.1	14.1	16.9
Total Dissolved Solids	ug/l	--	819000	660000	605000	988000	467000	930000	1010000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	4000	2000	5000	31000	9000	<2000
Metals									
Arsenic	ug/l	100 [11]	0.8	<0.5	<1	<1	<1	<1	<1
Boron	ug/l	200 [12]	66	61	50	80	50	80	100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	96300	94300	78000	124000	57000	116000	160000
Chromium	ug/l	-- [13]	<2	<2	4	6	6	5	5
Cobalt	ug/l	0.9	<0.5	0.9	0.5	0.9	0.7	**1.0**	0.8
Copper	ug/l	5	<2	2	2	2	2	2	3
Iron	ug/l	300	263	**381**	**690**	**420**	**1730**	**410**	210
Lead	ug/l	-- [14]	<0.1	<0.1	<1	<1	<1	<1	<1
Magnesium	ug/l	--	25500	17100	15000	26000	12000	25000	31000
Manganese	ug/l	--	73	476	330	1490	510	1460	1340
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	9800	8500	7000	10000	7000	9000	12000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	172000	127000	96000	145000	57000	152000	143000
Zinc	ug/l	30 [11]	<5	<5	<10	<10	<10	<10	<10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**2**	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S15	S15	S15	S15	S15	S15	S15
			14-Oct-2010	19-May-2011	16-Aug-2011 [2]	30-Nov-2011 [21]	30-May-2012	22-Aug-2012	29-Nov-2012
			S-11	W-13	N-7	S15	S 15	S-15	S15
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	332000	189000	413000	213000	370000	520000	420000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	70	70	60	80	<50	<50	360
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	2000	1000	3000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	33000	55000	50000	28000	54000	55000	33000
Chloride	ug/l	--	186000	80000	158000	114000	190000	190000	200000
Conductivity	uS/cm	--	1430	700	1370	968	--	--	--
Conductivity (Field)	uS/cm	--	1174	672	1114	890	1358	1515	1506
Dissolved Inorganic Carbon	ug/l	--	78200	45200	95200	37400	94000	110000	95000
Dissolved Organic Carbon	ug/l	--	12500	16000	18000	9400	18000	21000	13000
Dissolved Oxygen (Field)	ug/l	-- [7]	14430	7180	6970	11190	10160	**4640**	11760
Hardness, Calcium Carbonate	ug/l	--	417000	223000	438000	283000	440000	650000	500000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	290	220	230	630	150	270	660
Nitrite as N	ug/l	--	<100	<100	<100	<100	16	12	<10
Nitrogen, Total Kjeldahl	ug/l	--	630	760	1030	870	1200	900	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	160	280	660
pH (Field)	-	8.5	7.62	7.68	7.85	7.86	7.82	7.62	7.67
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	**60**	30	**80**	**64**	19	25
Sulphate	ug/l	--	124000	40000	91000	88000	89000	160000	120000
Temperature (Field)	deg c	-- [10]	10.7	13.7	18.8	5.6	21.7	18.8	0
Total Dissolved Solids	ug/l	--	930000	455000	890000	629000	872000	1130000	986000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	7000	26000	23000	5000	21000	6000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	<10	<50	<1.0	<1.0	<1.0
Boron	ug/l	200 [12]	60	40	70	100	84	110	73
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<10	<0.10	<0.10	<0.10
Calcium	ug/l	--	129000	68000	126000	82000	140000	180000	170000
Chromium	ug/l	-- [13]	6	3	7	**<50**	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.6	0.5	0.7	<10	0.53	0.79	0.68
Copper	ug/l	5	2	2	2	<10	3.1	2.4	2.6
Iron	ug/l	300	**310**	**740**	**600**	**2300**	**790**	**630**	**550**
Lead	ug/l	-- [14]	<1	<1	<1	<10	<0.50	<0.50	<0.50
Magnesium	ug/l	--	23000	13000	30000	19000	30000	48000	39000
Manganese	ug/l	--	710	280	710	570	800	1500	1800
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	10000	9000	11000	11000	15000	17000	11000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	135000	62000	122000	81000	170000	160000	170000
Zinc	ug/l	30 [11]	<10	<10	<10	<50	<5.0	<5.0	<5.0
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1.0	<1.0	<1.0

Parameter	Unit	PWQO [1]	S15	S15	S15	S15	S15	S15	S15
			28-May-2013	15-Aug-2013	21-Nov-2013	28-May-2014	26-Aug-2014	13-Nov-2014	27-May-2015
			S3	S15	SA-12	S15	S15	S-15	S-15
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	330000	540000	360000	360000	480000	270000	353000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	200	67	77	<50	100	110	120
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	36000	54000	34000	38000	52000	32000	33000
Chloride	ug/l	--	220000	200000	190000	260000	220000	150000	325000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1294	1648	1370	1419	1674	945	1704
Dissolved Inorganic Carbon	ug/l	--	74000	130000	89000	78000	120000	64000	83600
Dissolved Organic Carbon	ug/l	--	14000	22000	12000	14000	18000	14000	16600
Dissolved Oxygen (Field)	ug/l	-- [7]	**530**	**5150**	**3130**	11320	6830	11400	10240
Hardness, Calcium Carbonate	ug/l	--	440000	570000	480000	440000	540000	320000	416000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	430	320	720	410	200	300	200
Nitrite as N	ug/l	--	15	<10	<10	<10	<10	23	<50
Nitrogen, Total Kjeldahl	ug/l	--	1600	1000	840	860	1000	730	700
Nitrogen, Nitrate-Nitrite	ug/l	--	450	320	720	410	200	320	--
pH (Field)	-	8.5	7.07	7.75	7.65	7.36	7.76	7.34	7.34
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**42**	14	**33**	20	21	**32**	<10
Sulphate	ug/l	--	81000	58000	120000	74000	79000	57000	71000
Temperature (Field)	deg c	-- [10]	14.9	18.8	1.1	15.0	21.2	4.3	20.4
Total Dissolved Solids	ug/l	--	820000	1030000	908000	1010000	978000	636000	994000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	2000	<1000	31000	2000	6000	4000	<2000
Metals									
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
Boron	ug/l	200 [12]	55	82	91	80	100	57	84
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Calcium	ug/l	--	130000	170000	140000	130000	150000	99000	117000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1
Cobalt	ug/l	0.9	0.55	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5
Copper	ug/l	5	2.4	1.4	2.2	2.1	1.4	1.6	<0.5
Iron	ug/l	300	**650**	<100	**650**	290	180	**860**	262
Lead	ug/l	-- [14]	<0.50	<0.50	1.1	<0.50	<0.50	<0.50	<0.1
Magnesium	ug/l	--	28000	45000	35000	30000	38000	23000	29800
Manganese	ug/l	--	850	360	470	790	370	560	520
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	12000	14000	12000	13000	13000	10000	11400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	160000	160000	150000	180000	170000	110000	169000
Zinc	ug/l	30 [11]	<5.0	<5.0	<5.0	<5.0	5.5	<5.0	<5
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	<1.0	**3.8**	<1

Parameter	Unit	PWQO [1]	S15	S15	S15	S15	S15	S15	S15
			25-Aug-2015	25-Nov-2015	24-May-2016	18-Aug-2016	16-Nov-2016	18-May-2017	28-Aug-2017
			S-15	S-15	S-15	S-15	S-15	S-15	S-15
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	538000	411000	408000	508000	417000	331000	520000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	30	290	80	190	180	100	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	18000	<2000	<2000	5000	3000	<2000	6000
Chemical Oxygen Demand	ug/l	--	45000	40000	38000	67000	32000	39000	44000
Chloride	ug/l	--	335000	280000	207000	258000	346000	159000	250000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1888	1769	1364	1792	1981	1140	1288
Dissolved Inorganic Carbon	ug/l	--	115000	81900	82100	84600	75500	42500	97400
Dissolved Organic Carbon	ug/l	--	19700	13100	15300	45500	12100	25100	17000
Dissolved Oxygen (Field)	ug/l	-- [7]	**4570**	13590	10400	6340	11590	9890	7240
Hardness, Calcium Carbonate	ug/l	--	504000	620000	490000	580000	518000	324000	683000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	200	200	200	100	200	200
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	900	1100	900	1600	700	800	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	**8.69**	7.81	7.87	7.79	7.53	7.96	7.85
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	30	<10	**90**	20	30	20
Sulphate	ug/l	--	77000	106000	101000	204000	120000	80000	63000
Temperature (Field)	deg c	-- [10]	17.7	0.1	22.6	20.6	7.5	22.0	16.0
Total Dissolved Solids	ug/l	--	1160000	987000	868000	1210000	1140000	708000	1010000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	21000	2000	5000	7000	7000	3000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<5 [17]	<1
Boron	ug/l	200 [12]	91	80	110	134	94	**252**	87
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1
Calcium	ug/l	--	133000	191000	129000	147000	150000	87600	211000
Chromium	ug/l	-- [13]	<1	1	<1	<1	<1	<5 [17]	1
Cobalt	ug/l	0.9	0.5	0.6	<0.5	<0.5	0.6	<2.5 [17]	0.6
Copper	ug/l	5	<0.5	<0.5	1.5	0.7	0.8	**5.5**	<0.5
Iron	ug/l	300	197	**527**	254	223	**328**	**647**	**325**
Lead	ug/l	-- [14]	<0.1	0.1	<0.1	<0.1	<0.1	<0.5 [17]	0.1
Magnesium	ug/l	--	41100	34900	40500	51600	34600	25600	38100
Manganese	ug/l	--	1370	1220	614	488	1250	554	1100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	12900	10900	12300	24200	14400	10300	15300
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	176000	205000	161000	185000	186000	115000	171000
Zinc	ug/l	30 [11]	5	8	<5	<5	<5	<25 [17]	12
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	<1	**6**	**5**	**5**	<1	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S15 28-Nov-2017 S-15	S15 23-May-2018 S-15	S15 30-Aug-2018 S-15	S15 28-Nov-2018 S-15	S15 20-Jun-2019 S-15	S15 28-Aug-2019 S-15	S15 21-Nov-2019 S-15
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	324000	343000	664000	323000	344000	371000	377000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	280	160	70	120	210	150	350
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	2000	3000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	24000	37000	75000	35000	43000	54000	32000
Chloride	ug/l	--	171000	162000	253000	214000	154000	168000	308000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1141	1124	1724	1213	1177	1149	1883
Dissolved Inorganic Carbon	ug/l	--	15300	70400	115000	62000	72300	125000	<500
Dissolved Organic Carbon	ug/l	--	53000	13400	29300	11800	10400	27400	11000
Dissolved Oxygen (Field)	ug/l	-- [7]	13660	10480	**2020**	14410	8880	7230	14600
Hardness, Calcium Carbonate	ug/l	--	341000	312000	647000	385000	345000	385000	544000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	500	200	400	1000	400	200	300
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	900	800	2400	1200	900	1000	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	8.35	7.70	7.94	7.55	7.69	7.55	8.00
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	10	20	**40**	**90**	**50**	**60**	20
Sulphate	ug/l	--	70000	45000	13000	117000	113000	59000	92000
Temperature (Field)	deg c	-- [10]	0.7	18.5	18.2	2	17	17.8	0.6
Total Dissolved Solids	ug/l	--	670000	666000	1040000	764000	712000	724000	976000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	7000	4000	17000	6000	21000	4000	5000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1	<1
Boron	ug/l	200 [12]	76	76	61	83	100	64	69
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	96600	92500	168000	102000	90700	101000	150000
Chromium	ug/l	-- [13]	<1	<1	2	4	1	1	1
Cobalt	ug/l	0.9	0.6	<0.5	**1.1**	**1.0**	0.7	0.8	**1.0**
Copper	ug/l	5	1.7	<0.5	1.4	**5.1**	2.2	2.1	1.5
Iron	ug/l	300	**894**	**634**	**1170**	**938**	**1730**	**1070**	**1260**
Lead	ug/l	-- [14]	0.2	<0.1	0.4	0.4	0.5	0.3	0.1
Magnesium	ug/l	--	24100	19700	55200	31400	28700	31900	41000
Manganese	ug/l	--	956	503	1800	388	830	1240	1670
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	9660	8070	21800	14400	11000	12900	15800
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	110000	94200	152000	161000	119000	96300	164000
Zinc	ug/l	30 [11]	5	<5	6	8	<5	5	5
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	**5**	<1	<1	**6**	**10**

Parameter	Unit	PWQO [1]	S16 27-Sep-2001	S16 21-Nov-2001	S16 22-May-2002	S16 08-Nov-2002	S16 31-May-2003	S16 03-Jul-2003	S16 22-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	153000	86000	176000	156000	103000	210000	93000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	670	30	30	1070	180	240	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	4000	1000	2000	2000
Chemical Oxygen Demand	ug/l	--	70000	29000	36000	31000	63000	44000	40000
Chloride	ug/l	--	394000	63300	83000	300000	56000	340000	92500
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1580	450	490	1400	480	1490	680
Dissolved Inorganic Carbon	ug/l	--	39700	12000	20000	39000	25000	57000	24000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	2920	7410	8200	3000	3860	2000	8400
Hardness, Calcium Carbonate	ug/l	--	386000	191000	211000	303000	161000	292000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	2600	600	200	600	200	1600
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2460	920	640	1980	1220	1500	850
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.37	6.4	6.15	7.4	7.5	7.03	7.5
Phosphate	ug/l	--	280	70	40	130	60	150	130
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	154000	76000	37000	134000	42000	37000	75000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1050000	328000	340000	700000	266000	937000	347000
Total Organic Carbon	ug/l	--	9600	15000	11000	10000	23000	15000	13000
Total Suspended Solids	ug/l	--	186000	22000	2000	34000	3000	77000	6000
Metals									
Arsenic	ug/l	100 [11]	2	1	1	1	1	2	1
Boron	ug/l	200 [12]	50	30	40	70	20	46	34
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	131000	57000	64700	104000	48300	96700	56300
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	3	7
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	**8.2**	2.1	<1	2.9	3	2	**11**
Iron	ug/l	300	**2400**	**410**	**650**	**1150**	**870**	**2970**	**437**
Lead	ug/l	-- [14]	**8**	0.2	<1	3.9	0.5	3.6	1.8
Magnesium	ug/l	--	14400	11700	11800	10600	9740	12300	10300
Manganese	ug/l	--	390	40	240	860	160	1060	60
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10
Potassium	ug/l	--	7100	9000	7000	9100	5500	5600	11300
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	208000	30300	50900	176000	38800	209000	49500
Zinc	ug/l	30 [11]	30	**500**	20	20	10	13	16
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S16 17-May-2004	S16 21-Aug-2004 [19]	S16 18-Nov-2004	S16 25-May-2005	S16 09-Sep-2005 [19]	S16 09-Nov-2005	S16 24-May-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	215000	--	327000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	<5000	--	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	194000	--	150000	180000	--	268000	183000
Ammonia, unionized	ug/l	20	<10	--	<10	<20	--	<20	<20
Ammonia Nitrogen	ug/l	--	50	--	10	<10	--	570	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	--	2000	<3000	--	<3000	3000
Chemical Oxygen Demand	ug/l	--	55000	--	36000	52000	--	45000	48000
Chloride	ug/l	--	158000	--	68500	73000	--	666000	147000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	910	--	480	595	--	1600	550
Dissolved Inorganic Carbon	ug/l	--	37200	--	19700	50400	--	60000	40200
Dissolved Organic Carbon	ug/l	--	--	--	--	17700	--	11700	19200
Dissolved Oxygen (Field)	ug/l	-- [7]	7000	--	6600	**4600**	--	**6700**	11050
Hardness, Calcium Carbonate	ug/l	--	250000	--	196000	212000	--	395000	230000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	<10	--	<10	--
Nitrate as N	ug/l	--	300	--	300	200	--	400	600
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1310	--	680	1040	--	1200	970
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.1	--	6.8	7.2	--	7.5	7.5
Phosphate	ug/l	--	160	--	60	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**70**	--	**50**	**60**
Sulphate	ug/l	--	24000	--	56000	23000	--	133000	52000
Temperature (Field)	deg c	-- [10]	--	--	--	16.8	--	3	9
Total Dissolved Solids	ug/l	--	455000	--	240000	327000	--	1550000	489000
Total Organic Carbon	ug/l	--	12800	--	9500	--	--	--	--
Total Suspended Solids	ug/l	--	31000	--	13000	5000	--	13000	6000
Metals									
Arsenic	ug/l	100 [11]	1	--	1	<1	--	<1	<1
Boron	ug/l	200 [12]	25	--	23	38	--	39	39
Cadmium	ug/l	0.2 [11]	--	--	--	<0.3	--	<0.5	<0.1
Calcium	ug/l	--	76000	--	57900	60800	--	125000	70300
Chromium	ug/l	-- [13]	1	--	2	<2	--	<2	<2
Cobalt	ug/l	0.9	--	--	--	<3	--	0.7	0.7
Copper	ug/l	5	5	--	2	<2	--	<2	3
Iron	ug/l	300	**4610**	--	**1400**	**1610**	--	**5060**	**748**
Lead	ug/l	-- [14]	1.1	--	1.2	<0.6	--	1	0.8
Magnesium	ug/l	--	14600	--	12400	14500	--	19800	13300
Manganese	ug/l	--	1270	--	167	268	--	1710	212
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	<0.05	--	<0.06	--
Molybdenum	ug/l	40	--	--	--	4.5	--	<5	--
Nickel	ug/l	25	10	--	10	<10	--	<10	--
Potassium	ug/l	--	4800	--	5900	6100	--	5000	8400
Selenium	ug/l	100	--	--	--	<1	--	<1	--
Sodium	ug/l	--	101000	--	40000	47900	--	442000	92600
Zinc	ug/l	30 [11]	15	--	9	21	--	<5	7
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	<1	--	<1	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S16 15-Aug-2006 [19]	S16 16-Nov-2006	S16 08-May-2007 [19]	S16 22-Aug-2007	S16 20-Nov-2007	S16 23-May-2008	S16 12-Aug-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	72000	--	452000	200000	99000	435000
Ammonia, unionized	ug/l	20	--	--	--	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	--	20	--	110	60	<10	180
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	<3000	--	9000	8000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	--	38000	--	200000	173000	55000	40000
Chloride	ug/l	--	--	12800	--	1140000	222000	38600	790000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	160	--	3300	875	320	3500
Dissolved Inorganic Carbon	ug/l	--	--	20200	--	108000	54000	22300	107000
Dissolved Organic Carbon	ug/l	--	--	18800	--	11900	13200	18200	9400
Dissolved Oxygen (Field)	ug/l	-- [7]	--	7550	--	**4480**	8520	8220	**1070**
Hardness, Calcium Carbonate	ug/l	--	--	49000	--	645000	271000	112000	432000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	300	--	200	1000	200	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	--	900	--	7360	5120	1040	980
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	--	--	--	7.3	8	7.4	7.7
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**160**	--	**3130**	**2450**	**80**	**40**
Sulphate	ug/l	--	--	23000	--	158000	97000	18000	84000
Temperature (Field)	deg c	-- [10]	--	8.1	--	14.7	2.8	15	22.2
Total Dissolved Solids	ug/l	--	--	123000	--	2540000	713000	188000	1780000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	94000	--	1160000	432000	<3000	25000
Metals									
Arsenic	ug/l	100 [11]	--	1	--	6	1.6	1.5	2.2
Boron	ug/l	200 [12]	--	22	--	49	56	20	48
Cadmium	ug/l	0.2 [11]	--	<0.5	--	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	--	13900	--	195000	86500	32700	134000
Chromium	ug/l	-- [13]	--	6	--	**12**	5	<2	<2
Cobalt	ug/l	0.9	--	0.6	--	**3.9**	**1.5**	<0.5	<0.5
Copper	ug/l	5	--	**28**	--	**11**	**10**	<2	<2
Iron	ug/l	300	--	**894**	--	**10200**	**3430**	**866**	**1760**
Lead	ug/l	-- [14]	--	2	--	**17.7**	4.6	<0.1	<0.1
Magnesium	ug/l	--	--	3580	--	38100	13300	7440	23900
Manganese	ug/l	--	--	68	--	1730	438	78	1840
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	--	4600	--	6600	7100	4300	4400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	--	19800	--	726000	159000	25800	477000
Zinc	ug/l	30 [11]	--	**37**	--	**237**	**138**	<5	<5
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	--	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S16 06-Nov-2008	S16 13-May-2009 S-10	S16 25-Aug-2009 [33] A-10	S16 27-Nov-2009 S-7	S16 18-May-2010 S-9	S16 18-Aug-2010 [2] S-11	S16 14-Oct-2010 S-14
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	120000	128000	458000	93000	338000	415000	234000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	50	340	<20	180	90	70
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<1000	3000	2000	4000	2000	2000
Chemical Oxygen Demand	ug/l	--	33000	43000	73000	45000	28000	33000	38000
Chloride	ug/l	--	93900	79000	486000	25000	570000	593000	225000
Conductivity	uS/cm	--	--	566	2520	342	2540	2780	1350
Conductivity (Field)	uS/cm	--	525	470	2018	335	2555	2485	1038
Dissolved Inorganic Carbon	ug/l	--	30100	31600	115000	23600	153000	90400	55000
Dissolved Organic Carbon	ug/l	--	13000	18400	16400	16100	11600	13200	13500
Dissolved Oxygen (Field)	ug/l	-- [7]	7230	**2780**	**180**	9730	**1800**	**1420**	7240
Hardness, Calcium Carbonate	ug/l	--	160000	164000	358000	114000	428000	437000	261000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	250	<100	<100	<100	<100	260
Nitrite as N	ug/l	--	--	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	750	780	1940	540	1650	990	780
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.6	7.4	7.19	7.47	7.16	7.34	7.72
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	**90**	**400**	20	**110**	**130**	**120**
Sulphate	ug/l	--	57000	25000	51000	31000	44000	79000	75000
Temperature (Field)	deg c	-- [10]	8.7	18.3	20.5	5.0	17.5	18.9	11.7
Total Dissolved Solids	ug/l	--	357000	368000	1640000	222000	1650000	1810000	878000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	4000	43000	4000	49000	33000	25000
Metals									
Arsenic	ug/l	100 [11]	<0.5	<1	<50	<1	1	<1	<1
Boron	ug/l	200 [12]	34	30	<100	20	30	70	30
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<10	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	49900	49000	112000	34000	135000	142000	83000
Chromium	ug/l	-- [13]	<2	3	**<50**	3	8	<5	6
Cobalt	ug/l	0.9	<0.5	0.6	<10	0.3	**1.9**	0.8	0.7
Copper	ug/l	5	3	1	<10	2	2	2	2
Iron	ug/l	300	**491**	**1480**	**16200**	**680**	**4040**	**1690**	**1370**
Lead	ug/l	-- [14]	<0.1	<1	<10	<1	<1	<1	<1
Magnesium	ug/l	--	8610	10000	19000	7000	22000	20000	13000
Manganese	ug/l	--	187	220	3240	60	2540	1240	350
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	4900	4000	6000	6000	4000	6000	5000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	66800	52000	365000	22000	295000	408000	170000
Zinc	ug/l	30 [11]	5	<10	<50	10	20	<10	<10
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	**3**	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S16	S16	S16	S16	S16	S16
			19-May-2011 [2]	16-Aug-2011 [2]	30-Nov-2011 [21]	30-May-2012	22-Aug-2012 [19]	29-Nov-2012
			W-12	N-10	S16	S 16	S-16	S16
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	151000	411000	97000	340000	--	370000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	--	<20
Ammonia Nitrogen	ug/l	--	30	130	<20	230	--	530
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	2000	4000	--	3000
Chemical Oxygen Demand	ug/l	--	50000	45000	25000	58000	--	86000
Chloride	ug/l	--	48000	551000	58000	620000	--	480000
Conductivity	uS/cm	--	506	2650	477	--	--	--
Conductivity (Field)	uS/cm	--	496	1423	482	2451	--	1903
Dissolved Inorganic Carbon	ug/l	--	35900	33500	18600	85000	--	86000
Dissolved Organic Carbon	ug/l	--	18900	10800	7900	17000	--	9400
Dissolved Oxygen (Field)	ug/l	-- [7]	6720	**3500**	9120	**1780**	--	**1200**
Hardness, Calcium Carbonate	ug/l	--	174000	468000	141000	480000	--	410000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	640	<100	440	380	--	<100
Nitrite as N	ug/l	--	<100	<100	<100	56	--	<10
Nitrogen, Total Kjeldahl	ug/l	--	1290	750	540	1300	--	1700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	430	--	<100
pH (Field)	-	8.5	7.64	7.24	7.81	7.58	--	7.18
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**50**	30	**210**	**130**	--	**57**
Sulphate	ug/l	--	28000	62000	42000	56000	--	70000
Temperature (Field)	deg c	-- [10]	16.2	24.1	5.0	24.1	--	1.9
Total Dissolved Solids	ug/l	--	329000	1720000	310000	1580000	--	1440000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	8000	11000	26000	73000	--	14000
Metals								
Arsenic	ug/l	100 [11]	<10	<10	<50	1.8	--	<1.0
Boron	ug/l	200 [12]	20	40	<100	50	--	32
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<10	<0.10	--	<0.10
Calcium	ug/l	--	50000	146000	45000	170000	--	160000
Chromium	ug/l	-- [13]	3	<5	**<50**	<5.0	--	<5.0
Cobalt	ug/l	0.9	0.4	0.6	<10	**1.9**	--	0.65
Copper	ug/l	5	2	1	<10	4.3	--	1.2
Iron	ug/l	300	**600**	**580**	**6100**	**5000**	--	**8100**
Lead	ug/l	-- [14]	<1	<1	<10	3.0	--	<0.50
Magnesium	ug/l	--	12000	25000	7000	24000	--	29000
Manganese	ug/l	--	70	550	160	1700	--	2700
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	4000	14000	6000	5300	--	4100
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	40000	183000	38000	440000	--	440000
Zinc	ug/l	30 [11]	10	<10	<50	26	--	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1.0	--	<1.0

Parameter	Unit	PWQO [1]	S16	S16	S16	S16	S16	S16	S16
			28-May-2013	15-Aug-2013 [19]	21-Nov-2013	28-May-2014	26-Aug-2014	13-Nov-2014	27-May-2015
			S16	S16	SA-3	S16	S16	S-16	S-16
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	240000	--	330000	280000	390000	140000	255000
Ammonia, unionized	ug/l	20	<20	--	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	160	--	90	130	1500	62	120
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	<2000	<2000	<2000	<2000	9000
Chemical Oxygen Demand	ug/l	--	140000	--	150000	48000	2000000	160000	86000
Chloride	ug/l	--	400000	--	350000	560000	800000	88000	402000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1607	--	1653	2054	3177	502	1782
Dissolved Inorganic Carbon	ug/l	--	53000	--	85000	64000	100000	34000	62400
Dissolved Organic Carbon	ug/l	--	14000	--	10000	13000	11000	18000	16600
Dissolved Oxygen (Field)	ug/l	-- [7]	5330	--	10510	**4300**	**300**	9690	**110**
Hardness, Calcium Carbonate	ug/l	--	360000	--	330000	430000	470000	160000	67700
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	250	<100	<100	<100
Nitrite as N	ug/l	--	<10	--	<10	21	21	<10	<50
Nitrogen, Total Kjeldahl	ug/l	--	5600	--	3200	1600	65000	4400	2800
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	<100	270	<100	<100	--
pH (Field)	-	8.5	7.25	--	7.80	7.48	7.31	7.61	6.74
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**350**	--	**1300**	**200**	**4800**	**2200**	**810**
Sulphate	ug/l	--	38000	--	81000	41000	52000	25000	45000
Temperature (Field)	deg c	-- [10]	19.7	--	2.2	16.6	22.3	4.1	24.1
Total Dissolved Solids	ug/l	--	942000	--	1130000	1360000	1770000	346000	982000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	120000	--	1100000	410000	11000000	130000	363000
Metals									
Arsenic	ug/l	100 [11]	2.6	--	7.8	1.5	52	2.7	<1
Boron	ug/l	200 [12]	17	--	36	110	110	26	12
Cadmium	ug/l	0.2 [11]	<0.10	--	**0.25**	0.13	**3.1**	0.18	<0.1
Calcium	ug/l	--	110000	--	130000	150000	290000	54000	21800
Chromium	ug/l	-- [13]	7.0	--	**27**	<5.0	**250**	**11**	1
Cobalt	ug/l	0.9	**2.8**	--	**7.6**	**2.8**	**78**	**2.7**	<0.5
Copper	ug/l	5	5.0	--	**17**	3.5	**180**	**9.4**	<0.5
Iron	ug/l	300	**14000**	--	**60000**	**6700**	**430000**	**14000**	**1560**
Lead	ug/l	-- [14]	**5.2**	--	**19**	3.9	**190**	**9.8**	1.0
Magnesium	ug/l	--	19000	--	23000	22000	63000	12000	3230
Manganese	ug/l	--	1300	--	1900	2200	11000	280	137
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	5000	--	6200	5200	22000	7600	917
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	250000	--	290000	310000	530000	55000	52900
Zinc	ug/l	30 [11]	**39**	--	**130**	26	**1200**	**57**	7
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	--	**2.3**	<1.0	**4.8**	**11**	<1

Parameter	Unit	PWQO [1]	S16	S16	S16	S16	S16	S16	S16
			25-Aug-2015	25-Nov-2015	24-May-2016	18-Aug-2016	16-Nov-2016	18-May-2017	28-Aug-2017
			S-16	S-16	S-16	S-16	S-16	S-16	S-16
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	446000	392000	357000	430000	369000	186000	468000
Ammonia, unionized	ug/l	20	**30.59**	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	440	180	120	350	190	60	340
Biochemical Oxygen Demand, 5 Day	ug/l	--	17000	3000	24000	18000	16000	3000	16000
Chemical Oxygen Demand	ug/l	--	74000	80000	95000	90000	94000	51000	98000
Chloride	ug/l	--	1100000	288000	1010000	791000	815000	184000	802000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	3767	3549	3437	3144	3185	880	2483
Dissolved Inorganic Carbon	ug/l	--	77800	76200	54900	22700	66100	15100	85100
Dissolved Organic Carbon	ug/l	--	19100	10000	32100	78500	10800	35600	14800
Dissolved Oxygen (Field)	ug/l	-- [7]	**60**	**1780**	**4630**	**2610**	**4330**	**2860**	**990**
Hardness, Calcium Carbonate	ug/l	--	512000	733000	616000	651000	461000	205000	577000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	300	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<250 [18]	<50	<50	<250 [18]
Nitrogen, Total Kjeldahl	ug/l	--	3100	3100	4400	1900	3400	900	2900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	8.33	7.51	7.40	7.51	7.84	7.42	7.46
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**920**	**1400**	**1550**	**450**	**1470**	**50**	**970**
Sulphate	ug/l	--	55000	96000	58000	252000	89000	27000	58000
Temperature (Field)	deg c	-- [10]	18.3	0.6	28.2	22.3	9.4	22.9	18.1
Total Dissolved Solids	ug/l	--	2220000	1840000	2130000	2150000	1790000	550000	1780000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	170000	203000	382000	99000	44000	12000	970000
Metals									
Arsenic	ug/l	100 [11]	7	3	2	6	2	<5 [17]	2
Boron	ug/l	200 [12]	56	34	150	132	93	166	49
Cadmium	ug/l	0.2 [11]	**0.4**	0.2	0.1	0.1	0.1	<0.5 [17]	0.1
Calcium	ug/l	--	160000	243000	196000	216000	148000	61900	188000
Chromium	ug/l	-- [13]	**23**	**12**	7	7	7	<5 [17]	6
Cobalt	ug/l	0.9	**6.5**	**2.8**	**2.4**	**2.7**	**1.9**	<2.5 [17]	**1.9**
Copper	ug/l	5	**12.6**	**7.7**	**5.7**	**5.3**	**5.9**	2.9	3.8
Iron	ug/l	300	**42500**	**20100**	**10300**	**8310**	**10300**	**924**	**11100**
Lead	ug/l	-- [14]	**18.3**	**9.7**	**6.4**	**5.6**	**7.3**	<0.5 [17]	**6.6**
Magnesium	ug/l	--	27600	30700	30600	27200	22300	12200	26300
Manganese	ug/l	--	2020	1430	3490	3500	1750	413	2030
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	7060	5260	5940	6760	5630	4530	5560
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	584000	663000	670000	503000	504000	101000	497000
Zinc	ug/l	30 [11]	**121**	**66**	**59**	**46**	**58**	<25 [17]	**42**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	<1	**16**	<2 [34]	**11**	<1	**2**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S16 28-Nov-2017 S-16	S16 23-May-2018 S-16	S16 30-Aug-2018 S-16	S16 28-Nov-2018 S-16
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	155000	164000	429000	246000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	80	70	600	160
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	<2000	<30000 [25]	<2000
Chemical Oxygen Demand	ug/l	--	48000	52000	169000	56000
Chloride	ug/l	--	<1000	109000	995000	1410000
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	609	717	3400	>3999
Dissolved Inorganic Carbon	ug/l	--	10200	37300	67400	45900
Dissolved Organic Carbon	ug/l	--	34900	18200	25800	8700
Dissolved Oxygen (Field)	ug/l	-- [7]	**7660**	**730**	**630**	7770
Hardness, Calcium Carbonate	ug/l	--	145000	158000	605000	555000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	200
Nitrite as N	ug/l	--	<50	<50	<250 [18]	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	1100	2400	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--
pH (Field)	-	8.5	7.83	7.49	7.45	7.35
Phosphate	ug/l	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**150**	**60**	**290**	**80**
Sulphate	ug/l	--	36000	12000	31000	113000
Temperature (Field)	deg c	-- [10]	0.6	18.5	19.0	2.2
Total Dissolved Solids	ug/l	--	340000	366000	2060000	2720000
Total Organic Carbon	ug/l	--	--	--	--	--
Total Suspended Solids	ug/l	--	49000	11000	268000	11000
Metals						
Arsenic	ug/l	100 [11]	<1	<1	3	<1
Boron	ug/l	200 [12]	24	34	34	27
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	**0.3**	<0.1
Calcium	ug/l	--	43300	47700	189000	176000
Chromium	ug/l	-- [13]	1	<1	**27**	**9**
Cobalt	ug/l	0.9	<0.5	<0.5	**7.0**	**2.2**
Copper	ug/l	5	1.9	<0.5	**17.0**	**6.0**
Iron	ug/l	300	**1260**	**943**	**28800**	**3180**
Lead	ug/l	-- [14]	0.6	0.3	**20.1**	1.7
Magnesium	ug/l	--	9010	9460	32200	27900
Manganese	ug/l	--	190	233	2930	626
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--
Nickel	ug/l	25	--	--	--	--
Potassium	ug/l	--	4530	3980	8500	9200
Selenium	ug/l	100	--	--	--	--
Sodium	ug/l	--	38400	58700	440000	883000
Zinc	ug/l	30 [11]	12	11	**103**	24
Phenols						
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	**4**	<1

Parameter	Unit	PWQO [1]	S16 20-Jun-2019 S-16	S16 28-Aug-2019 S-16	S16 21-Nov-2019 S-16
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	222000	227000	352000
Ammonia, unionized	ug/l	20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	130	300	300
Biochemical Oxygen Demand, 5 Day	ug/l	--	<12000 [25]	4000	<30000 [25]
Chemical Oxygen Demand	ug/l	--	67000	46000	70000
Chloride	ug/l	--	335000	505000	1030000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	1322	1893	4110
Dissolved Inorganic Carbon	ug/l	--	45000	75700	<500
Dissolved Organic Carbon	ug/l	--	10700	14800	11300
Dissolved Oxygen (Field)	ug/l	-- [7]	**430**	**280**	**4420**
Hardness, Calcium Carbonate	ug/l	--	310000	284000	673000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	200	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1300	900	6600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
pH (Field)	-	8.5	7.41	7.31	7.31
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**210**	**140**	**3660**
Sulphate	ug/l	--	43000	36000	114000
Temperature (Field)	deg c	-- [10]	16.3	19.2	0.3
Total Dissolved Solids	ug/l	--	832000	1130000	2080000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	41000	62000	208000
Metals					
Arsenic	ug/l	100 [11]	<1	<1	4
Boron	ug/l	200 [12]	36	24	30
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	0.2
Calcium	ug/l	--	99100	92900	198000
Chromium	ug/l	-- [13]	3	5	**28**
Cobalt	ug/l	0.9	**2.0**	**1.4**	**6.2**
Copper	ug/l	5	**6.1**	4.8	**18.3**
Iron	ug/l	300	**2670**	**3640**	**31700**
Lead	ug/l	-- [14]	4.3	2.9	**12.8**
Magnesium	ug/l	--	15200	12700	43200
Manganese	ug/l	--	1020	843	2450
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	3390	3750	10300
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	147000	268000	544000
Zinc	ug/l	30 [11]	22	22	**82**
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**5**	**12**

Parameter	Unit	PWQO [1]	S17 27-Sep-2001	S17 21-Nov-2001	S17 22-May-2002	S17 08-Nov-2002	S17 31-May-2003	S17 03-Jul-2003	S17 22-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	240000	151000	158000	186000	151000	234000	106000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	150	30	60	450	170	100	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	2000	1000	2000	3000
Chemical Oxygen Demand	ug/l	--	29000	25000	44000	23000	59000	45000	58000
Chloride	ug/l	--	83600	83300	90000	406000	75500	371000	66900
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1230	510	580	1600	425	1320	640
Dissolved Inorganic Carbon	ug/l	--	59400	21100	17000	46000	39000	59000	26000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3550	10270	8350	9300	6020	3390	11800
Hardness, Calcium Carbonate	ug/l	--	367000	226000	221000	277000	187000	304000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1600	900	600	1600	900	1100	1100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1720	630	890	1070	1260	1210	1400
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.18	6.81	7.1	7.9	7.7	6.8	7.32
Phosphate	ug/l	--	190	40	50	60	50	190	350
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--
Sulphate	ug/l	--	430000	70000	37000	69000	38000	57000	56000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	842000	394000	362000	800000	334000	997000	294000
Total Organic Carbon	ug/l	--	10600	15000	12000	11000	22000	15000	16000
Total Suspended Solids	ug/l	--	11000	7000	14000	31000	3000	82000	20000
Metals									
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1
Boron	ug/l	200 [12]	100	40	30	160	30	61	36
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--
Calcium	ug/l	--	124000	65200	65600	92300	54700	100000	47100
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	3	**9**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--
Copper	ug/l	5	3.2	1.9	<1	**39.7**	2	4	**25**
Iron	ug/l	300	**500**	220	**380**	**1370**	**460**	**1360**	**1540**
Lead	ug/l	-- [14]	0.2	0.2	<1	**34.1**	0.5	3.2	3.4
Magnesium	ug/l	--	13900	15300	14000	11400	12300	13200	9500
Manganese	ug/l	--	140	20	90	290	40	344	70
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10
Potassium	ug/l	--	9300	5900	4800	9200	4800	7700	7600
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	162000	56300	37200	240000	49700	230000	44500
Zinc	ug/l	30 [11]	20	10	20	**50**	20	26	29
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	0.1	1

Parameter	Unit	PWQO [1]	S17 17-May-2004	S17 21-Aug-2004	S17 18-Nov-2004	S17 25-May-2005	S17 09-Sep-2005 [19]	S17 09-Nov-2005	S17 24-May-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	264000	--	237000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	<5000	--	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	196000	264000	200000	216000	--	190000	150000
Ammonia, unionized	ug/l	20	<10	<10	<10	<20	--	<20	<20
Ammonia Nitrogen	ug/l	--	120	360	170	40	--	50	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	6000	2000	6000	--	<3000	<3000
Chemical Oxygen Demand	ug/l	--	59000	92000	35000	50000	--	60000	63000
Chloride	ug/l	--	192000	337000	122000	139000	--	174000	102000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1050	1410	790	845	--	610	430
Dissolved Inorganic Carbon	ug/l	--	47200	42300	25300	56100	--	40800	39700
Dissolved Organic Carbon	ug/l	--	--	--	--	14000	--	10500	20900
Dissolved Oxygen (Field)	ug/l	-- [7]	4000	2700	7200	7110	--	12500	8620
Hardness, Calcium Carbonate	ug/l	--	260000	297000	245000	259000	--	290000	196000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	<10	--	<10	--
Nitrate as N	ug/l	--	1200	900	1600	400	--	1800	900
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1450	3120	880	1160	--	730	860
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.3	7.2	6.7	7.3	--	7.5	7.8
Phosphate	ug/l	--	100	740	60	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**80**	--	**120**	**40**
Sulphate	ug/l	--	42000	63000	68000	31000	--	79000	40000
Temperature (Field)	deg c	-- [10]	--	--	--	18.8	--	2	11
Total Dissolved Solids	ug/l	--	525000	705000	395000	485000	--	598000	370000
Total Organic Carbon	ug/l	--	12300	9200	9800	--	--	--	--
Total Suspended Solids	ug/l	--	32000	148000	6000	4000	--	16000	3000
Metals									
Arsenic	ug/l	100 [11]	1	3	1	<1	--	<1	<1
Boron	ug/l	200 [12]	51	78	39	39	--	34	23
Cadmium	ug/l	0.2 [11]	--	--	--	<0.5	--	<0.5	<0.1
Calcium	ug/l	--	81800	98000	73700	75200	--	89800	59200
Chromium	ug/l	-- [13]	2	6	2	<2	--	<2	<2
Cobalt	ug/l	0.9	--	--	--	**83**	--	0.6	0.2
Copper	ug/l	5	**16**	**84**	2	<2	--	<2	<2
Iron	ug/l	300	**1110**	129	**519**	**436**	--	**453**	**303**
Lead	ug/l	-- [14]	0.8	**5.8**	1.2	<1	--	2.5	<0.5
Magnesium	ug/l	--	13600	12600	14900	17200	--	15900	11800
Manganese	ug/l	--	341	528	95	85	--	56	40
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	<0.05	--	<0.06	--
Molybdenum	ug/l	40	--	--	--	8	--	<5	--
Nickel	ug/l	25	10	**90**	10	<10	--	<10	--
Potassium	ug/l	--	6400	6800	7100	5300	--	8400	4700
Selenium	ug/l	100	--	--	--	<1	--	<1	--
Sodium	ug/l	--	146000	254000	80600	90800	--	115000	62700
Zinc	ug/l	30 [11]	**34**	**164**	14	14	--	**56**	14
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S17 15-Aug-2006	S17 16-Nov-2006	S17 08-May-2007	S17 22-Aug-2007	S17 20-Nov-2007	S17 23-May-2008	S17 12-Aug-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	260000	90000	212000	302000	180000	142000	280000
Ammonia, unionized	ug/l	20	<20	--	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	40	100	<10	100	380	<10	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	3000	4000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	28000	38000	38000	37000	30000	19000	42000
Chloride	ug/l	--	434000	21200	252000	494000	193000	108000	455000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1700	210	1000	1450	750	550	1800
Dissolved Inorganic Carbon	ug/l	--	62400	24300	50900	72300	48600	34900	70400
Dissolved Organic Carbon	ug/l	--	13800	15700	10100	10000	13200	15400	9800
Dissolved Oxygen (Field)	ug/l	-- [7]	**800**	7880	8020	**1890**	9250	10540	**1780**
Hardness, Calcium Carbonate	ug/l	--	314000	69000	279000	351000	248000	148000	290000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1000	1100	1200	200	1500	300	900
Nitrite as N	ug/l	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	640	1190	2110	1790	1310	1130	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.6	--	7.9	7.4	8	7.8	7.9
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**50**	**230**	**70**	**310**	**100**	**100**	**130**
Sulphate	ug/l	--	63000	24000	47000	46000	80000	21000	57000
Temperature (Field)	deg c	-- [10]	18	8.1	18	14	1.9	14.6	18.7
Total Dissolved Solids	ug/l	--	1030000	158000	700000	1190000	620000	341000	1070000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<3000	45000	4000	30000	9000	40000	45000
Metals									
Arsenic	ug/l	100 [11]	1.6	2	1.4	3.3	1.6	1.9	1.1
Boron	ug/l	200 [12]	47	24	41	41	34	17	55
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	**0.7**	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	103000	18400	88400	115000	83300	42900	90600
Chromium	ug/l	-- [13]	<2	8	<2	<2	3	<2	<2
Cobalt	ug/l	0.9	0.4	0.5	0.5	**1.1**	**1.6**	<0.5	<0.5
Copper	ug/l	5	<2	**39**	**20**	4	5	<2	<2
Iron	ug/l	300	**355**	**399**	**858**	**1740**	**1260**	**726**	145
Lead	ug/l	-- [14]	0.5	2	0.7	1	3.2	<0.1	<0.1
Magnesium	ug/l	--	13800	5570	14000	15200	9720	9900	15400
Manganese	ug/l	--	342	80	204	772	179	72	107
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	6900	4300	6600	8700	8800	3200	7600
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	256000	25000	158000	323000	126000	68900	277000
Zinc	ug/l	30 [11]	25	28	19	**49**	**50**	5	15
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S17	S17	S17	S17	S17	S17	S17
			06-Nov-2008	13-May-2009	25-Aug-2009	27-Nov-2009	18-May-2010	18-Aug-2010	14-Oct-2010
				S-11	A-9	S-9	S-10	S-10	S-13
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	190000	165000	285000	152000	223000	283000	208000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	20	60	500	100	60	110	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<1000	<1000	2000	10000	4000	<1000
Chemical Oxygen Demand	ug/l	--	22000	50000	50000	45000	53000	40000	35000
Chloride	ug/l	--	123000	113000	296000	80000	262000	277000	102000
Conductivity	uS/cm	--	--	757	1620	660	1400	1630	864
Conductivity (Field)	uS/cm	--	750	600	1291	795	1475	1487	650
Dissolved Inorganic Carbon	ug/l	--	46500	40900	69600	37400	53700	63200	52000
Dissolved Organic Carbon	ug/l	--	8300	20000	12100	13900	18500	15600	13000
Dissolved Oxygen (Field)	ug/l	-- [7]	8710	8490	**2190**	10560	8840	**4010**	11690
Hardness, Calcium Carbonate	ug/l	--	252000	194000	260000	189000	267000	298000	228000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1100	750	880	950	1860	3710	2210
Nitrite as N	ug/l	--	--	<100	130	<100	<100	170	<100
Nitrogen, Total Kjeldahl	ug/l	--	650	1300	1180	880	2600	1050	820
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.9	7.8	7.22	7.93	7.80	7.38	7.84
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	**50**	**50**	**90**	**110**	**60**	**80**
Sulphate	ug/l	--	74000	27000	45000	51000	51000	75000	52000
Temperature (Field)	deg c	-- [10]	9.4	22.3	20.5	5.3	16.9	20.3	11.3
Total Dissolved Solids	ug/l	--	494000	492000	1050000	429000	910000	1060000	562000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	4000	3000	11000	17000	67000	15000	9000
Metals									
Arsenic	ug/l	100 [11]	0.9	1	1	<1	1	<1	<1
Boron	ug/l	200 [12]	29	30	50	30	140	180	30
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	76200	58000	86000	61000	87000	103000	70000
Chromium	ug/l	-- [13]	<2	3	7	4	7	**9**	4
Cobalt	ug/l	0.9	0.8	0.4	0.6	0.8	0.7	0.6	0.4
Copper	ug/l	5	2	3	1	3	5	4	2
Iron	ug/l	300	279	**430**	**1140**	**780**	**830**	**770**	260
Lead	ug/l	-- [14]	<0.1	<1	<1	2	1	<1	<1
Magnesium	ug/l	--	14900	12000	11000	9000	12000	10000	13000
Manganese	ug/l	--	70	90	640	130	340	70	70
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	6900	4000	8000	6000	8000	10000	7000
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	80400	81000	211000	69000	195000	212000	63000
Zinc	ug/l	30 [11]	<5	10	<10	**40**	**60**	**70**	20
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	2	<1	<1

Parameter	Unit	PWQO [1]	S17	S17	S17	S17	S17	S17	S17
			19-May-2011	16-Aug-2011 [2]	30-Nov-2011 [21]	30-May-2012	22-Aug-2012	29-Nov-2012	28-May-2013
			W-10	N-11	S17	S 17	S-17	S17	S17
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	107000	148000	97000	190000	250000	250000	180000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<20	420	60	<50	93	180	140
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	6000	3000	2000	3000	6000	4000
Chemical Oxygen Demand	ug/l	--	55000	48000	30000	64000	40000	43000	44000
Chloride	ug/l	--	36000	97000	41000	160000	290000	240000	140000
Conductivity	uS/cm	--	362	716	442	--	--	--	--
Conductivity (Field)	uS/cm	--	363	617	439	927	1357	1272	771
Dissolved Inorganic Carbon	ug/l	--	25800	35400	18700	45000	55000	54000	40000
Dissolved Organic Carbon	ug/l	--	20800	11500	8500	18000	12000	9500	17000
Dissolved Oxygen (Field)	ug/l	-- [7]	**3070**	**3610**	**4550**	6030	**3520**	**6940**	11360
Hardness, Calcium Carbonate	ug/l	--	128000	174000	138000	230000	310000	300000	250000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	1010	1210	980	480	4400	900
Nitrite as N	ug/l	--	<100	<100	<100	28	80	48	<10
Nitrogen, Total Kjeldahl	ug/l	--	1270	1800	1190	2400	1500	2700	1000
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	1000	560	4500	900
pH (Field)	-	8.5	7.26	7.61	7.83	8.26	7.72	7.51	7.77
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**190**	**200**	**320**	**160**	**280**	**56**
Sulphate	ug/l	--	15000	50000	50000	43000	59000	65000	36000
Temperature (Field)	deg c	-- [10]	14.7	23.9	5.0	26.6	22.8	0.9	17.0
Total Dissolved Solids	ug/l	--	235000	465000	287000	556000	852000	722000	462000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	31000	13000	4000	12000	24000	<1000
Metals									
Arsenic	ug/l	100 [11]	<1	<10	<50	1.6	1.3	<1.0	<1.0
Boron	ug/l	200 [12]	20	60	<100	50	71	45	19
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<10	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	38000	58000	42000	78000	110000	110000	74000
Chromium	ug/l	-- [13]	2	7	**<50**	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.5	0.8	<10	0.68	0.65	0.51	<0.50
Copper	ug/l	5	1	4	<10	4.4	3.1	4.4	1.8
Iron	ug/l	300	**1280**	**1370**	**900**	**920**	**990**	**620**	**410**
Lead	ug/l	-- [14]	<1	4	<10	1.1	1.2	0.83	<0.50
Magnesium	ug/l	--	8000	7000	8000	13000	12000	16000	13000
Manganese	ug/l	--	110	470	40	170	150	220	150
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	4000	11000	8000	6400	9700	8400	4900
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	25000	70000	29000	120000	230000	190000	85000
Zinc	ug/l	30 [11]	<10	20	<50	30	15	**73**	21
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	**2.2**	<1.0	<1.0	<1.0

Parameter	Unit	PWQO [1]	S17	S17	S17	S17	S17	S17	S17
			15-Aug-2013 [19]	21-Nov-2013	28-May-2014	26-Aug-2014 [19]	13-Nov-2014	27-May-2015	25-Aug-2015
			S17	SA-2	S17	S17	S-17	S-17	S-17
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	230000	210000	--	190000	244000	257000
Ammonia, unionized	ug/l	20	--	<20	<20	--	<20	<20	<20
Ammonia Nitrogen	ug/l	--	--	<50	69	--	<50	170	440
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	2000	<2000	--	<2000	3000	14000
Chemical Oxygen Demand	ug/l	--	--	32000	45000	--	42000	60000	88000
Chloride	ug/l	--	--	100000	240000	--	75000	654000	347000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	862	1122	--	584	2387	1513
Dissolved Inorganic Carbon	ug/l	--	--	57000	48000	--	44000	58700	62000
Dissolved Organic Carbon	ug/l	--	--	10000	16000	--	16000	22500	16000
Dissolved Oxygen (Field)	ug/l	-- [7]	--	10550	8150	--	**6620**	**4980**	**730**
Hardness, Calcium Carbonate	ug/l	--	--	300000	290000	--	230000	375000	224000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	1800	580	--	770	<100	200
Nitrite as N	ug/l	--	--	16	34	--	13	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	--	940	1000	--	960	1600	3000
Nitrogen, Nitrate-Nitrite	ug/l	--	--	1800	620	--	780	--	--
pH (Field)	-	8.5	--	7.98	7.85	--	7.74	6.62	8.07
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**140**	**66**	--	**86**	**150**	**650**
Sulphate	ug/l	--	--	78000	37000	--	56000	20000	43000
Temperature (Field)	deg c	-- [10]	--	2.2	16.4	--	3.8	20.9	19.7
Total Dissolved Solids	ug/l	--	--	554000	744000	--	394000	1410000	872000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	10000	12000	--	230000	8000	61000
Metals									
Arsenic	ug/l	100 [11]	--	1.4	1.1	--	<1.0	2	2
Boron	ug/l	200 [12]	--	40	32	--	25	33	53
Cadmium	ug/l	0.2 [11]	--	<0.10	<0.10	--	<0.10	<0.1	<0.1
Calcium	ug/l	--	--	100000	97000	--	68000	108000	72300
Chromium	ug/l	-- [13]	--	<5.0	<5.0	--	<5.0	2	6
Cobalt	ug/l	0.9	--	0.80	<0.50	--	<0.50	0.7	**1.6**
Copper	ug/l	5	--	4.7	1.5	--	2.3	<0.5	0.7
Iron	ug/l	300	--	**1700**	**620**	--	**880**	**1110**	**4140**
Lead	ug/l	-- [14]	--	3.2	<0.50	--	0.85	0.5	**5.4**
Magnesium	ug/l	--	--	20000	16000	--	18000	25800	10600
Manganese	ug/l	--	--	74	320	--	110	753	542
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	--	7300	5700	--	5400	7530	8850
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	--	70000	160000	--	52000	306000	183000
Zinc	ug/l	30 [11]	--	**47**	19	--	24	8	**48**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	--	**1.2**	<1.0	--	**5.7**	<1	**2**

Parameter	Unit	PWQO [1]	S17	S17	S17	S17	S17	S17	S17
			25-Nov-2015	24-May-2016	18-Aug-2016	16-Nov-2016	18-May-2017	28-Aug-2017	28-Nov-2017
			S-17	S-17	S-17	S-17	S-17	S-17	S-17
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	245000	201000	119000	200000	163000	246000	185000
Ammonia, unionized	ug/l	20	<20	<20	<20	<20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	80	280	60	80	60	370	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	16000	3000	4000	2000	<2000	25000	20000
Chemical Oxygen Demand	ug/l	--	63000	45000	47000	28000	49000	38000	79000
Chloride	ug/l	--	246000	317000	154000	183000	199000	273000	106000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1272	1286	933	1104	907	1000	705
Dissolved Inorganic Carbon	ug/l	--	52600	43600	4700	39200	16000	50700	14800
Dissolved Organic Carbon	ug/l	--	15900	15500	36800	9300	30300	12200	43100
Dissolved Oxygen (Field)	ug/l	-- [7]	**6900**	**110**	7180	8560	10440	**1690**	8240
Hardness, Calcium Carbonate	ug/l	--	363000	297000	191000	275000	193000	294000	216000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	<100	200	900	<100	400	1100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1200	1300	1100	600	900	2400	1300
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	8.5	7.83	7.38	7.75	8.38	8.08	7.42	7.93
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**150**	**60**	**150**	**90**	**50**	**490**	**220**
Sulphate	ug/l	--	55000	28000	144000	68000	30000	43000	48000
Temperature (Field)	deg c	-- [10]	1.8	27.5	25	8.0	25.5	19.7	0.6
Total Dissolved Solids	ug/l	--	667000	776000	592000	598000	552000	738000	428000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	6000	11000	18000	51000	10000	76000	63000
Metals									
Arsenic	ug/l	100 [11]	<1	1	3	<1	<5 [17]	1	<1
Boron	ug/l	200 [12]	33	34	43	125	141	158	29
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1
Calcium	ug/l	--	119000	98700	61700	88900	58600	97200	64200
Chromium	ug/l	-- [13]	3	1	1	2	<5 [17]	2	3
Cobalt	ug/l	0.9	0.7	0.6	<0.5	0.6	<2.5 [17]	0.6	0.7
Copper	ug/l	5	0.8	1.7	1.6	3.0	4.5	0.6	3.2
Iron	ug/l	300	**1330**	**970**	**864**	**1130**	**811**	**2200**	**1330**
Lead	ug/l	-- [14]	2.6	0.5	1.4	1.5	<0.5 [17]	1.3	2.0
Magnesium	ug/l	--	16100	12300	8850	13000	11300	12400	13600
Manganese	ug/l	--	137	641	109	149	160	751	120
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	6440	6310	5840	8600	4450	7590	4760
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	159000	199000	87000	121000	113000	181000	57600
Zinc	ug/l	30 [11]	**39**	9	13	**42**	<25 [17]	18	24
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**9**	**7**	**6**	<1	<1	<1

Parameter	Unit	PWQO [1]	S17	S17	S17
			23-May-2018	30-Aug-2018	28-Nov-2018
			S-17	S-17	S-17
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	183000	334000	133000
Ammonia, unionized	ug/l	20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	60	930	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	3000	2000
Chemical Oxygen Demand	ug/l	--	53000	56000	34000
Chloride	ug/l	--	274000	488000	151000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	1225	1931	351
Dissolved Inorganic Carbon	ug/l	--	41400	63000	23800
Dissolved Organic Carbon	ug/l	--	18600	13900	11900
Dissolved Oxygen (Field)	ug/l	-- [7]	11540	**1360**	12320
Hardness, Calcium Carbonate	ug/l	--	216000	400000	192000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	100	<100	1200
Nitrite as N	ug/l	--	<50	<250 [18]	<50
Nitrogen, Total Kjeldahl	ug/l	--	1100	2800	1000
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
pH (Field)	-	8.5	7.86	7.55	7.13
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	**510**	**150**
Sulphate	ug/l	--	19000	24000	54000
Temperature (Field)	deg c	-- [10]	21.7	18.0	1.0
Total Dissolved Solids	ug/l	--	710000	1090000	438000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	85000	3000
Metals					
Arsenic	ug/l	100 [11]	1	2	<1
Boron	ug/l	200 [12]	33	32	26
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	66100	131000	57100
Chromium	ug/l	-- [13]	<1	5	2
Cobalt	ug/l	0.9	<0.5	**1.3**	0.6
Copper	ug/l	5	0.9	3.8	3.4
Iron	ug/l	300	**738**	**5700**	**489**
Lead	ug/l	-- [14]	0.3	3.8	0.5
Magnesium	ug/l	--	12500	17500	11900
Manganese	ug/l	--	208	1380	125
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	4340	11500	6310
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	145000	241000	86500
Zinc	ug/l	30 [11]	10	27	21
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1

Parameter	Unit	PWQO [1]	S17 20-Jun-2019 S-17	S17 28-Aug-2019 S-17	S17 21-Nov-2019 S-17
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	211000	86000	200000
Ammonia, unionized	ug/l	20	<20	<20	<20
Ammonia Nitrogen	ug/l	--	160	80	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	4000	28000
Chemical Oxygen Demand	ug/l	--	65000	44000	76000
Chloride	ug/l	--	300000	192000	275000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	1256	884	1499
Dissolved Inorganic Carbon	ug/l	--	44800	27300	1380
Dissolved Organic Carbon	ug/l	--	13000	12900	17600
Dissolved Oxygen (Field)	ug/l	-- [7]	9810	**2950**	10230
Hardness, Calcium Carbonate	ug/l	--	285000	153000	352000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	300	500	600
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1400	900	800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
pH (Field)	-	8.5	7.64	7.49	7.67
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**70**	**150**	**40**
Sulphate	ug/l	--	31000	101000	104000
Temperature (Field)	deg c	-- [10]	17.6	20.1	0.9
Total Dissolved Solids	ug/l	--	770000	548000	772000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	43000	<2000
Metals					
Arsenic	ug/l	100 [11]	1	<1	<1
Boron	ug/l	200 [12]	32	34	37
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	86600	51700	104000
Chromium	ug/l	-- [13]	<1	4	1
Cobalt	ug/l	0.9	0.7	**1.0**	0.6
Copper	ug/l	5	2.1	**6.8**	2.9
Iron	ug/l	300	**821**	**1550**	**391**
Lead	ug/l	-- [14]	0.2	2.5	0.3
Magnesium	ug/l	--	16600	5720	22400
Manganese	ug/l	--	484	140	169
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	5900	6120	8110
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	165000	101000	152000
Zinc	ug/l	30 [11]	13	27	29
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**4**	**9**

Parameter	Unit	PWQO [1]	S18 16-Nov-2006
General Chemistry			
Alkalinity (Total as CaCO3)	ug/l	-- [5]	145000
Ammonia, unionized	ug/l	20	<20
Ammonia Nitrogen	ug/l	--	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000
Chemical Oxygen Demand	ug/l	--	28000
Chloride	ug/l	--	33400
Conductivity (Field)	uS/cm	--	300
Dissolved Inorganic Carbon	ug/l	--	37700
Dissolved Organic Carbon	ug/l	--	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	6800
Hardness, Calcium Carbonate	ug/l	--	147000
Nitrate as N	ug/l	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	780
pH (Field)	-	8.5	6.9
Phosphorus	ug/l	-- [9]	**40**
Sulphate	ug/l	--	35000
Temperature (Field)	deg c	-- [10]	6.2
Total Dissolved Solids	ug/l	--	262000
Total Suspended Solids	ug/l	--	13000
Metals			
Arsenic	ug/l	100 [11]	<1
Boron	ug/l	200 [12]	177
Cadmium	ug/l	0.2 [11]	<0.5
Calcium	ug/l	--	39000
Chromium	ug/l	-- [13]	**10**
Cobalt	ug/l	0.9	<0.5
Copper	ug/l	5	**37**
Iron	ug/l	300	**880**
Lead	ug/l	-- [14]	0.6
Magnesium	ug/l	--	12000
Manganese	ug/l	--	38
Potassium	ug/l	--	5300
Sodium	ug/l	--	49700
Zinc	ug/l	30 [11]	26
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	<1

Parameter	Unit	PWQO [1]	S19 16-Nov-2006
General Chemistry			
Alkalinity (Total as CaCO3)	ug/l	-- [5]	170000
Ammonia, unionized	ug/l	20	<10
Ammonia Nitrogen	ug/l	--	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000
Chemical Oxygen Demand	ug/l	--	34000
Chloride	ug/l	--	82600
Conductivity (Field)	uS/cm	--	450
Dissolved Inorganic Carbon	ug/l	--	42500
Dissolved Organic Carbon	ug/l	--	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	7930
Hardness, Calcium Carbonate	ug/l	--	197000
Nitrate as N	ug/l	--	1200
Nitrogen, Total Kjeldahl	ug/l	--	960
Phosphorus	ug/l	-- [9]	**200**
Sulphate	ug/l	--	38000
Temperature (Field)	deg c	-- [10]	8.6
Total Dissolved Solids	ug/l	--	379000
Total Suspended Solids	ug/l	--	82000
Metals			
Arsenic	ug/l	100 [11]	<1
Boron	ug/l	200 [12]	38
Cadmium	ug/l	0.2 [11]	<0.5
Calcium	ug/l	--	57100
Chromium	ug/l	-- [13]	8
Cobalt	ug/l	0.9	**1**
Copper	ug/l	5	**42**
Iron	ug/l	300	**1850**
Lead	ug/l	-- [14]	4
Magnesium	ug/l	--	13300
Manganese	ug/l	--	88
Potassium	ug/l	--	4900
Sodium	ug/l	--	73900
Zinc	ug/l	30 [11]	**40**
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	<1

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than PWQO
(1)	Provincial Water Quality Objectives (July 1994, reprinted February 1999)
(2)	Arsenic MRL elevated due to matrix interference.
(3)	TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.
(4)	Sampling location was slightly moved due to ditch alterations.
(5)	Alkalinity should not be decreased by more than 25% of the natural concentration.
(6)	PWQO is for free cyanide in an unfiltered water sample.
(7)	Objective depends on water temperature and biota. Dissolved oxygen concentrations should not be less than the values specified in the PWQO document for cold water biota (e.g. salmonid fish communities) and warm water biota (e.g. centrarchid fish communities).
(8)	Undissociated hydrogen sulphide.
(9)	Current scientific evidence is insufficient to develop a firm Objective at this time. Accordingly, the following phosphorus concentrations should be considered as general guidelines which should be supplemented by site-specific studies: To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L; A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to all lakes naturally below this value; Excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L.
(10)	(1) General: The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed. (2) Waste Heat Discharge: (a) Ambient Temperature Changes: The temperature at the edge of a mixing zone shall not exceed the natural ambient water temperature at a representative control location by more than 10°C (18°F). However, in special circumstances, local conditions may require a significantly lower temperature difference than 10°C (18°F). Potential dischargers are to apply to the MOEE for guidance as to the allowable temperature rise for each thermal discharge. This ministry will also specify the nature of the mixing zone and the procedure for the establishment of a representative control location for temperature recording on a case-by-case basis. (b) Discharge Temperature Permitted: The maximum temperature of the receiving body of water, at any point in the thermal plume outside a mixing zone, shall not exceed 30°C (86°F) or the temperature of a representative control location plus 10°C (18°F) or the allowed temperature difference, which ever is the lesser temperature. These maximum temperatures are to be measured on a mean daily basis from continuous records. (c) Taking and Discharging of Cooling Water: Users of cooling water shall meet both the Objectives for temperature outlined above and the "Procedures for the Taking and Discharge of Cooling Water" as outlined in the MOEE publication Deriving Receiving-Water Based, Point-Source Effluent Requirements for Ontario Waters(1994).
(11)	An Interim PWQO also exists for this parameter. See Section 1.10 of the PWQO - Where both a PWQO and an Interim PWQO exist.
(12)	See Section 1.2.3. of PWQO. This Interim PWQO was set for emergency purposes based on the best information readily available. Employ due caution when applying this value.
(13)	PWQO values exist for Cr(III) and Cr(VI)
(14)	If alkalinity as CaCO3 < 20 mg/L, PWQO = 5 µg/L; if alkalinity as CaCO3 from 20 to 40 mg/L, PWQO = 10 µg/L; if alkalinity as CaCO3 from 40 to 80 mg/L, PWQO = 20 µg/L; if alkalinity as CaCO3 > 80 mg/L, PWQO = 25 ug/L. An Interim PWQO also exists for this parameter. See Section 1.10 of the PWQO - Where both a PWQO and an Interim PWQO exist.

(15) In a filtered water sample.
(16) Determined by the total reactive phenols test - the 4-AAP (4-amino-antipyrine) test. This objective should be used primarily as a screening tool. The isomer specific PWQOs for various phenolics should be employed where possible.
(17) Water sample required digestion for Total metals analysis, which resulted in elevated detection limits.
(18) Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(19) Monitoring location was dry during this sampling event. No sample was collected.
(20) Metals analysis performed on aqua-regia digest of sample material except for Boron.
(21) Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.
(22) Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(23) Nitrite/Nitrate: Due to the colour interferences, some sample required dilution. Detection limits were adjusted accordingly.
(24) Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(25) Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(26) Metals analysis performed on aqua-regia digest of sample material.
(27) TP MRL elevated due to matrix interference.
(28) Arsenic and TP MRL elevated due to matrix interference.
(29) Metals analysis performed on aqua-regia digest of sample material, except for Boron. Phenols MRL elevated due to matrix interference.
(30) Metals analysis performed on aqua-regia digest of sample material except for Boron.
(31) Phenols MRL elevated due to matrix interference.
(32) Elevated detection limits due to the nature of the sample matrix.
(33) TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material.
(34) Elevated Reporting Limit due to matrix interference.
(35) Arsenic and Phenols MRL elevated due to matrix interference.
(36) Monitoring location was stagnant during sampling event. No sample was collected.
(37) Monitoring location was frozen during this sampling event. No sample was collected.
(38) Insufficient sample volume was collected for analysis.
(39) At pH 4.5 to 5.5 the Interim PWQO is 15 µg/L based on inorganic monomeric aluminum measure in clay-free samples; At pH > 5.5 to 6.5, no condition should be permitted which would increase the acid soluble inorganic aluminum concentration in clay-free samples to more than 10% above natural background concentrations for waters representative of that geological area of the Province that are unaffected by man-made inputs. At pH > 6.5 to 9.0, the Interim PWQO is 75 µg/L based on total aluminum measured in clay-free samples. If natural background aluminum concentrations in water bodies unaffected by man-made inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level. Note: pH values of < 6.5 and > 8.5 are outside the range considered acceptable by the PWQO for pH. See the Scientific Criteria Document for Development of Provincial Water Quality Objectives and Guidelines - Aluminum for a discussion of analytical procedures.
(40) Metals analysis performed on aqua-regia digest of sample material, except for Boron.
(41) TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 18-Sep-1992	L5 19-Oct-1992	L5 11-Nov-1992	L5 08-Jun-1993	L5 15-Nov-1993	L5 15-Jun-1994	L5 02-Nov-1994
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	185	1696	1677	1140	1565
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	0.1	--	0.83	22.6	26.51	19.1	12.38
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	9.6	10.3	3.8	70	81	1.6	31.7
Chemical Oxygen Demand	mg/l	--	--	220	--	69.2	370	331	158	321
Chloride	mg/l	--	250	410	379	76.5	342	533	370	378
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	669	3520	3970	3830	4350
Cyanide	mg/l	0.2	--	0.078	0.012	0.014	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	455	--	--	376
Dissolved Organic Carbon	mg/l	--	5	--	--	17.5	--	107	76	107
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	1.6	0.1	2.07	5.77
Fluoride	mg/l	1.5	--	**1.56**	**1.66**	0.84	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	227	1320	1340	858	1256
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	6.9	0.1	7.18	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.15	0.1	0.1	--	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	37.7	28.7	2.1	32	31.92	23.5	28
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	37.6	--	1.27	--	--	--	--
pH (Field)	-	--	--	7.79	7.51	7.65	6.74	7.52	6.99	--
Phosphorus	mg/l	--	--	0.28	0.17	0.26	0.3	0.37	0.11	0.45
Sulphate	mg/l	--	500 [16]	207.3	164	60.7	42.2	83	109	61
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	--	2572	2344	1920	2120
Total Organic Carbon	mg/l	--	--	--	--	17.5	--	107	76	107
Total Suspended Solids	mg/l	--	--	79	25	130	--	--	30	12
Metals										
Aluminum	mg/l	--	--	4.61	0.1	1.79	--	0.293	--	0.37
Antimony	mg/l	0.006	--	0.001	0.001	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.001	0.001	--	--	--	--
Barium	mg/l	1	--	**1.78**	--	0.1	--	--	--	--
Bismuth	mg/l	--	--	0.31	0.1	--	--	--	--	--
Boron	mg/l	5	--	**11.9**	--	0.37	**11.4**	**10.4**	**8.454**	**6.797**
Cadmium	mg/l	0.005	--	**0.051**	**0.008**	0.005	--	--	0.0001	0.0001
Calcium	mg/l	--	--	--	--	63	344	345	177	295
Chromium	mg/l	0.05	--	**0.31**	0.05	0.05	**0.064**	0.023	0.01	0.01
Cobalt	mg/l	--	--	0.05	0.05	--	--	--	--	--
Copper	mg/l	--	1	0.05	0.05	0.05	0.004	0.01	0.0131	0.0036
Iron	mg/l	--	0.3	1.92	7.16	1.55	0.003	8.086	1.918	2.44
Lead	mg/l	0.01	--	**0.05**	**0.05**	**0.05**	**0.0104**	**0.1**	0.0021	**0.0127**
Magnesium	mg/l	--	--	--	--	17	112	116	101	126
Manganese	mg/l	--	0.05	8.56	1.71	0.13	1.813	1.637	0.688	1.011
Mercury	mg/l	0.001	--	**0.21**	**0.1**	**0.16**	--	--	--	0.0001
Molybdenum	mg/l	--	--	0.05	0.05	--	--	--	--	--
Nickel	mg/l	--	--	0.17	0.06	0.05	0.029	0.02	0.02	0.02
Potassium	mg/l	--	--	--	--	11.8	76	68	62	80
Selenium	mg/l	0.05	--	0.001	0.001	--	--	--	--	0.005
Silver	mg/l	--	--	0.05	0.05	--	--	--	--	0.0073
Sodium	mg/l	--	200 [17]	--	--	53.9	367	394	343	372
Sulfur	mg/l	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	0.2	0.7	0.1	--	--	--	--
Titanium	mg/l	--	--	0.1	0.07	--	--	--	--	--
Vanadium	mg/l	--	--	0.1	0.1	--	--	--	--	--
Zinc	mg/l	--	5	0.13	0.05	0.05	0.032	0.022	0.031	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.012	0.005	0.003	0.06	0.098	0.055	0.03

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 28-Jun-1995	L5 24-Nov-1995	L5 12-Jun-1996	L5 12-Oct-1996	L5 17-Jun-1997	L5 05-Nov-1997	L5 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1680	1650	2000	1970	2210	1610	1960
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	20	25	31	27	5.14	31.4	32.5
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	16	15	173	27	95	37	40
Chemical Oxygen Demand	mg/l	--	--	202	270	600	350	495	388	328
Chloride	mg/l	--	250	312	342	393	492	525	540	471
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3850	4540	4650	4750	4890	4680	4610
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	16	233	433	132	407	392
Dissolved Organic Carbon	mg/l	--	5	74.1	114	131	125	140	111	82
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	9.47	--	0.29	0.36	1.71	2.85	3.39
Fluoride	mg/l	1.5	--	--	--	--	--	0.5	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1167	1640	2090	1890	1790	1580	1560
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	0.37
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	--	--	--	--
Nitrite as N	mg/l	1.0	--	0.1	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	25.5	30	38.8	39.4	34.7	38	33.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.25	7.66	6.26	6.6	6.93	6.75	--
Phosphorus	mg/l	--	--	0.44	0.43	0.66	0.45	0.8	0.35	0.34
Sulphate	mg/l	--	500 [16]	247	199	--	--	340	--	84
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1930	2270	2330	2390	2460	--	2310
Total Organic Carbon	mg/l	--	--	74.1	114	131	125	--	111	82
Total Suspended Solids	mg/l	--	--	39	85	59	2	13	44	23
Metals										
Aluminum	mg/l	--	--	--	--	--	--	0.17	--	--
Antimony	mg/l	0.006	--	--	--	--	--	0.003	--	--
Arsenic	mg/l	0.01	--	--	--	--	--	**0.017**	--	--
Barium	mg/l	1	--	--	--	--	--	0.396	--	--
Bismuth	mg/l	--	--	--	--	--	--	14.9	--	--
Boron	mg/l	5	--	**9**	**12**	**14.3**	**16.9**	**14.9**	**14.3**	**14.3**
Cadmium	mg/l	0.005	--	0.0001	0.0001	--	--	0.0001	--	--
Calcium	mg/l	--	--	290.6	370	415	383	399	295	290
Chromium	mg/l	0.05	--	0.03	0.02	--	--	0.01	--	--
Cobalt	mg/l	--	--	--	--	--	--	0.01	--	--
Copper	mg/l	--	1	--	0.0016	0.005	0.004	0.02	0.0071	0.0281
Iron	mg/l	--	0.3	2.25	2.67	1.66	1.21	0.31	2.07	2.07
Lead	mg/l	0.01	--	0.0008	0.0012	0.0024	0.0002	0.0002	0.0019	0.0002
Magnesium	mg/l	--	--	105.8	171	252	224	189	203	200
Manganese	mg/l	--	0.05	1.06	1.08	0.845	0.84	0.85	1.11	1.39
Mercury	mg/l	0.001	--	--	--	--	--	0.0003	--	--
Molybdenum	mg/l	--	--	--	--	--	--	0.11	--	--
Nickel	mg/l	--	--	0.03	0.02	0.02	0.02	0.02	0.03	0.02
Potassium	mg/l	--	--	67.2	80.4	97.5	99.2	91.4	96.8	89.4
Selenium	mg/l	0.05	--	--	--	--	--	0.015	--	--
Silver	mg/l	--	--	--	--	--	--	0.02	--	--
Sodium	mg/l	--	200 [17]	324.7	476	481	514	493	486	452
Sulfur	mg/l	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	0.02	--	--
Vanadium	mg/l	--	--	--	--	--	--	0.013	--	--
Zinc	mg/l	--	5	0.02	0.01	0.011	0.01	0.08	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	0.296	--	0.94	0.016	0.049

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 26-Aug-1998	L5 29-Oct-1998	L5 27-Nov-1998	L5 30-Jun-1999	L5 18-Oct-1999	L5 03-May-2000	L5 25-Oct-2000
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1330	1820	1980	1610	1800	1850	2180
Ammonia, unionized	mg/l	--	--	--	0.05	0.01	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	18.6	25.8	1.26	30.3	19	28.5	29.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	13	15	14	24	23	38	--
Chemical Oxygen Demand	mg/l	--	--	212	316	270	324	170	240	--
Chloride	mg/l	--	250	281	440	470	529	473	360	516
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3360	4210	--	4390	3970	4070	4430
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	197	308	611	95	469	340	--
Dissolved Organic Carbon	mg/l	--	5	72	90.6	97.2	101	87.2	85.2	--
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	2.98	5.49	--	3.59	4.98	2.2	3.14
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1030	1590	1460	1310	1430	1340	1392
Hydrogen Sulfide	mg/l	--	0.05	0.08	--	0.34	0.02	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	20.7	28.6	17.2	37.8	19.8	28.4	36.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.39	6.9	--	7.1	6.9	6.67	6.97
Phosphorus	mg/l	--	--	0.3	0.34	0.34	0.31	0.39	0.31	--
Sulphate	mg/l	--	500 [16]	--	--	--	--	--	--	22
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1690	2100	--	2200	2050	--	2820
Total Organic Carbon	mg/l	--	--	72	90.6	97.2	101	87.2	85.2	--
Total Suspended Solids	mg/l	--	--	73	28	19	48	42	54	60
Metals										
Aluminum	mg/l	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	--	--	--	--	--	--	0.001
Barium	mg/l	1	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	8.6	14	14.9	13.3	14.5	11.6	18.2
Cadmium	mg/l	0.005	--	--	--	--	--	--	--	0.0001
Calcium	mg/l	--	--	240	304	297	270	298	267	292
Chromium	mg/l	0.05	--	--	--	--	--	--	--	0.02
Cobalt	mg/l	--	--	--	--	--	--	--	--	0.0352
Copper	mg/l	--	1	0.0051	0.008	0.0005	0.003	0.0042	0.0085	0.0077
Iron	mg/l	--	0.3	9.31	9.83	5.57	7.05	7.47	8.27	15.2
Lead	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0006	0.0002	0.0002	0.0002
Magnesium	mg/l	--	--	104	199	171	153	165	161	161
Manganese	mg/l	--	0.05	1.24	1.74	1.33	1.37	1.54	1.56	2.38
Mercury	mg/l	0.001	--	--	--	--	--	--	--	0.0001
Molybdenum	mg/l	--	--	--	--	--	--	--	--	0.002
Nickel	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.07
Potassium	mg/l	--	--	66.7	79.3	85.6	88.6	83.4	77.9	77.6
Selenium	mg/l	0.05	--	--	--	--	--	--	--	0.001
Silver	mg/l	--	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	312	532	543	578	520	471	590
Sulfur	mg/l	--	--	0.08	0.02	--	--	0.02	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	0.05	0.01	0.01	0.01	0.01	0.07	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.035	0.001	0.001	0.039	0.045

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 13-Jun-2001	L5 20-Sep-2001	L5 21-Nov-2001	L5 22-May-2002	L5 08-Nov-2002	L5 31-May-2003	L5 23-Jul-2003
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1900	--	1890	1820	2190	1890	1820
Ammonia, unionized	mg/l	--	--	0.07	--	<0.02	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	33.6	--	38.3	1.53	35	31.5	37.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	319	207	15	49	507	84	58
Chemical Oxygen Demand	mg/l	--	--	728	490	292	335	986	390	371
Chloride	mg/l	--	250	530	515	500	404	458	419	470
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4300	4080	4710	3500	4900	--	3570
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	312	--	265	344	550	440	566
Dissolved Organic Carbon	mg/l	--	5	--	--	139	66	524	141	231
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	3.6	3.16	4.1	--	2.73
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1716	--	1461	1470	1744	1309	1350
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	0.44	24.9	11.7	5.7
Nitrate as N	mg/l	10.0	--	0.1	--	0.1	0.1	0.1	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	40	40.2	48.2	31.5	41.1	43.3	41.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.18	6.53	6.68	--	--	6.83
Phosphorus	mg/l	--	--	0.58	0.41	0.21	0.35	0.68	0.42	0.55
Sulphate	mg/l	--	500 [16]	357	58	25	107	55	43	30
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3080	--	2730	10300	--	2260	3130
Total Organic Carbon	mg/l	--	--	249	--	139	66	524	141	231
Total Suspended Solids	mg/l	--	--	80	124	76	58	46	30	11
Metals										
Aluminum	mg/l	--	--	--	1.24	--	--	--	--	--
Antimony	mg/l	0.006	--	--	0.006	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	--	0.001	0.001	0.003	0.003	0.004
Barium	mg/l	1	--	--	0.615	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	13.5	14.6	17.1	13.9	13.2	12.4	15.3
Cadmium	mg/l	0.005	--	0.0001	0.01	0.0001	0.01	0.0001	0.0001	0.0003
Calcium	mg/l	--	--	387	--	275	300	413	285	285
Chromium	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt	mg/l	--	--	0.147	0.01	0.0267	0.01	0.0384	0.002	0.0018
Copper	mg/l	--	1	0.009	0.01	0.114	0.01	0.0161	0.004	0.254
Iron	mg/l	--	0.3	18.2	8.22	8.61	7.76	11.6	0.02	6.46
Lead	mg/l	0.01	--	0.0024	0.1	0.0041	0.1	0.0047	0.0005	0.0031
Magnesium	mg/l	--	--	182	--	188	175	173	145	154
Manganese	mg/l	--	0.05	1.9	1.54	1.43	1.59	1.94	1.24	1.14
Mercury	mg/l	0.001	--	0.0001	--	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	mg/l	--	--	0.041	0.02	0.005	0.02	0.042	0.0006	0.0002
Nickel	mg/l	--	--	0.02	0.02	0.02	0.03	0.02	0.02	0.01
Potassium	mg/l	--	--	116	--	95.6	82.3	88.2	86.6	95.2
Selenium	mg/l	0.05	--	0.001	--	0.001	0.001	0.005	0.001	0.006
Silver	mg/l	--	--	--	0.01	--	--	--	--	--
Sodium	mg/l	--	200 [17]	525	--	542	469	494	463	507
Sulfur	mg/l	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	0.2	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	0.005	--	--	--	--	--
Zinc	mg/l	--	5	0.2	0.06	0.19	0.17	0.34	0.02	0.369
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.283	0.197	0.012	0.033	0.638	0.162	0.009

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 21-Oct-2003	L5 17-May-2004	L5 23-Aug-2004	L5 18-Nov-2004	L5 25-May-2005	L5 09-Sep-2005	L5 28-Nov-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	2560	2710	2500
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	<1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	2120	2080	2190	2330	2100	2220	2050
Ammonia, unionized	mg/l	--	--	--	0.26	--	0.49	0.15	0.16	0.14
Ammonia Nitrogen	mg/l	--	--	39.4	30.2	29.4	37.5	34.3	37.7	32.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	53	346	198	237	32	24	45
Chemical Oxygen Demand	mg/l	--	--	416	669	631	698	377	382	342
Chloride	mg/l	--	250	477	439	386	499	360	454	380
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4630	--	3530	2000	4400	3750	--
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	525	137	701.2	369	651	710	595
Dissolved Organic Carbon	mg/l	--	5	188	203	29.8	401.1	108.8	202.5	91.8
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	4	--	--	2.8	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1380	1460	1550	1690	1630	1370	1370
Hydrogen Sulfide	mg/l	--	0.05	4.94	5.6	--	8.8	1	1	4
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.3	<1	0.3	<0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	48.9	40.3	37.3	45.5	41	51.4	38.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	--	6.7	7.2	6.6	6.9	--
Phosphorus	mg/l	--	--	0.47	0.42	0.57	0.46	0.42	0.36	0.38
Sulphate	mg/l	--	500 [16]	12	71	96	40	30	19	74
Temperature (Field)	deg c	--	15	--	--	--	--	17.8	17	--
Total Dissolved Solids	mg/l	--	500	2864	--	2940	--	2790	2930	2760
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	33	30	45	67	54	16	17
Metals										
Aluminum	mg/l	--	--	--	0.241	--	--	--	--	--
Antimony	mg/l	0.006	--	--	0.001	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.007	0.002	0.001	0.001	0.001	0.003	0.003
Barium	mg/l	1	--	--	0.832	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	15.5	12.9	11.5	14.9	16.3	15.1	13.2
Cadmium	mg/l	0.005	--	0.0001	<0.005	<0.0006	<0.001	0.0001	0.0001	0.0003
Calcium	mg/l	--	--	293	323	369	379	349	288	282
Chromium	mg/l	0.05	--	0.006	0.01	0.008	0.012	0.012	0.008	0.005
Cobalt	mg/l	--	--	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/l	--	1	0.002	0.002	<0.002	0.042	0.008	<0.002	<0.002
Iron	mg/l	--	0.3	0.64	9.84	13.4	11.2	11.9	7.62	0.793
Lead	mg/l	0.01	--	0.0006	0.02	0.0021	0.0029	0.0065	0.001	<0.001
Magnesium	mg/l	--	--	158	158	152	181	185	159	163
Manganese	mg/l	--	0.05	1.01	1.22	1.55	1.38	1.62	1.27	0.649
Mercury	mg/l	0.001	--	0.0001	--	<0.0001	<0.0001	<0.00006	<0.00005	0.00006
Molybdenum	mg/l	--	--	0.01	--	<0.01	<0.01	<0.01	<0.01	0.02
Nickel	mg/l	--	--	0.01	0.02	0.01	0.02	0.01	<0.01	<0.01
Potassium	mg/l	--	--	104	93.6	88.9	109	106	102	98.6
Selenium	mg/l	0.05	--	0.006	0.001	0.001	<0.001	<0.001	0.001	<0.001
Silver	mg/l	--	--	--	<0.005	--	--	--	<0.005	--
Sodium	mg/l	--	200 [17]	546	505	566	589	549	624	592
Sulfur	mg/l	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	<0.005	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	0.01	--	--	--	--	--
Zinc	mg/l	--	5	0.23	0.48	0.12	0.149	0.045	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.066	0.419	0.237	0.31	0.03	0.021	0.08

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 21-Oct-2003	L5 17-May-2004	L5 23-Aug-2004	L5 18-Nov-2004	L5 25-May-2005	L5 09-Sep-2005	L5 28-Nov-2005
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	<0.0004	<0.004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	0.0001	0.0004	<0.001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	<0.0001	<0.001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	<0.0002	<0.002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	0.0001	0.0002	<0.001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	0.0015	0.0016	<0.002
Benzene	mg/l	0.001	--	--	--	--	--	**0.0013**	**0.004**	<0.005
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	<0.002	<0.02
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	<0.0002	<0.002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	0.0039	0.0049	<0.002
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	<0.0003	<0.003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	0.001	0.0115	0.006
m,p-Xylenes	mg/l	--	--	--	--	--	--	0.0015	0.0175	<0.01
Methyl tert-Butyl Ether	mg/l	--	0.015	--	0.002	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	0.0007	0.0027	<0.003
o-Xylene	mg/l	--	--	--	--	--	--	0.0006	0.0082	<0.005
Styrene	mg/l	--	--	--	--	--	--	<0.0006	<0.0006	<0.006
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	<0.0002	<0.002
Toluene	mg/l	0.06	0.024	--	--	--	--	0.0027	0.0115	0.014
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	<0.0001	<0.001
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	<0.0002	<0.002

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 25-May-2006	L5 15-Aug-2006	L5 16-Nov-2006	L5 17-May-2007	L5 29-Aug-2007	L5 20-Nov-2007	L5 23-May-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1940	2150	1820	2180	2210	2150	1900
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	31.3	34.6	26	37.2	36.4	37.9	39.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	132	86	40	41	182	<20	447
Chemical Oxygen Demand	mg/l	--	--	1170	442	239	309	560	332	863
Chloride	mg/l	--	250	329	348	262	380	546	437	448
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3690	3600	2800	3400	2200	1600	4500
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	640	538	395	632	553	602	494
Dissolved Organic Carbon	mg/l	--	5	122	201	135	95.7	165.1	83.4	226
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	1.1	2.97	--	1.19	2.46	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1390	1340	1130	1320	1500	1260	1300
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	35.2	43.3	35.6	45.2	46.1	47.9	51.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	6.9	--	7.1	6.7	7.9	7.8
Phosphorus	mg/l	--	--	0.83	0.34	0.33	0.31	0.27	0.36	0.43
Sulphate	mg/l	--	500 [16]	97	28	40	47	98	135	260
Temperature (Field)	deg c	--	15	--	15.5	13.1	13.5	15.2	6.9	16.5
Total Dissolved Solids	mg/l	--	500	2550	2660	2290	2820	3140	2930	2930
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1190	21	66	20	35	124	308
Metals										
Aluminum	mg/l	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.002	0.005	0.003	0.0053	0.005	0.004	0.0079
Barium	mg/l	1	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	10.8	13.3	11	13.8	11.6	14	12.2
Cadmium	mg/l	0.005	--	0.0002	<0.001	<0.001	0.00014	<0.0002	<0.0002	<0.005
Calcium	mg/l	--	--	325	296	241	280	311	261	252
Chromium	mg/l	0.05	--	0.014	0.006	0.008	0.006	0.009	0.007	0.011
Cobalt	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/l	--	1	0.042	<0.002	0.002	<0.002	<0.002	<0.002	0.002
Iron	mg/l	--	0.3	27.5	5.54	10.5	6.39	10.2	14.2	6.71
Lead	mg/l	0.01	--	0.0097	<0.001	<0.001	<0.00002	<0.0002	<0.0002	<0.02
Magnesium	mg/l	--	--	139	145	129	151	175	148	163
Manganese	mg/l	--	0.05	1.52	0.964	1.4	0.957	0.654	0.924	1.38
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	77.2	89.2	76.1	91.5	90.1	94.7	94.8
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	428	499	408	505	579	500	529
Sulfur	mg/l	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	--	--	--	0.007	0.008	0.037	0.12
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.028	0.11	0.007	0.015	0.16	0.006	0.33

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 25-May-2006	L5 15-Aug-2006	L5 16-Nov-2006	L5 17-May-2007	L5 29-Aug-2007	L5 20-Nov-2007	L5 23-May-2008
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.005	0.0003	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.03	**0.0021**	--	--	--	--	**0.0012**
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.03	0.0075	--	--	--	--	0.0021
m,p-Xylenes	mg/l	--	--	<0.05	0.0108	--	--	--	--	0.0053
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.02	0.0021	--	--	--	--	0.0052
o-Xylene	mg/l	--	--	<0.03	0.0037	--	--	--	--	0.0023
Styrene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.03	0.0143	--	--	--	--	0.0127
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.01	**0.0014**	--	--	--	--	<0.0002

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 13-Aug-2008	L5 10-Nov-2008	L5 19-May-2009 [3]	L5 25-Aug-2009 [4]	L5 23-Sep-2009	L5 30-Nov-2009 [4]
						L-1	L-1	L-1	L-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	2280	1990	1867	2063	--	1960
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	44	44.7	56.4	50.1	--	41.8
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	484	154	662	320	--	10
Chemical Oxygen Demand	mg/l	--	--	1120	595	1010	782	--	275
Chloride	mg/l	--	250	538	562	569	538	--	397
Conductivity	uS/cm	--	--	--	--	5050	5210	--	4410
Conductivity (Field)	uS/cm	--	--	5000	4400	--	>4000	--	>2999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	499	498	445	462	--	460
Dissolved Organic Carbon	mg/l	--	5	354	147.2	273	247	--	106
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1790	1410	1070	1290	--	1310
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.20	<0.10	--	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	58.2	50.5	68.5	59.2	--	43.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.3	7.7	--	7.29	--	8.5
Phosphorus	mg/l	--	--	0.54	0.32	0.10	0.34	--	0.24
Sulphate	mg/l	--	500 [16]	72	61	99	108	--	45
Temperature (Field)	deg c	--	15	18	10	--	18.4	--	9
Total Dissolved Solids	mg/l	--	500	3310	3040	3280	3390	--	2870
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	254	152	496	332	--	222
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.0065	0.0042	**0.02**	<0.05	--	<0.05
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**14.5**	**14.8**	**14**	**15**	--	**14**
Cadmium	mg/l	0.005	--	<0.005	<0.0001	<0.001	<0.01	--	<0.01
Calcium	mg/l	--	--	438	316	184	228	--	269
Chromium	mg/l	0.05	--	0.012	0.01	0.015	<0.05	--	<0.02
Cobalt	mg/l	--	--	<0.005	<0.005	0.003	<0.01	--	0.005
Copper	mg/l	--	1	<0.002	0.015	<0.01	0.01	--	<0.01
Iron	mg/l	--	0.3	5.48	7.48	7.5	32.4	--	32.7
Lead	mg/l	0.01	--	<0.02	<0.0001	<0.01	<0.01	--	<0.01
Magnesium	mg/l	--	--	168	150	148	175	--	155
Manganese	mg/l	--	0.05	1.07	0.592	0.5	0.91	--	1.65
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	105	102	87	99	--	87
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	555	591	555	601	--	533
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	0.105	0.023	<0.1	0.09	--	<0.05
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.438	0.24	0.688	0.469	--	<0.001

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 13-Aug-2008	L5 10-Nov-2008	L5 19-May-2009 [3]	L5 25-Aug-2009 [4]	L5 23-Sep-2009	L5 30-Nov-2009 [4]
						L-1	L-1	L-1	L-1
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	0.0004	<0.0001	<0.0004	--	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	**0.0017**	**0.0017**	**0.0080**	--	**0.0013**	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	0.0038	0.0034	0.0009	--	0.0011	<0.0005
m,p-Xylenes	mg/l	--	--	0.0086	0.0069	0.0024	--	0.0034	<0.0010
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	0.0051	0.0009	<0.0040	--	0.0049	<0.0040
o-Xylene	mg/l	--	--	0.0033	0.0028	0.0019	--	0.0016	<0.0005
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	0.0188	0.0103	0.0047	--	0.0067	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	--	<0.0002	<0.0002

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 25-May-2010 [4]	L5 18-Aug-2010 [5]	L5 14-Oct-2010	L5 24-May-2011 [6]	L5 16-Aug-2011 [7]	L5 30-Nov-2011
				L-1	L-1	L-1	L-1	L-1	L5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1906	2079	1914	1940	2052	2200
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	47.6	40.7	39.6	45.5	63.2	53.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	13	22	18	60	64	45
Chemical Oxygen Demand	mg/l	--	--	300	250	275	450	475	275
Chloride	mg/l	--	250	366	351	320	421	543	553
Conductivity	uS/cm	--	--	4190	4080	4000	4180	4910	4920
Conductivity (Field)	uS/cm	--	--	>3999	3366	2256	>3999	>4000	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	352	417	458	453	2.2	79.8
Dissolved Organic Carbon	mg/l	--	5	91.6	85.6	80.2	112	1.5	103
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	7.34	--	--	1.21	4.45
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1230	1080	1250	1080	1010	1180
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.11	<0.10	<0.10	<0.10	<1.0	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<1.0	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	48.4	43.7	43.3	47.5	69.4	59.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.28	7.65	7.64	7.75	8.31	7.64
Phosphorus	mg/l	--	--	0.34	0.25	0.30	0.27	0.28	0.28
Sulphate	mg/l	--	500 [16]	16	59	25	102	57	42
Temperature (Field)	deg c	--	15	18.2	18.3	14.6	16.6	28.5	11.9
Total Dissolved Solids	mg/l	--	500	2720	2650	2600	2720	3190	3200
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	367	366	204	310	188	60
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	<0.05	<0.01	<0.05	<0.05	<0.05	<0.01
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	18	17	14	15	16	16
Cadmium	mg/l	0.005	--	<0.01	<0.0001	<0.01	<0.01	<0.01	<0.001
Calcium	mg/l	--	--	242	192	263	142	152	229
Chromium	mg/l	0.05	--	<0.05	<0.005	<0.05	<0.05	<0.05	0.008
Cobalt	mg/l	--	--	<0.01	0.0053	<0.01	<0.01	<0.01	0.003
Copper	mg/l	--	1	<0.01	0.002	<0.01	<0.01	<0.01	<0.01
Iron	mg/l	--	0.3	20.1	25.8	12.1	14.3	7.5	9.3
Lead	mg/l	0.01	--	<0.01	<0.001	<0.01	<0.01	<0.01	<0.01
Magnesium	mg/l	--	--	152	147	143	177	152	148
Manganese	mg/l	--	0.05	1.80	1.53	1.18	1.00	0.62	1.1
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	86	80	75	85	94	90
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	474	486	435	542	790	673
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	<0.05	<0.01	<0.05	<0.05	<0.05	<0.1
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.002	0.001	0.082	0.049	0.003

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 25-May-2010 [4]	L5 18-Aug-2010 [5]	L5 14-Oct-2010	L5 24-May-2011 [6]	L5 16-Aug-2011 [7]	L5 30-Nov-2011
				L-1	L-1	L-1	L-1	L-1	L5
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.002	<0.0008	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.002	<0.001	0.0010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.002	0.001	0.0019
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0050	<0.0020	0.0040
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.02	<0.0080	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.002	0.001	0.0015
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.002	0.002	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.001	<0.0004	<0.0002

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 04-Jun-2012 [8]	L5 22-Aug-2012 [8]	L5 29-Nov-2012 [9]	L5 29-May-2013 [10]	L5 15-Aug-2013 [10]	L5 26-Nov-2013 [10]
				L5	L - 5	L5	L5	L-1	LEACHATE
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1700	1800	2300	1800	1900	1500
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	57	58	73	72 [20]	70	45
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	32	43	45	25	29	13
Chemical Oxygen Demand	mg/l	--	--	370	420	480	410	420	230
Chloride	mg/l	--	250	470	520	620	510	580	380
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3787	3655	>3999	3659	>3999	2974
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	440	450	460	390	420	360
Dissolved Organic Carbon	mg/l	--	5	130	130	150	120	130	74
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	10.4
Dissolved Oxygen (Field)	mg/l	--	--	-- [18]	5.98	1.24	--	8.71	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	980	920	1100	940	840	830
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	0.20	0.30
Nitrite as N	mg/l	1.0	--	0.021	<0.010	<0.010	0.014	0.018	0.037
Nitrogen, Total Kjeldahl	mg/l	--	--	64	62	81	71 [20]	76	47
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	0.21	0.34
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.08	8.25	6.93	8.11	7.26	8.37
Phosphorus	mg/l	--	--	<0.10 [19]	0.28	0.33	0.28	<0.20 [19]	0.17
Sulphate	mg/l	--	500 [16]	99	<1	<1	3	<1	21
Temperature (Field)	deg c	--	15	16.3	19.4	14.2	17.5	19.7	8.9
Total Dissolved Solids	mg/l	--	500	2670	2940	3400	2810	3030	2220
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	96	84	18	100	<2	45
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.0079	0.0090	0.013	0.0096	0.0080	0.0021
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	18	23	23	21	25	17
Cadmium	mg/l	0.005	--	<0.00010	<0.00010	<0.00020	<0.00010	<0.00010	<0.00010
Calcium	mg/l	--	--	140	120	220	170	140	100
Chromium	mg/l	0.05	--	0.0089	0.011	0.016	0.01	0.012	<0.0050
Cobalt	mg/l	--	--	0.0028	0.0029	0.0034	0.0033	0.0038	0.0025
Copper	mg/l	--	1	0.0017	0.0012	<0.0020	<0.0010	<0.0010	<0.0010
Iron	mg/l	--	0.3	0.5	6.3	6.7	8.3	5.4	3.8
Lead	mg/l	0.01	--	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00050
Magnesium	mg/l	--	--	180	200	200	170	180	150
Manganese	mg/l	--	0.05	0.29	0.25	0.87	0.52	0.38	0.27
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	100	110	120	100	120	84
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	650	760	850	610	760	530
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	0.0088	0.0053	<0.01	0.013	0.0055	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.034	0.094	0.11	0.016	0.0037	0.0069

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 04-Jun-2012 [8]	L5 22-Aug-2012 [8]	L5 29-Nov-2012 [9]	L5 29-May-2013 [10]	L5 15-Aug-2013 [10]	L5 26-Nov-2013 [10]
				L5	L - 5	L5	L5	L-1	LEACHATE
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0020	<0.0010	<0.00050	<0.0025	<0.0010	<0.0025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0020	<0.0010	**0.0065**	<0.0025	<0.0010	<0.0025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0020	<0.0010	0.011	<0.0025	<0.0010	<0.0025
m,p-Xylenes	mg/l	--	--	<0.0020	<0.0010	0.014	<0.0025	<0.0010	<0.0025
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.01	<0.0050	<0.0025	<0.013	<0.0050	<0.013
o-Xylene	mg/l	--	--	<0.0020	<0.0010	0.0033	<0.0025	<0.0010	<0.0025
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0040	<0.0020	0.0055	<0.0050	<0.0020	<0.0050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0040	<0.0020	<0.0010	<0.0050	<0.0020	<0.0050

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 28-May-2014 [11]	L5 27-Aug-2014 [12]	L5 13-Nov-2014 [13]	L5 27-May-2015	L5 25-Aug-2015	L5 25-Nov-2015
				L-5	L-5	L-5	L-5	L-5	L-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1800	1900	2000	1710	1850	1250
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	66	82 [20]	70	66.3	52.3	37.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	23	29	15	<60 [22]	134	25
Chemical Oxygen Demand	mg/l	--	--	360	430	370	378	384	242
Chloride	mg/l	--	250	500	630	550	553	1000	393
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3765	>3999	3616	>3999	>3999	3742
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	380	460	430	372	317	253
Dissolved Organic Carbon	mg/l	--	5	120	130	120	134	111	73.1
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	8.25	--	7.44	7.56	7.09	5.10
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	890	970	990	172	980	1250
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.50	<0.50	0.26	<0.1	<0.1	0.7
Nitrite as N	mg/l	1.0	--	<0.050	<0.050	0.042	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	71	81 [20]	77	69.5	53.9	45.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.50	<0.50	0.30	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.00	8.03	7.55	7.58	8.60	7.87
Phosphorus	mg/l	--	--	<0.10 [21]	0.33	0.31	0.39	0.25	0.16
Sulphate	mg/l	--	500 [16]	2	2	<1	41	34	403
Temperature (Field)	deg c	--	15	15.7	19.0	12.2	20.4	17.3	7.8
Total Dissolved Solids	mg/l	--	500	2980	3230	2920	2850	2820	2310
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	110	63	70	88	130	41
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	<0.01	<0.02	**0.011**	0.001	0.007	0.003
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**20**	**26**	**22**	4.27	**22.1**	**13.2**
Cadmium	mg/l	0.005	--	<0.0010	<0.0020	<0.0010	<0.0001	<0.0001	<0.0001
Calcium	mg/l	--	--	170	180	160	25.3	154	254
Chromium	mg/l	0.05	--	<0.05	<0.1	<0.05	0.002	0.009	0.006
Cobalt	mg/l	--	--	<0.0050	<0.01	<0.0050	0.0006	0.0032	0.0073
Copper	mg/l	--	1	<0.01	<0.02	<0.01	<0.0005	<0.0005	<0.0005
Iron	mg/l	--	0.3	7.1	7.8	5.4	0.852	7.81	3.47
Lead	mg/l	0.01	--	<0.0050	<0.01	<0.0050	<0.0001	<0.0001	0.0003
Magnesium	mg/l	--	--	160	180	160	26.4	145	148
Manganese	mg/l	--	0.05	0.61	0.64	0.51	0.084	0.606	0.491
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	100	110	110	17.9	94.7	62.9
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	640	750	700	110	571	577
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	<0.05	<0.1	<0.05	<0.005	0.015	0.012
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.012	0.0058	0.072	0.011	0.032	<0.004 [23]

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 28-May-2014 [11]	L5 27-Aug-2014 [12]	L5 13-Nov-2014 [13]	L5 27-May-2015	L5 25-Aug-2015	L5 25-Nov-2015
				L-5	L-5	L-5	L-5	L-5	L-5
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.01	<0.0020	<0.0020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.01	<0.0020	<0.0020	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 24-May-2016	L5 18-Aug-2016	L5 16-Nov-2016	L5 18-May-2017	L5 28-Aug-2017	L5 28-Nov-2017	L5 23-May-2018
				L-5	L-5	L-5	L-5	L-5	L-5	L-5
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1500	1520	1870	1850	1660	2050	1430
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	73.2	64.9	87.1	101	45.6 [26]	80.1	81.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	210	42	58	495	<60 [27]	652	43
Chemical Oxygen Demand	mg/l	--	--	647	368	427	1240	269	1210	448
Chloride	mg/l	--	250	654	523	614	689	374	640	572
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	>3999	>3999	3999	3234	3999	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	262	110	285	158	299	130	302
Dissolved Organic Carbon	mg/l	--	5	194	356	125	335	82.4	407	123
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	9.70	8.46	9.02	6.85	7.47	7.69	10.12
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1220	929	1030	1220	1300	1750	1200
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	1.3	<0.1	<0.5 [25]	<0.5 [25]	<0.5 [25]	1.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [24]	<0.05	<0.05	<0.25 [24]	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	139	83.8	94.3	127	34.4	94.4	93.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.36	8.26	8.00	7.88	7.79	7.70	7.91
Phosphorus	mg/l	--	--	0.41	0.33	0.34	0.48	0.14	0.36	0.29
Sulphate	mg/l	--	500 [16]	124	43	24	76	19	41	374
Temperature (Field)	deg c	--	15	19.5	20	14.5	21.0	16.1	10.5	17.6
Total Dissolved Solids	mg/l	--	500	3290	2620	3130	3930	2590	3090	3030
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	279	13	57	162	140	96	32
Metals										
Aluminum	mg/l	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.009	0.005	0.004	**0.017**	0.001	**0.014**	**0.012**
Barium	mg/l	1	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**25.5**	**20.2**	**29.3**	**24.7**	**14.2**	**13.4**	**16.2**
Cadmium	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	--	--	196	139	145	229	254	382	240
Chromium	mg/l	0.05	--	0.012	0.009	0.011	0.024	0.006	0.019	0.014
Cobalt	mg/l	--	--	0.0147	0.0034	0.0043	0.0040	0.0028	0.0030	0.0091
Copper	mg/l	--	1	0.0020	<0.0005	<0.0005	0.0060	<0.0005	0.0018	0.0082
Iron	mg/l	--	0.3	5.57	7.9	5.9	2.52	8.56	2.44	3.44
Lead	mg/l	0.01	--	0.0013	<0.0001	<0.0001	0.0005	<0.0001	0.0017	0.0019
Magnesium	mg/l	--	--	179	141	161	158	161	193	147
Manganese	mg/l	--	0.05	0.948	0.541	0.397	1.21	0.704	1.6	0.541
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	108	76.2	123	109	94.7	118	104
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	812	576	717	666	490	622	542
Sulfur	mg/l	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	0.01	<0.005	0.009	0.029	0.01	0.031	0.016
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.142	0.052	0.025	0.360	<0.004 [25]	0.629	0.016

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 24-May-2016	L5 18-Aug-2016	L5 16-Nov-2016	L5 18-May-2017	L5 28-Aug-2017	L5 28-Nov-2017	L5 23-May-2018
				L-5	L-5	L-5	L-5	L-5	L-5	L-5
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	0.0019	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.0005
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	0.0020	<0.0005	0.0288	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 30-Aug-2018	L5 11-Nov-2018 [14]	L5 19-Dec-2018 [15]	L5 20-Jun-2019	L5 28-Aug-2019	L5 21-Nov-2019
				L-5	L5	L-5	L-5	L-5	L-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	975	--	2040	2250	2080	1940
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	74.2	--	90.0	112	69.1 [26]	89.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	27	--	22	178	86	35
Chemical Oxygen Demand	mg/l	--	--	330	--	441	497	414	428
Chloride	mg/l	--	250	504	--	662	619	536	658
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	--	>3999	>3999	>3999	5640
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	158	--	368	2.80	818	10.1
Dissolved Organic Carbon	mg/l	--	5	99.8	--	131	125	129	122
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	8.71	--	7.31	7.86	7.74	7.7
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	976	--	1150	1200	1420	1510
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	--	<0.5 [25]	<0.1	0.2	<0.1
Nitrite as N	mg/l	1.0	--	0.12	--	<0.25 [25]	<0.05	0.09	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	81.6	--	118	115	68.0	92.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.45	--	8.26	7.82	7.26	8.24
Phosphorus	mg/l	--	--	0.18	--	0.58	0.36	0.34	0.25
Sulphate	mg/l	--	500 [16]	812	--	58	87	135	143
Temperature (Field)	deg c	--	15	18.5	--	10.9	17.8	17.2	11.4
Total Dissolved Solids	mg/l	--	500	2620	--	3040	3120	3020	3320
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	40	--	95	5	48	47
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	**0.011**	--	0.004	0.007	**0.019**	0.006
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**10.3**	--	**20.9**	**25.6**	**13.2**	**24.6**
Cadmium	mg/l	0.005	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	--	--	129	--	196	208	287	320
Chromium	mg/l	0.05	--	0.011	--	0.011	0.015	0.021	0.019
Cobalt	mg/l	--	--	0.0051	--	0.0043	0.0055	0.0033	0.0063
Copper	mg/l	--	1	0.0025	--	<0.0005	0.0006	0.0013	0.0005
Iron	mg/l	--	0.3	9.53	--	2.39	1.33	11.2	5.73
Lead	mg/l	0.01	--	0.0014	--	0.0001	<0.0001	0.0005	0.0003
Magnesium	mg/l	--	--	159	--	161	166	171	172
Manganese	mg/l	--	0.05	0.066	--	0.308	0.315	13.2	0.776
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	96.3	--	123	123	102	132
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	512	--	589	666	503	714
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	<0.005	--	<0.005	0.015	0.01	0.006
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.009	--	<0.010 [25]	0.008	0.033	0.008

Report of Monitoring Results - Leachate

Parameter	Unit	ODWQS (169/03) Health [1]	ODWQS AO [2]	L5 30-Aug-2018	L5 11-Nov-2018 [14]	L5 19-Dec-2018 [15]	L5 20-Jun-2019	L5 28-Aug-2019	L5 21-Nov-2019
				L-5	L5	L-5	L-5	L-5	L-5
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	0.0006	0.0009
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005	0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	0.0014	<0.0005
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	0.0008	<0.0005
Styrene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005	0.0032	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2018).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised June 2006).
(3)	Metals and TP MRL elevated due to matrix interference.
(4)	Metals analysis performed on aqua-regia digest of sample material.
(5)	Arsenic MRL elevated due to matrix interference.
(6)	Metals analysis performed on aqua-regia digest of sample material due to solids present in sample, except for Boron. MRLs may be elevated. TP MRL elevated due to matrix interference. Due to matrix interference 5x dilution factor required for VOCs. TKN and N-NH3 were analysed at SGS Lakefield.
(7)	N-NO2,N-NO3 and TP MRL elevated due to matrix interference.VOC MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.
(8)	VOC Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(9)	Metal analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
(10)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(11)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.Metal Analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(12)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.Nitrite/Nitrate: Due to the colour interferences, some sample required dilution. Detection limits were adjusted accordingly.Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(13)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.Nitrite/Nitrate: Due to the sample matrix, some sample required dilution. Detection limits were adjusted accordingly.Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(14)	Leachate pump was not working. No sample could be collected.
(15)	Clarity: slight turbidity, sediments: none, colour: light greyish brownish tint, odour: leachate-like odour
(16)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(17)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(18)	The dissolved oxygen reading was missed during this monitoring session.

(19) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
(20) TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.
(21) Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(22) Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(23) Elevated Reporting Limit due to matrix interference.
(24) Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(25) Elevated Reporting Limit due to matrix interference.
(26) Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions.
(27) Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

Appendix '1'

Golder 2020 Landfill Monitoring Report

GOLDER

REPORT

2020 Landfill Monitoring

Waste Connections of Canada
Navan Waste Recycling and Disposal Facility
Ottawa, Ontario

Submitted to:

Waste Connections of Canada
Waste Connections of Canada
3354 Navan Road
Ottawa, Ontario
K4B 1H9

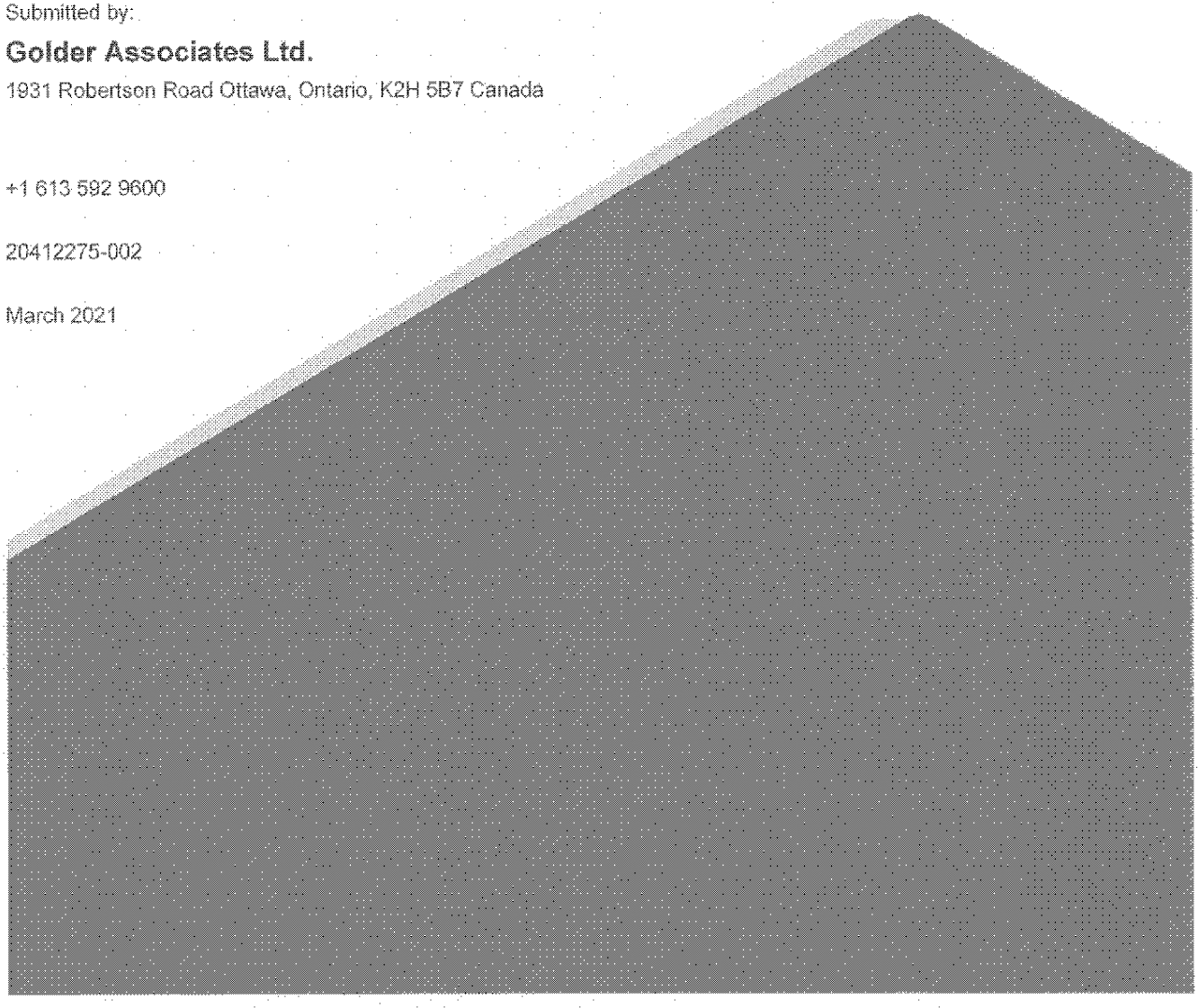
Submitted by:

Golder Associates Ltd.
1931 Robertson Road Ottawa, Ontario, K2H 5B7 Canada

+1 613 592 9600

20412275-002

March 2021



Appendix D-Monitoring and Screening Checklist
General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.

Instructions: A complete checklist consists of:

(a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.

(b) completed contact information for the Competent Environmental Practitioner (CEP)

(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

(a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or

(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

Definition of Surface water CEP:

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site (WDS) Name	Navan Waste Recycling and Disposal Facility
Location (e.g. street address, lot, concession)	3354 Navan Road. Parts of Lots 2, 3 and 4, Concession IV
GPS Location (taken within the property boundary at front gate/ front entry)	460569.6m E 5030570.0m N (Zone 18)
Municipality	City of Ottawa (formerly City of Gloucester)
Client and/or Site Owner	Waste Connections of Canada
Monitoring Period (Year)	2020
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval (ECA) Number (formerly "Certificate of Approval" (C of A)) :	No. A460702
Director's Order No.:	N/A
Provincial Officer's Order No.:	N/A

Other:	N/A		
Report Submission Frequency	(•) **Annual** ( ) **Other**	Due March 31	
The site is: **(Operation Status)**	(•) **Open** ( ) **Inactive** ( ) **Closed**		
Is there an active waste transfer station at the site?	( ) **Yes** (•) **No**		
Does this WDS have a Closure Plan?	(•) **Not yet submitted** ( ) **Submitted and under review** ( ) **Submitted and approved**		
Total Approved Capacity	7,600,000 (excl. final cover)	*Units*	Cubic Metres
Maximum Approved Fill Rate	1,500	*Units*	Tonnes per Day
Total Waste Received within Monitoring Period (Year)	207,996	*Units*	Tonnes
Total Waste Received within Monitoring Period (Year) *Describe the methodology used to determine this quantity*	Weighed		
Estimated Remaining Capacity	1,624,753	*Units*	Cubic Metres
Estimated Remaining Capacity *Describe the methodology used to determine this quantity*	Estimation		
Estimated Remaining Capacity *Date Last Determined*	31-Dec-2020		
Non-Hazardous Approved Waste Types	[X] Domestic [X] Industrial, Commercial & Institutional (IC&I) [ ] Source Separated Organics (Green Bin) [ ] Tires	[X] Contaminated Soil [X] Wood Waste [ ] Blue Box Material [ ] Processed Organics [ ] Leaf and Yard Waste	[ ] Food Processing/Preparation Operations Waste [ ] Hauled Sewage Other: Asbestos waste. Petruscible waste are not accepted for landfilling.
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*	None		

Year Site Opened *(enter the Calendar Year only)*	1960	**Current ECA Issue Date**	April 16, 2009, not incl. notices
Is your Site required to submit Financial Assurance?		◉ **Yes** ○ **No**	
Describe how your WDS is designed.		○ Natural Attenuation only ◉ Fully engineered Facility ○ Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		○ **Yes** ◉ **No**	
If closed, specify ECA, control or authorizing document closure date:		N/A	
Has the nature of the operations at the site changed during this monitoring period?	○ **Yes** ◉ **No**		
If yes, provide details:			

Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)	○ Yes ◉ No

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:	◉ **Yes** ○ **No**	
2) All groundwater, leachate and landfill gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by ECA or other relevant authorizing/ control document(s):	○ **Yes** ◉ **No** ○ **Not Applicable**	If no, list exceptions below or attach information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
MW09-1A, 1B, 1C, and 1D	Those groundwater monitoring locations were not sampled during the winter of 2021 due to historical conditions of frozen water in the monitoring wells. Instead, they were monitored in November 2020. MW09-1A was frozen at the time and no sample was collected at this location.	26-Nov-2020

3) a) Some or all groundwater, leachate and landfill gas sampling and monitoring requirements have been established or defined outside of a ministry ECA, authorizing, or control document, *or Ministry concurrence.*	○ Yes ◉ No ○ Not Applicable	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	○ Yes ○ No ◉ Not Applicable	If no, list exceptions below or attach additional information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

4) **All field work for groundwater investigations was done in accordance with Standard Operating Procedures (SOP) as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):**	○ Yes ◉ No	Golder Associates Ltd. standard practices were followed as described in the report.
Sampling and Monitoring Program Results/WDS Conditions and Assessment:		
5) **The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/ or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.**	◉ Yes ○ No	
6) **The site meets compliance and assessment criteria.**	◉ Yes ○ No	In 2020, no confirmed (continued increase in concentration beyond the background range) trigger exceedance of the background range was reported in any stratigraphic unit monitored.
7) **The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.**	◉ Yes ○ No	Some parameters' exceedance of background conditions will need to be confirmed during the 2021 monitoring sessions.

1) Is one or more of the following risk reduction practices in place at the site: *(a)* There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or *(b)* There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or *(c)* The site meets the following two conditions (typically achieved after 15 years or longer of site operation): *i.* The site has developed stable leachate mound(s) and stable leachate plume geometry/ concentrations; and *ii.* Seasonal and annual water levels and water quality fluctuations are well understood.	◉ Yes ○ No	Note which practice(s):	☒ (a) ☒ (b) ☐ (c)
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	○ Yes ◉ No ○ Not Applicable	In 2020, no confirmed (continued increase in concentration beyond the background range) trigger exceedance of the background range was reported in any stratigraphic unit monitored.	

Groundwater CEP Declaration:

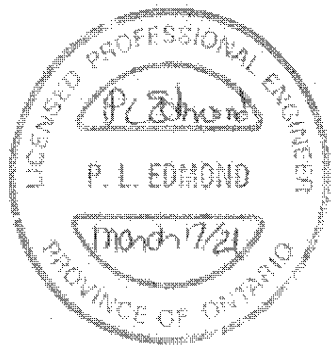
I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

Any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

○ **No changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/ are recommended:**	Due to on-going inability to collect water samples in monitoring wells MW09-1A through D located in Mer Bleue because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or fall). It is also proposed to remove VOCs from the list of parameters of the groundwater monitoring program as well as discontinue sediment monitoring (see rationale in Section 9.0).
◉ **No Changes to site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/are recommended:**	
Name:	Trish Edmond, M.E.Sc., P.Eng.
Seal:	

Signature:	Patricia Edmond	**Date:**	17-Mar-2021
CEP Contact Information:			
Company:	Golder Associates Ltd.		
Address:	1931 Robertson Road, Ottawa, Ontario, K2H 5B7		
Telephone No.:	613-592-9600	Fax No. :	613-592-9601
E-mail Address:	Trish_Edmond@golder.com		
Co-signers for additional expertise provided:			
Signature:		**Date:**	
Signature:		**Date:**	

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):	
me (s)	See Attachment A.

Distance(s)	N/A

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	(•) **Yes** ( ) **No**	
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the ECA or relevant authorizing/control document(s) (if applicable):	(•) **Yes** ( ) **No** ( ) **Not applicable**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry ECA or authorizing/control document, *or Ministry concurrence.*	( ) **Yes** (•) **No** ( ) **Not Applicable**	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:	( ) **Yes** ( ) **No** (•) **Not Applicable**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

All field work for surface water investigations was done in accordance with SOP, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	○ Yes ◉ No	Golder Associates Ltd. standard practices were followed as described in the report.

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) **The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):**	◉ Yes ○ No

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table on t following page or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. ECA limit, PWQO, background	e.g. X% above PWQO
6) **In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?**	(•) **Yes** ( ) **No**	There are no exceedances as there is no surface water-related compliance criteria (see question 7).

7) **All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.**	(•) **Yes** ( ) **No**	The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility. The MECP has agreed that this is the preferred approach for the WCC Navan Facility.
8) **For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g., PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):**	( ) Yes ( ) No ( ) Not Known (•) Not Applicable	
9) **Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):**	( ) **Yes** ( ) **No** (•) **Not Applicable**	

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for th monitoring period.

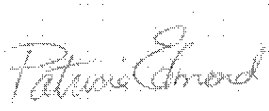
I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories,* or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

○ **No Changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/are recommended:**	It is proposed to discontinue sediment monitoring (see rationale in Section 9.0).
◉ **No changes to the site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/ are recommended:**	

CEP Signature	
Relevant Discipline	P.Eng. with demonstrated relevant experience.
Date:	17-Mar-2021
CEP Contact Information:	Trish Edmond, M.E.Sc., P.Eng.
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Fax No. :	613-592-9601
E-mail Address:	Trish_Edmond@golder.com

Save As | Print Form

Attachment A

In the event that leachate-impacted water was to reach either stormwater management ponds or ditches on the site, the source of the impact would be determined and then intercepted, as required. If necessary, the affected pond and/or ditches could then be emptied through a temporary pumping operation and the pumped water could be combined with the leachate and directed for off-site treatment. Therefore, there are no surface water bodies potentially receiving waste disposal site effluent.

Distribution List

10 copies	Waste Connections of Canada
1 copy	National Capital Commission
1 e-copy	Golder Associates Ltd.

Executive Summary

This report serves as the annual environmental monitoring portion of the 2020 site operations and monitoring report and presents the results of groundwater, surface water, leachate and sediment monitoring activities carried out during 2020 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility). This report has been prepared to fulfill the reporting requirements outlined in Conditions 135 and 136 of Environmental Compliance Approval (ECA) No. A460702.

The following executive summary highlights key points only; for complete information and findings it is necessary for the reader to examine the complete report.

Based on the groundwater levels obtained during the 2020 monitoring program, no significant change in groundwater flow patterns has been observed.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (un-weathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present up-gradient, at the down-gradient edge (used to assess compliance) and further down-gradient of the landfill in each of these units.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2019 background range.

Leachate quality monitoring results for 2020 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Trigger concentrations exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

WCC's efforts were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented.

In 2020, no confirmed (continued increase in concentration beyond the background range) trigger exceedance of the background range was reported in any stratigraphic unit monitored. Some parameters' exceedance of background conditions will need to be confirmed during the 2021 monitoring sessions to determine if the trigger

protocol needs to be implemented and/or the background range of that parameter should be considered to increase.

The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

The proposed 2021 Environmental Monitoring Program is the same as was conducted in 2020, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (see Section 9.0). As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or the fall depending on site conditions) as has been done between 2014 and 2020.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the May 2020 monitoring session and will be monitored again in the fall of 2021.

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1.0 INTRODUCTION

This report serves as the 2020 annual monitoring report and presents the results of monitoring activities carried out during 2020 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility).

The WCC Navan Facility is a 91.87 hectare (ha) waste management facility that includes a 40 ha landfill, as well as processing (recycling). The site is located on parts of Lots 2, 3 and 4, of Concession IV, Ottawa Front in the City of Ottawa (formerly the city of Gloucester), Ontario (see Key Plan, Figure 1). This site has been in operation since 1960 and operates under Environmental Compliance Approval (ECA) No. A460702. In April 2009, WCC received *Environmental Protection Act* approval for the expansion of the WCC Navan Facility.

The monitoring program undertaken in 2020 by Golder Associates Ltd. (Golder) is outlined in Tables 1a through 1c. Monitoring to date at the WCC Navan Facility consists of water quality analysis of surface water, groundwater and leachate. The 2020 monitoring program was a continuation of the monitoring program carried out in 2019 and followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and Condition 10.1 of the Conditions of Environmental Assessment Approval. As per Condition 109 of ECA No. A460702, the monitoring program includes sampling of the monitoring wells located in BH09-1, in order to assess the groundwater quality in the Mer Bleue Bog. The original monitoring program indicated that the wells would be sampled during the winter, when the Mer Bleue Bog is frozen and the wells are accessible. However, the groundwater in the monitoring wells has frequently been frozen during these events. In the 2013 monitoring report (Golder, 2014), it was proposed to sample them during the summer, rather than winter, and this recommendation has carried forward to present (monitoring is now completed either in summer or in the fall, depending on site conditions). Due to dry conditions in the vicinity of the Mer Bleue Bog in the summer of 2020, groundwater samples were instead successfully collected at monitoring well MW09-1B, MW09-C, and MW09-D on November 26, 2020 (no sample was collected from monitoring well MW09-1A in November due to frozen conditions).

In addition, sediment quality monitoring which started in 2000 at the request of the National Capital Commission (NCC) at three locations within the Mer Bleue Bog is also documented in this report. Results of landfill gas, noise and odour monitoring undertaken in 2020 are provided under separate covers in Attachments 2 and 3.

2.0 FIELD PROCEDURES

2.1 Objectives

The objectives of the 2020 water quality monitoring program were:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

2.2 Environmental Monitoring Program

2.2.1 Groundwater Component

The 2020 groundwater monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and satisfies objectives listed above. Water quality monitoring at the WCC Navan Facility was initiated in 1981. Since 1991, semi-annual monitoring programs were undertaken. Observation wells were added in 1992, 1994, 1995, 1998, 2000, 2005, 2007, 2009, 2010 and 2011. Groundwater monitoring sessions were carried out on May 21 and November 26, 2020. The groundwater monitors are outlined in Tables 1a, 1b and 1c and illustrated on the Site Plan (Figure 2). Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected in May 2020. The monitoring wells screened in the intact clay deposit and in the glacial till/upper bedrock zone will be sampled again in the fall of 2021.

The approved groundwater monitoring program was followed, except that as discussed in Section 1.0, groundwater monitoring locations BH09-1A, BH09-1B, BH09-1C and BH09-1D were not sampled during the winter of 2021 due to historical conditions of frozen water in the monitoring wells. Due to dry conditions in the summer, monitoring wells BH09-1B, BH09-1C, and BH09-1D were sampled instead during the fall session on November 26, 2020 (monitoring well BH09-1A was frozen and therefore no sample could be collected at the time).

Detailed logs of the subsurface conditions encountered in each borehole are provided on the Record of Borehole sheets in Appendix A for most of the groundwater monitors included in the 2020 groundwater monitoring program. The top of pipe and ground surface elevations at each groundwater monitor location were surveyed with reference to geodetic datum following completion of the corresponding borehole drilling and groundwater installation program. The top of pipe for each of the monitoring wells included in the groundwater monitoring program were re-surveyed by WCC during November 2011 to account for any movement of the monitors over time.

The groundwater levels in the monitors included in the sampling sessions were measured on May 13, 2020 and November 17, 2020.

All monitors sampled during 2020 were developed through the removal of at least one standing volume of water using dedicated samplers which have been provided in each groundwater monitor. Sampling of groundwater was generally performed one week after monitor development, because the wells recover slowly.

As part of the Quality Assurance/Quality Control (QA/QC) program, a total of six field groundwater samples duplicates were prepared (four in the spring and two in the fall) along with Three field blanks (one in the spring and two in the fall) and two trip blanks (one in the spring and one in the fall).

The temperature, pH and electrical conductivity of the groundwater samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private certified analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol provided below was followed for the groundwater samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, hardness (calcium and magnesium), potassium, sodium, manganese and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
total dissolved solids (TDS), alkalinity, sulphate, nitrate, nitrite, chloride, bicarbonate, and carbonate	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with hydrochloric acid or sodium bisulphate

Notes: * Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.

Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario performed all laboratory chemical and physical analyses on the groundwater samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The reportable detection limits (RDLs) for the specific groundwater analyses were generally commensurate with the standards established in the Ontario Drinking Water Quality Standards, Objectives and Guidelines (referred to as ODWQS, MOE, 2006, revised January 1, 2020).

2.2.2 Leachate Component

The leachate monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702. Leachate quality analysis was undertaken on samples obtained from the pump station (L5) during the May 14, August 27 and November 25 monitoring sessions as outlined in Tables 1a through 1c. The location of the leachate monitor is illustrated on the Site Plan (Figure 2).

As part of the QA/QC program, one field blank and one trip blank for the volatile organic compounds (VOCs) were prepared during the August sampling session.

The temperature, pH, electrical conductivity and dissolved oxygen of the collected leachate samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All leachate samples were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2.

The sample preparation and preservation protocol outlined below was followed for the leachate samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, hardness (calcium and magnesium), potassium, sodium and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, total suspended solids (TSS), and biochemical oxygen demand (BOD)	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)**, dissolved organic carbon (DOC)	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with hydrochloric acid or sodium bisulphate

Notes:
* Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.
** Dissolved inorganic carbon (DIC) calculated based on laboratory dissolved organic carbon (DOC) and total dissolved carbon

Paracel performed all laboratory chemical and physical analyses on the leachate samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific leachate analyses were commensurate with the standards established in the ODWQS (MOE, 2006, revised January 1, 2020).

2.2.3 Surface Water

The 2020 surface water monitoring program followed the program outlined in Condition 109 of ECA No. A460702. The 2020 surface water monitoring program is outlined in Tables 1a through 1c and monitoring stations are illustrated on Figure 2. Surface water samples were obtained on May 14, August 26, and November 25, 2020.

The only deviations from the approved surface water monitoring program were due to dry or stagnant conditions. Surface water monitoring stations S5, S8, S10, and S11 were not sampled in August 2020 and station S5 in November 2020.

The estimation of surface water flow was obtained concurrently with surface water sampling on May 14, August 26 and November 25, 2020.

One field duplicate was prepared during the May and November sampling sessions as part of the QA/QC program.

The temperature, pH, electrical conductivity and dissolved oxygen of the surface water samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The same preparation and preservation protocol below was followed for each of the surface water samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, hardness (calcium and magnesium), potassium, sodium, manganese and zinc	plastic bottle, unfiltered and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, TSS, and BOD	plastic bottle, unfiltered and unpreserved
ammonia*, total phosphorus, dissolved organic carbon (DOC), phenols, COD and TKN	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)	amber glass bottle, unfiltered and unpreserved

Notes: * Unionized ammonia calculated based on laboratory ammonia concentration, field temperature and pH measurements.

Paracel performed all laboratory chemical and physical analyses on the surface water samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific surface water analyses were generally commensurate with the standards established in the Provincial Water Quality Objectives (referred to as PWQO, MOE, 1994, reprinted 1999).

2.3 Sediments

Sediment quality was monitored at three locations within the Mer Bleue Bog. The sampling locations are the same as the surface water sampling stations located within the bog, i.e., SED-W was obtained at SW-W, SED-C at SW-C and SED-E at SW-E (refer to Figure 2). Sediment quality monitoring in the Mer Bleue Bog was added to the monitoring program in 2000 and sediment samples were obtained in 2020 at three locations on May 14 and November 25.

All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol outlined below was followed for the sediment samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium and zinc	glass jar, with a plastic lid

Paracel performed all laboratory chemical and physical analyses on the sediment samples. The Report of Analyses sheets from Paracel are provided in Appendix B.

2.4 Status of Monitoring Well Network

During the spring monitoring session, the condition of each well within the monitoring well network at the site was assessed. A summary of the findings of the 2020 monitoring well network condition survey (properly cased, capped and locked) are provided in Table 3. At the time of the condition survey it was observed that all monitoring wells were in good condition noting that monitoring well MW09-1A requires a new cap.

3.0 WATER LEVEL DATA

3.1 Groundwater Levels

Records of monitoring well water elevations obtained in May and November 2020 are provided in Tables C-1 and C-2, Appendix C and are shown graphically on Figures C1 through C10. Water level changes for 2020 are discussed in the following sub-sections. It should be noted that all monitoring wells were resurveyed in 2011 which resulted in an increase in water elevations at some locations. This reflects the more accurate survey data and does not necessarily reflect changes in the groundwater elevations.

3.1.1 Up-Gradient Control Wells

The results of water levels measured at the up-gradient wells are shown graphically on Figure C1 through Figure C4 in Appendix C. There are no significant changes indicated in groundwater levels measured at these locations. The results indicate the shallow water table to be typically located approximately 1 to 2 metres (m) below ground surface at up-gradient wells OW-92-12 to OW-92-19 and MW05-1A to MW05-1D. There are only small fluctuations in water levels indicated for recent years, except for an unusually elevated groundwater level recorded in November 2017 at monitoring location OW-92-15 which returned to levels similar to historical levels during 2018.

Hydraulic head profiles for monitoring wells OW-92-12 to OW-92-19 for May and November 2020 are shown on Figure 3 illustrating a downward hydraulic gradient. The only variation in the direction of the hydraulic gradient is indicated in the upper 5.6 m to 10.4 m below ground surface in the spring and fall, from a downward gradient to an upward gradient in the weathered clay. This result may be attributed to a perched water table at the interface of the weathered clay and the intact clay. The relatively weak downward gradient from the sand to the weathered clay suggests a hydraulic interconnection between these units. The downward gradient is quite pronounced from the weathered clay down to the lower reaches of the intact clay deposit. It is interpreted that the intact clay deposit at depth beneath the landfill site acts as a barrier to groundwater flow.

3.1.2 Immediate Down-Gradient Wells and Wells in Line with Immediate Down-Gradient Wells

The results of the water levels measured at the large down-gradient nest of observation wells (OW-92-1 to OW-92-8 and MW05-8) are shown graphically on Figure C5 provided in Appendix C. These results indicate the shallow groundwater table lies within the sand deposit close to the original ground surface ranging in elevation from about 68.58 m to 71.46 m. Similar results are indicated at observation wells OW-92-9 to OW-92-11 and MW05-11 as well as OW-94-1 to OW-94-3 and MW05-R3 as shown graphically on Figures C6 and C7, respectively. Seasonal variations of nearly 1 m have previously been indicated. The high water levels generally occur during the wet spring whereas the lower water levels are recorded during the dry summer months and fall. Similar trends were observed in 2020 at most wells, with the higher spring elevations being more pronounced in the spring of 2020.

Hydraulic head profiles for the nest of observation wells OW-92-1 to OW-92-8 are presented on Figure 3. Unlike the up-gradient groundwater level profiles, the down-gradient profiles historically have indicated a slight upward vertical gradient and a localized weak downward gradient observed at times between the upper 6.3 m to 7.6 m within the weathered clay. Similar to 2019, a slight downward gradient is observed from the sand to the weathered clay in 2020. The upper four wells historically have appeared to be hydraulically connected with near vertical or hydrostatic water level profiles. A slight upward gradient from the bedrock to the weathered clay at the down-gradient boundary of the landfill would suggest there is upward vertical flow at this location, which would retard the potential for leachate migration into the deeper groundwater system. In the spring of 2020, there was near vertical or a hydrostatic water level profile between the bedrock and weathered clay.

3.1.3 Mer Bleue/Down-Gradient Control Wells

Water levels obtained at the down-gradient control wells are shown graphically on Figures C8, C9 and C10 in Appendix C. These results indicate artesian conditions at OW-94-4 to OW-94-6, OW-95-5 to OW-95-7 and OW-95-9, while at OW-95-1 to OW-95-3, the shallow groundwater table is close to the ground surface within the upper sand, weathered and intact clay. The water level measured at monitoring well OW-94-4 in November 2019 was lower than recent historical data (by 0.42 m) but returned to more recent levels in 2020. The water levels measured in May of 2020 at monitoring wells OW-95-2 and OW-95-1 were unusual but returned to their more usual values in November 2020.

Hydraulic head profiles for the nest of observation wells OW-95-5 to 95-7 and OW-95-9, as shown on Figure 3, illustrate an upward gradient through most of the profile with a weak downward gradient from the sand to the weathered clay. Historically, there has been an upward gradient through the entire profile. The presence of an upward gradient suggests upward groundwater flow is occurring south of the landfill. These results may also suggest upward leaching of porewater from the Champlain Sea clay, a brackish water deposit, may be occurring at the southern boundary of the landfill. North of the landfill, downward leaching of the clay porewater is indicated.

3.1.4 Horizontal Hydraulic Gradients

The horizontal hydraulic gradient in the shallow sand deposit and weathered clay at this site is consistent with the relief of the property which changes in elevation by approximately 15 m to 18 m between the up-gradient and down-gradient boundaries of the landfill. Since the shallow water table appears to be a reflection of the original surface topography, horizontal hydraulic gradients are expected to vary between 0.007 in the plateau above the escarpment and 0.014 in the valley below. Water levels measured south of the landfill indicate shallow groundwater is flowing in a south to southwest direction with a small hydraulic gradient ranging between 0.005 and 0.025. The horizontal gradients in the bog area are influenced by seasonal fluctuations in the surface water levels. Hydraulic gradients could also be influenced by the leachate collection system (LCS) located along the south toe of the landfill. Keeping the LCS drained could result in a lowering of the water table at the southeast corner of the landfill by more than 3 m below the original grade at the southeast corner of the landfill and by 2 m at the southwest corner. This water table lowering could significantly influence the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient side of the LCS was constructed to alleviate any potential problems related to lowering of the groundwater table south of the landfill.

Water levels measured in the up-gradient and down-gradient deep wells (OW-92-12 and OW-95-9) indicate a typical difference in water levels of about 6 m, which represents a hydraulic gradient of approximately 0.01 (0.008 in spring 2020) across the site within the glacial till/upper bedrock.

Many factors, such as mounding within the waste pile, the installation of the leachate collection system and the construction of waste cells with under drainage will influence the rate of groundwater flow across the site.

3.2 Surface Water Flow Measurements

Estimates of surface water flow measurements for 2020 are summarised below along with the historical minimum and maximum flow rates estimated at each monitoring station.

Monitoring Station	Minimum Flow L/s	Maximum Flow L/s	Expected Dry Weather Flow L/s	Estimated Flow May 14, 2020 L/s	Estimated Flow Aug. 26, 2020 L/s	Estimated Flow Nov. 25, 2020 L/s
S-1	No flow	73	0.5 – 2	1.0	0.9	0.6
S-3	No flow	140	<0.5	0.2	No flow	No flow
S-5	No flow	No flow	No flow	No flow	Dry	Dry
S-8	No flow	5 – 10	0.5 – 2	No flow	Dry	No flow
S-9	No flow	94	2 – 5	2.3	1.5	No flow
S-10 (SW-W) [a]	No flow	No flow	No flow	No flow	Dry	No flow
S-11 (SW-C) [a]	No flow	No flow	No flow	No flow	Dry	No flow
S-12 (SW-E) [a]	No flow	No flow	No flow	No flow	No flow	No flow
S-15	No flow	120	0.3 – 2	1.2	1.4	1.0
S-16	No flow	56	No flow	No flow	No flow	No flow
S-17	No flow	44	0.5 – 2	2.0	0.6	3.0

Notes:
[a] Monitoring stations S-10 (SW-W), S-11 (SW-C) and S-12 (SW-E) are located at the northern edge of the Mer Bleue Bog and consist of stagnant bog water.

Input: ETB
Checked: RPM

4.0 GROUNDWATER QUALITY ASSESSMENT

Groundwater has been monitored at observation wells since 1981. However, since 1985, landfilling operations expanded over the original down-gradient observation wells which have since been replaced with the existing wells. Existing observation wells were installed in 1992, 1994, 1995, 1998, 2005, 2007, 2009, 2010 and 2011.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as follows:

- a shallow surface sand layer at depths ranging from 1.5 to 2.5 m below original grade
- the weathered clay zone of a thick clay deposit at depths ranging from 3.5 to 4.5 m below original grade
- the intact clay deposit at depths ranging from 7 to 8 m below original grade
- glacial till/bedrock contact zone at depths ranging from 22.3 to 37.1 m below original grade

The two upper stratigraphic units, the sand and weathered clay units, were sampled for both the May and November monitoring events. The two lower stratigraphic units, the intact clay and near bedrock units, are sampled every 18 months. Groundwater samples from these units were collected in May 2020 and the next sampling session for

the monitoring wells screened in these units will be in the fall of 2021. The observation wells monitored in 2020 are listed in Tables 1a, 1b and 1c and illustrated on Figure 2.

As previously discussed, Condition 109 of the ECA requires groundwater monitoring locations MW09-1A, MW09-1B, MW09-1C and MW09-1D to be sampled once per year. Due to expected frozen conditions in the winter, MW09-1A, MW09-1B, MW09-1C and MW09-D have been monitored during the summer sessions starting in 2014. Due to dry conditions in the summer of 2020, these monitoring wells were monitored during the fall session instead. As indicated earlier, due to frozen conditions, no sample could be collected from monitoring well MW09-1A in November 2020. Data from these wells is being collected to assess the groundwater quality in the area of the Mer Bleue as part of the expansion of the landfill.

Current and historical analytical results for groundwater in all units are presented in Appendix D.

4.1 Quality Assurance/Quality Control

The 2020 QA/QC protocol included the following: (i) preparation of one laboratory trip blank and two field blanks for the November 2020 monitoring session and one laboratory trip blank and one field blank for the May 2020 monitoring session to be analyzed for VOCs; (ii) the collection and analysis of four blind groundwater sample duplicates for the May 2020 sampling session and (iii) two blind groundwater sample duplicate for the November 2020 sampling session. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the RPD between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All QA/QC results for groundwater were within acceptable tolerance limits during the May 2020 monitoring session, except for the sulphate concentration in the sample collected from MW95-8 (identified as 95-8 in the laboratory report) and its duplicate (identified as Dupe-2 in the laboratory report) and for the phosphorous concentration in the sample collected from MW05-3B (identified as 05-3B in the laboratory report) and its duplicate (identified as Dupe-4 in the laboratory report). A data check was requested for the sample collected at MW95-8 in May 2020 and its duplicate; it was determined that there was a dilution error on the duplicate sulphate concentration and a revised report was issued. Following the revised report, the sulphate concentration does not exceed the acceptable tolerance limits. MW05-3B and its duplicate had phosphorous concentrations consistent with historical results.

Two blind groundwater sample duplicates were analyzed during the November 2020 session. All QA/QC results for groundwater were within acceptable tolerance limits during the November 2020 monitoring session except for the ammonia nitrogen and copper concentrations in the sample collected from MW95-8 (identified as 95-8 in the laboratory report) and its duplicate (identified as Dupe-2 in the laboratory report). The sample collected at MW95-8 and its duplicate were re-analyzed by the laboratory and the results demonstrated that the QC on the original sample concentrations was acceptable. Ammonia nitrogen and copper concentrations are consistent with historical results for both MW95-8 and its duplicate.

It is believed that the discrepancies noted should not affect the interpretation of the groundwater results.

The results of the VOCs analyses of the field blanks and trip blank (identified respectively as Field Blank and Trip Blank in the laboratory report from the May and November 2020 monitoring sessions) were within acceptable tolerance limits with all parameters concentrations below their respective RDL.

4.2 Up-Gradient Control Wells

Monitoring of groundwater quality up-gradient from the site was made possible with the use of observation wells installed in 1992 behind the WCC administration office at 3354 Navan Road (OW-92-12 to OW-92-19). In 1995, two additional wells were installed within the shallow sand deposit to the southeast (OW-95-4) and west (OW-95-8) of the administration office. Four additional wells were installed in the fall of 1998 at the up-gradient corners of the waste footprint (OW-98-1 to 98-4). In August 2011, a borehole was drilled and a new observation well was installed to replace OW-98-2 in the intact clay deposit, as it was filled with sand. Monitoring wells OW-95-4, OW-98-4 and OW-98-3 were decommissioned in 2012 and replaced by existing monitoring wells MW05-1A to D as per item 42 listed in Schedule A of ECA No. A460702. All these wells are referred to as the up-gradient control wells. The up-gradient groundwater quality in each stratigraphic unit was compared to the ODWQS for which aesthetic objectives or maximum or interim maximum acceptable concentrations exist.

4.2.1 Sand Layer

The background groundwater quality within the sand layer was monitored during the 2020 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-19, MW05-1D (replacing OW-95-4), and OW-95-8.

The groundwater quality during 2020 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2020 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2020 Monitoring Session
92-19	Manganese	Manganese and TDS
05-1D	Chloride, TDS and sodium	Chloride and TDS
95-8	Temperature, iron, manganese and TDS	Manganese and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, manganese, iron, sodium and TDS, which exceed the ODWQS.

4.2.2 Weathered Clay Deposit

The background groundwater quality within the weathered clay deposit was monitored during the 2020 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-18, OW-98-1 and MW05-1C (replacing OW-98-4).

The groundwater quality during 2020 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During June 2020 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2020 Monitoring Session
92-18	Chloride and TDS	Chloride and TDS
98-1	Chloride, manganese, sodium and TDS	Chloride, iron, manganese, sodium and TDS
05-1C	Manganese	Iron

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS, which exceed the ODWQS.

4.2.3 Intact Clay Deposit

The background groundwater quality within the intact clay deposit was monitored during the 2020 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-16, MW11-1 (replacing OW-98-2) and MW-05-1B (replacing OW-98-3).

The groundwater quality during 2020 at the intact clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2020 Monitoring Session
92-16	Manganese
05-1B	[None]
11-1	Chloride, sodium and TDS

Input: YJM
Checked: ETB

As apparent from the above table and historical data, the groundwater quality within the intact clay deposit is characterized by concentrations of chloride, manganese, sodium and TDS which exceed the ODWQS.

4.2.4 Glacial Till/Upper Bedrock Zone

The background groundwater quality within the glacial till/upper bedrock was monitored during the 2020 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-12 and MW-05-1A.

The groundwater quality during 2020 at the glacial till/upper bedrock groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2020 Monitoring Session
92-12	Sodium and TDS
05-1A	Sodium and TDS

Input: ETB
Checked: YJM

As apparent from the above table, the groundwater quality within the glacial till/upper bedrock is characterized by concentrations of sodium and TDS which regularly exceed the ODWQS.

4.3 Mer Bleue/Down-Gradient Control Wells

Groundwater further down-gradient from the landfill is monitored with the use of nested observation wells installed in 1994 and 1995 south of the landfill at the northern edge of the Mer Bleue Bog. These observation wells were installed to obtain a better understanding of the hydrogeology of the area and geochemistry of the groundwater south of the landfill. The nested wells are located in line with the eastern limits of the landfill (OW-94-4, OW-94-5 and OW-94-6), east of the landfill centre line (OW-95-5, OW-95-6, OW-95-7 and OW-95-9) and in line with the western limits of the existing landfill (OW-95-1, OW-95-2 and OW-95-3). All these wells are referred to as the down-gradient control wells. The groundwater quality of the down-gradient control wells in each stratigraphic unit was compared to the ODWQS for aesthetic objectives or maximum or interim maximum acceptable concentrations.

4.3.1 Sand Layer

The down-gradient groundwater quality within the sand layer was monitored during the 2020 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-6, OW-95-3, and OW-95-7.

The groundwater quality during 2020 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2020 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2020 Monitoring Session
94-6	Chloride, iron, manganese, sodium, and TDS	Chloride, manganese, and TDS
95-3	Iron, manganese, sodium and TDS	Manganese, sodium and TDS
95-7	Chloride, manganese, sodium and TDS	Chloride, manganese, sodium and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, iron, manganese, sodium and TDS which exceed the ODWQS. Similar ODWQS exceedances for these parameters were also observed in the up-gradient groundwater at similar concentrations.

4.3.2 Weathered Clay Deposit

The down-gradient groundwater quality within the weathered clay deposit was monitored during the 2020 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-5, OW-95-2, and OW-95-6.

The groundwater quality during 2020 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2020 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2020 Monitoring Session
94-5	Chloride, iron, manganese, sodium, and TDS	Chloride, manganese, sodium, and TDS
95-2	Chloride, iron, manganese, sodium, and TDS	Chloride, manganese, sodium, and TDS
95-6	Chloride, manganese, sodium, and TDS	Chloride, manganese, sodium, and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS which exceed the ODWQS, similarly to groundwater quality within the same deposit upgradient of the landfill.

4.3.3 Intact Clay Deposit

The down-gradient groundwater quality within the intact clay deposit was monitored during the 2020 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-4, OW-95-1, and OW-95-5.

The groundwater quality during 2020 at the intact clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2020 Monitoring Session
94-4	Chloride, iron, manganese, sodium, and TDS
95-1	Chloride, manganese, sodium, and TDS
95-5	Chloride, manganese, sodium, and TDS

Input: YJM
Checked: ETB

As apparent from the above table as well as historical data, the groundwater quality within the intact clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS which exceed the ODWQS. Up-gradient groundwater quality is different than down-gradient water quality, even though similar parameters exceed ODWQS at up-gradient observation well MW11-1. The concentrations observed at the down-gradient locations were generally higher than at the up-gradient locations.

4.3.4 Glacial Till/Upper Bedrock Zone

The down-gradient groundwater quality within the glacial till/upper bedrock zone was monitored during the 2020 groundwater monitoring program through the inclusion of down-gradient monitor OW-95-9.

The groundwater quality during 2020 at the glacial till/upper bedrock zone groundwater monitor met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2020 Monitoring Session
95-9	Chloride, iron, manganese, sodium and TDS

Input: YJM
Checked: ETB

As apparent from the above table as well as historical data, the groundwater quality within the glacial till/upper bedrock zone is characterized by concentrations of chloride, sodium, and TDS which regularly exceed the ODWQS. Historically, concentrations of iron and manganese have occasionally exceeded the ODWQS. The concentrations of chloride and sodium in the down-gradient groundwater quality are typically higher than in the up-gradient groundwater quality. The iron and manganese exceedances reported in 2020 at OW-95-9 were unusual with the last reported exceedances for these parameters dating back to 2003.

4.4 Results

Piper trilinear diagrams for groundwater in the sand layer during May and November 2020 are shown on Figures 4 and 5, respectively. The diagrams indicate that shallow groundwater at the immediately down-gradient locations is somewhat variable and has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the sand within the Mer Bleue Bog. Similar to past observations, the distribution of up-gradient groundwater quality on the Piper diagrams is reflecting elevated but stable chloride and hardness (calcium and magnesium) concentrations at MW05-1D since 2012.

Figures 6 and 7 indicate that groundwater in the weathered clay at the immediately down-gradient site OW-92-10 has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the weathered clay within the Mer Bleue Bog. Groundwater at other compliance sites is more like groundwater in the weathered clay within the Mer Bleue Bog. These diagrams also indicate that groundwater in the weathered clay deposit up-gradient of the landfill is different from groundwater in the bog. There are no significant changes from the previous year.

Figures 8 and 9 indicate that groundwater in the intact clay and glacial till/upper bedrock zone downgradient of the site has a geochemical fingerprint similar to groundwater quality in the intact clay and glacial till/upper bedrock zone in the Mer Bleue Bog.

A Phase II Environmental Site Assessment was conducted at the landfill by Intera (Intera, 2003). This assessment concluded that groundwater within the sand layer, the upper weathered clay and perhaps the deeper intact clay deposit on down-gradient lands has slightly elevated concentrations of parameters previously thought to be indicative of landfill leachate (e.g., boron, ammonia, TKN). However, there is no obvious spatial correlation of these parameters with proximity to the landfill or groundwater migration pathway. The lack of spatial correlation suggests that groundwater on down-gradient lands is representative of naturally elevated background groundwater quality associated with the Mer Bleue environment.

In addition, the groundwater and surface water trigger mechanism report prepared by Golder (Golder, 2007b) demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are not potential impacts from landfill activities. Naturally elevated parameters measured included boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

5.0 LEACHATE CHARACTERISTICS

Prior to the construction of the leachate collection system (LCS) in 1991-1992, leachate was sampled and analysed in areas where surface breakout was observed. Breakout of leachate, when encountered, usually occurred at the down-gradient toe of the landfill.

The monitoring program for leachate quality has focused on the LCS. For the purpose of the annual monitoring report, leachate generated by the landfill is monitored at the down-gradient end of the south toe collector at L5 at the same time surface water is monitored. A more extensive leachate monitoring program is carried out throughout the year in accordance with a City of Ottawa Leachate Discharge Agreement for the discharge of treated leachate at the Robert O. Pickard Environmental Centre (ROPEC), the municipal wastewater treatment plant.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation. The landfill is underlain by a thick natural clay deposit which has a hydraulic conductivity, K, of less than 10^{-9} metres per second and as such performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater, but rather it is predominantly precipitation that has infiltrated through the waste pile. It should be noted that leachate at the site could also consist of porewater from the underlying clay as a result of upward gradients and/or consolidation, noting that porewater release to the leachate collection system is slowed by the low hydraulic conductivity of the clay.

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is

wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. The intrinsic biodegradability of municipal landfill leachate can be measured by a BOD:COD ratio. During the first several years of production, the BOD:COD ratio generally is in the 0.5 range. As the landfill ages, the ratio decreases to levels less than 0.1 suggesting a more or less biologically recalcitrant organic composition (Andreottola et al., 1989). Also, the concentration of ammonia tends to increase with landfill age since ammonia is a by-product of the stabilisation of organic matter (Elefiniotis et al., 1989), although at a dry waste facility such as the WCC Navan Facility, ammonia concentrations can be expected to remain relatively low.

Typical parameter concentrations in leachate are provided in the tables below. Average concentrations indicate that the WCC Navan Facility leachate is distinctly different from most other landfill sites in Ontario, including the City of Ottawa Trail Waste Facility, with most analytes measured in the WCC Navan Facility leachate having much lower concentrations. The concentration of various parameters listed below suggests a comparatively low strength leachate is generated at the WCC Navan Facility. The concentration of the traditional indicators of environmental quality (conventional pollutants) such as BOD_5, suspended solids, ammonia and metals such as iron and zinc are relatively low. The WCC Navan Facility leachate has much lower concentrations because it is not generated from municipal waste.

Parameter	WCC Navan Waste Recycling and Disposal Facility L5 *			Trail Road & Nepean Landfills [1]			Ontario Landfills [2]		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
Boron	0.37	29.3	15.3	3.92	6.22	5.348	0.8	52	10.4
Ammonia	0.01	112	44.5	----	----	----	7.6	1,820	175
BOD_5	1.6	662	102.5	111	1,790	652	1	66,000	4,975
Conductivity	669	5,640	3,861	----	----	----	475	26,100	6,088
TDS	1,690	10,300	2,856	----	----	----	196	9,030	4,327
Sodium	53.9	850	536.6	----	----	----	13.8	16,000	936
Manganese	0.066	13.2	1.28	0.0879	1.62	0.627	0.03	793	3.54
COD	69.2	1,240	443	380	4,700	1,493	1	47,300	7,855
Iron	0.003	32.7	7.9	0.798	58.3	13.26	0.01	1,300	58
Copper	<0.0005	0.254	0.012	0.0165	0.374	0.1567	0.007	7	0.045
TSS	<2	1,190	108	2	12,400	92.1	3	8,130	445
Chloride	76.5	1,000	477.5	1,000	1,640	1,308	0.4	12,000	270
Lead	<0.00002	0.1	0.008	<0.05	0.276	----	0.001	2.1	0.070
Zinc	<0.005	4.54[3]	0.11	0.0366	2.21	0.62	----	16	1.42

Notes:
All concentrations are in mg/L except conductivity (µS/cm)

Updated by: ETB
Checked by: RPM

* Calculated using all historical data collected for the Annual Monitoring Report since 1992 for L5.

< Denotes concentration is lower than the Reportable Detection Limit (RDL).

[1] City of Ottawa Trail Road Annual Operating and Monitoring Report – 2000.

[2] Howard and Livingston, "Contaminant Source Audits and Groundwater Quality", Environmental Geology of Urban Areas, 104-116, Ed. by N. Eyles, Geological Association of Canada, 1997.

[3] The concentration of zinc reported in August 2020 is considered anomalous but has been used in the calculation of the average zinc concentration in the leachate monitor.

Water impacted by leachate will typically have high concentrations of dissolved constituents with chemical concentrations ten to several hundred times higher than those measured at reference monitoring locations. Chemical concentrations have a high temporal variability due to variations in the composition, age and moisture of the waste and meteorological conditions.

Leachate monitored in 2020 to assist with assessment of surface water and groundwater quality was sampled on May 14, August 27 and November 25, 2020. Results of the chemical analysis undertaken by Paracel and the field measured parameters are provided along with historical data in Appendix E. The results indicate that leachate generated at the WCC Navan Facility continues to be a relatively weak wastewater when compared to municipal landfill leachate.

One field blank and one laboratory trip blank were analyzed during the August 2020 monitoring session. The results of the VOCs analyses for these two samples were within acceptable tolerance limits with all parameters concentrations below the RDL.

Leachate quality monitoring results for 2020 indicate that the leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Concentrations of ammonia, boron, chloride, potassium, and TKN show a generally increasing trend over time although chloride and boron concentrations have been relatively stable in recent years. The concentrations of DIC, manganese, show a general decreasing trend over time. Previously reported decreasing trend in hardness appears to be stabilizing. The concentrations of certain parameters remain above the surface water and groundwater quality near the site.

6.0 GROUNDWATER COMPLIANCE ASSESSMENT

6.1 Compliance Mechanism

The objectives of groundwater trigger mechanisms at the WCC Navan Facility are to utilize the results of the ongoing groundwater monitoring program to assess site compliance and to trigger implementation of the contingency plans, when and if necessary. The purpose of the trigger mechanisms is to prevent leachate-impacted groundwater exceeding a certain negative threshold level from occurring. The trigger mechanism was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the Navan Facility.

Traditional methods of site compliance provide very limited useful and/or reliable parameters for assessment of the WCC Navan Facility; therefore, an alternate method must be used. The difference in hydrogeology across the site coupled with the very saline environment of the clay deposit that underlies the Mer Bleue clay have resulted in the MECP accepting that Guideline B-7 (RUPO) is not applicable at this site. The MECP's position in this regard was documented in a November 2000 memorandum issued by the MECP (MOE, 2000). Therefore, the Leachate Indicator Parameter list and the method to determine if leachate from the site is impacting local groundwater was developed in the Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The Leachate Indicator Parameter list includes alkalinity, ammonia, boron, chloride, hardness, magnesium, manganese and potassium.

After the completion of a monitoring session, the concentration of each Leachate Indicator Parameter for all groundwater locations used to assess compliance should be visually checked. If a parameter concentration appears to be elevated, a comparison to the background concentration range should be completed. The potential for an increase in concentration of a Leachate Indicator Parameter will be investigated by comparing the concentrations for each parameter to the background range for its corresponding stratigraphic unit. The background range will be

derived from the maximum and minimum data obtained at the locations used to assess compliance from 1998 to present in each stratigraphic unit. In addition, data from monitoring wells MW05-3A to D located to the east of the site and not impacted by landfill leachate will be used to define the background range. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each location used to assess compliance are presented in time-concentration graphs in Appendix F. The background ranges will be updated annually using the most recent data if it is not deemed impacted by landfill leachate. An exceedance of the background range is considered an exceedance of the trigger mechanism and the implementation of the trigger format outlined in the trigger mechanism report should proceed.

No comments from the MECP have been received on the groundwater aspects of the 2019 annual monitoring report at the time this report was completed.

6.2 Immediately Down-Gradient Wells Used to Assess Compliance

At the down-gradient limit of the landfill, groundwater quality was monitored at three nests of observation wells installed in 1992 and 1994. These wells are located at the southeast corner of the landfill (OW-92-9, OW-92-10 and OW-92-11), east of the landfill centre line at grid line 9 (OW-92-1 to OW-92-8) and at the southwest corner of the landfill (OW-94-1, OW-94-2 and OW-94-3). Two additional wells, MW-C and MW-E, were installed within the upper sand unit and shallow clay in 2000 at the northern boundary of the NCC property (now WCC property) located south of the VIA ROW. These observation wells are referred to as wells used to assess compliance.

MW07-1 is located in line with the wells used to assess compliance, to the southeast of the landfill in an area that has historically not been impacted by landfill leachate. These wells were installed in 2007 and their purpose is to monitor the future performance of the landfill expansion. With the commencement of landfilling operations in the expansion area east of the historical landfill footprint in 2016, these wells will be used along with the wells used in past reports to assess compliance along the southern property line.

New trigger concentrations were proposed in the 2019 monitoring report (Golder, 2020). These trigger concentrations are implemented herein.

In 2005, three sand layer wells used to assess compliance were installed to evaluate some unusual results at OW-94-3, OW-92-8 and OW-92-11. The monitoring wells are called MW05-R3, MW05-8 and MW05-11 and have replaced OW-94-3, OW-92-8 and OW-92-11 for groundwater quality results, respectively, as of November 2006.

6.2.1 Sand Layer

The down-gradient compliance site groundwater quality within the sand layer was monitored during the 2020 groundwater monitoring program through the inclusion of monitors MW05-R3, MW05-8, MW05-11, MW-C, MW-E and MW07-1D.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the sand layer are presented in time-concentration graphs in Appendix F-A.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	May 2020 Monitoring Session	November 2020 Monitoring Session
MW-C	None	None
MW-E	None	None
05-R3	None	None
05-8	Manganese	Alkalinity, boron, and manganese
05-11	None	None
07-1D	None	None

Input: ETB
Checked: RPM

6.2.2 Weathered Clay Deposit

The down-gradient compliance site groundwater quality within the weathered clay deposit was monitored during the 2020 groundwater monitoring program through the inclusion of monitors OW-92-7, OW-92-10, OW-94-2 and MW07-1C.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the weathered clay deposit are presented in time-concentration graphs in Appendix F-B.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	May 2020 Monitoring Session	November 2020 Monitoring Session
92-7	None	None
92-10	Hardness and manganese	None
94-2	None	None
07-1C	None	None

Input: ETB
Checked: RPM

6.2.3 Intact Clay Deposit

The down-gradient compliance site groundwater quality within the intact clay deposit was monitored during the 2020 groundwater monitoring program through the inclusion of monitors OW-94-1, OW-92-5, OW-92-9 and MW07-1B.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the intact clay deposit are presented in time-concentration graphs in Appendix F-C.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations May 2020 Monitoring Session
94-1	Manganese
92-5	None
92-9	None
07-1B	Ammonia, chloride, hardness, magnesium

Input: ETB
Checked: RPM

The manganese concentration reported at OW-94-1 in May 2020 was unusually elevated. Additional monitoring data is required to confirm this isolated increase.

6.2.4 Glacial Till/Upper Bedrock Zone

The down-gradient compliance site groundwater quality within the glacial till/upper bedrock zone was monitored during the 2020 groundwater monitoring program through the inclusion of monitors OW-92-1 and MW-07-1A.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the glacial till/upper bedrock zone are presented in time-concentration graphs in Appendix F-D.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations May 2020 Monitoring Session
92-1	Hardness, manganese
07-1A	Hardness, magnesium

Input: ETB
Checked: RPM

The manganese concentration reported at OW-92-1 in May 2020 was unusually elevated but not as high as has been observed historically. Additional monitoring data is required to confirm this isolated increase.

6.3 Results

The Leachate Indicator Parameters at all groundwater monitoring locations used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2019 background range.

As proposed in the 2019 Annual Monitoring Report (Golder, 2020), the maximum background concentrations for ammonia and chloride in the sand stratigraphic unit were increased to 2.22 mg/L and 322 mg/L, respectively.

After the reported 2018 increases in several parameter concentrations above the background ranges observed in the sand stratigraphic unit, the increasing trend for manganese at MW05-8 has stabilized in 2020 with concentrations reported lower than in 2019, although still above the trigger concentration.

Manganese concentrations at this location have been variable in the past but overall there is a general increasing trend. The maximum historical manganese concentration observed in the groundwater at MW05-8 is slightly

higher than the maximum concentration of manganese reported for leachate from L5 (13.2 mg/L). As such, it is possible that the overall increasing trend of manganese concentrations is not caused entirely by landfill leachate.

Exceedances of trigger concentrations for boron and alkalinity in November 2020 at MW05-8 do not appear to be a part of an overall increasing trend in these parameter concentrations.

Previously reported increasing concentrations at MW05-11 for ammonia, continued to decrease in 2020.

An increasing trend in potassium concentration at monitoring well MW05-3D (background) since June 2015 is no longer observed and the concentrations decreased in 2020 below the corresponding trigger concentration.

Therefore, there were no continued increases throughout 2020 above the background ranges observed in the sand stratigraphic unit in 2020 at trigger locations.

It is proposed to increase the maximum background concentration for potassium in the sand stratigraphic unit to 18.3 mg/L, the historical maximum reached at monitoring well 05-3D in 2019, since groundwater quality at this well is interpreted to be not impacted by landfill leachate and the well is located cross-gradient from the landfill.

There were no continued increases above the background ranges observed in the weathered clay stratigraphic unit in 2020 at trigger locations, although concentrations of hardness and manganese at OW-92-10 exceeded their corresponding background concentrations in May 2020 (538 mg/L for hardness and 1.34 mg/L for manganese, respectively). In both cases, they decreased slightly in the fall 2020. While other leachate indicator parameters at this location were reported to be well within the background range, an increasing trend since 2012 in concentrations of alkalinity and ammonia has been observed. The concentrations of alkalinity, ammonia and chloride in the groundwater from the weathered clay are lower than the concentrations observed in the groundwater from the underlying intact clay. The historic upward gradients between the intact clay and weathered clay and potential release of porewater within the intact clay may, at least in part, be the source of the increased concentrations overtime observed in the weathered clay.

Groundwater quality in the intact clay and glacial till/upper bedrock unit was monitored during the spring 2020 monitoring session. Monitoring of these stratigraphic units occurs every 18 months with the next scheduled session in fall 2021.

Concentrations of Leachate Indicator Parameters in groundwater samples collected in 2020 from compliance monitors screened in the intact clay unit were all below the respective trigger concentrations, except for concentrations of ammonia, chloride, hardness, and magnesium at MW07-1B, as well as concentrations of manganese at OW-94-1 reported in May 2020, which exceeded their corresponding maximum background concentration. The exceedances for ammonia and chloride at MW07-1B and manganese were preceded by concentrations reported below the maximum background level. These exceedances will therefore need to be verified during in the fall 2021 monitoring session. If future results do not reflect an upward trend and the data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in the MW07-1B monitoring well is still considered unimpacted by landfill leachate. The concentrations of hardness and magnesium at MW07-1B are following exceedances reported at this location in the fall of 2018, although both concentrations decreased in spring 2020 comparatively.

Concentrations of Leachate Indicator Parameters in groundwater samples collected from compliance monitors screened in the glacial till/upper bedrock unit in 2020 were all below the respective trigger concentrations, except for the concentrations of hardness and magnesium from monitoring well MW07-1A reported in May 2020 and the concentrations of hardness and manganese from monitoring well OW-92-1 which were above the trigger

concentrations . Both concentrations reported at MW07-1A follow exceedances reported in the spring of 2017 and the fall of 2018 with a slight decrease in both concentrations in the spring of 2020. If future results do not reflect an upward trend and the data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in this monitoring well is still considered unimpacted by landfill leachate. The hardness exceedance reported at OW-92-1 follow a previous exceedance reported in the fall of 2018 and continued showing an increasing trend from the spring of 2017. Particular attention should be paid to this parameter in the fall of 2021 as a continued increasing trend and a third consecutive exceedance would require implementing the trigger protocol. The manganese exceedance reported at OW-92-1 was preceded by concentrations reported below the maximum background level. These exceedances will need to be confirmed during the fall 2021 monitoring session.

It is proposed to increase the maximum background concentration for manganese in the glacial till/upper bedrock zone from 0.020 mg/L to 0.025 mg/L, the historical maximum reached at monitoring well 05-3A in 2017, since groundwater quality at this well is interpreted to be not impacted by landfill leachate and the well is located cross-gradient from the landfill.

6.3.1 Confirmed Exceedances and Proposed Course of Action

As mentioned above, there is no confirmed exceedance (continued increase above the background range) of the trigger concentrations for any of the stratigraphic units for the 2020 monitoring session.

Following the confirmed exceedances reported in the 2018 annual monitoring report (Golder, 2019), in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. Trigger results of the spring and fall monitoring sessions were reported by Golder, on behalf of WCC, to the MECP Ottawa District Office via email on August 8, 2019 and December 24, 2019, respectively. In accordance with the proposed course of action presented to the MECP in the 2018 annual monitoring report and communications in 2019, WCC acquired a spare leachate pump to reduce down time when a pump requires servicing and WCC intends to proactively maintain the forcemain in good working condition in a continuing effort to achieve a drained state in the leachate collection system.

Leachate pumping and disposal operating issues reported in the fall 2018 had an impact to groundwater quality in the sand and weathered clay units in monitoring wells located immediately downgradient of the leachate collection system (less than 10 m south of the leachate collection system and close to the south toe collector).

Concentrations of some Leachate Indicator Parameters in the sand unit spiked in November 2018, but the efforts from WCC in 2019 were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented. Since the hydraulic conductivity of the sand is greater than the weathered clay, elevated concentrations have been taking longer to dissipate in the weathered clay unit.

Golder contacted the MECP Ottawa District Office via email on July 9, 2020 to update them on the trigger exceedances and notify them that no trigger exceedance reported in the spring of 2020 was following two previous exceedances showing an increasing trend and that there was no need to implement a contingency plan at this time. A copy of this correspondence is provided in Appendix H.

It is WCC's intention to continue implementing in 2021 the proposed voluntary action plan to control potential increases in concentrations.

7.0 SURFACE WATER QUALITY ASSESSMENT

7.1 Quality Control/Quality Assurance

One blind sample duplicate was analyzed per surface water monitoring session in 2020 as part of the QA/QC protocol. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the RPD between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All duplicate results for surface water were within acceptable tolerance limits in 2020 and the surface water analytical results are considered acceptable.

7.2 Surface Water Quality Monitoring

A total of eleven surface water stations continue to be monitored on an on-going basis at this site. The monitoring stations have been located to obtain representative information on water quality up-gradient from the landfill at stations S1, S3, S15, S16 and S17 (background), on water quality at compliance sites down-gradient from the landfill at stations S5, S8 and S9 and on water quality in the Mer Bleue Bog at S10 (SW-W), S11 (SW-C) and S12 (SW-E). Monitoring locations SW-W, SW-C and SW-E are location references used by the NCC.

Stations S1 and S17 are located northeast and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Stations S3, S15 and S16 are located to the west/northwest and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Station S1 is located at the northeast corner of the landfill below a culvert that discharges into a south flowing east perimeter ditch. Station S3 is located at the northwest corner within the site buffer, down-gradient from where a north diversion ditch flows into a west drainage channel. Station S15 is located to the west of the landfill where the north ditch flows into a southward flowing west perimeter ditch. Station S16 is located northwest of the site in a ditch along the south side of Navan Road and up-gradient from station S15. Station S17 is located in an east ditch along the south side of Navan Road and up-gradient from station S1. These stations are considered to be representative of up-gradient background surface water quality.

Stations S5, S8 and S9 are located down-gradient from the landfill. Station S5 is located at a culvert beneath the VIA Rail right-of-way (ROW) just east of the landfill centre line near grid line 10 and is dry throughout most of the year. Station S8 is located in a wide and shallow westward flowing channel having a swamp environment and is down-gradient from the southwest corner of the landfill and north of the VIA ROW, immediately west from where the west drainage channel discharges into the ditch. Station S9 is located near a large concrete box culvert beneath the VIA ROW and down-gradient from the southeast corner of the landfill. Since the fall of 2013, water has been backing up upstream of surface water station S9 as a result of blockage in the box culvert by aggressive beaver activity. Steps were taken by WCC in spring 2017 to reduce the beaver activity in the area and no blockage was observed during the fall monitoring session. No specific beaver activity was noted in 2020.

Surface water sampling stations S10, S11 and S12, also referred to by the NCC in other reports as SW-W, SW-C and SW-E, respectively, are located south of the landfill at the northern edge of the Mer Bleue Bog and consist of stagnant bog water. Stations S10, S11 and S12 were added in 1995 to obtain data considered to be representative of water quality in the receiving water at the perimeter of the bog.

For the purpose of surface water quality assessment, the background surface water quality is assumed to be represented by the data available from stations located in close proximity to the landfill and up-gradient of surface water flow. For the 2020 monitoring program, the PWQO is being applied for the purpose of water quality assessment at the surface water sampling stations.

Surface water monitoring for 2020 was carried out on May 14, August 26, and November 25 at up-gradient control sites S1, S3, S15, S16 and S17, sites S5, S8 and S9 and the down-gradient control sites S10, S11 and S12. Analytical test reports submitted by Paracel for water samples obtained in 2020 are provided in Appendix B. Historical data are also provided in Appendix G.

Station S5, S8, , S10, and S11 were found to be dry during the summer monitoring session in 2020. Station S5 was also dry in the fall monitoring sessions. Therefore, samples could not be collected at these stations at those times.

Water quality data was compared to historical data obtained at each station and trends in the concentration of key indicator parameters were examined.

The PWQO criteria for chromium changed in 1999 from chromium to chromium III and chromium VI. The laboratory reports total chromium and the exceedances noted in the tables in the following sections are values of total chromium that are greater than the PWQO for chromium III, i.e. 8.9 µg/L (there is no PWQO for total chromium). Should current data show an increasing trend, attempts will be made to separate the analysis into chromium III and chromium VI.

7.2.1 Up-Gradient Control Stations

The up-gradient surface water quality was monitored during the 2020 monitoring program through the inclusion of up-gradient stations S1, S3, S15, S16 and S17.

The surface water quality during 2020 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Station	Parameter(s) Exceeding or Outside PWQO		
	May 2020 Monitoring Session	August 2020 Monitoring Session	November 2020 Monitoring Session
S1	Cobalt and iron	Boron, iron and phenols	Iron
S3	Dissolved oxygen and iron	Iron and phenols	Iron and total phosphorous
S15	Iron	Iron and phenols	Iron
S16	Cobalt, dissolved oxygen, iron, total phosphorous, and phenols	Cobalt, copper, dissolved oxygen, iron, phenols, and total phosphorous	Cobalt, dissolved oxygen, iron, total phosphorous
S17	Iron	Cobalt, , iron, phenols and total phosphorous	Iron, total phosphorous

Input: ETB
Checked: RPM

As apparent from the above table, the up-gradient surface water quality is characterized by concentrations of the following parameters which exceed or are outside the PWQO: cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorus. Occasional PWQO exceedances of cadmium, chromium, boron, and zinc have been observed in the past as well.

Surface water quality is generally consistent over time (with seasonal variability). An increasing trend in concentrations of alkalinity, chloride, and conductivity, can be observed at surface water station S1 over time. Previously observed overall increasing trends for concentrations of DIC, sodium, TDS, and hardness at surface water station S1, concentrations of alkalinity, ammonia, DIC and iron at surface water station S3, and concentrations of manganese, sodium and TDS at surface water station S15 appear to have stabilized, with seasonal variability remaining. Similarly, the previously observed decreasing trend in dissolved oxygen concentrations at surface water stations S3 appears to have stabilized with seasonal variability remaining. Previously observed increasing trend in iron concentrations at surface water station S15 has stabilized during the 2020 monitoring session.

The current or historical increases in concentrations of parameters at these locations is not related to leachate impact as these stations are up-gradient of the site.

7.2.2 Down-Gradient Control Stations

The down-gradient surface water quality was monitored during the 2020 monitoring program through the inclusion of down-gradient stations S10, S11 and S12.

The surface water quality during 2020 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Monitor	Parameter(s) Exceeding or Outside PWQO		
	May 2020 Monitoring Session	August 2020 Monitoring Session	November 2020 Monitoring Session
S10	Dissolved oxygen, iron, and total phosphorous	[No sample collected due to dry conditions]	Dissolved oxygen, iron, phenols and total phosphorus
S11	Dissolved oxygen, iron and total phosphorus	[No sample collected due to dry conditions]	Cobalt, dissolved oxygen, iron, phenols, and total phosphorus
S12	Dissolved oxygen, iron, total phosphorus, and phenols	Dissolved oxygen, cadmium, chromium, cobalt, copper, iron, phenols, total phosphorous, and zinc	Dissolved oxygen, cadmium, chromium, cobalt, copper, iron, phenols, total phosphorus, and zinc

Input: ETB
Checked: RPM

As apparent from the above table, the down-gradient surface water quality is characterized by dissolved oxygen, iron, and total phosphorus concentrations which exceed or are outside the PWQO. Occasional PWQO exceedances of boron, cadmium, cobalt, copper, chromium, phenols and zinc have been observed.

The concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the May, August and November 2020 monitoring sessions were generally similar to or lower than the surface water quality at the up-gradient station S16 during the same session.

Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed.

7.3 Surface Water Compliance Assessment

As previously mentioned, surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. It becomes increasingly difficult to assess surface water site compliance with scattered data. The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater-based trigger mechanism is the appropriate approach for the WCC Navan Facility. Surface water quality monitoring will continue at the site, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the WCC Navan Facility.

8.0 SEDIMENTS

Sediment samples SED-W, SED-C and SED-E were obtained at the surface water sampling stations SW-10, SW-11 and SW-12, respectively, on May 14 and November 25, 2020. Laboratory reports are presented in Appendix B and the results are summarized in Table 4 and Table 5. Included for comparison in Table 4 and Table 5 are the MECP Table 1 sediment criteria and Table 2 and Table 4 Recreation/Parkland soil criteria (MOE, 2011) and the CCME freshwater sediment and Recreation/Parkland soil criteria (CCME, 1999). The table below summarizes the parameters which exceeded sediment criteria.

Sediment Monitor	Parameter(s) Exceeding MECP Table 1 Sediment		Parameter(s) Exceeding CCME Freshwater Sediment	
	May 2020 Monitoring Session	November 2020 Monitoring Session	May 2020 Monitoring Session	November 2020 Monitoring Session
SED-E	[None]	Chromium, copper, nickel	[None]	[None]
SED-C	[None]	Chromium	[None]	[None]
SED-W	Chromium, copper, nickel	Copper	[None]	[None]

Input: ETB
Checked: RPM

Analytical results on the sediment samples indicate that no parameters exceed the CCME Guidelines for freshwater sediment. Copper, chromium and nickel concentrations exceed the MECP Table 1 sediment criteria. The analytical results observed at the sampling locations are consistent with historical results observed at the respective locations.

The following table summarizes the parameters which exceeded the soil criteria in 2020.

Sediment Monitor	Parameter(s) Exceeding MECP Table 2/Table 4 Soil		Parameter(s) Exceeding CCME Soil	
	May 2020 Monitoring Session	November 2020 Monitoring Session	May 2020 Monitoring Session	November 2020 Monitoring Session
SED-E	[None]	Boron	[None]	Selenium
SED-C	Boron	Boron	[None]	[None]
SED-W	Boron	Boron	[None]	Selenium

Input: ETB
Checked: RPM

Analytical results on the sediment samples indicate that boron exceeds MECP Table 2 and Table 4 soil criteria during the spring and fall monitoring sessions at each sampling location, except at sediment monitoring location SED-E in the spring 2020 monitoring session. Selenium exceeded the CCME soil criteria during the fall monitoring session at SED-W. In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Natural wetland systems have been used to treat a variety of wastewater including agricultural and surface mine runoff, irrigation return flows, leachate, urban storm water discharge and other sources of water pollution (U.S. Environmental Protection Agency, 1987). Today, increasing attention is being given to artificial wetlands for the treatment of wastewater. Approximately 90% of Canada's 127 million hectares of wetlands are classified as peatlands where peaty soils are predominant (NAWCC, 1994). The value of peat as an agent for pollution prevention and control has been recognized during the last three decades. Peat's value is directly related to its unique physical and chemical properties. Compared to other mineral soils, peat has a very high organic content (60% carbon), with lignin and cellulose as its main constituents. Peat has a large specific area and is highly porous, properties similar to natural zeolites and activated carbon, which makes it a good adsorbent material (McLellan and Rock, 1988). These contain some functional organic groups such as carboxyl and amino groups that form complexes with metal ions (Dissanayake and Weerasooriya, 1981). Peat is also reported to exhibit ion exchange capacities (Sharma and Froster, 1993). The combination of the above mentioned properties, i.e., being a good adsorbent, forming complexes with metals and having ion exchange capacity makes peat an excellent metal trapping media. Peat is proven to be effective in removal of lead, cadmium, zinc and chromium from raw wastewater (Zhipie et al., 1984), removal of hexavalent chromium from wastewater, removal of copper, iron, manganese, zinc, lead and potassium from industrial wastewater (Cameron, 1978). Sphagnum peat, such as the peat found in eastern Ontario, is reported to be the most suitable peat to use for wastewater treatment systems, in terms of decay resistance (Warith, 1996).

The peat deposit in the Mer Bleue Bog predates any human activity in this area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink. Water levels in the Mer Bleue Bog fluctuate naturally from time to time and have been aggressively drained (in the early 1930's) to promote agricultural exploitation of the bog. Drainage of the Mer Bleue Bog is now under the management of the NCC. In more recent years, water levels have been allowed to rise and agricultural use of the bog has been significantly reduced. From time to time, given the right water levels and environment,

the release of constituents absorbed by the peat can be expected. Therefore, it would appear that metals in excess of sediment criteria are the result of natural peat processes and not impacts from the landfill.

In 2002/2003, an assessment of the WCC site operations was undertaken in support of a WCC-NCC exchange of land parcels located south of the Navan landfill along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

9.0 PROPOSED 2021 MONITORING PROGRAM

The proposed 2021 Environmental Monitoring Program is the same as was conducted in 2020, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (these proposed changes were also listed in the 2019 Annual Monitoring Report).

In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in downgradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations of one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in downgradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As explained in Section 7.3, the MECP agreed that an excursion of landfill leachate would be apparent in the underlying stratigraphic units prior to a surface water impact and a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. Therefore, it is proposed to discontinue sediment monitoring and rely on the groundwater and surface water monitoring programs to assess off-site leachate impacts. With MECP concurrence, sediment monitoring could resume temporarily if leachate impacts and trigger exceedances are reported at the site.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during May 2020 monitoring session and will be monitored again in the fall of 2021.

The objectives of the 2021 environmental monitoring program are:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

10.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Waste Connections of Canada. The report, which specifically includes all tables and figures, is based on data and information collected by Golder and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder as described in this report.

Golder has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Groundwater, leachate and/or surface water quality conditions may vary from these sampled locations.

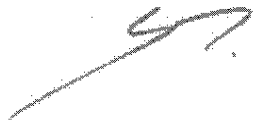
The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

11.0 CLOSURE

We trust this report meets your current needs. If you have any questions regarding this report, please contact the undersigned.

Golder Associates Ltd.



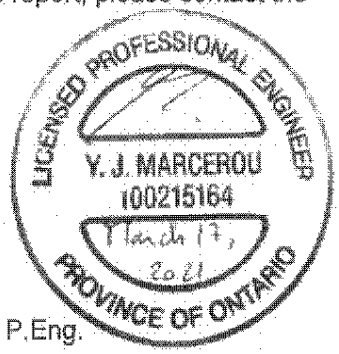


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Table 1a: Summary of Water Sampling Stations for May 2020

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5 S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-4/05-1D 95-8	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2 05-3C 07-1C	94-5 95-2 95-6
Intact Clay Deposit	92-16 98-3/05-1B 98-2/11-1	92-5 92-9 94-1 05-3B 07-1B	94-4 95-1 95-5
Glacial Till/Upper Bedrock	92-12 05-1A	92-1 05-3A 07-1A	95-9
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Table 1b: Summary of Water Sampling Stations for August 2020

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5* S8* S9	S10 (SW-W)* S11 (SW-C)* S12 (SW-E)
Sand Layer			09-1D*
Weathered Clay Deposit			09-1C*
Intact Clay Deposit			09-1B*
Glacial Till/Upper Bedrock			09-1A*
Leachate	L-5		

Notes: * Dry conditions did not permit sampling at this station.

Prepared by: ETB
Checked by: RPM

Table 1c: Summary of Water Sampling Stations for November 2020

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5* S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-8 95-4/05-1D	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7 09-1D
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2 05-3C 07-1C	94-5 95-2 95-6 09-1C
Intact Clay Deposit			09-1B
Glacial Till/Upper Bedrock			09-1A**
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Notes:

* Monitoring location was dry during this sampling event. No sample was collected.

** Monitoring location was frozen during this sampling event. No sample was collected.

Prepared by: ETB
Checked by: RPM

Table 2: List of Parameters Analyzed or Calculated in 2020

Parameter	Surface Water	Leachate	Groundwater	Sediments
Hardness ($CaCO_3$)	X	X	X	
Alkalinity ($CaCO_3$)	X	X	X	
Total Suspended Solids	X	X		
Bicarbonate (HCO_3)			X	
Carbonate (CO_3)			X	
Calcium	X	X	X	
Chloride	X	X	X	
Magnesium	X	X	X	
Total Phosphorous	X	X	X	
Potassium	X	X	X	
Sodium	X	X	X	
Sulphate	X	X	X	
Nitrate nitrogen	X	X	X	
Nitrite nitrogen	X	X	X	
Ammonia nitrogen[1]	X	X	X	
Total Kjeldahl nitrogen	X	X	X	
TDS	X	X	X	
Metals				
Arsenic	X	X	X	X
Boron	X	X	X	X
Cadmium	X	X	X	X
Chromium	X	X	X	X
Cobalt	X	X	X	X
Copper	X	X	X	X
Iron	X	X	X	X
Lead	X	X	X	X
Manganese	X	X	X	X
Mercury				X
Molybdenum				X
Nickel				X
Selenium				X
Zinc	X	X	X	X
Bulk Organics				
Phenols	X	X	X	
BOD_5	X	X		
COD (Chemical Oxygen Demand)	X	X	X	
DIC (Dissolved Inorganic Carbon)	X	X		

Parameter	Surface Water	Leachate	Groundwater	Sediments
DOC (Dissolved Organic Carbon)	X	X		
1,1-Dichloroethane		X	X	
Benzene		X	X	
Ethylbenzene		X	X	
Methylene Chloride		X	X	
Toluene		X	X	
Vinyl Chloride		X	X	
Xylene – m/p		X	X	
Xylene – o		X	X	
Field Measured Parameters				
pH	X	X	X	
Conductivity	X	X	X	
Temperature	X	X	X	
Dissolved Oxygen	X	X		
Flow	X			

Notes: [1] Unionized ammonia calculated for surface water.

Prepared by: ETB
Checked by: RPM

Table 3: 2020 Monitoring Well Network Condition Survey

Well Number	Properly Cased?	Cap?	Lock?	Comments
OW-92-1	√	√	√	
OW-92-2	√	√	√	
OW-92-3	√	√	√	
OW-92-4	√	√	√	
OW-92-5	√	√	√	
OW-92-6	√	√	√	
OW-92-7	√	√	√	
OW-92-8	√	√	√	
OW-92-9	√	√	√	
OW-92-10	√	√	√	
OW-92-11	√	√	√	
OW-92-12	√	√	√	
OW-92-13	√	√	√	
OW-92-14	√	√	√	
OW-92-15	√	√	√	
OW-92-16	√	√	√	
OW-92-17	√	√	√	
OW-92-18	√	√	√	
OW-92-19	√	√	√	
OW-94-1	√	√	√	
OW-94-2	√	√	√	
OW-94-3	√	√	√	
OW-94-4	√	√	√	
OW-94-5	√	√	√	
OW-94-6	√	√	√	
OW-95-1	√	√	√	
OW-95-2	√	√	√	
OW-95-3	√	√	√	
OW-95-4				Abandoned, well removed.
OW-95-5	√	√	√	
OW-95-6	√	√	√	
OW-95-7	√	√	√	
OW-95-8	√	√	√	
OW-95-9	√	√	√	
OW-98-1	√	√	√	
OW-98-3				Abandoned, well removed.
OW-98-4				Abandoned, well removed.
MW05-R3	√	√	√	
MW05-8	√	√	√	
MW05-11	√	√	√	
MW-C	√	√	√	
MW-E	√	√	√	

Well Number	Properly Cased?	Cap?	Lock?	Comments
MW05-1A	√	√	√	
MW05-1B	√	√	√	
MW05-1C	√	√	√	
MW05-1D	√	√	√	
MW05-2A	√	√	√	
MW05-2B	√	√	√	
MW05-2C	√	√	√	
MW05-2D	√	√	√	
MW05-3A	√	√	√	
MW05-3B	√	√	√	
MW05-3C	√	√	√	
MW05-3D	√	√	√	
MW07-1A	√	√	√	
MW07-1B	√	√	√	
MW07-1C	√	√	√	
MW07-1D	√	√	√	
MW09-1A	√	X	√	Needs new cap (to be installed in 2021)
MW09-1B	√	√	√	
MW09-1C	√	√	√	
MW09-1D	√	√	√	
MW11-1	√	√	√	

Entered by: ETB
Checked by: RPM

Table 4: Summary of Analytical Results – Sediments (May 2020)

Parameter	May 14, 2020			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	1.1	1.8	3.1	18	18	12	6	5.9
Boron*	1.1	**1.9**	**14.8**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	14.3	19.3	**29.5**	160	160	64	26	37.3
Cobalt	2.0	2.6	5.1	22	22	50	50	nac
Copper	<5.0	7.1	**23.9**	180	180	63	16	35.7
Iron	7,690	6,970	12,300	nac	nac	nac	nac	nac
Lead	5.3	6.6	9.3	120	120	140	31	35.0
Manganese	125	108	304	nac	nac	nac	nac	nac
Mercury	<0.1	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	<1	<1	3.5	6.9	6.9	10	nac	nac
Nickel	5.5	8.5	**17.4**	130	130	45	16	nac
Selenium	<1	<1	<1	2.4	2.4	1	nac	nac
Zinc	<20.0	24.2	68	340	340	250	120	123

Notes:
All concentrations are reported in µg/g dry.
nac - no applicable criteria for this parameter. **Bold** indicates that a concentration exceeds one or more of the applicable soil quality guidelines in this table.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2018 (CCME, 1999).
* Criteria based on a hot water extract for available boron.

Prepared by: ETB
Checked by: RPM

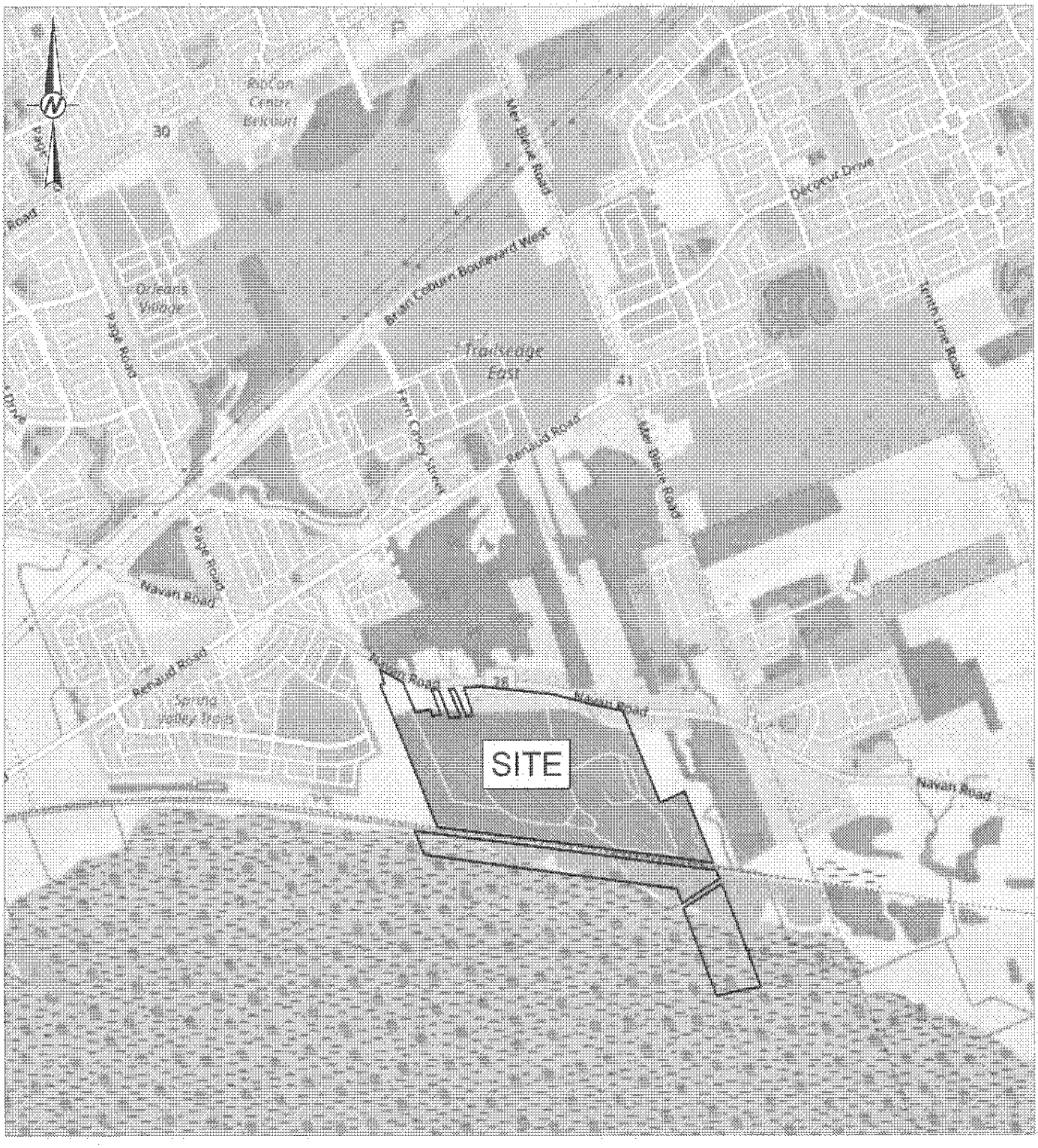
Table 5: Summary of Analytical Results – Sediments (November 2020)

Parameter	November 25, 2020			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	3.7	2.2	3.0	18	18	12	6	5.9
Boron*	**8.5**	**7.1**	**15.7**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	**52.1**	**28.7**	21.7	160	160	64	26	37.3
Cobalt	9.1	4.6	4.7	22	22	50	50	nac
Copper	**24.9**	13.0	**21.0**	180	180	63	16	35.7
Iron	22,000	13,200	15,400	nac	nac	nac	nac	nac
Lead	13.3	9.5	8.0	120	120	140	31	35.0
Manganese	309	180	374	nac	nac	nac	nac	nac
Mercury	<0.1	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	2.0	<1	3.4	6.9	6.9	10	nac	nac
Nickel	**31.2**	13.7	14.5	130	130	45	16	nac
Selenium	**1.1**	<1	**1.2**	2.4	2.4	1	nac	nac
Zinc	92.4	50.7	64.0	340	340	200	120	123

Prepared by: ETB
Checked by: RPM

Notes:
All concentrations are reported in µg/g dry.
nac - no applicable criteria for this parameter. **Bold** indicates that a concentration exceeds one or more of the applicable soil quality guidelines in this table.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2007 (CCME, 1999).
* Criteria based on a hot water extract for available boron.

001221



WASTE CONNECTIONS OF CANADA

0 500 1,000
1:25,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

CLIENT
WASTE CONNECTIONS OF CANADA

CONSULTANT
GOLDER

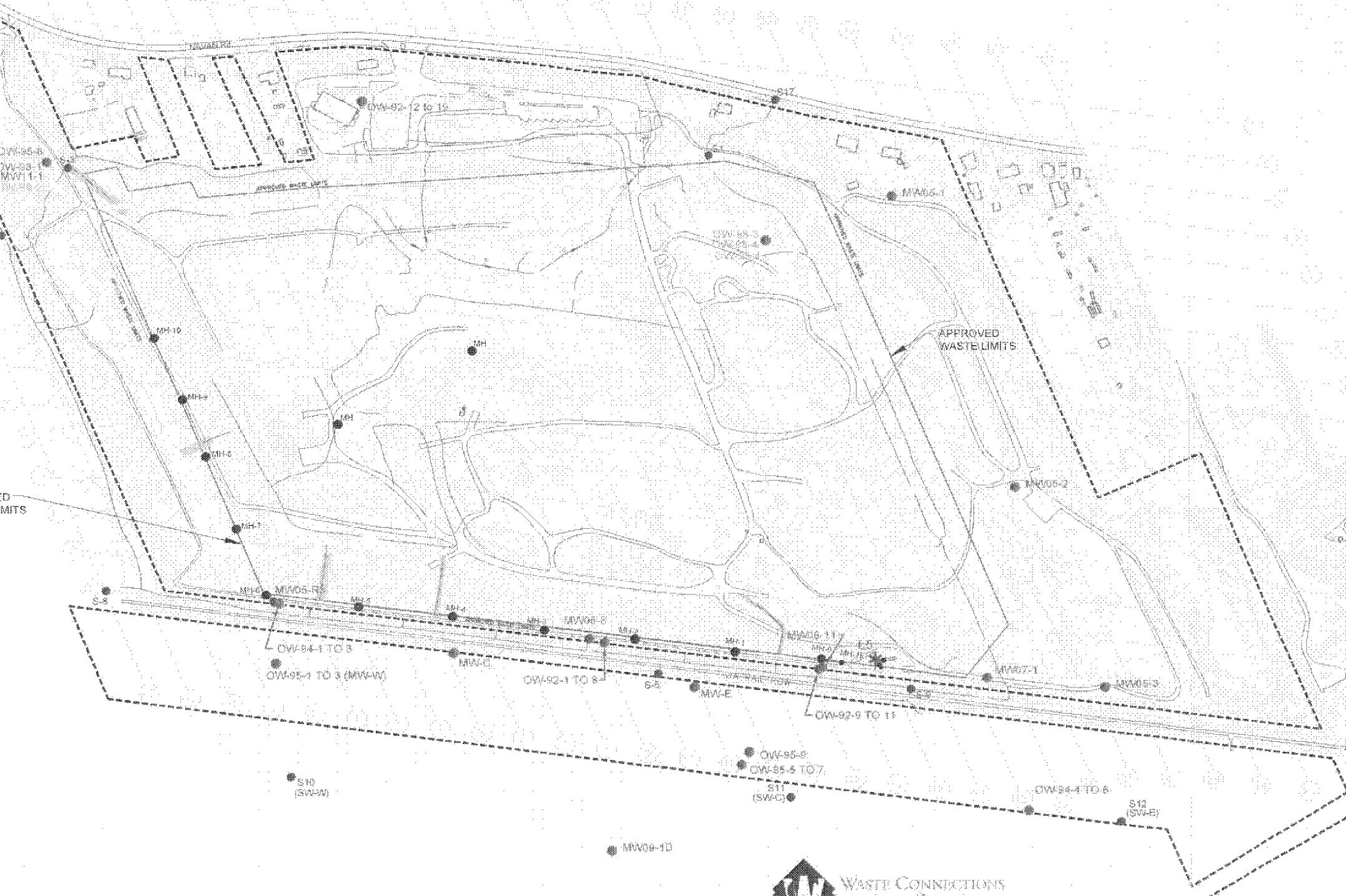
YYYY-MM-DD	2021-03-09
DESIGNED	ETB
PREPARED	JM
REVIEWED	YJM
APPROVED	PLE

PROJECT
REPORT ON 2020 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
20412275	0002	0	

001223



FENCE LINE

SURFACE WATER SAMPLING STATION

GROUNDWATER SAMPLING STATION

001225

REFERENCE(S)

1. BASE TOPOGRAPHY BY THE BASE MAPPING CO. LTD DATED APRIL 28, 2020 (0.5 METRE INTERVALS SHOWN)
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

WASTE CONNECTIONS OF CANADA

CLIENT
WASTE CONNECTIONS OF CANADA

PROJECT
REPORT ON 2020 LAND
NAVAN WASTE RECYC
3354 NAVAN ROAD, OT

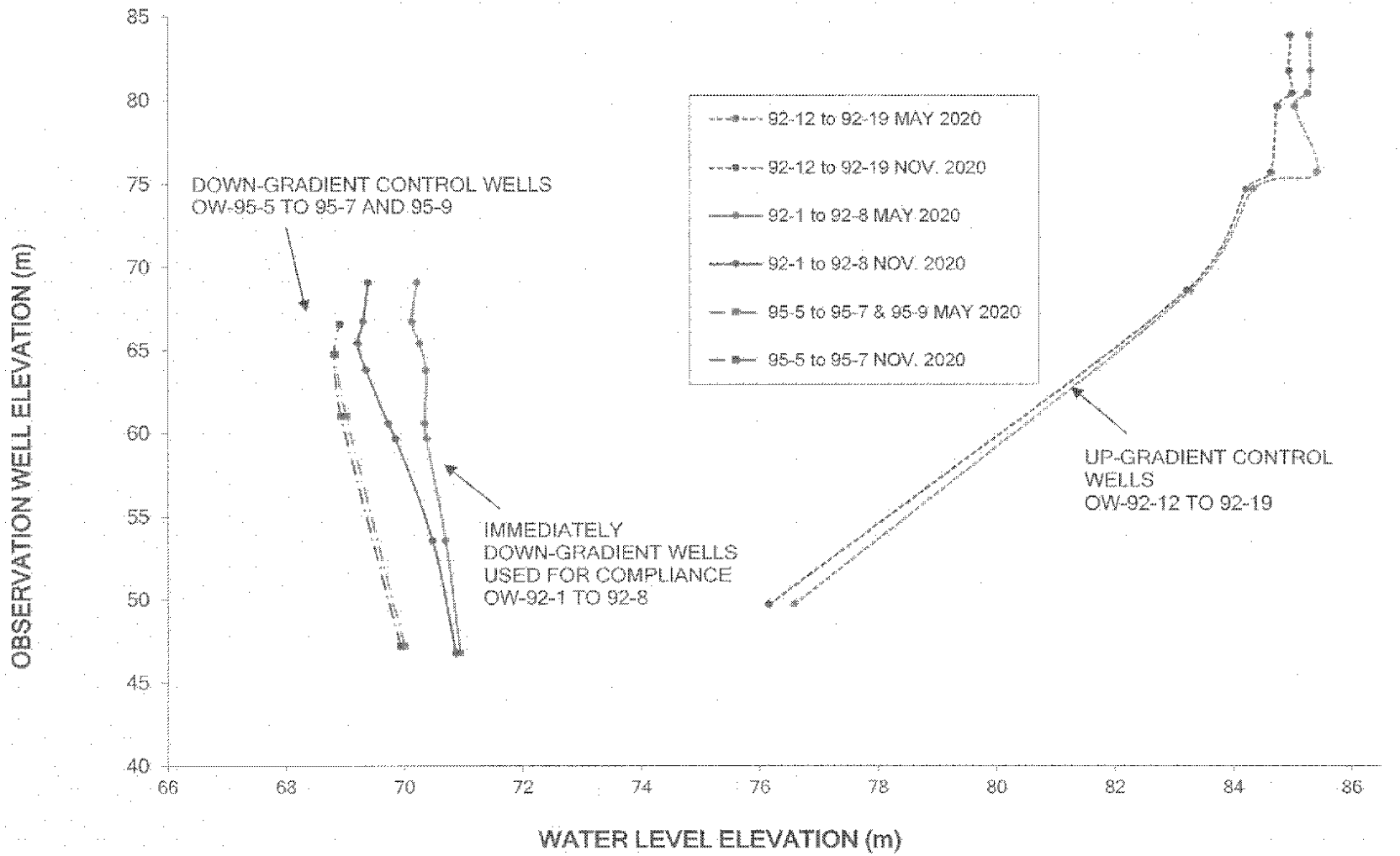


FIGURE 3

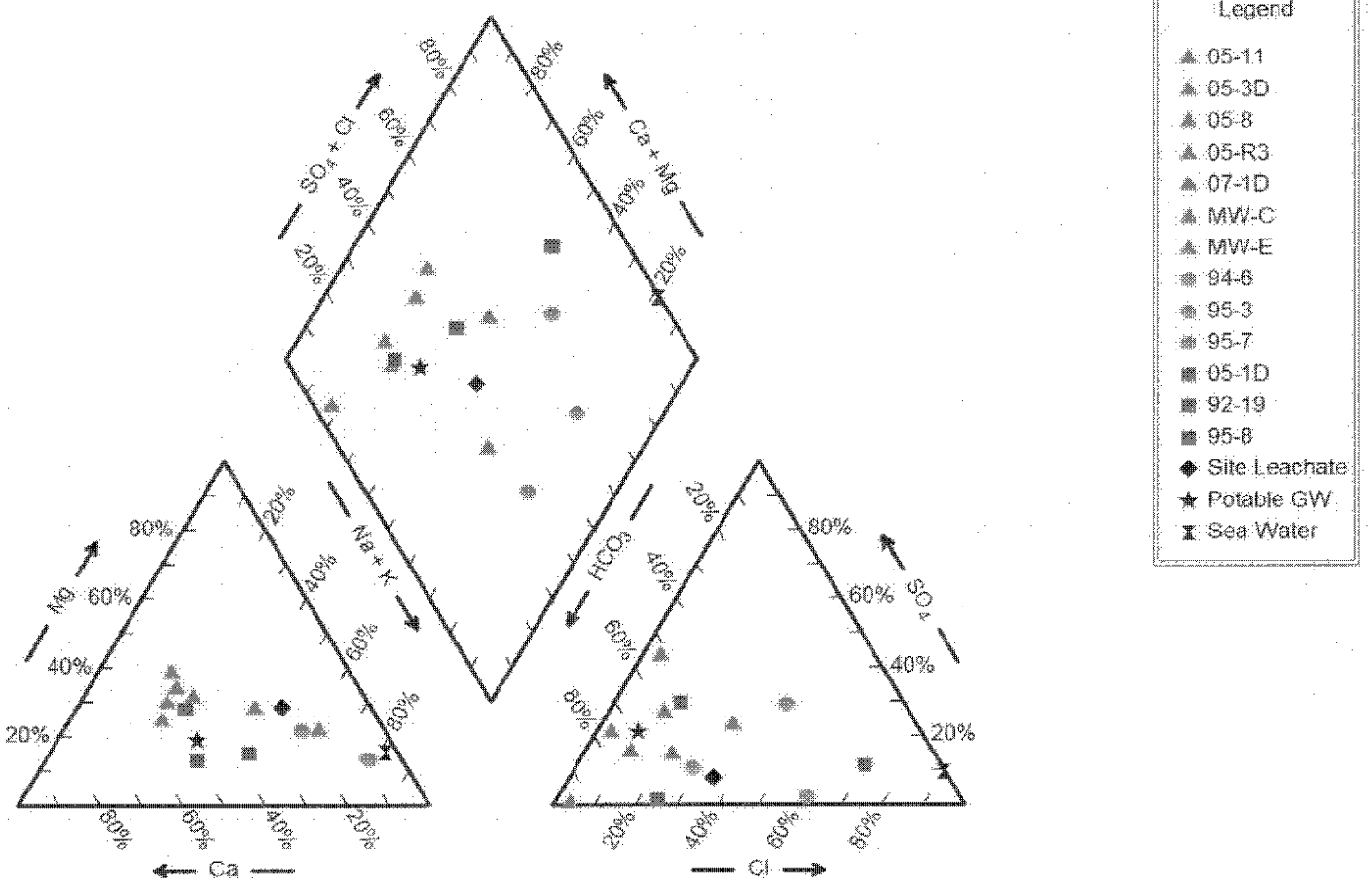
Project No. 20412275
Prepared by: ETB
Checked by: RPM March 2021

WCC NAVAN FACILITY

HYDRAULIC HEAD PROFILES

GOLDER

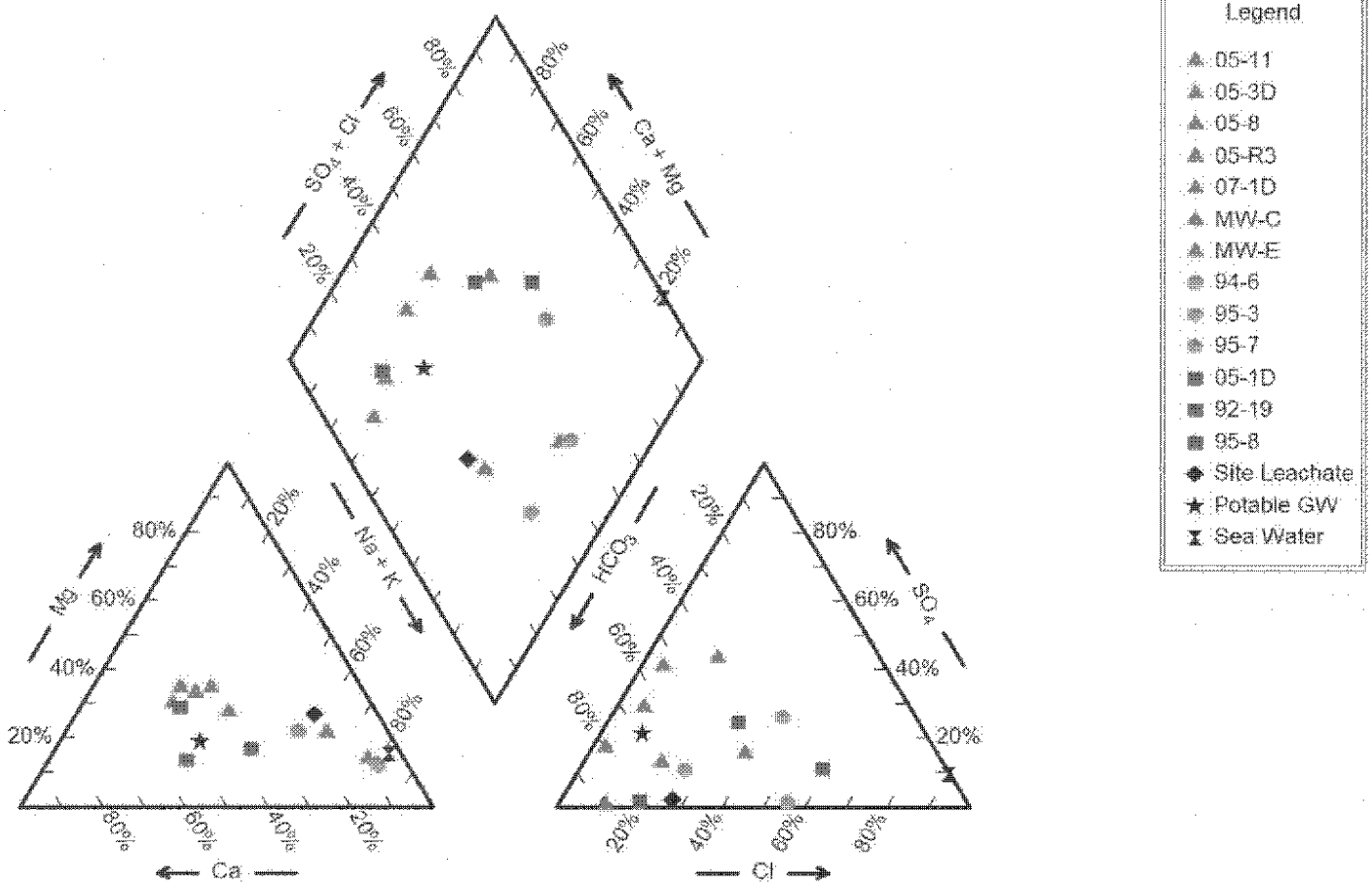
001227



WCC NAVAN FACILITY

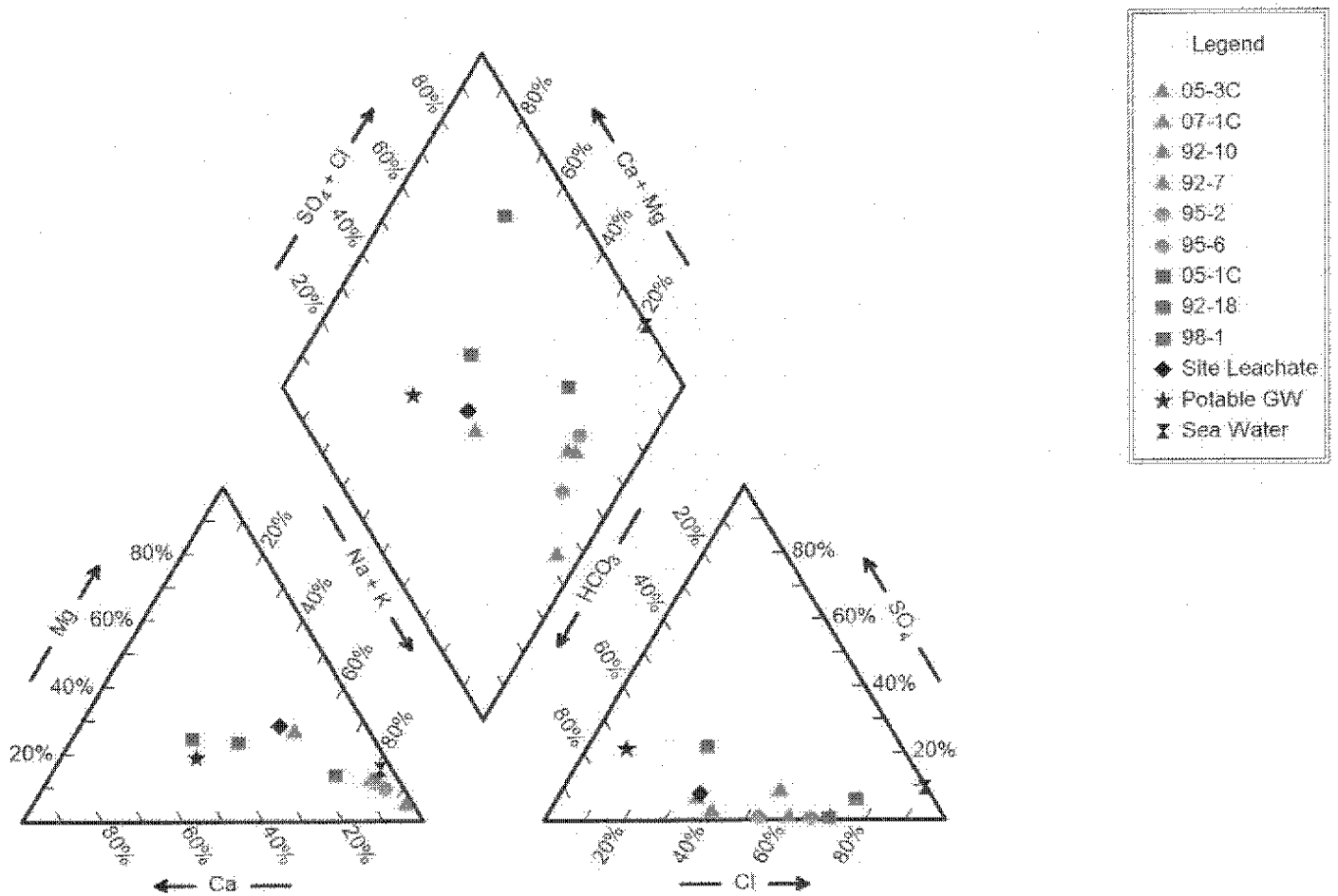
GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Sand Deposit (May 2020)
	Checked By	ETB	
	Reviewed By	PLE	March 2021 | 20412275-02 | Figure 4

001228



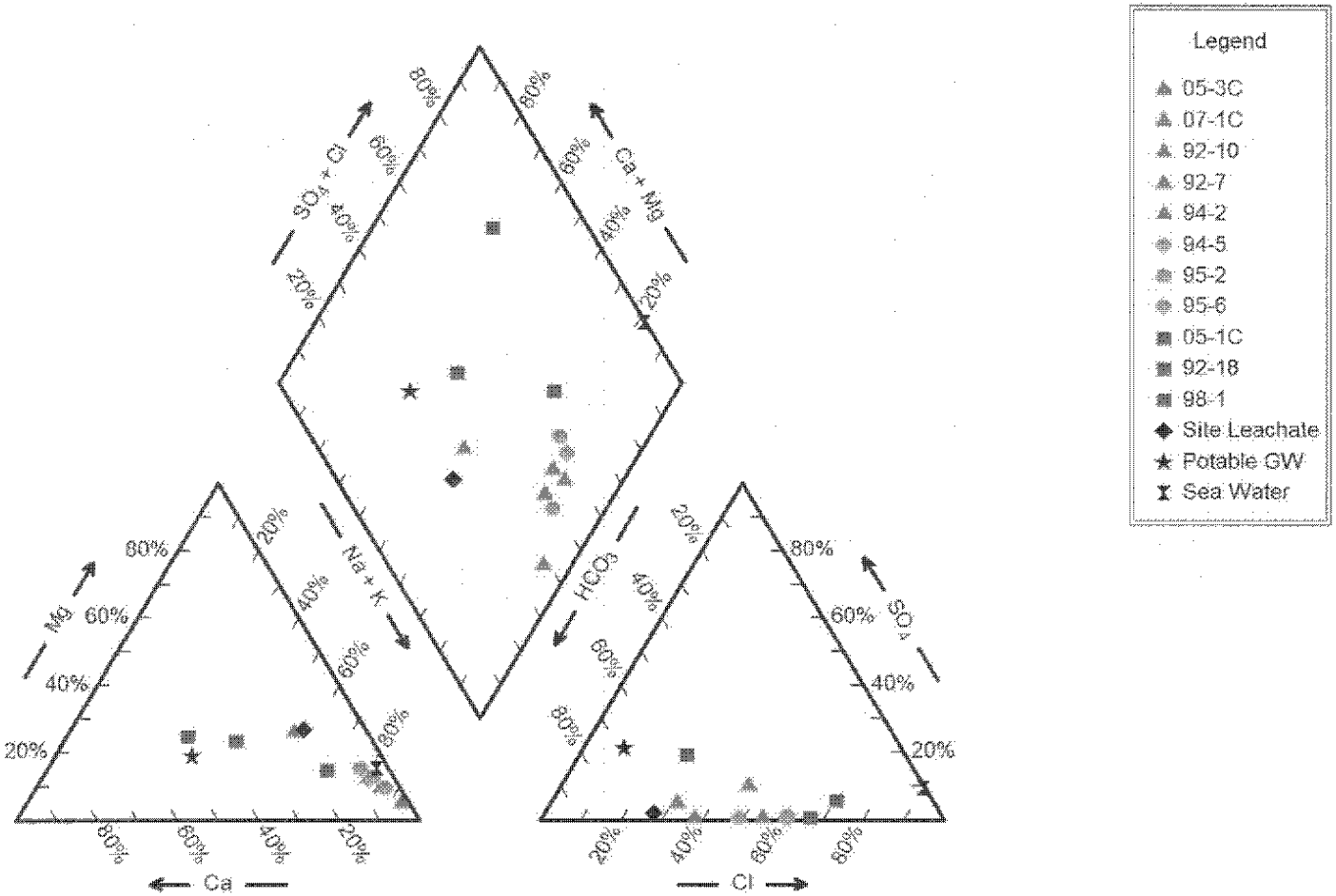
WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Sand Deposit (November 2020)	
	Checked By	ETB		
	Reviewed By	PLE	March 2021	20412275-02	Figure 5



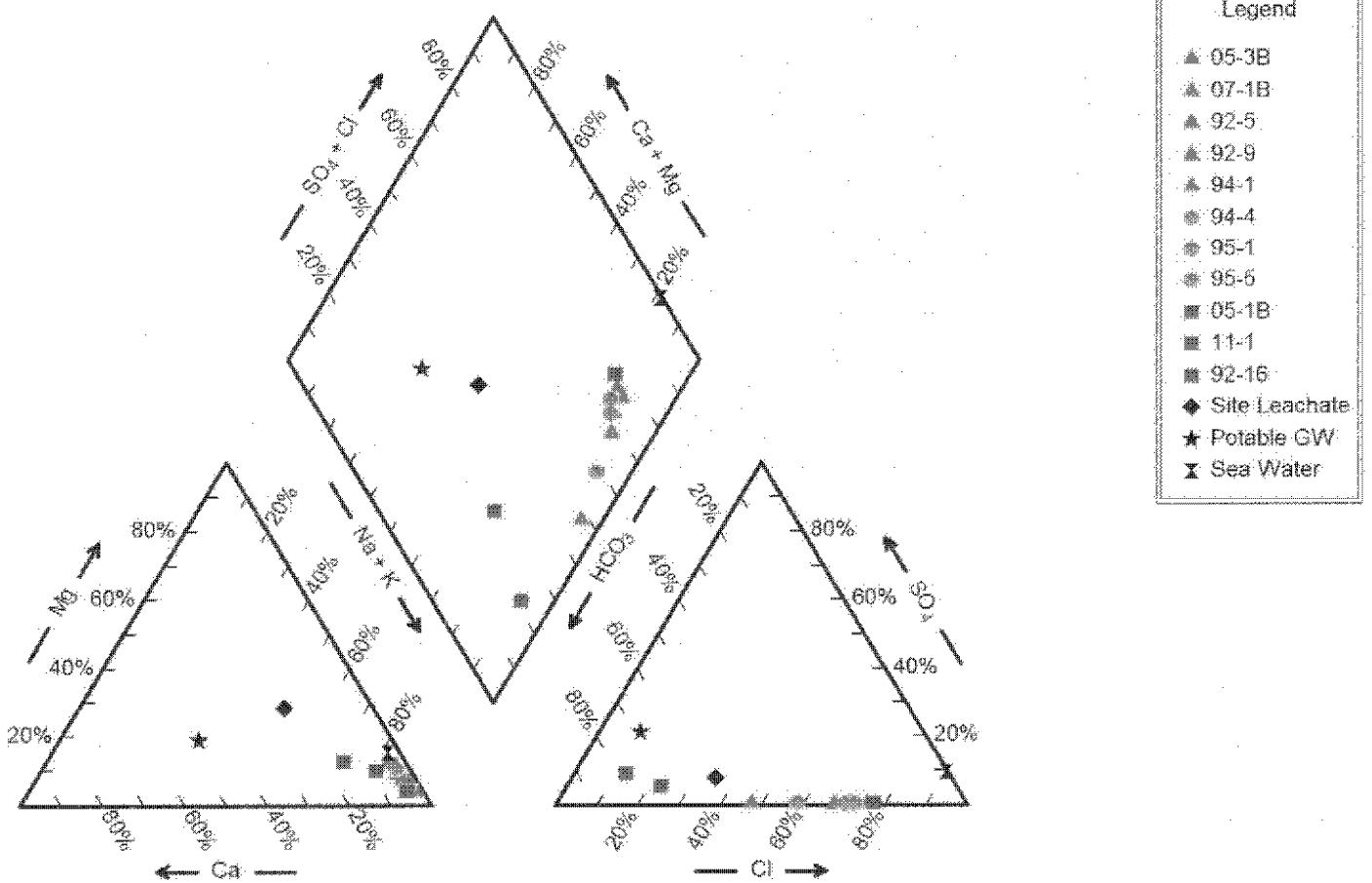
WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Weathered Clay Deposit (May 2020)	
	Checked By	ETB		
	Reviewed By	PLE	March 2020	20412275-02	Figure 6



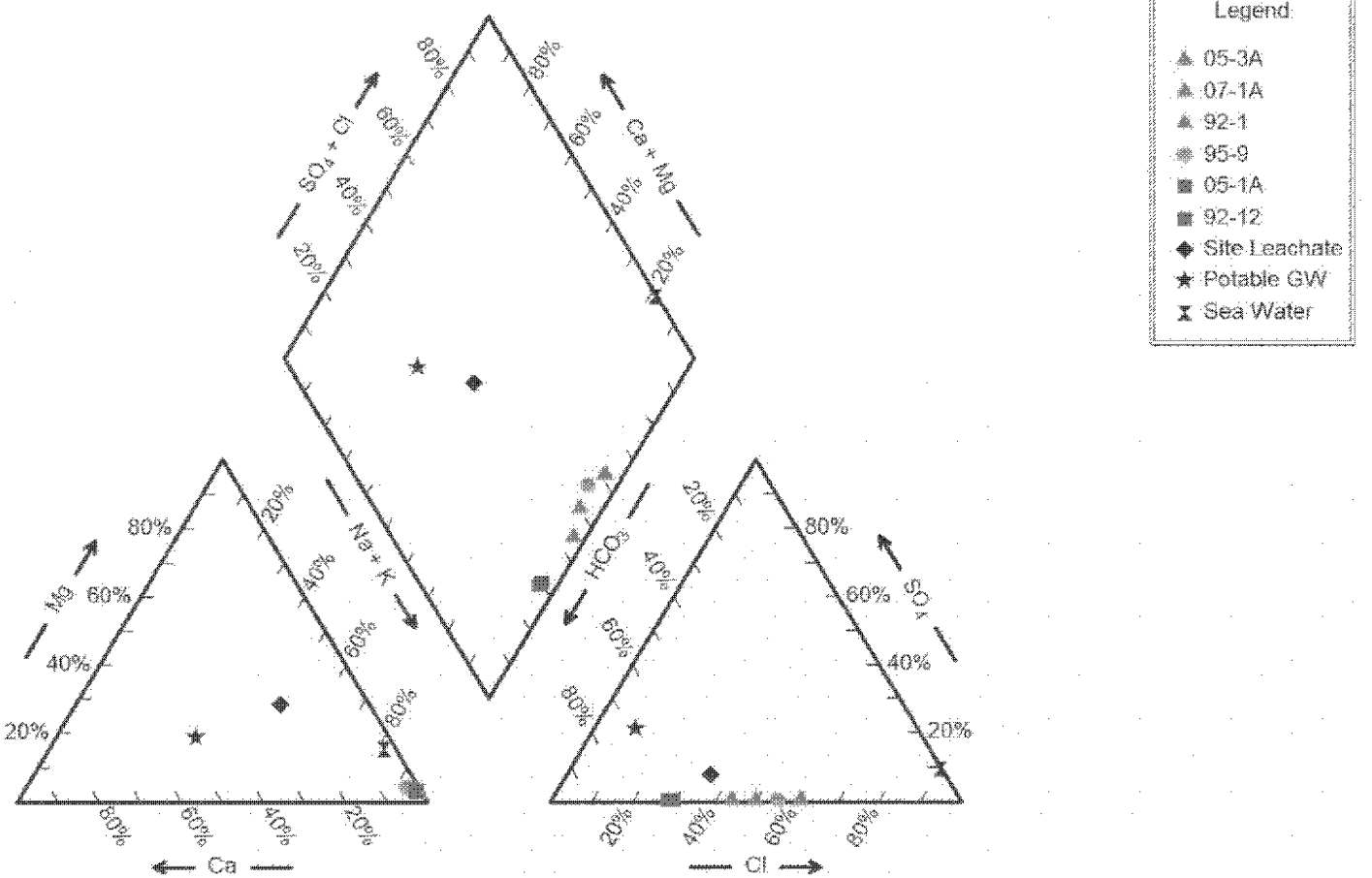
WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Weathered Clay Deposit (November 2020)
	Checked By	ETB	
	Reviewed By	PLE	March 2021 | 20412275-02 | Figure 7



WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Intact Clay Deposit (May 2020)	
	Checked By	ETB		
	Reviewed By	PLE	March 2021	20412275-02	Figure 8.



WCC NAVAN FACILITY

GOLDER

Drawn By	YJM
Checked By	ETB
Reviewed By	PLE

Chemical Analyses of Groundwater
Plotted on a Piper Trilinear Diagram
Glacial Till / Upper Bedrock Zone (May 2020)

March 2021	20412275-02	Figure 9

APPENDIX A

Record of Borehole Sheets

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX B

Laboratory Certificates of Analysis

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX C

Groundwater Level Records

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	24-Mar-92	25-Mar-92	26-Mar-92	30-Mar-92	31-Mar-92	01-Apr-92	02-Apr-92	03-Apr-92	06-Apr-92	10-
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
73.67		71.10	25.1	46.75	45.25	71.10	70.00	70.00	69.96		69.95		69.80		
73.50		71.10	18.32	53.53	52.03	53.25	58.88	60.78	67.15		68.15		69.28		
73.64		71.10	12.22	59.63	58.13		63.48	64.58	67.28		67.78		68.38		
73.67		71.10	g	60.54	59.04		62.54	63.09	65.12		65.73		66.69		
73.64		71.10	8.06	63.79	62.29		65.04	65.54	67.22		67.67		68.29		
73.74		71.10	6.47	65.38	63.88		69.06	69.30	69.76		69.73		69.63		
73.59		71.10	5.13	66.72	65.22		69.32	69.41	69.84		69.87		69.77		
73.52		71.10	2.8	69.05	67.55		69.49	69.58	69.85		69.84		69.69		
73.39		70.67	7.6	63.82	62.32			64.27	66.67		67.44		68.12		
73.27		70.70	4.6	66.85	65.35			69.35	69.75		69.75		69.75		
73.33		70.75	2.6	68.9	67.4			69.40	69.78		69.79		69.76		
87.41		86.03	37.1	49.68	48.18					74.31	74.25	74.25	74.25	74.25	
87.26		86.03	18.22	68.56	67.06							80.61	81.01	81.68	
87.24		86.03	12.11	74.67	73.17								79.12	82.95	
87.35		86.03	11.11	75.67	74.17								76.62	79.92	
87.19		86.03	7.19	79.59	78.09								81.36	82.72	
87.37		86.03	6.38	80.4	78.9								83.75	84.29	
87.28		86.03	5.05	81.73	80.23								84.12	84.92	
87.22		86.03	2.93	83.85	82.35								84.35	85.39	
		86.96													
		71.99													
		72.00													
72.83		71.33	8.56	63.52	62.02										
72.84		71.33	4.57	67.51	66.01										
72.74		71.33	2.58	69.5	68										
69.61		68.7	8.38	61.07	59.57										
70.2		68.7	3.55	65.9	64.4										
70.13		68.7	1.91	67.54	66.04										
70.23															
70.87															
86.27															
86.33															
86.34															
86.39															
81.38															
81.31															
81.20															
81.25															
70.93	74.53														
70.85	74.47														
70.80	74.52														
70.91	74.46														

ained in November 2005

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-May-92	01-Jun-92	17-Jun-92	30-Jun-92	21-Jul-92	05-Aug-92	19-Jul-93	02-Nov-93	04-Apr-94	23
m	m	m	m	m	m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	El
73.67		71.10	25.1	46.75	45.25	60.49	66.30	68.85	69.35	69.63	69.66	69.81	69.82	69.85	
73.50		71.10	18.32	53.53	52.03	67.93	69.51	69.58	69.60	69.60	69.58	69.65	69.58	69.50	
73.64		71.10	12.22	59.63	58.13	67.66	69.16	69.40	69.43	69.42	69.44	69.63	69.42	69.27	
73.67		71.10	g	60.54	59.04	65.99	68.60	69.29	69.37	69.38	69.43	69.62	69.40	69.24	
73.64		71.10	8.06	63.79	62.29	68.54	69.17	69.28	69.25	69.31	69.36	69.38	69.43	69.09	
73.74		71.10	6.47	65.38	63.88	69.44	69.45	69.13	69.14	69.59	69.67	69.10	69.43	69.74	
73.59		71.10	5.13	66.72	65.22	69.29	69.50	69.12	69.17	69.55	69.67	69.11	69.41	69.85	
73.52		71.10	2.8	69.05	67.55	69.40	69.49	69.12	69.16	69.54	69.66	69.07	69.37	69.75	
73.39		70.67	7.6	63.82	62.32	67.29	69.09	69.14	69.12	69.23	69.23	69.14	69.22	68.96	
73.27		70.70	4.6	66.85	65.35	69.29	69.34	69.12	69.16	69.38	69.44	68.94	69.24	69.36	
73.33		70.75	2.6	68.9	67.4	69.33	69.38	69.15	69.17	69.40	69.46	68.98	69.27	69.40	
87.41		86.03	37.1	49.68	48.18	74.64	74.68	74.57	74.53	74.64	74.65	74.72	74.43		
87.26		86.03	18.22	68.56	67.06	81.01	82.31	82.44	82.46	82.51	82.50	82.42	82.46	82.47	
87.24		86.03	12.11	74.67	73.17	83.34	83.50	83.56	83.58	83.62	83.63	83.57	83.55	83.41	
87.35		86.03	11.11	75.67	74.17	82.12	83.70	83.78	83.78	83.83	83.82	83.77	83.76	83.57	
87.19		86.03	7.19	79.59	78.09	83.32	84.18	84.32	84.29	84.41	84.43	84.32	84.41	84.12	
87.37		86.03	6.38	80.4	78.9	84.19	84.50	84.55	84.49	84.75	84.72	84.51	84.69	84.44	
87.28		86.03	5.05	81.73	80.23	84.19	84.58	84.62	84.56	84.86	84.82	84.57	84.75	84.92	
87.22		86.03	2.93	83.85	82.35	84.74	84.88	84.56	84.57	85.14	85.29	84.48	84.82	85.24	
		86.96				-	84.61	84.49	85.13	84.99	84.56				
		71.99				68.67	70.37	70.32	70.28	70.56	70.46				
		72.00				68.99	70.41	70.64	70.59	70.62	70.52				
72.83		71.33	8.56	63.52	62.02										
72.84		71.33	4.57	67.51	66.01										
72.74		71.33	2.58	69.5	68										
69.61		68.7	8.38	61.07	59.57										
70.2		68.7	3.55	65.9	64.4										
70.13		68.7	1.91	67.54	66.04										
70.23															
70.87															
86.27															
86.33															
86.34															
86.39															
81.38															
81.31															
81.20															
81.25															
70.93	74.53														
70.85	74.47														
70.80	74.52														
70.91	74.46														

ained in November 2005

001247

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	25-Oct-94 Elevation	06-Dec-94 Elevation	28-Mar-95 Elevation	20-Apr-95 Elevation	16-May-95 Elevation	23-Jun-95 Elevation	12-Jul-95 Elevation	26-Jul-95 Elevation	09-Aug-95 Elevation	13
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
73.67		71.10	25.1	46.75	46.25	69.88	69.83	69.90	69.88	69.92	69.92				
73.50		71.10	18.32	53.53	52.03	69.56	69.50	69.81	69.77	69.72	69.70				
73.64		71.10	12.22	59.63	58.13	69.39	69.28	69.61	69.63	69.57	69.58				
73.67		71.10	g	60.54	59.04	69.35	69.21	69.54	69.57	69.53	69.56				
73.64		71.10	8.06	63.79	62.29	69.15	69.27	69.45	69.43	69.40	69.50				
73.74		71.10	6.47	65.38	63.88	69.01	69.51	69.49	69.48	69.72	69.21				
73.59		71.10	5.13	66.72	65.22	69.00	69.50	69.48	69.49	69.82	69.23				
73.52		71.10	2.8	69.05	67.55	68.94	69.43	69.05	69.43	69.76	69.20				
73.39		70.67	7.6	63.82	62.32	69.05	69.15	69.17	69.21	69.16	69.18				
73.27		70.70	4.6	66.85	65.35	68.90	69.32	69.25	69.32	69.44	69.08				
73.33		70.75	2.6	68.9	67.4	68.92	69.36	69.29	69.35	69.50	69.11				
87.41		86.03	37.1	49.68	48.18	74.57	74.33	74.59	74.69	74.97	74.86				
87.26		86.03	18.22	68.56	67.06	82.47	82.50	82.52	82.49	82.47	82.44				
87.24		86.03	12.11	74.67	73.17	83.48	83.49	83.48	83.48	83.50	83.50				
87.35		86.03	11.11	75.67	74.17	83.65	83.68	83.65	83.65	83.66	83.71				
87.19		86.03	7.19	79.59	78.09	84.18	84.26	84.15	84.24	84.20	84.26				
87.37		86.03	6.38	80.4	78.9	84.40	84.54	84.46	84.52	84.45	84.47				
87.28		86.03	5.05	81.73	80.23	84.52	84.63	84.56	84.62	84.85	84.54				
87.22		86.03	2.93	83.85	82.35	84.48	84.85	84.85	84.73	84.46	84.45				
		86.96													
		71.99													
		72.00													
72.83		71.33	8.56	63.52	62.02					71.09	71.09				
72.84		71.33	4.57	67.51	66.01					70.52	70.47				
72.74		71.33	2.58	69.5	68					70.39	70.33				
69.61		68.7	8.38	61.07	59.57					68.54	68.54				
70.2		68.7	3.55	65.9	64.4					68.51	68.35				
70.13		68.7	1.91	67.54	66.04					68.42	68.32				
70.23															
70.87															
86.27															
86.33															
86.34															
86.39															
81.38															
81.31															
81.20															
81.25															
70.93	74.53														
70.85	74.47														
70.80	74.52														
70.91	74.46														

ained in November 2005

001249

WELL WATER ELEVATIONS

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	21-Aug-95 Elevation	28-Aug-95 Elevation	13-Sep-95 Elevation	18-Sep-95 Elevation	29-Sep-95 Elevation	11-Nov-95 Elevation	06-Jun-96 Elevation	08-Aug-96 Elevation	04-Sep-96 Elevation	09- El
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
73.67		71.10	25.1	46.75	45.25					69.8	69.97	69.89	69.9	69.89	
73.50		71.10	18.32	53.53	52.03					69.95	69.92	69.7	69.63	69.6	
73.64		71.10	12.22	59.63	58.13					69.89	69.9	69.62	69.39	69.45	
73.67		71.10	g	60.54	59.04					69.89	69.87	69.62	69.38	69.44	
73.64		71.10	8.06	63.79	62.29					69.45	69.77	69.54	69.24	69.34	
73.74		71.10	6.47	65.38	63.88					69.13	69.55	69.35	69.2	69.17	
73.59		71.10	5.13	66.72	65.22					69.13	69.5	69.4	69.17	69.17	
73.52		71.10	2.8	69.05	67.55					69.1	69.46	69.35	69.11	69.17	
73.39		70.67	7.6	63.82	62.32					68.99	69.36	69.21	69.08	69.15	
73.27		70.70	4.6	66.85	65.35					68.92	69.34	69.22	68.97	69	
73.33		70.75	2.6	68.9	67.4					68.91	69.36	69.23	68.99	69.03	
87.41		86.03	37.1	49.68	48.18					74.67	74.69	74.82	74.62	74.49	
87.26		86.03	18.22	68.56	67.06					82.4	82.45	82.62	82.58	82.77	
87.24		86.03	12.11	74.67	73.17					83.41	83.55	83.72	83.56	83.51	
87.35		86.03	11.11	75.67	74.17					83.6	83.74	83.9	83.7	83.67	
87.19		86.03	7.19	79.59	78.09					84.04	84.37	84.42	84.25	84.24	
87.37		86.03	6.38	80.4	78.9					84.22	84.63	84.58	84.47	84.42	
87.28		86.03	5.05	81.73	80.23					84.24	84.66	84.64	84.62	84.47	
87.22		86.03	2.93	83.85	82.35					84.24	84.79	84.57	84.47	84.41	
		86.96													
		71.99													
		72.00													
72.83		71.33	8.56	63.52	62.02					69.13	69.29	69.626	69.316	68.81	
72.84		71.33	4.57	67.51	66.01					68.65	69.31	68.911	68.951	68.91	
72.74		71.33	2.58	69.5	68					68.62	69.62	69.041	68.891	68.85	
69.61		68.7	8.38	61.07	59.57					67.7	68.08	68.51	68.25	68.28	
70.2		68.7	3.55	65.9	64.4					68.13	68.5	68.38	67.95	67.54	
70.13		68.7	1.91	67.54	66.04					68.83	69.02	68.35	68.01	67.51	
70.23															
70.87															
86.27															
86.33															
86.34															
86.39															
81.38															
81.31															
81.20															
81.25															
70.93	74.53														
70.85	74.47														
70.80	74.52														
70.91	74.46														

ained in November 2005

001251

WELL WATER ELEVATIONS

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-Aug-98 Elevation	26-Oct-98 Elevation	03-May-99 Elevation	11-Oct-99 Elevation	02-May-00 Elevation	20-Oct-00 Elevation	08-Jun-01 Elevation	03-Oct-01 Elevation	17-May-02 Elevation	30 El
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
73.67		71.10	25.1	46.75	45.25	70.01	70.01	70.2	70.12	70.2	70.28	70.32	70.31	70.37	
73.50		71.10	18.32	53.53	52.03	70.08	70.15	69.81	70.16	69.87	70.18	70.24	70.23	70.4	
73.64		71.10	12.22	59.63	58.13	69.92	69.86	69.31	69.67	69.97	69.79	69.91	69.74	70.2	
73.67		71.10	g	60.54	59.04				69.57	69.97	69.7	69.84	69.6	70.27	
73.64		71.10	8.06	63.79	62.29	69.35	69.54	68.95	69.17	69.97	69.2	69.51	68.98	69.91	
73.74		71.10	6.47	65.38	63.88	69.08	69.36	69.4	69.02	69.84	68.95	69.4	69.07	69.89	
73.59		71.10	5.13	66.72	65.22	69.03	69.33	69.4	68.96	69.69	68.85	69.37	68.79	69.95	
73.52		71.10	2.8	69.05	67.55	69.07	69.34	69.39	68.96	69.74	68.86	69.41	68.8	69.97	
73.39		70.67	7.6	63.82	62.32	69.06	69.2	69.29	68.99	69.33	68.96	69.63	69.02	69.59	
73.27		70.70	4.6	66.85	65.35	68.99	69.21	69.21		69.28	68.82	69.3	68.88	69.66	
73.33		70.75	2.6	68.9	67.4	69.12	69.23	69.18	68.96	69.25	68.76	69.27	68.86	69.67	
87.41		86.03	37.1	49.68	48.18	74.61	74.6	75.13	74.58	74.89	74.89	75.04	74.66	75.16	
87.26		86.03	18.22	68.56	67.06	82.53	82.57	82.61	82.61	82.6	82.6	82.62	82.55	82.58	
87.24		86.03	12.11	74.67	73.17	83.52	83.58	83.69	83.61	83.65	83.57	83.59	83.46	83.52	
87.35		86.03	11.11	75.67	74.17	83.7	83.75	84.01	83.76	83.85	83.82	84.23	83.65	84.42	
87.19		86.03	7.19	79.59	78.09	84.18	84.32	84.46	84.35	84.53	84.17	84.31	84.04	84.52	
87.37		86.03	6.38	80.4	78.9	84.36	84.32	84.67	84.6	84.78	84.33	84.49	84.21	84.72	
87.28		86.03	5.05	81.73	80.23	84.43	84.54	84.77	84.76	84.89	84.46	84.74	84.5	84.72	
87.22		86.03	2.93	83.85	82.35	84.34	84.54	84.67	84.59	84.81	84.3	84.49	84.2	85.2	
		86.96													
		71.99													
		72.00													
72.83		71.33	8.56	63.52	62.02	69.2	69.29	69.52	68.9	69.6	69.2	69.41	69.4	69.77	
72.84		71.33	4.57	67.51	66.01	68.68	69.01	69.25	68.52	69.51	68.72	69.17	69.28	69.65	
72.74		71.33	2.58	69.5	68	68.64	68.98	69.21	68.53	69.46	68.69	69.06	69.22	69.69	
69.61		68.7	8.38	61.07	59.57	68.25	68.48	68.58	68.13	68.58	68.52	68.6	68.08	68.65	
70.2		68.7	3.55	65.9	64.4	67.66	68.38	68.34	68.27	68.45	68.31	68.4	67.92	68.46	
70.13		68.7	1.91	67.54	66.04	67.74	68.44	68.38	68.32	68.48	68.32	68.43	67.93	68.48	
70.23															
70.87															
86.27															
86.33															
86.34															
86.39															
81.38															
81.31															
81.20															
81.25															
70.93	74.53														
70.85	74.47														
70.80	74.52														
70.91	74.46														

ained in November 2005

001253

WELL WATER ELEVATIONS

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	05-Nov-03 Elevation	08-May-04 Elevation	05-Nov-04 Elevation	29-May-05 Elevation	16-Nov-05 Elevation	19-May-06 Elevation	14-Nov-06 Elevation	07-May-07 Elevation	19-Nov-07 Elevation	13- El
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
73.67		71.10	25.1	46.75	45.25	70.49	70.51	70.53	70.47	70.4	70.48	70.57	70.52	70.47	
73.50		71.10	18.32	53.53	52.03	70.35	70.40	70.20	70.32	70.14	70.27	70.36	70.35	70.44	
73.64		71.10	12.22	59.63	58.13	69.87	70.09	69.84	70.07	69.63	70.03	70.07	70.02	69.94	
73.67		71.10	g	60.54	59.04	69.77	70.05	69.76	70.02	69.55	69.99	70.015	70.03	69.84	
73.64		71.10	8.06	63.79	62.29	69.48	69.88	69.33	69.83	69.11	69.78	69.899	69.88	69.41	
73.74		71.10	6.47	65.38	63.88	69.52	69.80	69.2	69.61	68.98	70.13	69.818	69.73	69.33	
73.59		71.10	5.13	66.72	65.22	69.57	69.70	69.25	69.44	69.94	70.22	70.16	69.60	69.34	
73.52		71.10	2.8	69.05	67.55	69.57	69.70	69.25	69.44	68.93	70.21	70.24	69.60	69.37	
73.39		70.67	7.6	63.82	62.32	69.55	69.67	69.32	69.59	69.22	69.61	69.679	69.53	69.33	
73.27		70.70	4.6	66.85	65.35	69.63	69.61	69.19	69.34	69.16	70.1	70.165	69.46	69.32	
73.33		70.75	2.6	68.9	67.4	69.64	69.59	69.27	69.42	69.15	70.09	70.102	69.45	69.44	
87.41		86.03	37.1	49.68	48.18	74.80	75.16	74.88	75.23	74.84	75.35	75.33	75.46	75.36	
87.26		86.03	18.22	68.56	67.06	82.57	82.59	82.54	82.58	82.53	82.63	82.675	82.70	82.59	
87.24		86.03	12.11	74.67	73.17	83.55	83.54	83.46	83.63	83.52	83.72	83.756	83.71	83.51	
87.35		86.03	11.11	75.67	74.17	85.00	85.02	84.69	85	84.87	85.15	85.057	85.19	84.57	
87.19		86.03	7.19	79.59	78.09	84.32	84.43	84.20	84.44	84.22	84.6	84.606	84.55	84.17	
87.37		86.03	6.38	80.4	78.9	84.59	84.66	84.36	84.63	84.44	84.88	84.841	84.76	84.37	
87.28		86.03	5.05	81.73	80.23	84.66	84.75	84.42	83.7	84.5	84.81	84.9	84.85	82.87	
87.22		86.03	2.93	83.85	82.35	85.00	84.92	84.53	84.69	84.67	85.42	85.486	84.81	84.52	
		86.96													
		71.99													
		72.00													
72.83		71.33	8.56	63.52	62.02	69.60	69.76	69.55	69.756	69.506	69.756	70.03	69.91	70.06	
72.84		71.33	4.57	67.51	66.01	69.52	69.53	68.99	69.331	69.361	69.671	69.576	69.45	69.22	
72.74		71.33	2.58	69.5	68	69.56	69.56	69.06	69.301	69.361	69.841	70.111	69.42	69.21	
69.61		68.7	8.38	61.07	59.57	68.48	68.55	68.63	68.67	68.49	68.69	68.755	68.67	68.45	
70.2		68.7	3.55	65.9	64.4	68.56	68.51	68.50	68.47	68.44	68.46	68.485	68.37	68.30	
70.13		68.7	1.91	67.54	66.04	68.54	68.51	68.51	68.48	68.45	68.56	68.507	68.41	68.35	
70.23															
70.87															
86.27													78.55	78.68	
86.33													84.275	83.975	
86.34													84.915	84.625	
86.39													84.88	84.58	
81.38													66.21	66.11	
81.31													68.195	67.535	
81.20													70.38	67.99	
81.25													71.2	68.02	
70.93	74.53												70.02	70.02	
70.85	74.47												69.9	69.91	
70.80	74.52												69.46	69.43	
70.91	74.46												69.355	69.405	

ained in November 2005

001255

WELL WATER ELEVATIONS

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	18-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	16-May-11 Elevation	22-Nov-11 Elevation	23-May-12 Elevation	20-Nov-12 Elevation	21-May-13 Elevation	20-Nov-13 Elevation	23 El
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
73.67		71.10	25.1	46.75	45.25	70.49	70.52	70.01	70.38	70.49	70.59	70.53	70.62	70.56	
73.50		71.10	18.32	53.53	52.03	70.35	70.37	70.03	70.20	70.33	70.43	70.24	70.37	70.26	
73.64		71.10	12.22	59.63	58.13	69.96	70.21	69.69	70.09	69.86	70.21	69.87	70.17	69.85	
73.67		71.10	g	60.54	59.04	69.90	70.28	69.63	70.07	69.78	70.20	69.80	70.15	69.78	
73.64		71.10	8.06	63.79	62.29	69.47	69.88	69.60	70.00	69.23	70.03	69.45	69.92	69.48	
73.74		71.10	6.47	65.38	63.88	70.27	69.55	69.72	69.95	69.02	69.94	69.32	69.82	69.46	
73.59		71.10	5.13	66.72	65.22	69.17	69.40	69.89	70.05	68.93	69.77	69.23	69.69	69.63	
73.52		71.10	2.8	69.05	67.55	69.10	69.41	69.66	69.44	68.93	69.77	69.26	69.73	69.59	
73.39		70.67	7.6	63.82	62.32	69.39	69.76	69.64	69.61	69.73	69.80	69.62	69.65	69.65	
73.27		70.70	4.6	66.85	65.35	69.19	69.41	69.66	69.80	69.85	69.73	69.63	69.62	69.88	
73.33		70.75	2.6	68.9	67.4	69.18	69.42	69.16	69.80	69.81	69.68	69.59	69.58	69.86	
87.41		86.03	37.1	49.68	48.18	75.46	75.36	74.71	75.43	75.00	75.01	75.35	75.81	75.64	
87.26		86.03	18.22	68.56	67.06	82.90	82.84	82.94	83.03	83.13	83.21	83.18	83.23	83.24	
87.24		86.03	12.11	74.67	73.17	83.94	83.83	83.91	84.05	84.13	84.32	84.30	84.33	84.31	
87.35		86.03	11.11	75.67	74.17	84.57	84.58	85.15	85.32	84.70	85.46	85.11	85.32	84.73	
87.19		86.03	7.19	79.59	78.09	84.50	84.57	84.70	84.77	84.60	85.01	84.86	84.99	84.78	
87.37		86.03	6.38	80.4	78.9	84.62	84.74	84.94	84.98	84.81	85.24	85.05	85.20	85.00	
87.28		86.03	5.05	81.73	80.23	84.60	84.81	85.03	85.04	84.73	85.26	85.01	85.22	85.01	
87.22		86.03	2.93	83.85	82.35	84.51	84.80	85.01	85.27	84.74	85.35	85.00	85.20	85.15	
		86.96													
		71.99													
		72.00													
72.83		71.33	8.56	63.52	62.02	69.57	68.79	69.53	69.86	69.58	69.96	69.81	70.00	69.65	
72.84		71.33	4.57	67.51	66.01	69.05	69.11	69.51	69.53	68.97	69.60	69.31	69.44	69.17	
72.74		71.33	2.58	69.5	68	69.04	69.13	69.50	69.67	68.92	69.45	69.28	69.39	69.20	
69.61		68.7	8.38	61.07	59.57	67.69	68.72	68.71	68.73	69.07	69.10	69.17	69.08	69.14	
70.2		68.7	3.55	65.9	64.4	68.38	68.39	68.41	68.46	68.89	68.98	68.96	68.99	68.96	
70.13		68.7	1.91	67.54	66.04	68.40	68.46	68.46	68.55	68.89	68.98	68.97	68.99	68.98	
70.23										68.31	69.16	69.00	69.16	68.83	
70.87										68.79	69.74	69.40	69.68	69.05	
86.27						78.43	78.66	78.16	78.70	78.43	78.50	78.17	78.37	78.38	
86.33						83.82	83.71	83.65	83.67	83.60	83.61	83.60	83.71	83.56	
86.34						84.26	84.22	84.45	84.73	84.13	84.34	84.23	84.30	84.34	
86.39						84.27	84.21	85.01	84.81	84.18	84.36	84.28	84.31	84.42	
81.38						66.23	66.27	65.72	66.28	73.94	74.05	74.32	74.66	74.54	
81.31						67.97	68.14	67.75	68.11	76.00	76.29	75.99	76.33	76.42	
81.20						69.50	69.70	69.82	69.93	77.37	78.00	77.92	78.10	78.07	
81.25						70.34	70.04	71.01	71.17	77.80	78.65	78.55	78.55	78.99	
70.93	74.53					69.99	70.05	69.65	69.87	70.18	70.19	70.13	70.23	70.15	
70.85	74.47					70.14	70.17	70.17	70.22	70.44	70.51	70.52	70.72	70.63	
70.80	74.52					69.77	69.86	69.82	69.80	70.07	70.14	70.29	70.47	70.62	
70.91	74.46					69.60	69.60	69.67	69.71	70.04	70.12	70.28	70.43	70.54	

ained in November 2005

001257

WELL WATER ELEVATIONS

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	26-Aug-15 Elevation	19-Nov-15 Elevation	19-May-16 Elevation	18-Aug-16 Elevation	10-Nov-16 Elevation	17-May-17 Elevation	28-Aug-17 Elevation	22-Nov-17 Elevation	15-May-18 Elevation	03 El
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
73.67		71.10	25.1	46.75	45.25		70.77	70.88		70.81	71.00		70.98	71.06	
73.50		71.10	18.32	53.53	52.03		70.25	70.53		70.22	70.50		70.78	71.10	
73.64		71.10	12.22	59.63	58.13		69.77	70.37		69.70	70.34		70.31	71.00	
73.67		71.10	g	60.54	59.04		69.67	70.35		69.60	70.33		70.22	70.99	
73.64		71.10	8.06	63.79	62.29		69.18	70.06		69.16	70.78		70.41	71.18	
73.74		71.10	6.47	65.38	63.88		69.07	69.92		69.09	71.07		70.51	71.18	
73.59		71.10	5.13	66.72	65.22		69.07	69.78		69.16	71.03		70.64	71.34	
73.52		71.10	2.8	69.05	67.55		69.06	69.79		69.04	71.07		70.74	71.46	
73.39		70.67	7.6	63.82	62.32		69.57	69.79		69.56	70.11		70.06	70.45	
73.27		70.70	4.6	66.85	65.35		69.75	69.63		69.78	70.22		70.12	70.32	
73.33		70.75	2.6	68.9	67.4		69.72	69.59		69.75	70.23		70.11	70.34	
87.41		86.03	37.1	49.68	48.18		75.90	76.23		75.99	76.73		76.45	76.69	
87.26		86.03	18.22	68.56	67.06		83.23	83.29		83.20	83.30		83.39	83.36	
87.24		86.03	12.11	74.67	73.17		84.22	84.40		84.21	84.44		84.41	84.41	
87.35		86.03	11.11	75.67	74.17		84.74	85.32		84.62	85.54		86.17	85.34	
87.19		86.03	7.19	79.59	78.09		84.76	85.02		84.79	85.27		85.06	85.08	
87.37		86.03	6.38	80.4	78.9		84.97	85.21		85.05	85.56		85.39	85.30	
87.28		86.03	5.05	81.73	80.23		84.99	85.23		85.06	85.63		85.37	85.34	
87.22		86.03	2.93	83.85	82.35		85.08	85.23		85.13	85.53		85.47	85.34	
		86.96													
		71.99													
		72.00													
72.83		71.33	8.56	63.52	62.02		69.59	70.09		69.50	70.25		70.09	70.55	
72.84		71.33	4.57	67.51	66.01		69.02	69.37		68.94	69.80		69.62	69.84	
72.74		71.33	2.58	69.5	68		69.03	69.38		68.94	69.75		69.66	69.80	
69.61		68.7	8.38	61.07	59.57		69.16	69.12		69.02	69.13		69.18	69.15	
70.2		68.7	3.55	65.9	64.4		68.88	68.86		68.88	68.86		68.89	68.85	
70.13		68.7	1.91	67.54	66.04		68.96	68.95		68.96	68.97		68.99	68.94	
70.23							68.63	69.15		68.08	69.24		69.24	69.24	
70.87							69.24	69.69		69.26	69.60		69.83	69.74	
86.27							78.44	78.32		78.25	78.83		78.45	78.75	
86.33							83.56	83.78		83.44	83.78		83.71	83.80	
86.34							84.33	84.33		84.18	84.68		84.51	84.46	
86.39							84.37	84.32		84.23	84.59		84.65	84.41	
81.38							74.74	75.08		74.82	75.55		75.31	75.52	
81.31							76.55	76.82		76.51	76.86		76.96	77.10	
81.20							78.07	78.49		77.90	78.71		78.42	78.76	
81.25							78.81	78.94			79.36		79.21	79.19	
70.93	74.53						70.33	70.49		70.92	70.59		70.64	70.73	
70.65	74.47						70.85	70.85		72.18	71.32		71.49	71.46	
70.80	74.52						70.57	70.65		71.46	70.81		70.80	70.99	
70.91	74.46						70.54	70.57			70.83		70.87	70.75	

ained in November 2005

001259

WELL WATER ELEVATIONS

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	13-Jun-19 Elevation	14-Nov-19 Elevation	13-May-20 Elevation	17-Nov-20 Elevation
m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	71.12	70.95	70.95	70.87
73.50		71.10	18.32	53.53	52.03	71.04	70.63	70.70	70.48
73.64		71.10	12.22	59.63	58.13	70.69	69.95	70.38	69.85
73.67		71.10	g	60.54	59.04	70.63	69.82	70.35	69.73
73.64		71.10	8.06	63.79	62.29	70.19	69.45	70.37	69.35
73.74		71.10	6.47	65.38	63.88	69.92	69.32	70.26	69.21
73.59		71.10	5.13	66.72	65.22	69.95	69.47	70.13	69.30
73.52		71.10	2.8	69.05	67.55	70.04	69.57	70.21	69.38
73.39		70.67	7.6	63.82	62.32	70.09	69.72	70.13	69.85
73.27		70.70	4.6	66.85	65.35	69.86	69.87	69.82	69.68
73.33		70.75	2.6	68.9	67.4	69.84	69.84	69.79	69.65
87.41		86.03	37.1	49.68	48.18	76.74	76.30	76.59	76.16
87.26		86.03	18.22	68.56	67.06	83.29	83.26	83.27	83.21
87.24		86.03	12.11	74.67	73.17	84.39	84.27	84.34	84.21
87.35		86.03	11.11	75.67	74.17	85.33	85.25	85.41	84.63
87.19		86.03	7.19	79.59	78.09	85.04	84.80	85.04	84.74
87.37		86.03	6.38	80.4	78.9	85.23	85.10	85.26	84.99
87.28		86.03	5.05	81.73	80.23	85.28	85.10	85.30	84.94
87.22		86.03	2.93	83.85	82.35	85.34	85.16	85.28	84.96
		86.96							
		71.99							
		72.00							
72.83		71.33	8.56	63.52	62.02	70.21	69.61	70.13	69.61
72.84		71.33	4.57	67.51	66.01	69.41	69.27	69.58	69.14
72.74		71.33	2.58	69.5	68	69.37	69.30	69.57	69.08
69.61		68.7	8.38	61.07	59.57	69.16	68.74	69.12	69.03
70.2		68.7	3.55	65.9	64.4	68.85	68.74	68.82	68.78
70.13		68.7	1.91	67.54	66.04	68.97	68.88	68.92	68.89
70.23						69.10	68.55	69.18	68.32
70.87						69.59	69.07	69.76	68.98
86.27						78.58	78.39	78.66	77.85
86.33						83.79	83.44	83.75	83.49
86.34						84.31	84.18	84.41	84.14
86.39						84.26	84.26	84.39	84.22
81.38						75.54	75.14	75.38	75.02
81.31						77.26	77.07	77.04	76.86
81.20						78.72	78.35	78.71	78.28
81.25						79.04	79.01	79.21	78.83
70.93	74.53					70.81	70.64	70.66	70.55
70.85	74.47					71.32	71.29	71.30	71.26
70.80	74.52					70.90	70.87	70.87	70.92
70.91	74.46					70.77	70.77	70.75	70.66

ained in November 2005

WELL WATER ELEVATIONS

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	23-Jun-95 Elevation	12-Jul-95 Elevation	26-Jul-95 Elevation	9-Aug-95 Elevation	13-Sep-95 Elevation	15-Aug-95 Elevation	18-Aug-95 Elevation	21-Aug-95 Elevation	25-Aug Elevati
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.8	68.576	68.686				68.736		
	69.65	69.232	4.57	64.7	63.95	68.6	68.206	68.366				68.596		
	69.81	69.232	2.33	66.7	66.325	68.52	68.276	68.486				68.536		
	85.67	85.312	2.72	83.34	82.59	83.01	82.57	83.46				83.22		
	69.73	68.477	8.25	60.98	60.23	68.55	68.367	68.437				68.507		
	69.7	68.477	4.52	64.71	63.96	68.46	68.27	68.352				68.432		
	69.83	68.477	2.31	66.55	66.18	68.45	68.41	68.377				68.427		
84.46	84.62	79.32	2.72	77.35	76.6	78.38	79.1	78.99				78.68		
	70.93	68.73	22.30	47.18	46.43	68.96	69.222	69.282				69.232		
84.3		79.32	4.57	75.5	74.75									
84.79	84.4	79.32	8.19	71.88	71.13									
	85.84	85.312	7.09	78.97	78.22									
	85.87	85.312	4.51	81.55	80.8									
	85.08				73.58									
			3.06				69.888		70.988	70.888	70.918	70.988	70.708	70.92
			2.54				70.246		70.946	70.886	70.986	71.016	70.876	71.08
			2.05				70.696		70.856	70.936	71.086	71.116	71.096	71.34
			1.52				DRY		70.758	71.038	71.108	71.118	71.198	71.48
			3.07				69.745		70.925	70.845	70.905	70.985	70.705	70.92
			2.5				70.578		70.828	70.868	71.018	71.068	70.918	71.16
			2.04				70.783		70.753	70.883	71.023	71.073	71.033	71.28
			1.53				DRY		70.599	71.079	71.079	71.109	71.189	71.46
			3.04				69.89		70.84	70.81	70.83	70.92	70.62	70.75
			2.52				70.326		70.826	70.786	70.846	70.956	70.756	70.87
			2.01				70.631		70.351	70.881	71.061	71.081	71.021	71.20
			1.52				DRY		69.974	71.414	71.134	71.124	71.204	71.47
			3.05				69.752		70.822	70.692	70.792	70.852	70.502	70.56
			2.49				70.192		70.562	70.812	70.962	71.012	70.822	70.97
			2.01				70.505		70.305	70.905	71.085	71.105	71.025	71.20
			1.53				DRY		70.058	71.308	71.108	71.108	71.198	71.41
			3.05				69.782		71.042	70.902	70.892	70.912	70.602	71.39
			2.56				70.353		70.863	70.943	71.083	71.143	70.953	71.16
			2.02				70.684		70.724	71.184	71.144	71.164	71.114	71.41
			1.53				DRY		70.66	71.28	71.11	71.12	71.21	71.53
												70.821	70.791	70.68
												70.857	70.837	70.73
	73.85			57.86	55.36									
	74.11			58.48	55.98									
	73.858			58.655	56.155									
	71.645		23.9	47.49	46.73									
	71.605		8.53	62.86	62.1									
	71.635		4.72	66.64	65.88									
	71.815		2.44	68.925	68.16									
	69.87													
	69.79													
	69.79													

Nov. 5. New survey done in Nov. 2011 for top of riser.
uster he November 2015 groundwater elevation
k-up ained in November 2015 compared to the

001263

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	18-Sep-95	29-Sep-95	16-Oct-95	29-Oct-95	11-Nov-95	6-Jun-96	8-Aug-96	4-Sep-96	9-Jun-97
						Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45		68.706			68.756	68.756	68.589	68.636	
	69.65	69.232	4.57	64.7	63.95		68.486			68.576	68.506	68.386	68.316	68.426
	69.81	69.232	2.33	66.7	66.325		68.396			68.536	68.436	68.266	68.096	68.266
	85.67	85.312	2.72	83.34	82.59		82.76			84.24	82.79	82.56	82.56	82.76
	69.73	68.477	8.25	60.98	60.23		68.407			68.507	68.447	68.327	68.297	
	69.7	68.477	4.52	64.71	63.96		68.082			68.382	68.312	68.052	67.752	68.232
	69.83	68.477	2.31	66.55	66.18		68.067			68.427	68.387	68.027	67.727	68.217
84.46	84.62	79.32	2.72	77.35	76.6		78.46			77.81	78.79	78.48	78.26	78.4
	70.93	68.73	22.30	47.18	46.43		69.182			69.292	69.182	69.282	69.282	
84.3		79.32	4.57	75.5	74.75									
84.79	84.4	79.32	8.19	71.88	71.13									
	85.84	85.312	7.09	78.97	78.22									
	85.87	85.312	4.51	81.55	80.8									
	85.08				73.58									
			3.06			71.398	71.488	71.448	71.428					
			2.64			71.376	71.446	71.456	71.356					
			2.05			71.366	71.476	71.426	70.966					
			1.52			71.358	71.468	71.458	70.258					
			3.07			71.425	71.465	71.445	71.345					
			2.5			71.358	71.458	71.428	71.158					
			2.04			71.373	71.463	71.433	70.983					
			1.53			71.319	71.439	71.419	70.089					
			3.04			71.51	71.49	71.46	71.43					
			2.52			71.476	71.496	71.466	71.426					
			2.01			71.361	71.461	71.441	71.021					
			1.52			71.354	71.444	70.434	70.214					
			3.05			71.452	71.482	71.462	71.422					
			2.49			71.342	71.402	71.342	71.212					
			2.01			71.335	71.405	71.405	70.925					
			1.53			71.348	71.448	71.428	70.188					
			3.05			71.502	71.522	71.472	71.462					
			2.56			71.403	71.403	71.483	71.153					
			2.02			71.394	71.404	71.474	70.244					
			1.53			71.37	71.38	71.47	2.54					
						70.631	70.911	71.021	71.061				69.911	
						70.687	70.957	71.127	71.107				70.147	
	73.85			57.86	55.36									
	74.11			58.48	55.98									
	73.858			58.655	56.155									
	71.645		23.9	47.49	46.73									
	71.605		8.53	62.86	62.1									
	71.635		4.72	66.64	65.88									
	71.815		2.44	68.925	68.16									
	69.87													
	69.79													
	69.79													

Nov. ›. New survey done in Nov. 2011 for top of riser.
ustec he November 2015 groundwater elevation
k-up ained in November 2015 compared to the

001265

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	14-Aug-98 Elevation	3-May-99 Elevation	11-Oct-99 Elevation	2-May-00 Elevation	18-Oct-00 Elevation	8-Jun-01 Elevation	3-Oct-01 Elevation	17-May-02 Elevation	30-Oct-02 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45				68.794	68.806	68.76	68.51	68.78	68.386
	69.65	69.232	4.57	64.7	63.95	68.326	68.586	68.526	68.546	68.566	68.55	68.29	68.56	68.186
	69.81	69.232	2.33	66.7	66.325		68.516	68.456	68.456	68.476	68.48	68.28	68.51	68.146
	85.67	85.312	2.72	83.34	82.59	82.6	82.7	82.88	82.83	82.68	82.68	82.43	82.19	81.98
	69.73	68.477	8.25	60.98	60.23				68.527	68.507	68.49	68.07	68.54	68.047
	69.7	68.477	4.52	64.71	63.96	67.982	68.422	68.402	68.422	68.402	68.43	67.99	68.51	67.972
	69.83	68.477	2.31	66.55	66.18	67.917	68.417	68.377	68.337	68.297	68.32	67.92	68.37	67.897
84.46	84.62	79.32	2.72	77.35	76.6	78.2	78.77	78.85	79.09	78.71	78.92	78.45	79.13	78.42
	70.93	68.73	22.30	47.18	46.43	69.282	69.182		69.362	69.432	69.48	69.38	69.48	69.482
84.3		79.32	4.57	75.5	74.75		79.09	78.78	79.32	79.01	78.07	78.42	79.09	78.39
84.79	84.4	79.32	8.19	71.88	71.13		80.33	78.34	79.41	79.02	77.87	78.02	78.9	77.91
	85.84	85.312	7.09	78.97	78.22		81.75	81.58	81.44	81.43	81.39	81.24	81.51	81.31
	85.87	85.312	4.51	81.55	80.8		82.49	82.22	82.1	82.01	82.03	81.94	82.16	81.95
	85.08				73.58									
			3.06			69.838								
			2.54			70.006								
			2.05			70.516								
			1.52			71.188								
			3.07			69.965								
			2.5			70.438								
			2.04			71.413								
			1.53			71.139								
			3.04			69.72								
			2.52			70.426								
			2.01			71.011								
			1.52			71.224								
			3.05			69.932								
			2.49			70.242								
			2.01			70.746								
			1.53			71.228								
			3.05			69.452								
			2.56			70.173								
			2.02			70.654								
			1.53			71.36								
						70.941								
						70.877								
	73.85			57.86	55.36									
	74.11			58.48	55.98									
	73.858			58.655	56.155									
	71.645		23.9	47.49	46.73									
	71.605		8.53	62.86	62.1									
	71.635		4.72	66.64	65.88									
	71.815		2.44	68.925	68.16									
	69.87													
	69.79													
	69.79													

Nov. 5. New survey done in Nov. 2011 for top of riser.
uste he November 2015 groundwater elevation
ck-u ained in November 2015 compared to the

001267

WELL WATER ELEVATIONS

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	5-Nov-03 Elevation	8-May-04 Elevation	5-Nov-04 Elevation	29-May-05 Elevation	16-Nov-05 Elevation	25-May-06 Elevation	14-Nov-06 Elevation	7-May-07 Elevation	19-Nov- Elevatio
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.71	68.84	68.76	68.776	68.456	68.826	68.896	68.82	68.826
	69.65	69.232	4.57	64.7	63.95	68.49	68.59	68.52	68.566	68.436	68.556	68.579	68.61	67.416
	69.81	69.232	2.33	66.7	66.325	68.47	68.46	68.44	68.41	68.32	69.126	68.351	68.31	68.226
	85.67	85.312	2.72	83.34	82.59	82.60	82.59	82.34	82.51	82.47	83.41	82.665	82.55	82.44
	69.73	68.477	8.25	60.98	60.23	68.37	68.53	68.48	68.567	68.277	68.587	68.632	68.60	68.337
	69.7	68.477	4.52	64.71	63.96	68.41	68.44	68.40	68.432	68.412	68.482	68.507	68.44	68.282
	69.83	68.477	2.31	66.55	66.18	68.41	68.43	68.40	68.43	68.3	68.297	68.36	68.27	68.127
84.46	84.62	79.32	2.72	77.35	76.6	79.15	79.12	79.15	79.06	79.04	79.17	79.178	79.12	78.8
	70.93	68.73	22.30	47.18	46.43	69.98	69.98	70.00	70.527	69.887	68.732	68.769	68.68	68.762
84.3		79.32	4.57	75.5	74.75	79.14	79.08	79.12	79.01	79.01	79.09	79.16	79.08	78.78
84.79	84.4	79.32	8.19	71.88	71.13	78.93	78.88	78.96	78.84	78.79	78.98	79.005	78.90	76.99
	85.84	85.312	7.09	78.97	78.22	81.48	81.44	81.46	81.47	81.49	81.68	81.784	81.73	81.57
	85.87	85.312	4.61	81.55	80.8	81.99	82.07	82.03	82.11	82.09	82.27	82.255	82.19	81.98
	85.08				73.58									
			3.06											
			2.54											
			2.05											
			1.52											
			3.07											
			2.5											
			2.04											
			1.53											
			3.04											
			2.52											
			2.01											
			1.52											
			3.05											
			2.49											
			2.01											
			1.53											
			3.05											
			2.56											
			2.02											
			1.53											
	73.85			57.86	55.36						69.27	69.43	68.82	68.60
	74.11			58.48	55.98						69.58	69.52	68.99	68.80
	73.858			58.655	56.155						69.48	69.56	68.87	68.78
	71.645		23.9	47.49	46.73									69.87
	71.605		8.53	62.86	62.1									69.33
	71.635		4.72	66.64	65.88									69.23
	71.815		2.44	68.925	68.16									69.23
	69.87													
	69.79													
	69.79													

Nov. 5. New survey done in Nov. 2011 for top of riser.
uste the November 2015 groundwater elevation
ck-up ained in November 2015 compared to the

001269

WELL WATER ELEVATIONS

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	11-May-09 Elevation	18-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	16-May-11 Elevation	22-Nov-11 Elevation	23-May-12 Elevation	20-Nov-12 Elevation	21-May Elevati
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.83	frozen	68.86	68.85	68.85	68.83	68.81	68.82	68.79
	69.65	69.232	4.57	64.7	63.95	68.67	68.57	68.57	68.59	68.64	68.81	68.87	68.82	68.83
	69.81	69.232	2.33	66.7	66.325	68.39	68.32	68.31	68.55	68.43	68.79	68.84	68.81	68.79
	85.67	85.312	2.72	83.34	82.59	81.53	82.43	82.44	81.53	82.72	82.61			
	69.73	68.477	8.25	60.98	60.23	68.57	68.40	68.61	68.62	68.69	68.97	68.99	69.01	68.94
	69.7	68.477	4.52	64.71	63.96	68.49	68.38	68.43	68.47	68.66	68.84	68.92	68.88	68.88
	69.83	68.477	2.31	66.55	66.18	68.33	68.31	68.25	68.29	68.44	68.89	68.96	68.93	68.92
84.46	84.62	79.32	2.72	77.35	76.6	79.16	79.80	79.74	79.66	79.86	79.72	80.07	79.88	80.32
	70.93	68.73	22.30	47.18	46.43	68.82	68.67		68.30	68.39		69.81	69.84	69.79
84.3		79.32	4.57	75.5	74.75	79.14	79.92	79.53	79.54	79.93	79.63	79.98	79.79	80.20
84.79	84.4	79.32	8.19	71.88	71.13	78.88	80.02	80.24	80.24	80.44				
	85.84	85.312	7.09	78.97	78.22	81.65	81.67	81.65	81.71	81.69	81.90			
	85.87	85.312	4.51	81.55	80.8	82.12	81.98	82.08	82.21	82.10	82.26			
	85.08				73.58						79.99	80.32	80.10	80.52
			3.06											
			2.54											
			2.05											
			1.52											
			3.07											
			2.5											
			2.04											
			1.53											
			3.04											
			2.52											
			2.01											
			1.52											
			3.05											
			2.49											
			2.01											
			1.53											
			3.05											
			2.56											
			2.02											
			1.53											
	73.85			57.86	55.36	68.83	68.39	68.51	68.90	69.09	68.99	69.54	69.35	69.48
	74.11			58.48	55.98	69.17	68.58	68.79	69.08	69.43	68.94	69.77	69.27	69.67
	73.858			58.655	56.155	69.06	68.60	68.91	69.08	69.19	69.83	69.72	69.63	69.61
	71.645		23.9	47.49	46.73	69.92	69.85	69.93	69.56	69.80	69.81	69.92	69.85	69.95
	71.605		8.53	62.86	62.1	69.54	69.50	69.61	69.57	69.48	69.98	69.86	69.89	69.82
	71.635		4.72	66.64	65.88	69.47	69.41	69.25	69.66	69.53	70.04	69.80	69.85	69.73
	71.815		2.44	68.925	68.16	69.45	69.39	69.24	69.70	69.52	70.18	69.93	69.98	69.87
	69.87							69.51	69.41	69.41		69.43	69.32	69.47
	69.79							68.65	68.77	68.77		68.65	68.74	68.60
	69.79							68.56	68.58	68.58		68.61	68.59	68.73
								69.20	69.25	69.25				

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5. New survey done in Nov. 2011 for top of riser.
he November 2016 groundwater elevation
ained in November 2015 compared to the

001271

WELL WATER ELEVATIONS

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	27-Aug-14 Elevation	12-Nov-14 Elevation	26-May-15 Elevation	26-Aug-15 Elevation	19-Nov-15 Elevation	19-May-16 Elevation	18-Aug-16 Elevation	16-Nov-16 Elevation	17-Ma Eleva
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45		68.84	68.81		68.74	68.79		68.41	68.
	69.65	69.232	4.57	64.7	63.95		68.83	68.73		68.74	68.76		68.71	68.
	69.81	69.232	2.33	66.7	66.325		68.82	68.80		68.78	68.74		68.73	68.
	85.67	85.312	2.72	83.34	82.59									
	69.73	68.477	8.25	60.98	60.23		69.04	68.99		69.01	69.00		68.95	69.
	69.7	68.477	4.52	64.71	63.96		68.92	68.89		68.90	68.88		68.86	68.
	69.83	68.477	2.31	66.55	66.18		69.00	68.94		68.97	68.91		68.90	68.
84.46	84.62	79.32	2.72	77.35	76.6		80.04	80.18		79.97	80.48		79.98	80.
	70.93	68.73	22.30	47.18	46.43		69.89	69.91		69.88	69.96		69.89	69.
84.3		79.32	4.57	75.5	74.75		79.92	80.06		79.85	80.34		79.86	80.
84.79	84.4	79.32	8.19	71.88	71.13									
	85.84	85.312	7.09	78.97	78.22									
	85.87	85.312	4.51	81.55	80.8									
	85.08				73.58		80.24	80.33		80.09	80.61		80.10	81.
			3.06											
			2.54											
			2.05											
			1.52											
			3.07											
			2.5											
			2.04											
			1.53											
			3.04											
			2.52											
			2.01											
			1.52											
			3.05											
			2.49											
			2.01											
			1.53											
			3.05											
			2.56											
			2.02											
			1.53											
	73.85			57.86	55.36		69.33	69.38		69.11	69.46		69.03	70.
	74.11			58.48	55.98		69.38	69.63		69.05	69.78		69.07	71.
	73.858			58.655	56.156		69.92	69.73		69.74	69.62		69.78	70.
	71.645		23.9	47.49	46.73		70.02	70.03		70.01	70.19		70.11	70.
	71.605		8.53	62.86	62.1		70.18	69.85		69.87	69.94		70.44	70.
	71.635		4.72	66.64	65.88		70.09	69.81		69.85	69.73		69.85	69.
	71.815		2.44	68.925	68.16		70.22	69.94		69.98	69.87		69.98	69.
	69.87					69.45	69.47	69.45	69.43	69.73	69.60	69.53	69.62	69.
	69.79					68.76	68.80	68.81	68.71	68.81	68.84	68.52	68.80	68.
	69.79					68.60	68.63	68.62	68.56	68.61	68.61	68.59	68.62	68.
						69.25	70.80		69.17			69.13		

Nov.). New survey done in Nov. 2011 for top of riser.
uste he November 2015 groundwater elevation
ck-up ained in November 2015 compared to the

001273

WELL WATER ELEVATIONS

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	15-May-18 Elevation	3-Aug-18 Elevation	22-Nov-18 Elevation	13-Jun-19 Elevation	14-Nov-19 Elevation	13-May-20 Elevation	17-Nov-20 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.87		68.88	68.83	68.73	68.67	68.71
	69.65	69.232	4.57	64.7	63.95	68.79		68.74	68.76	68.76	68.93	68.73
	69.81	69.232	2.33	66.7	66.325	68.77		68.73	68.76	68.72	68.77	68.72
	85.67	85.312	2.72	83.34	82.59							
	69.73	68.477	8.25	60.98	60.23	69.03		69.09	69.02	68.95	69.02	68.93
	69.7	68.477	4.52	64.71	63.96	68.86		68.88	68.84	68.79	68.83	68.81
	69.83	68.477	2.31	66.55	66.18	68.94		68.96	68.94	68.87	68.90	68.90
84.46	84.62	79.32	2.72	77.35	76.6	80.76		79.97	80.76	80.08	80.47	80.00
	70.93	68.73	22.30	47.18	46.43	70.11		frozen	70.11	Frozen	Frozen	Frozen
84.3		79.32	4.57	75.5	74.75	80.62		79.83	80.63	79.94	80.34	79.89
84.79	84.4	79.32	8.19	71.88	71.13							
	85.84	85.312	7.09	78.97	78.22							
	85.87	85.312	4.51	81.55	80.8							
	85.08				73.58	80.87		80.10	80.83	80.18	80.58	80.15
			3.06									
			2.54									
			2.05									
			1.52									
			3.07									
			2.5									
			2.04									
			1.53									
			3.04									
			2.52									
			2.01									
			1.52									
			3.05									
			2.49									
			2.01									
			1.53									
			3.05									
			2.56									
			2.02									
			1.53									
	73.85			57.86	55.36	70.36		69.67	69.53	69.45	69.69	69.18
	74.11			58.48	55.98	71.32		70.21	69.88	69.43	70.05	69.26
	73.858			58.655	56.155	70.35		70.13	69.86	69.86	69.82	69.67
	71.645		23.9	47.49	46.73	70.39		70.30	70.46	70.29	70.29	70.21
	71.605		8.53	62.86	62.1	70.23		70.12	70.16	70.09	70.12	70.05
	71.635		4.72	66.64	65.88	69.83		69.81	69.91	69.90	69.91	69.88
	71.815		2.44	68.925	68.16	69.96		69.94	70.04	70.03	70.04	70.02
	69.87					69.70	69.69	frozen	artesian	frozen	69.67	69.58
	69.79					68.90	68.76	70.20	68.88	68.74	68.86	68.83
	69.79					68.63	68.47	70.20	68.62	68.58	68.61	68.62
						69.28	69.18	70.20	Not monitored	69.22	Not monitored	Not monitored

Nov. i. New survey done in Nov. 2011 for top of riser.
uste he November 2015 groundwater elevation
k-up ained in November 2015 compared to the

001275

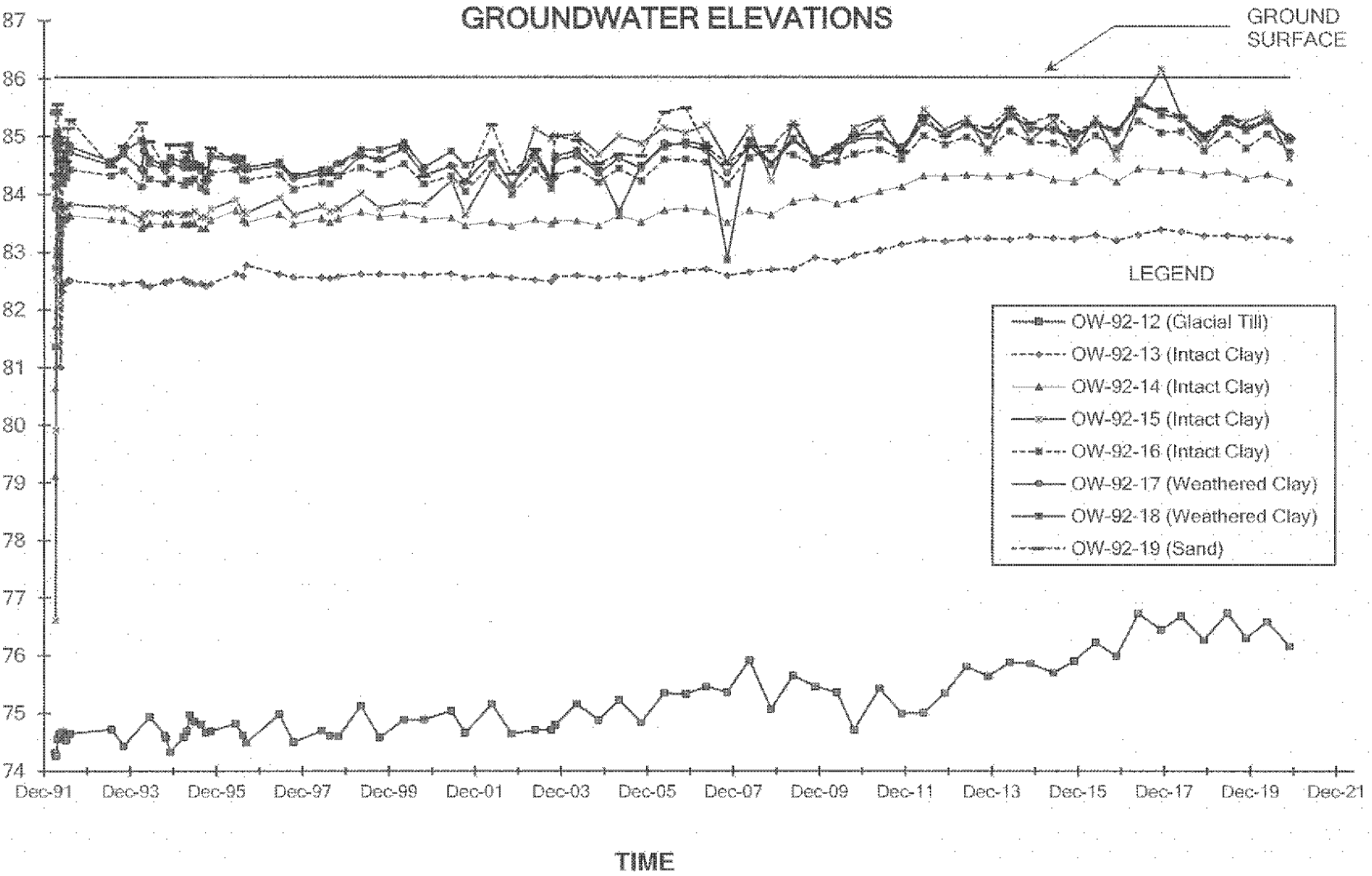

FIGURE C1

Project No. 20412275
Prepared by: ETB
Checked by: RPM March 2021

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-12 TO OW-92-19

GOLDER

001277

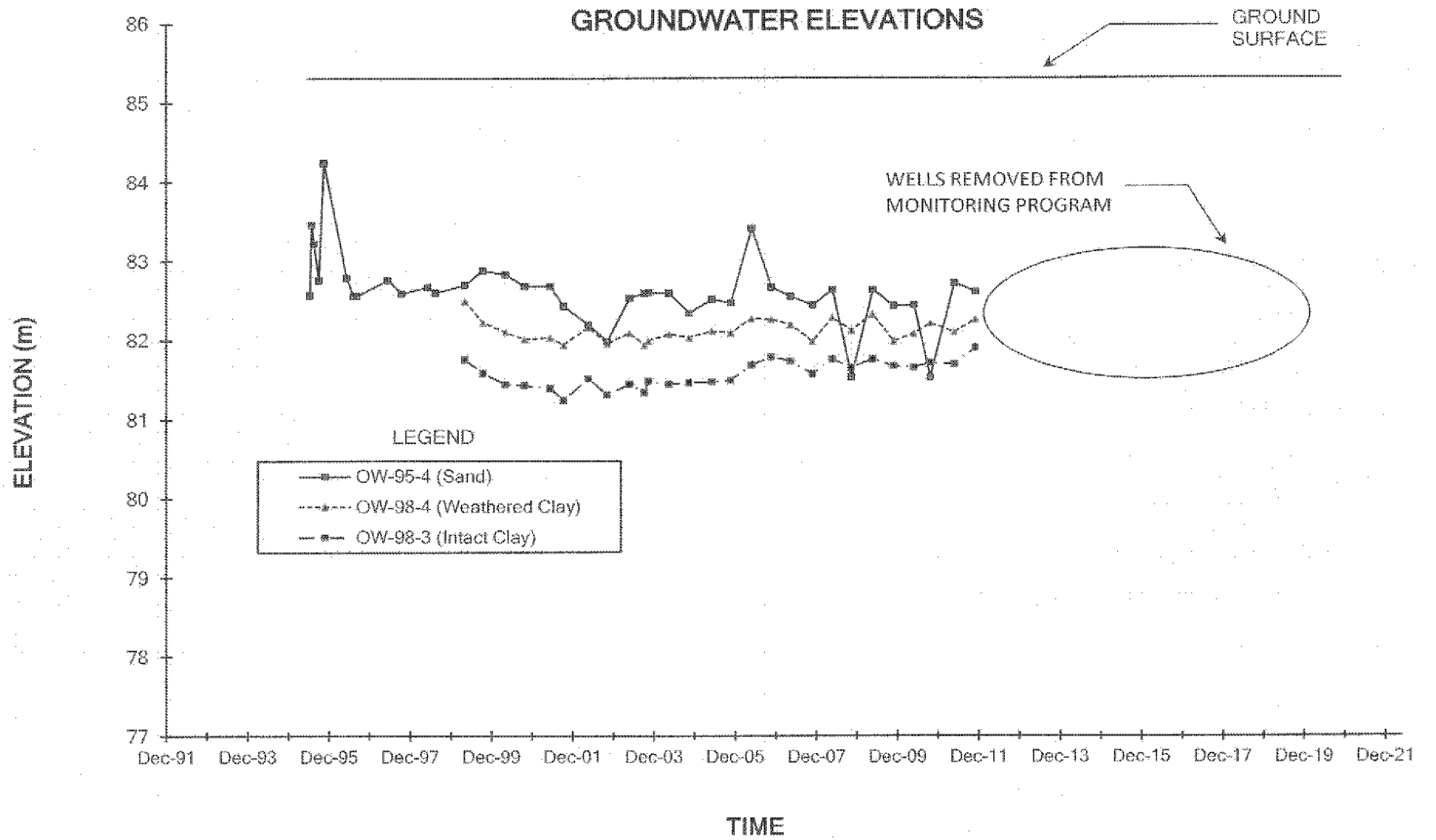

FIGURE C2

Project No. 20412275
Prepared by: ETB
Checked by: RPM March 2021

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-4 & OW-98-3 & 4

GOLDER

001278

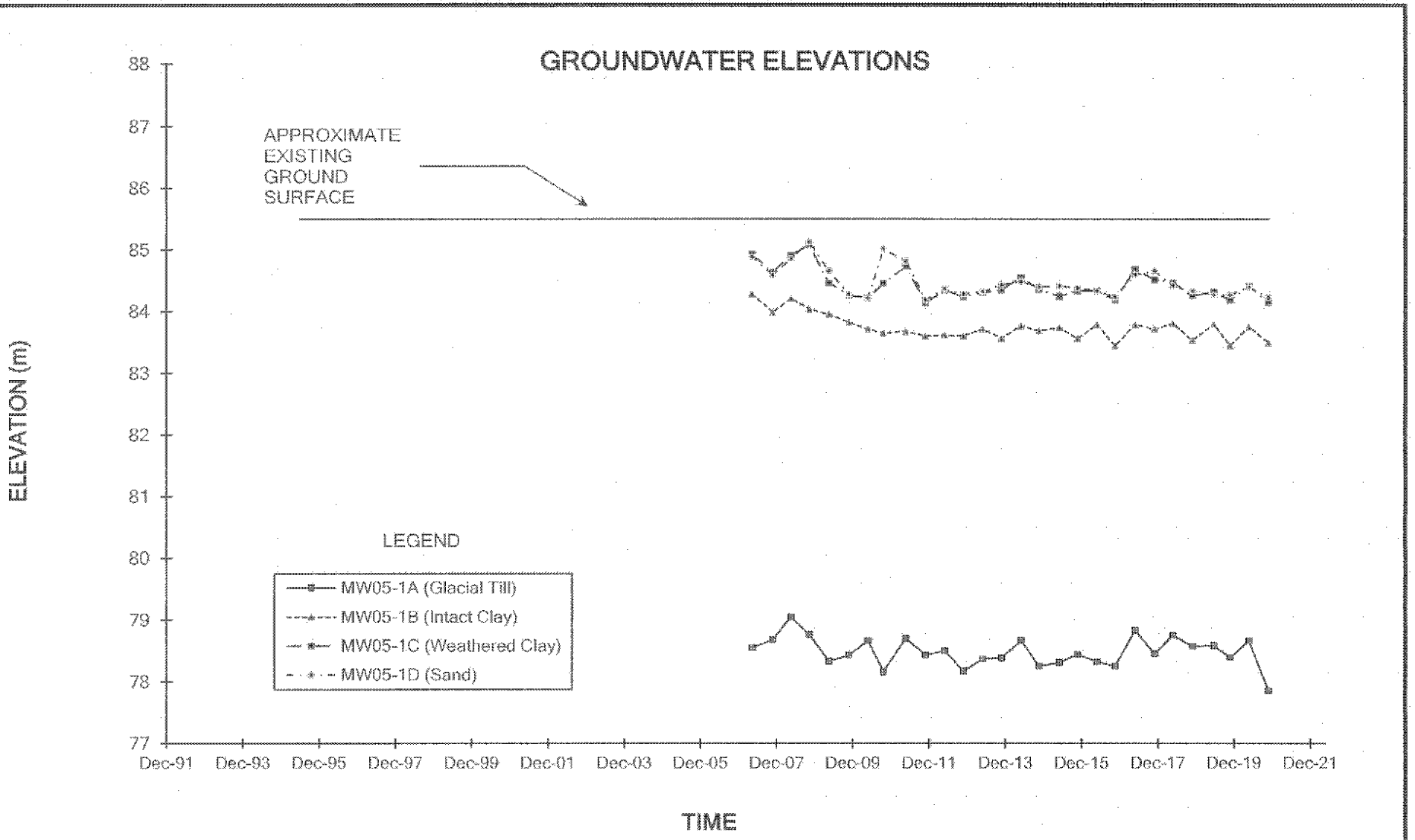

FIGURE C3

Project No. 20412275
Prepared by: ETB
Checked by: RPM March 2021

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS MW05-1A to MW05-1D

GOLDER

001279

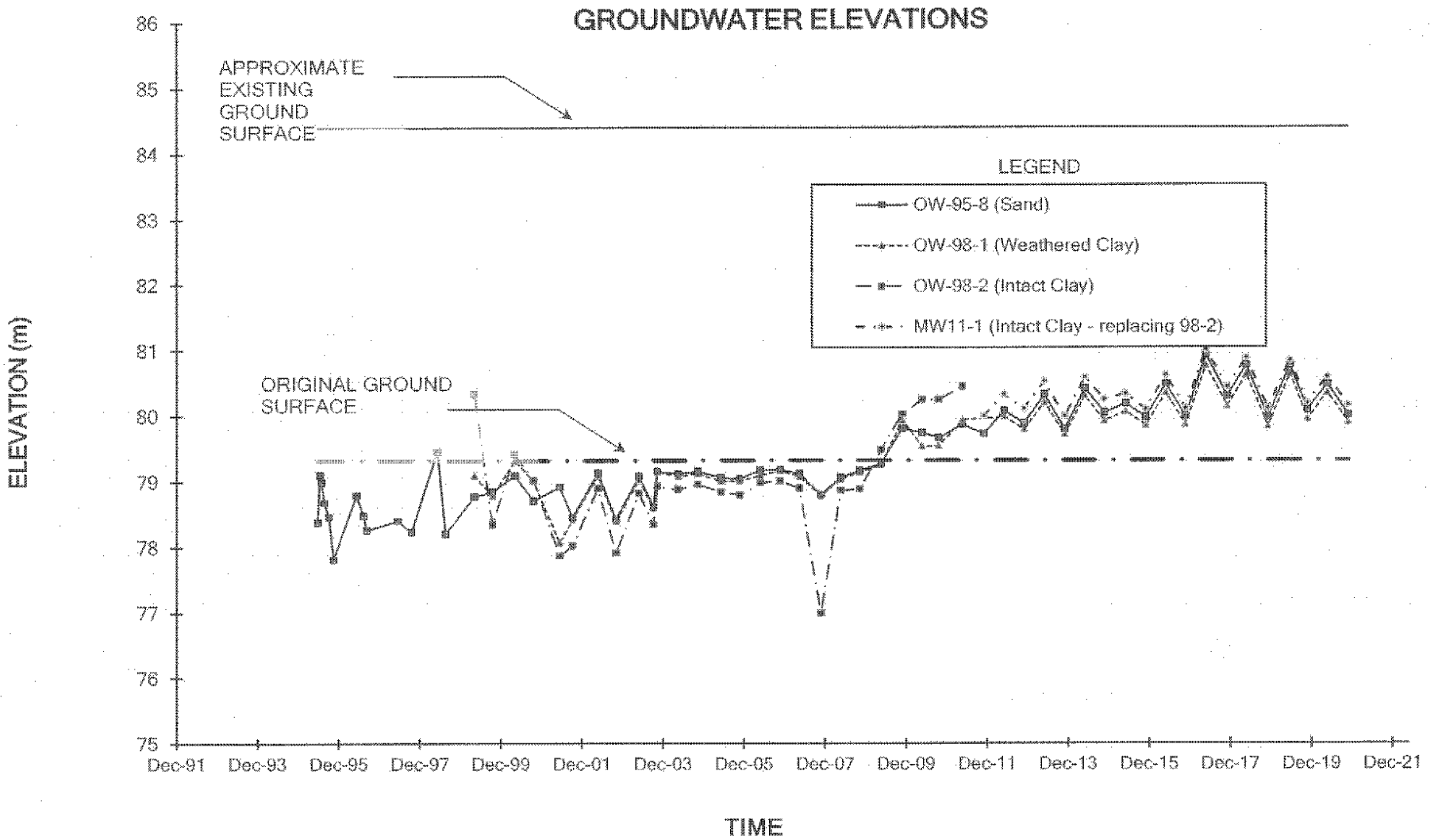

FIGURE C4

Project No. 20412275
Prepared by: ETB
Checked by: RPM March 2021

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-8, OW-98-1-2 & MW11-1

GOLDER

001280

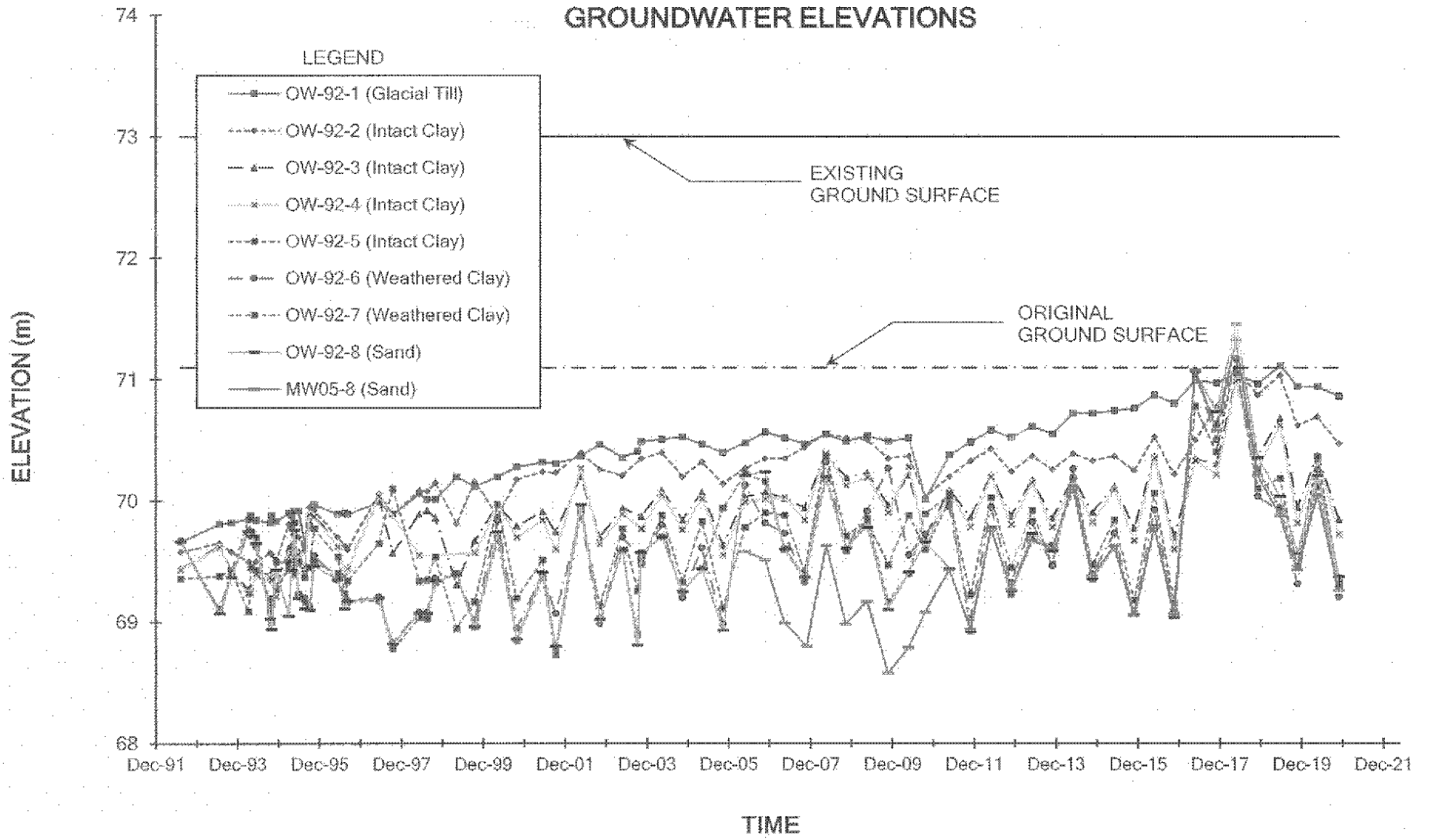

FIGURE C5

Project No. 20412275
Prepared by: ETB
Checked by: RPM March 2021

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-1 TO 92-8 & MW05-8

GOLDER

001281

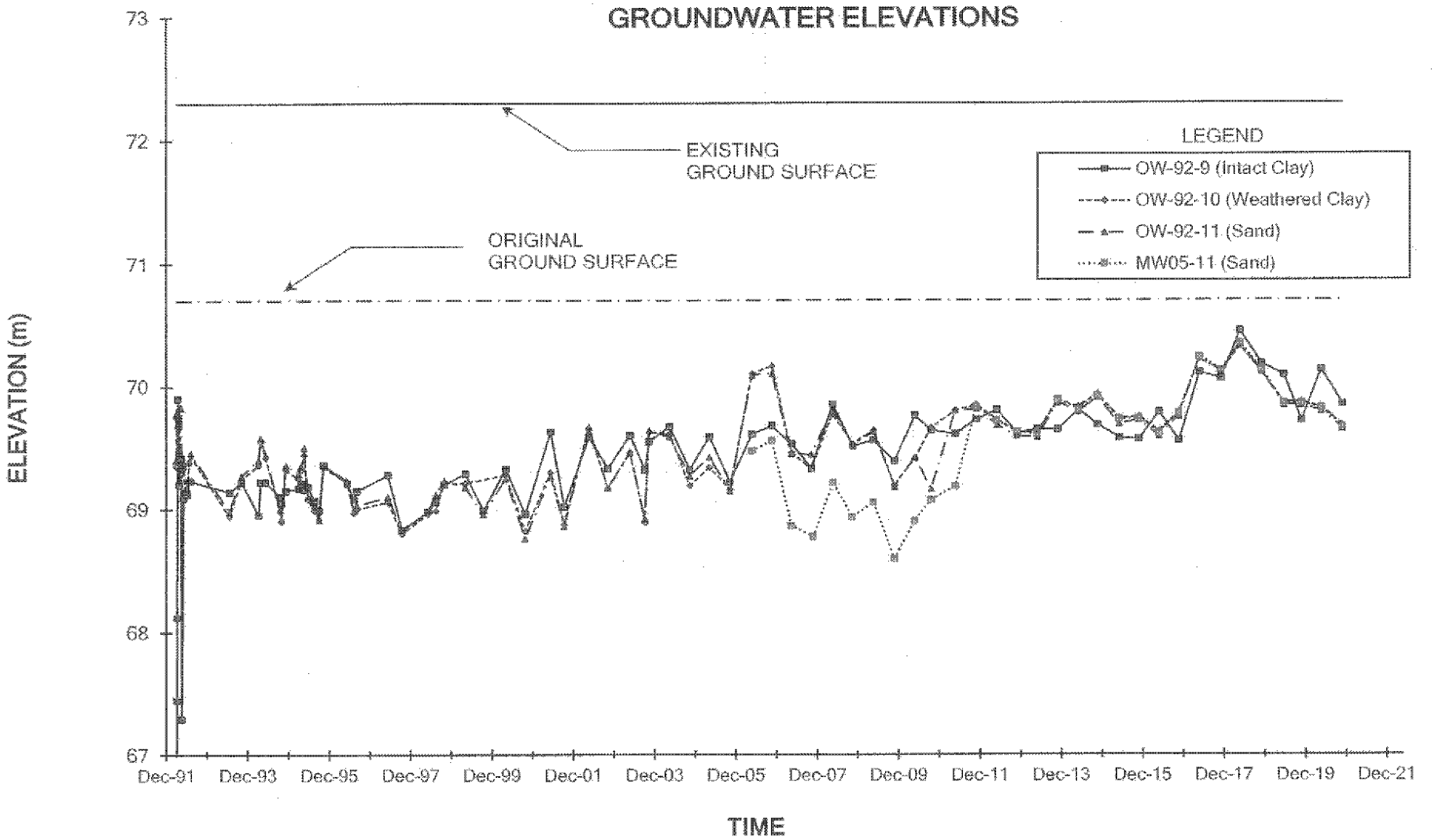

FIGURE C6

Project No. 20412275
Prepared by: ETB
Checked by: RPM March 2021

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-9 TO 92-11 & MW05-11

GOLDER

001282

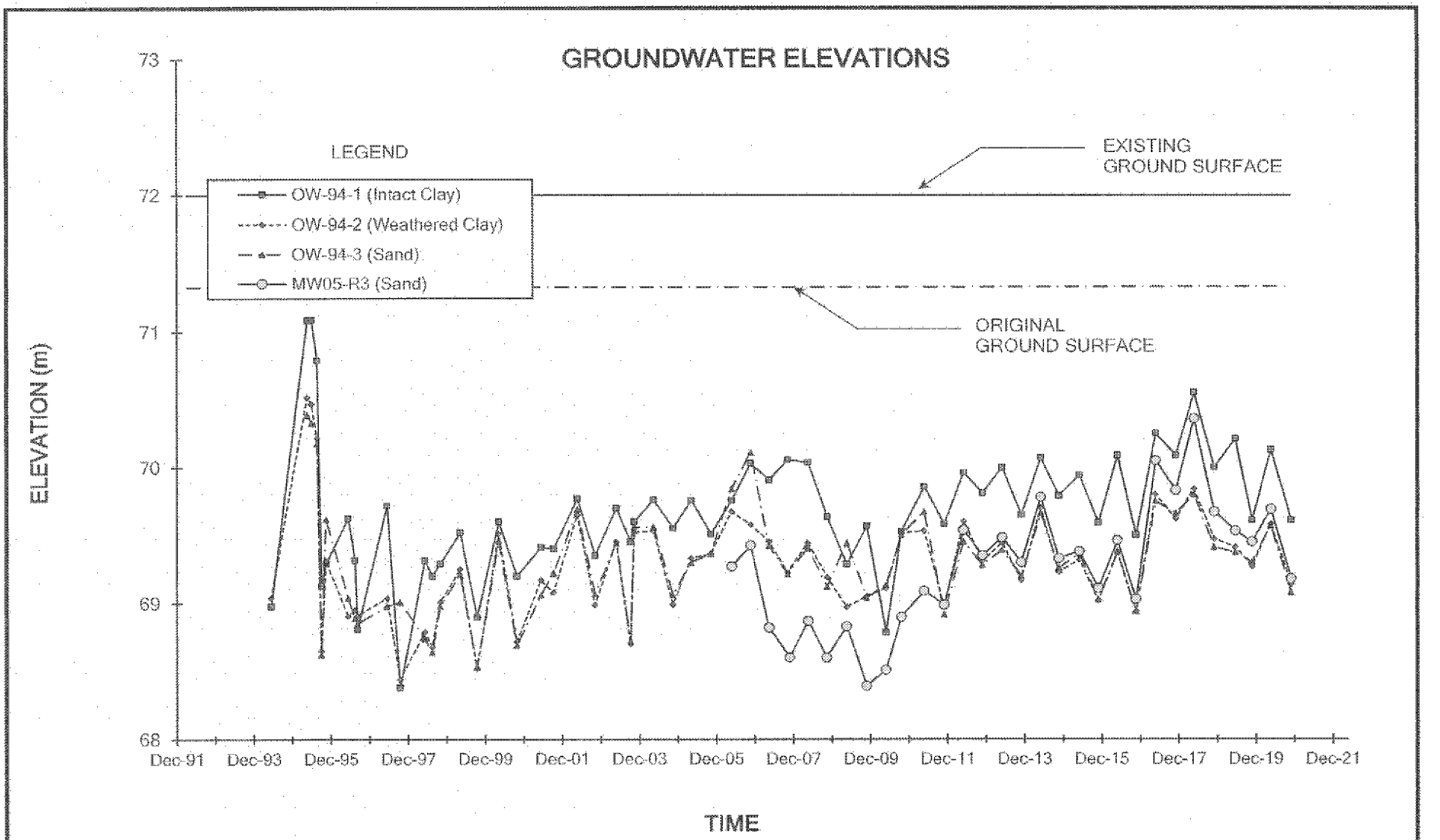

FIGURE C7

Project No. 20412275
Prepared by: ETB
Checked by: RPM March 2021

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-1 TO 94-3 & MW05-R3

GOLDER

001283

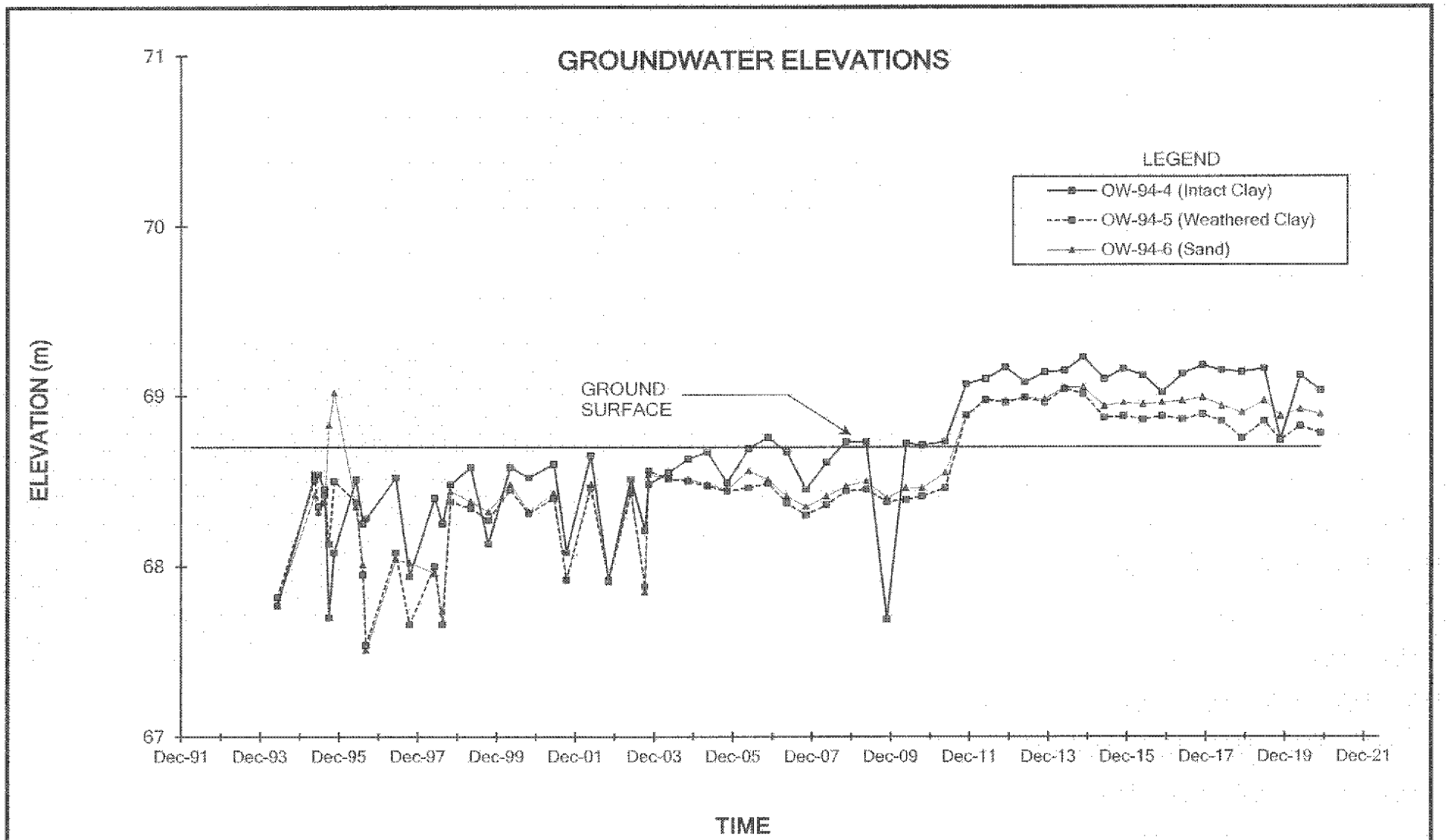

FIGURE C8

Project No. 20412275
Prepared by: ETB
Checked by: RPM March 2021

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-4 TO 94-6

GOLDER

001284

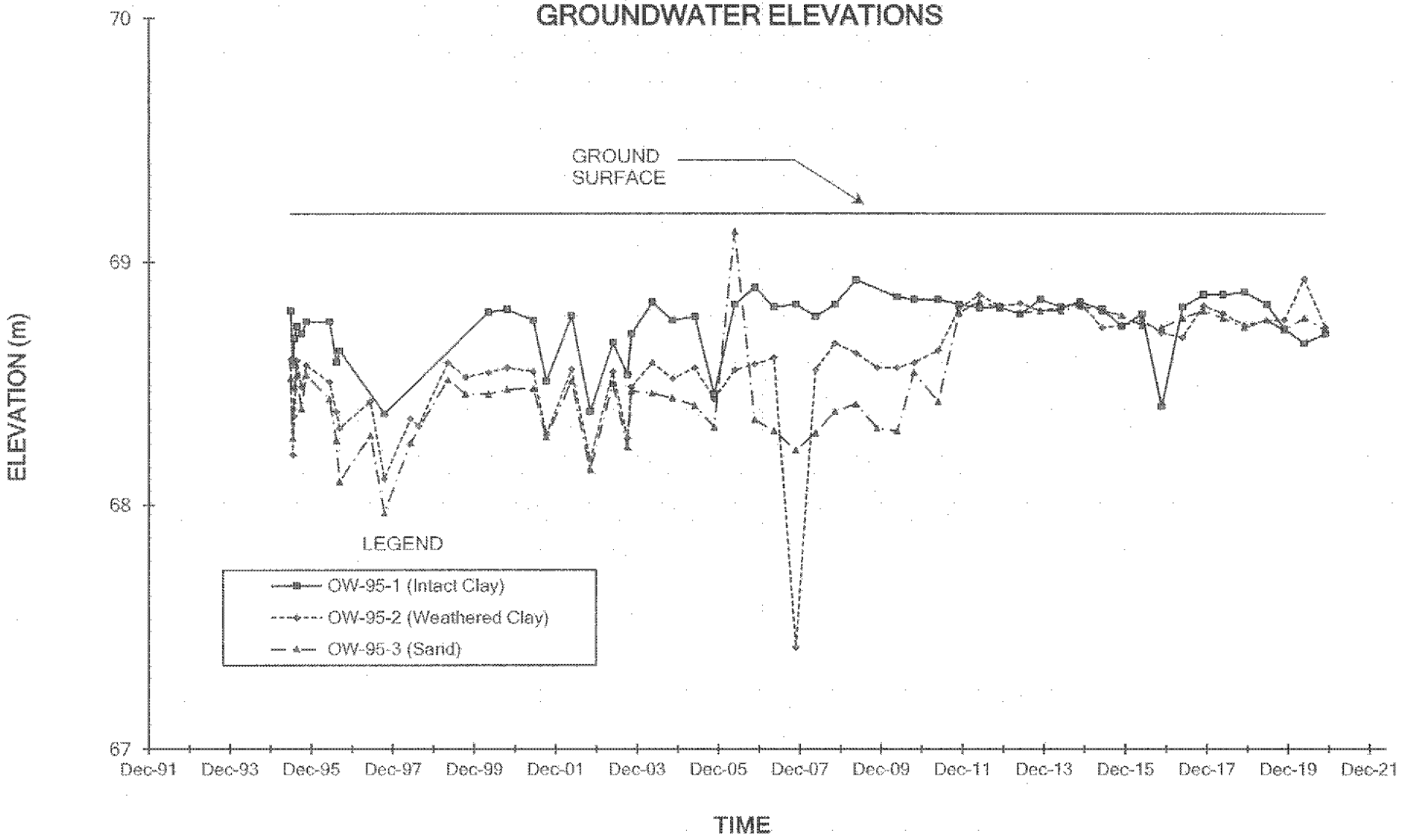

FIGURE C9

Project No. 20412275
Prepared by: ETB
Checked by: RPM March 2021

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-1 TO 95-3

GOLDER

001285

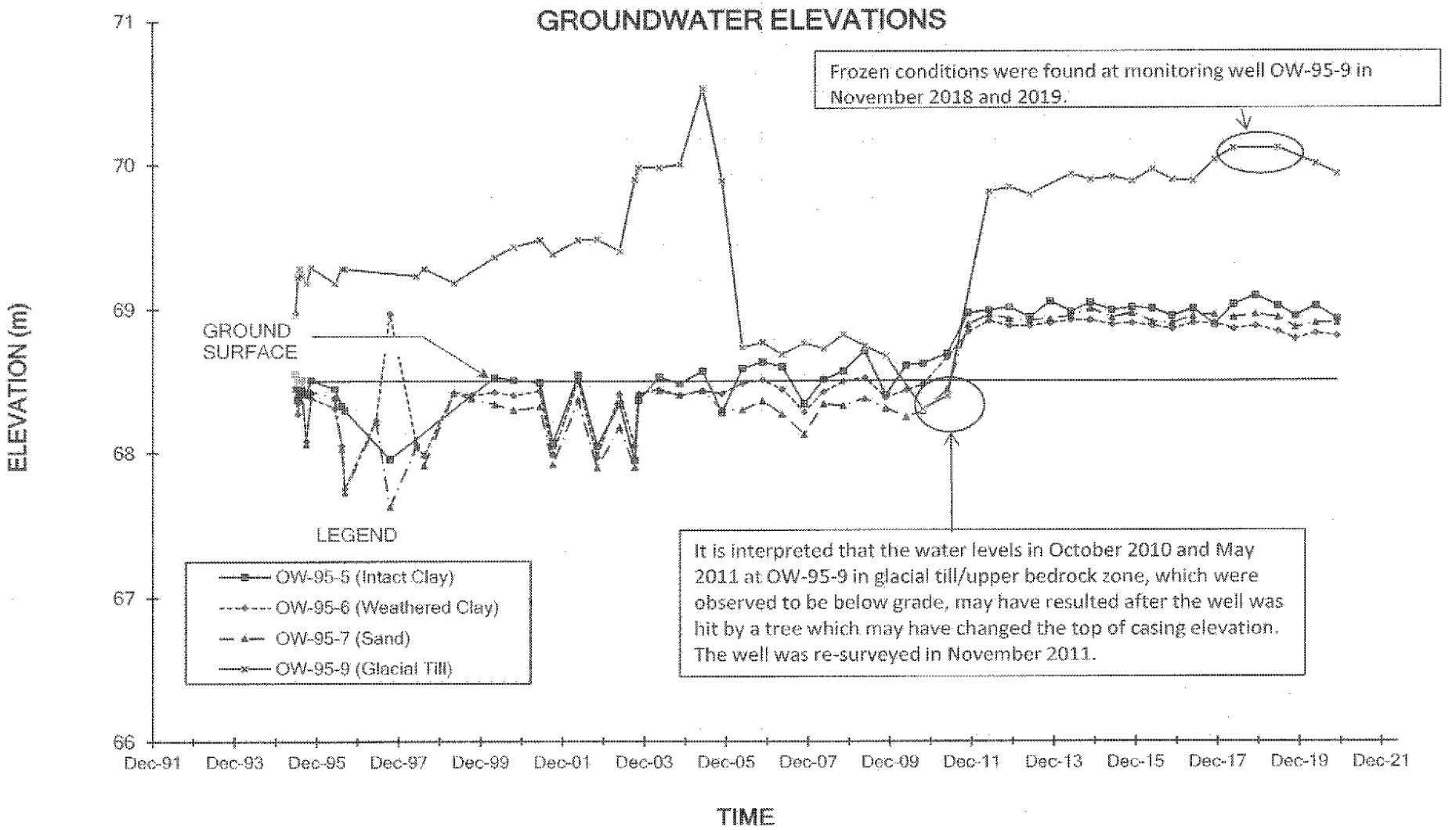

FIGURE C10

Project No. 20412275
Prepared by: ETB
Checked by: RPM March 2021

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-5 TO 95-7 & 95-9

GOLDER

001286

APPENDIX D

Groundwater Results of Field and Laboratory Chemical and Physical Analyses

Appendix D-1 – Up-Gradient Wells

Appendix D-2 – Immediately Down-Gradient Wells

Appendix D-3 – Down-Gradient/Mer Bleue Wells

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX E

Leachate Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX F

Groundwater Leachate Indicator Parameter Concentrations

Appendix F-A – Sand Layer

Appendix F-B – Weathered Clay Deposit

Appendix F-C – Intact Clay Deposit

Appendix F-D – Glacial Till/Upper Bedrock Zone

APPENDIX F-A

Sand Layer

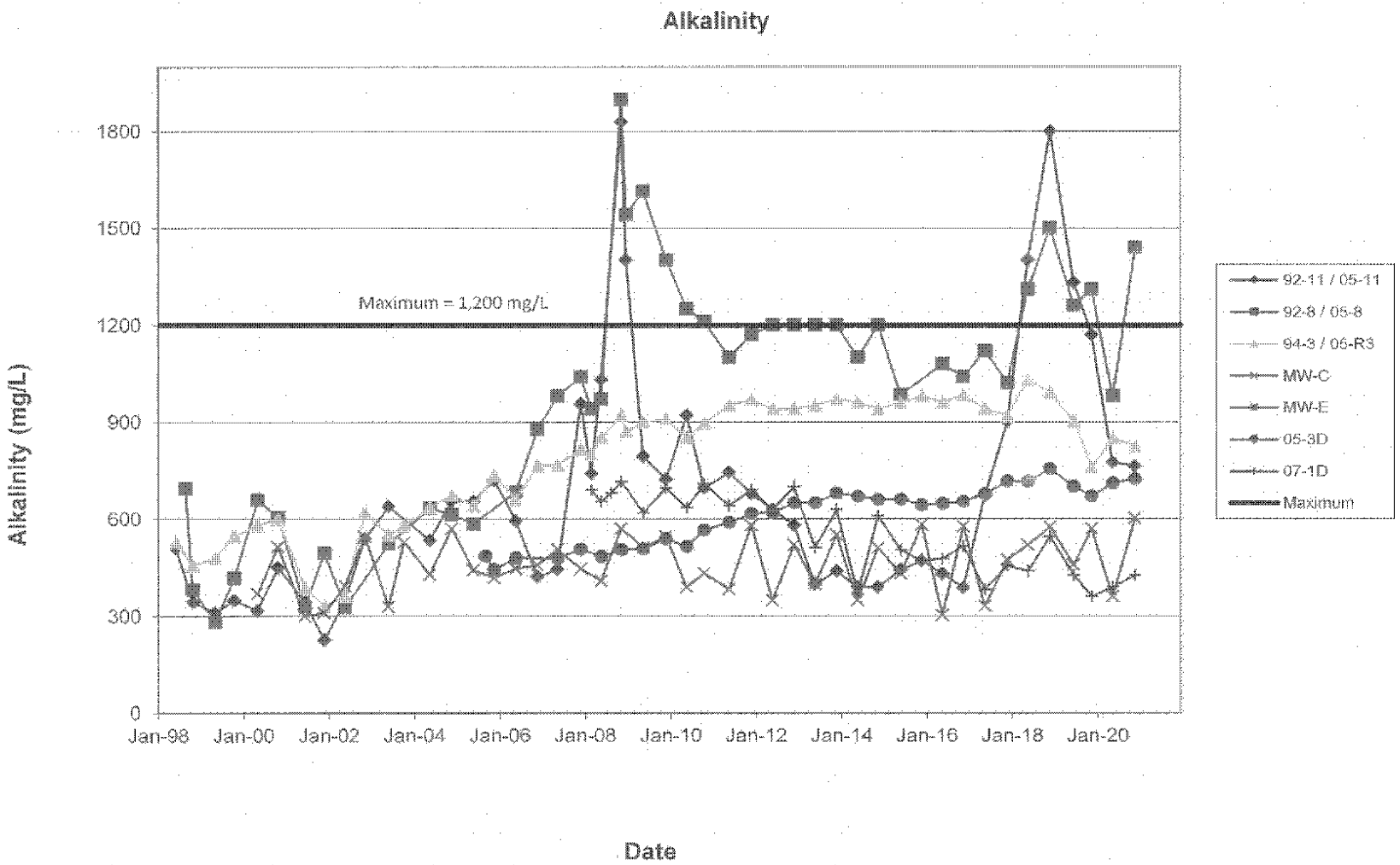

FIGURE FA1

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

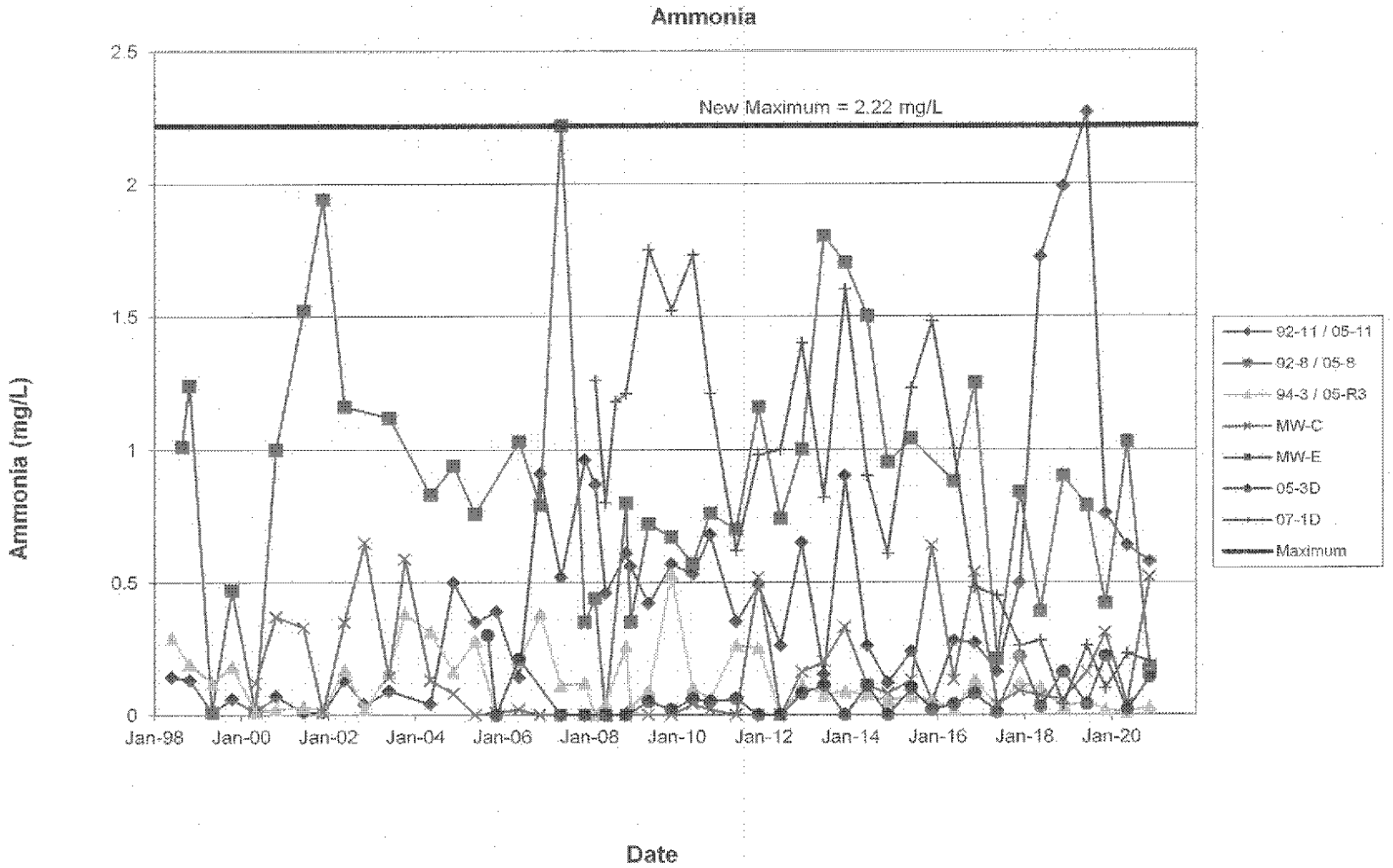

FIGURE FA2

Project No. 20412275

Prepared by: ETB

Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

001300

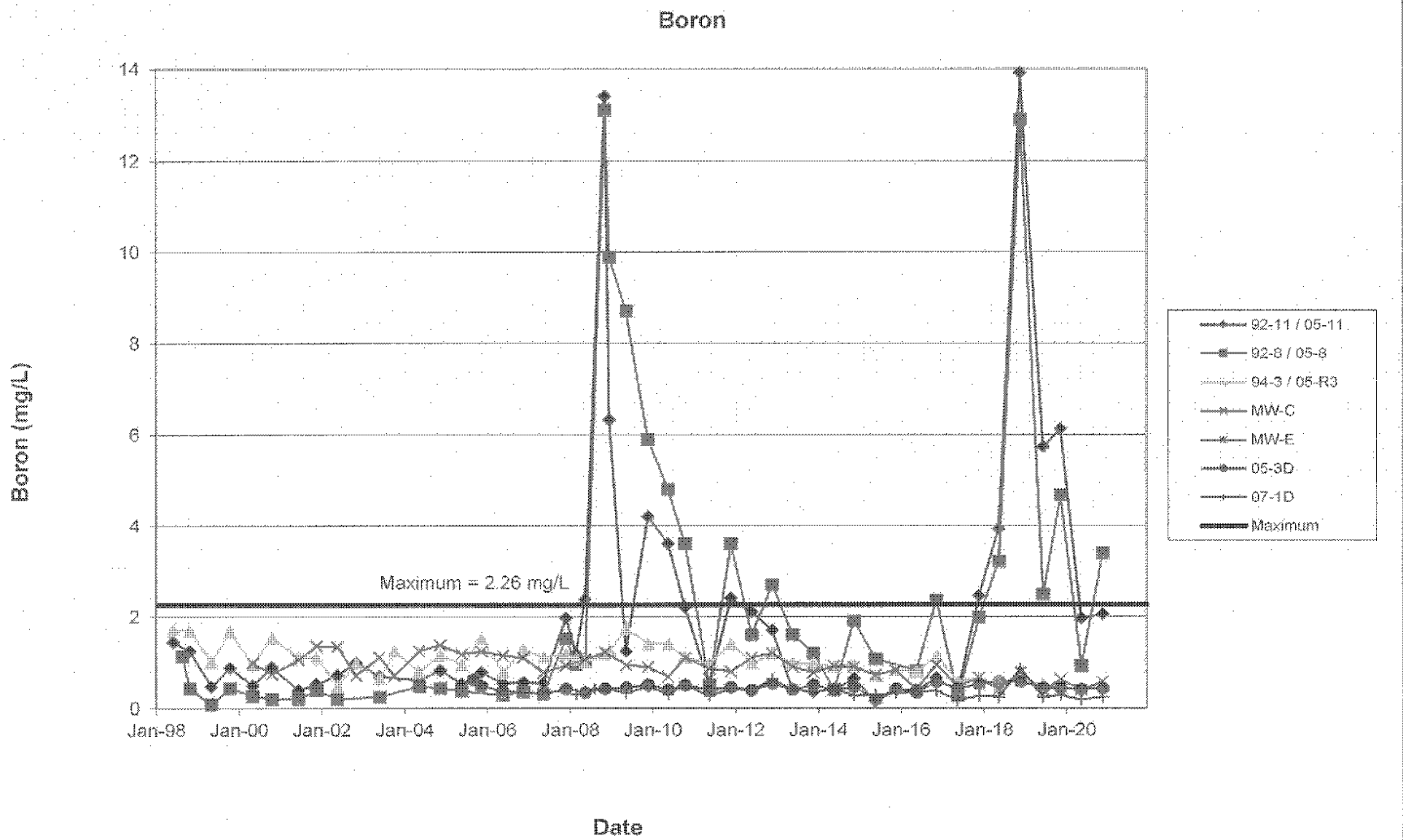

FIGURE FA3

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

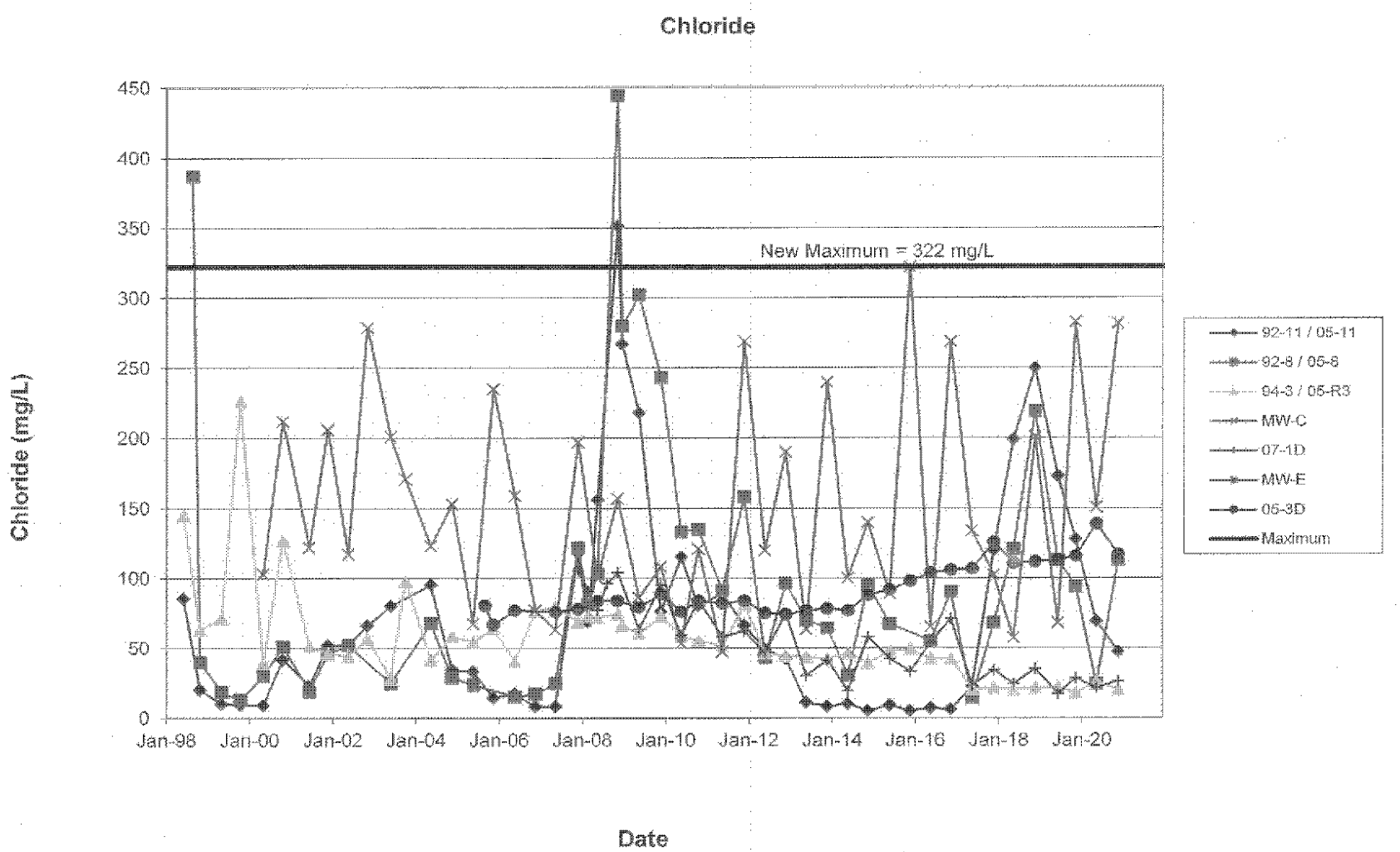

FIGURE FA4

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

001302

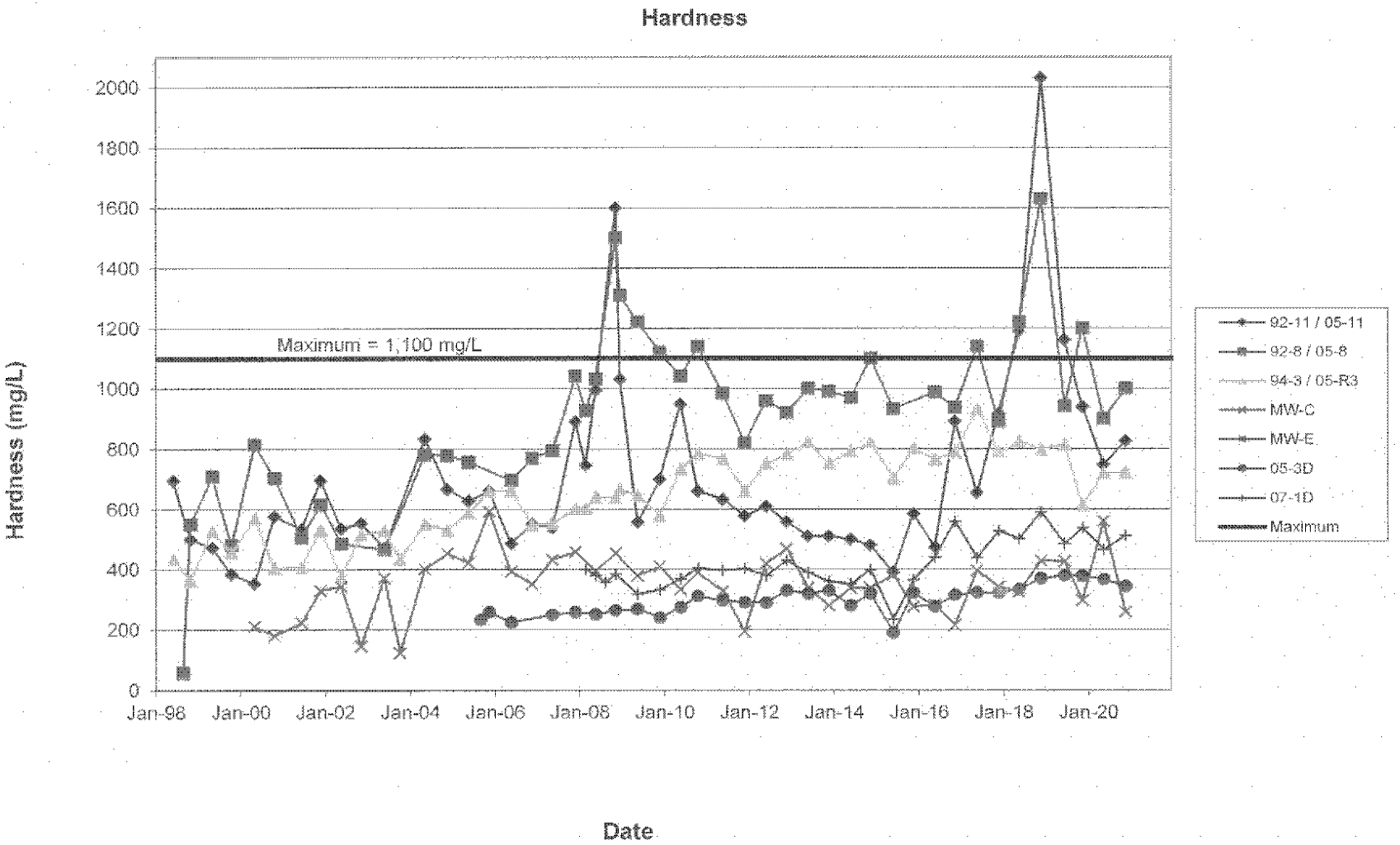

FIGURE FA5

Project No. 20412275

Prepared by: ETB

Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

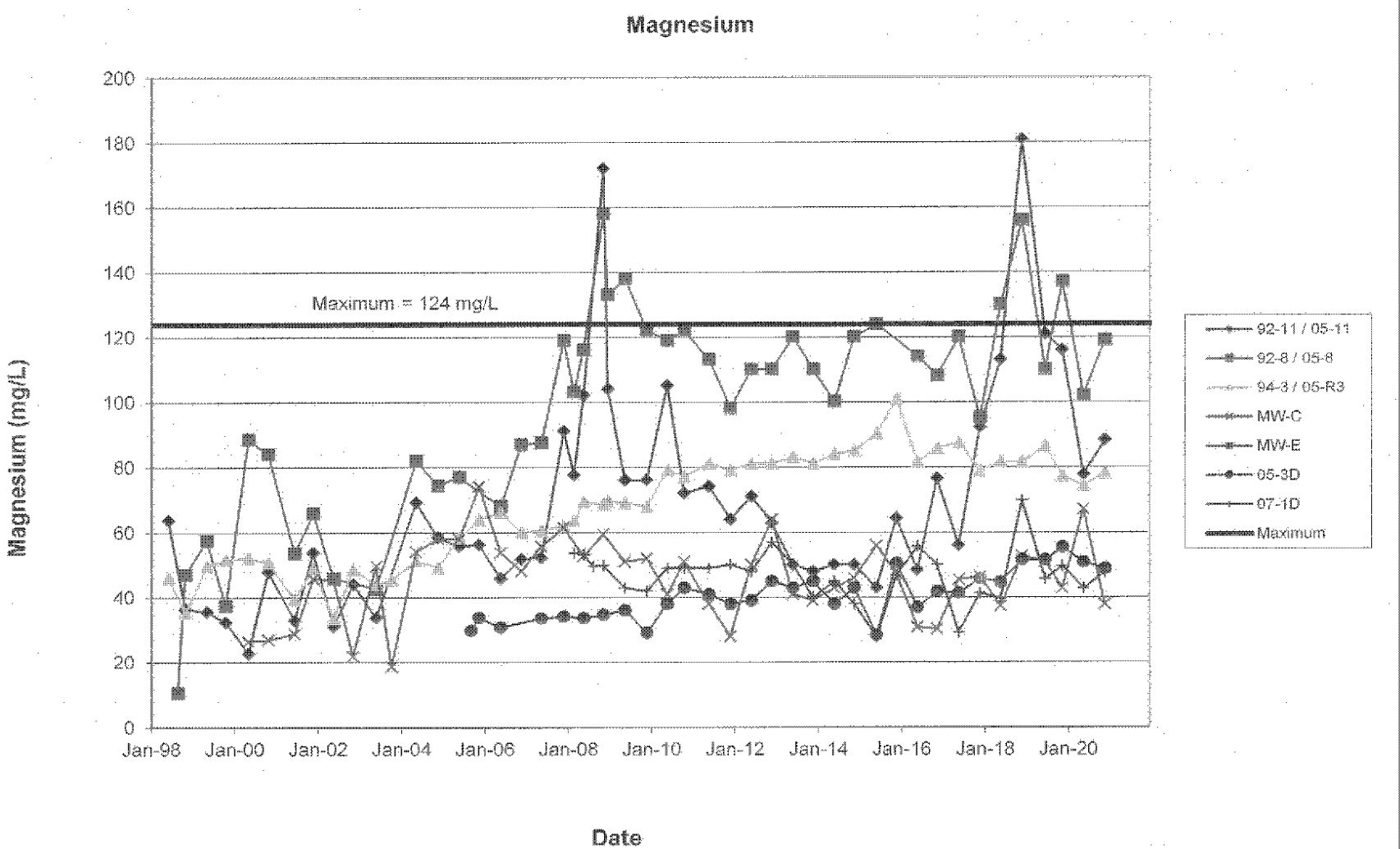

FIGURE FA6

Project No. 20412275
Prepared by: ETB
Checked by: YJM July 2020

WCC NAVAN FACILITY
GROUNDWATER
SAND

GOLDER

001304

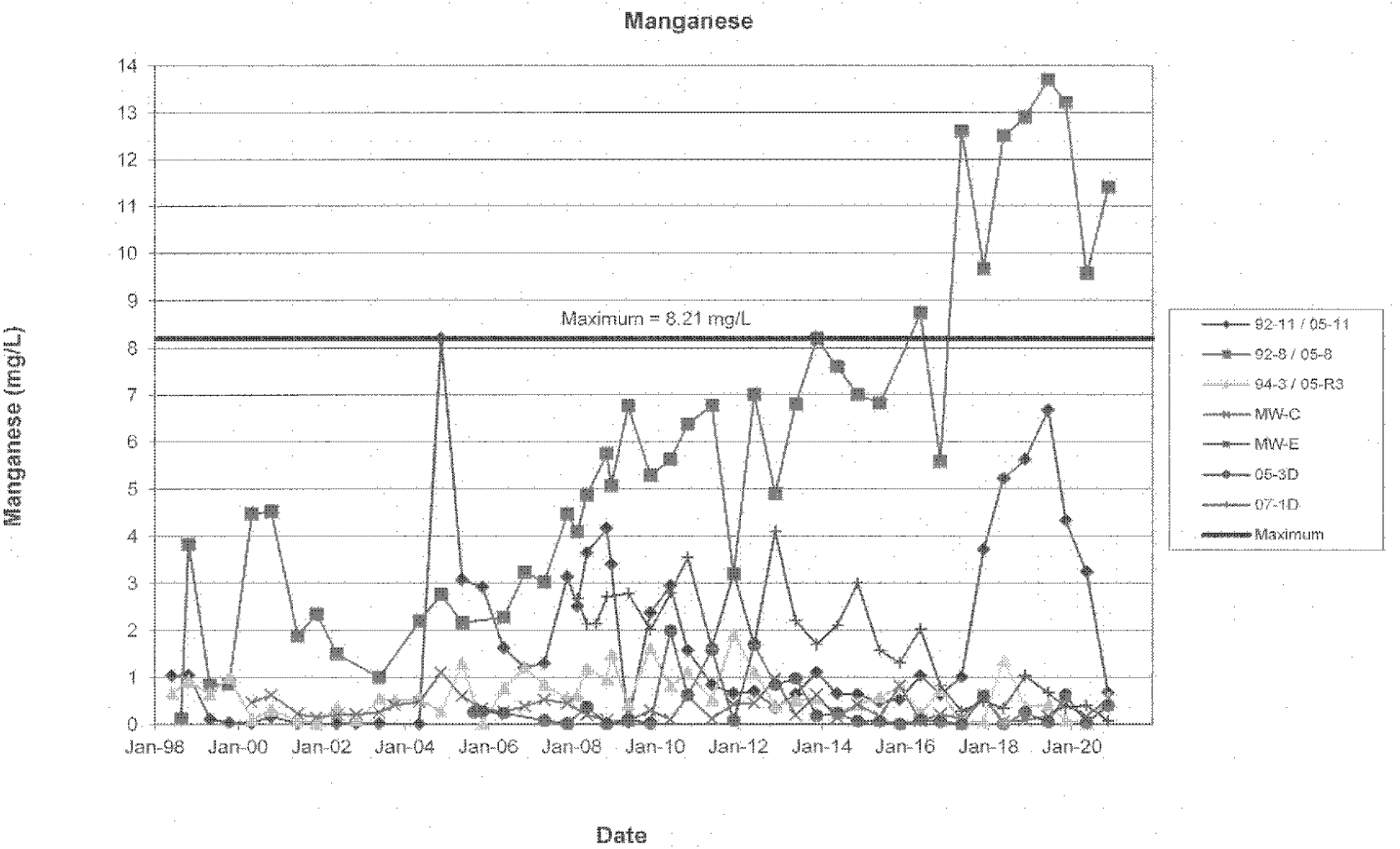

FIGURE FA7

Project No. 20412275

Prepared by: ETB

Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

001305

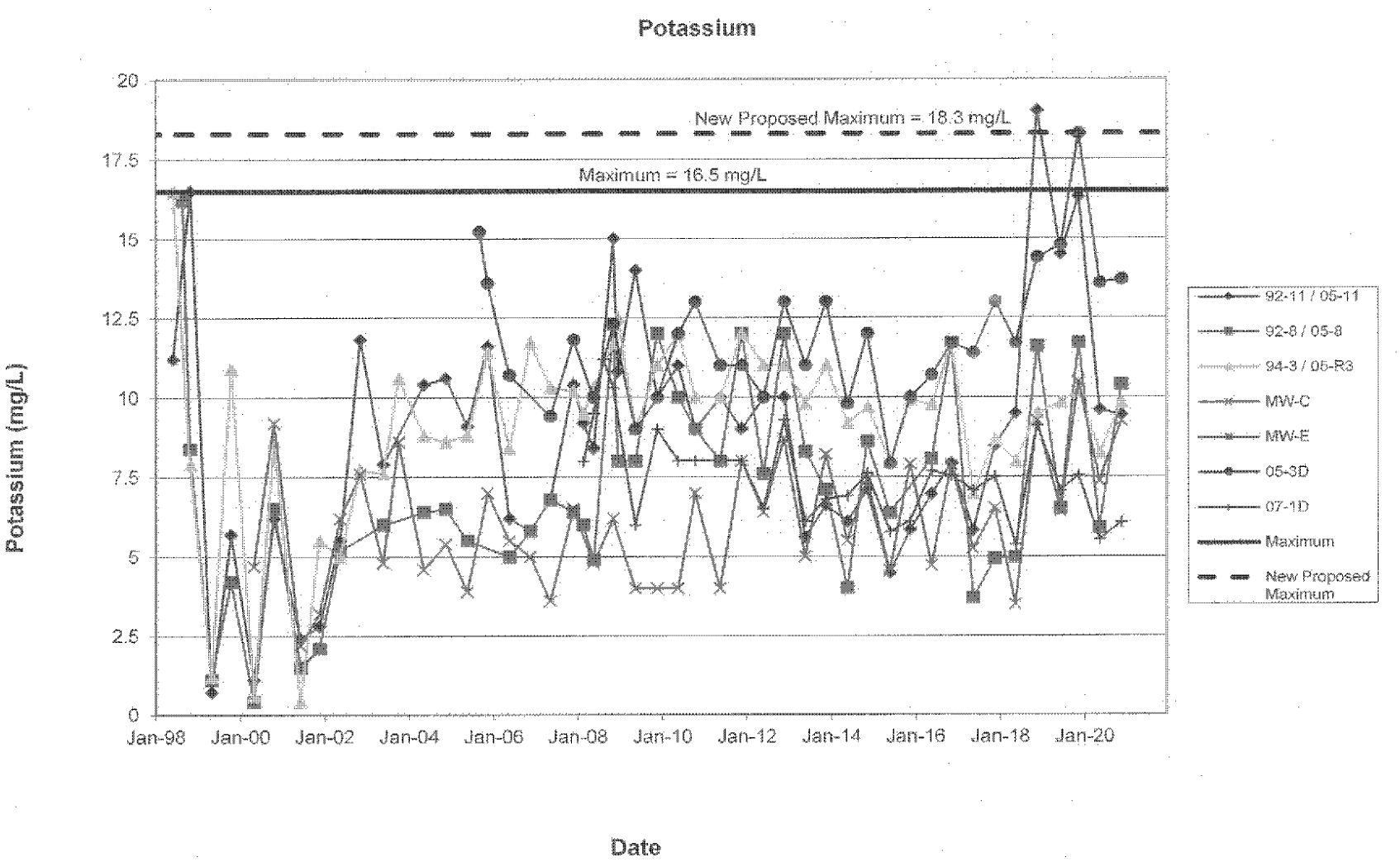

FIGURE FA8

Project No. 20412275

Prepared by: ETB

Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

001306

APPENDIX F-B

Weathered Clay Deposit

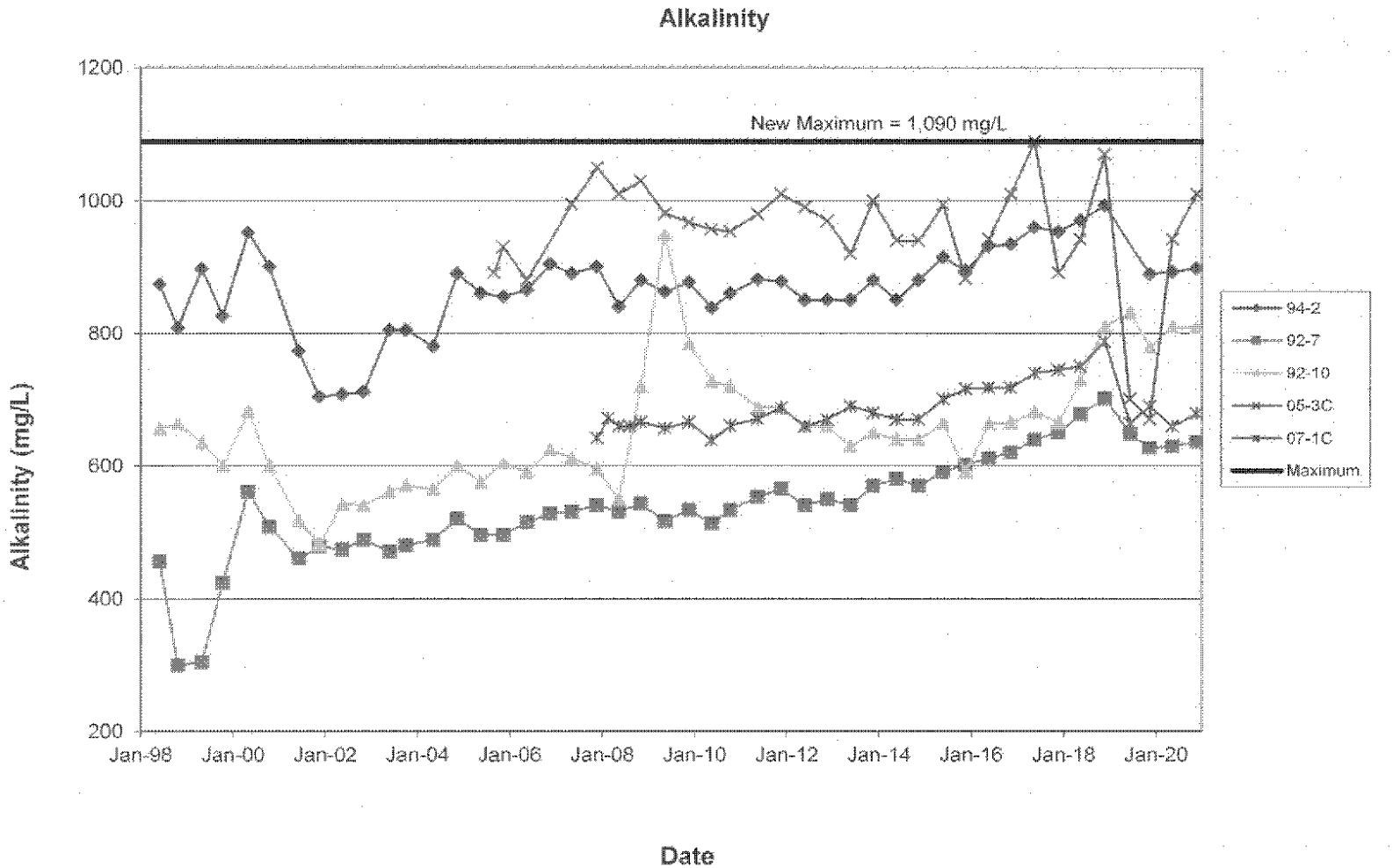

FIGURE FB1

Project No. 20412275

Prepared by: ETB

Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

001309

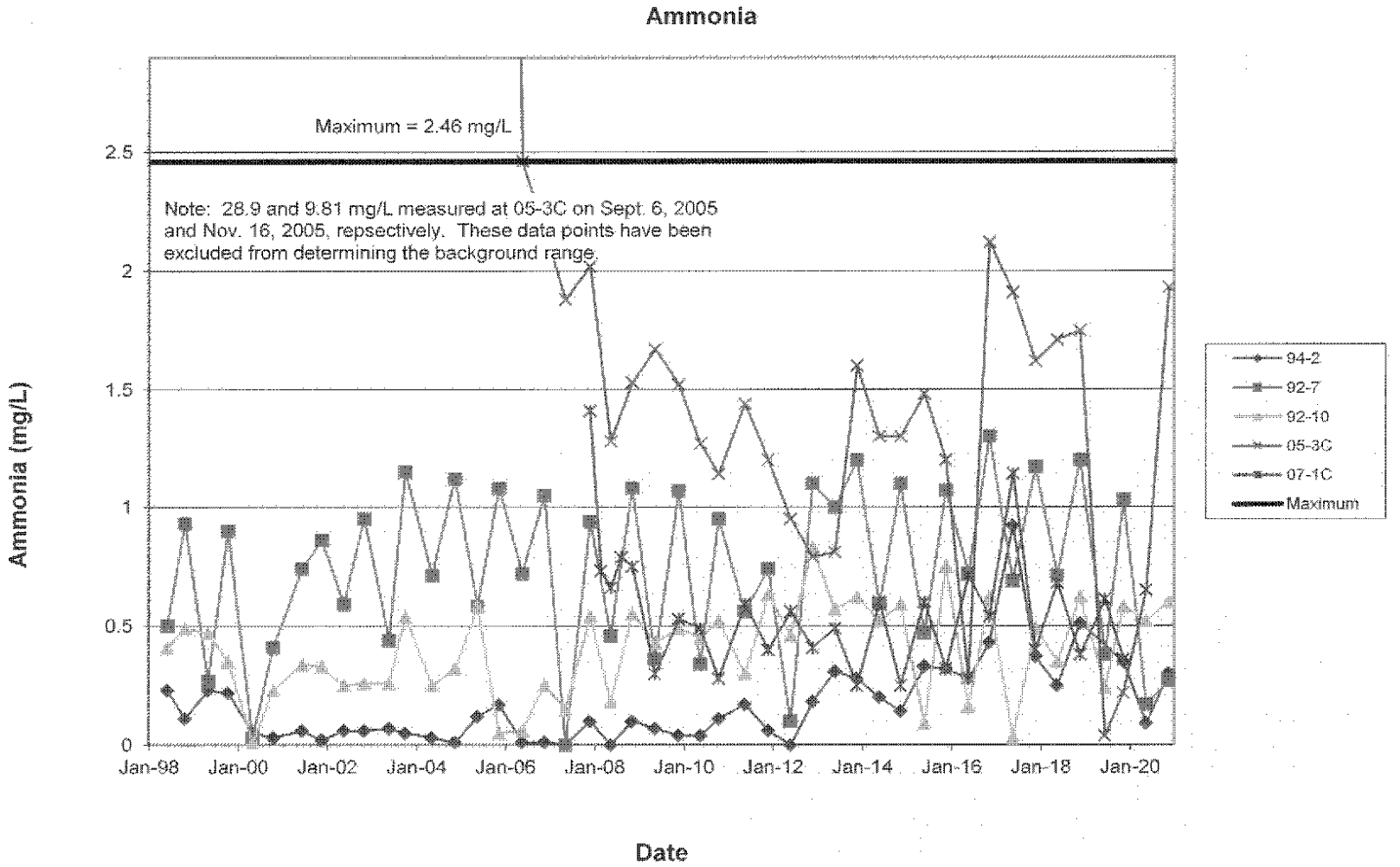

FIGURE FB2

Project No. 20412275

Prepared by: ETB

Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER

WEATHERED CLAY

GOLDER

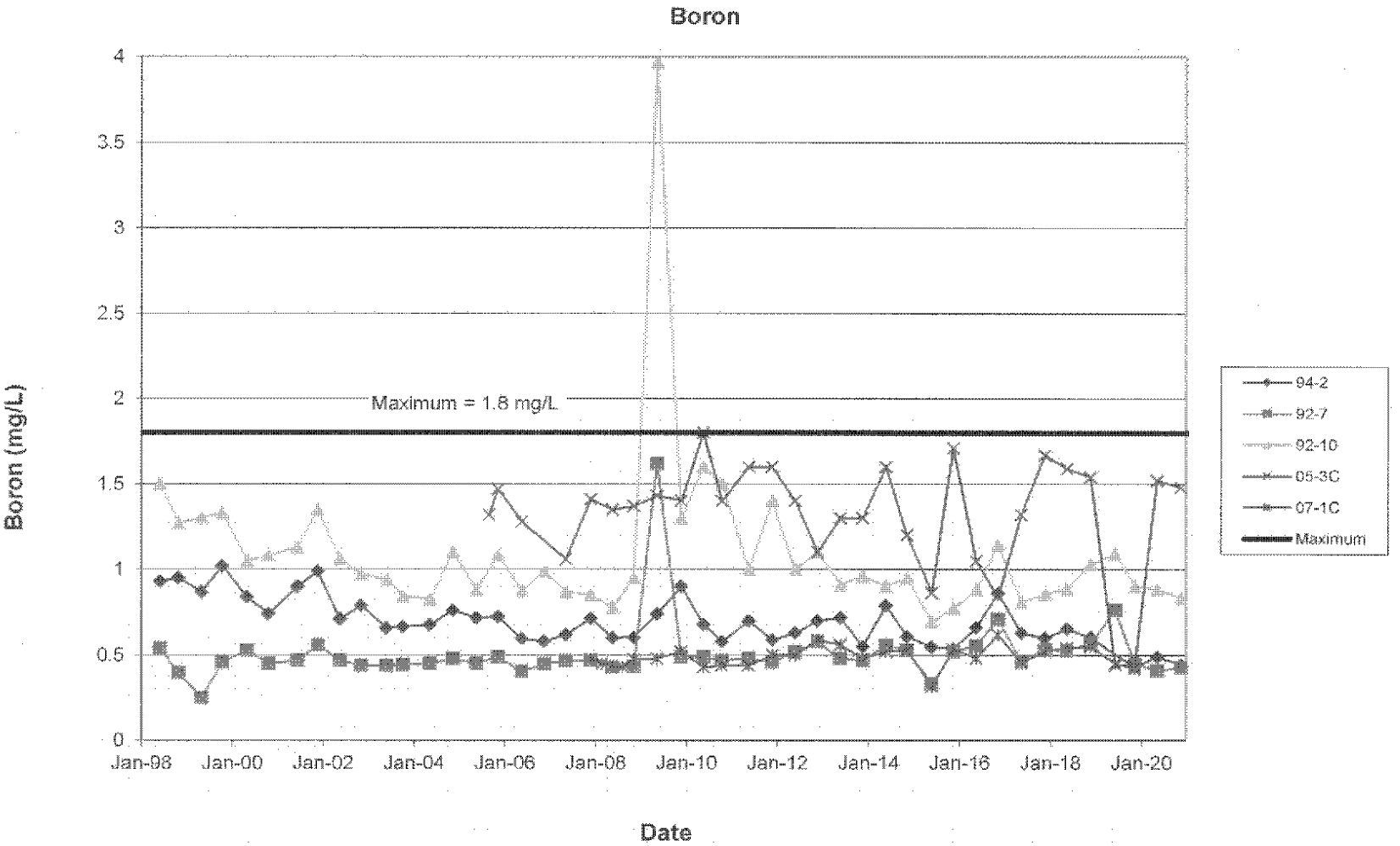

FIGURE FB3

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

001311

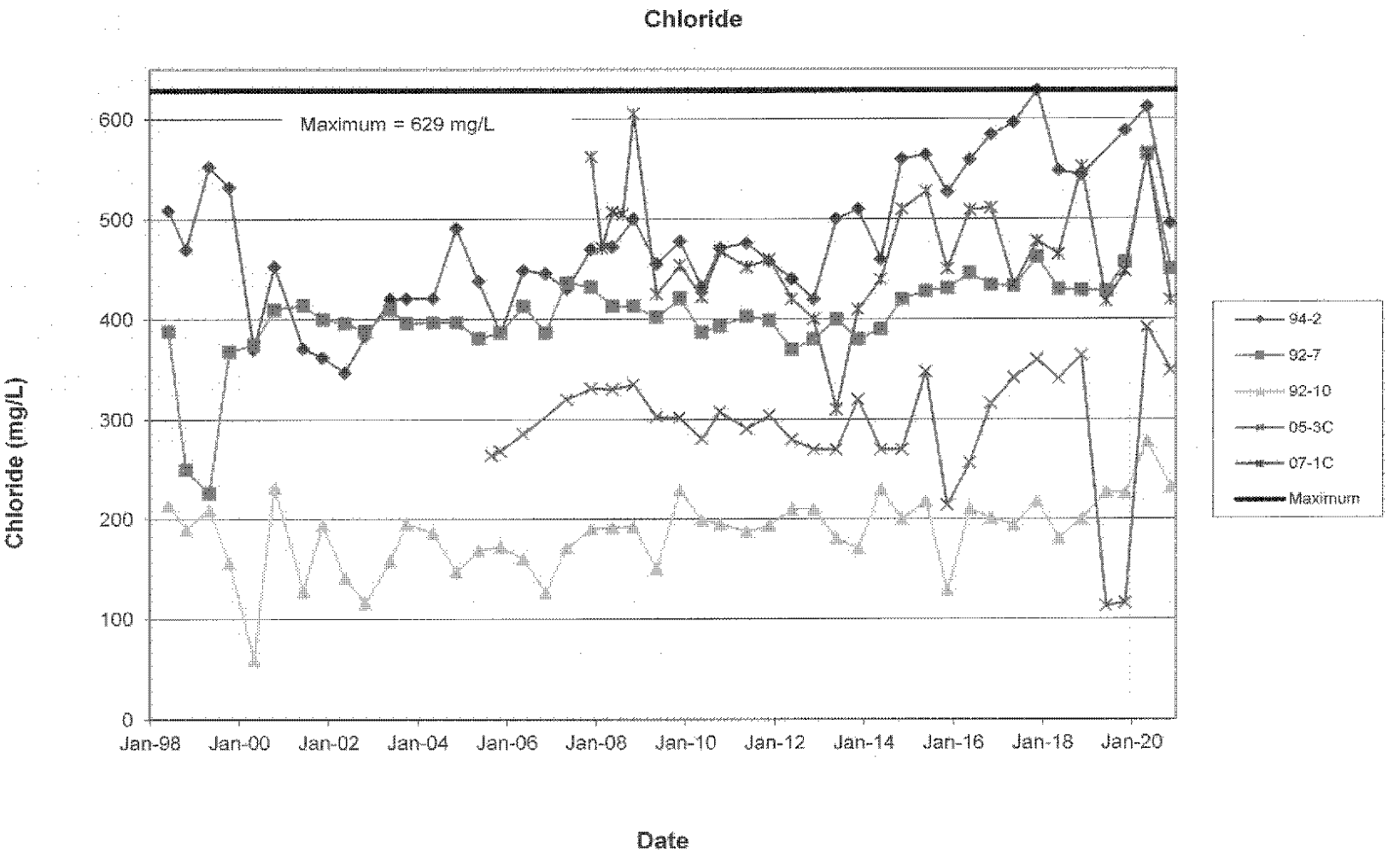

FIGURE FB4

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

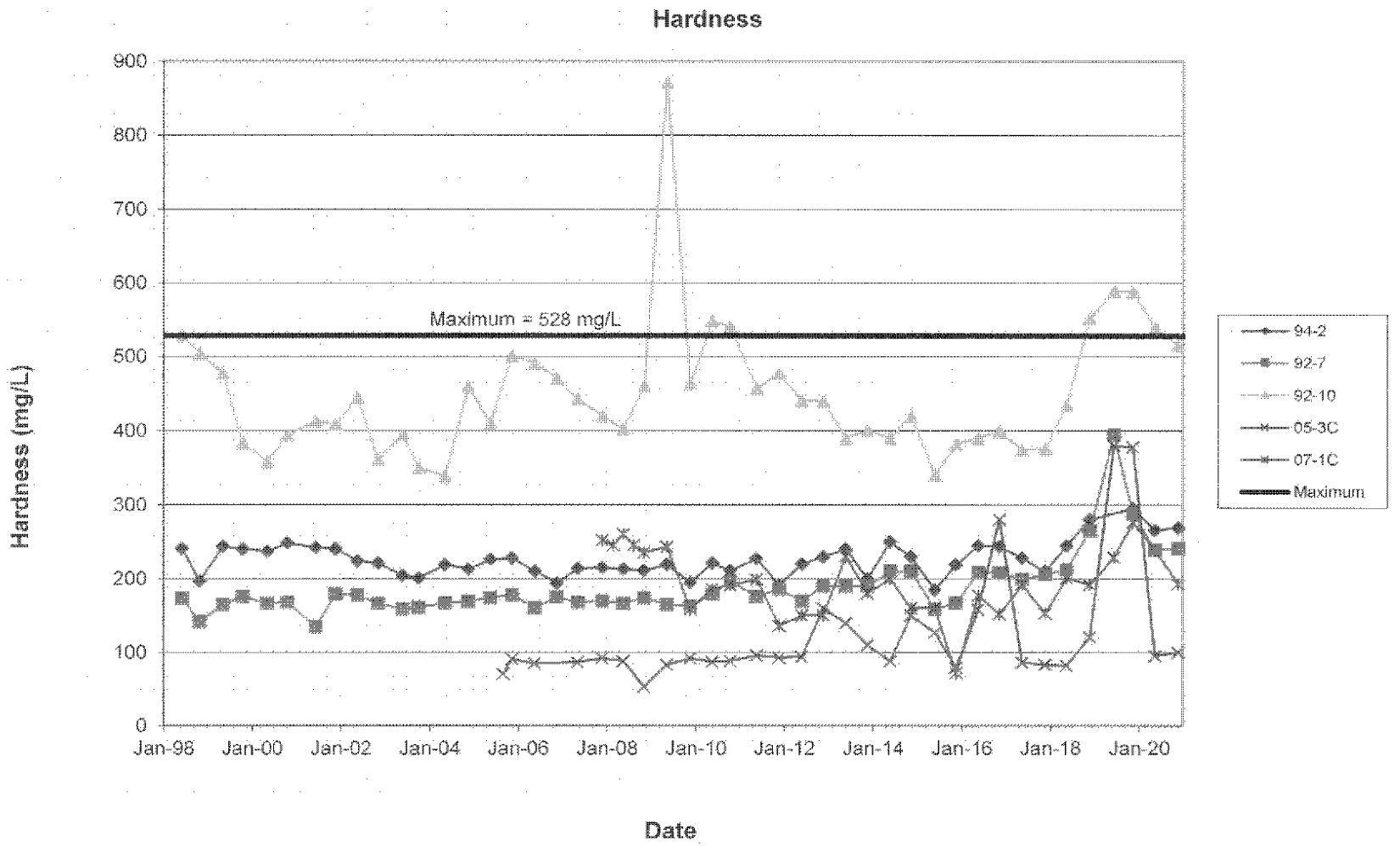

FIGURE FB5

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

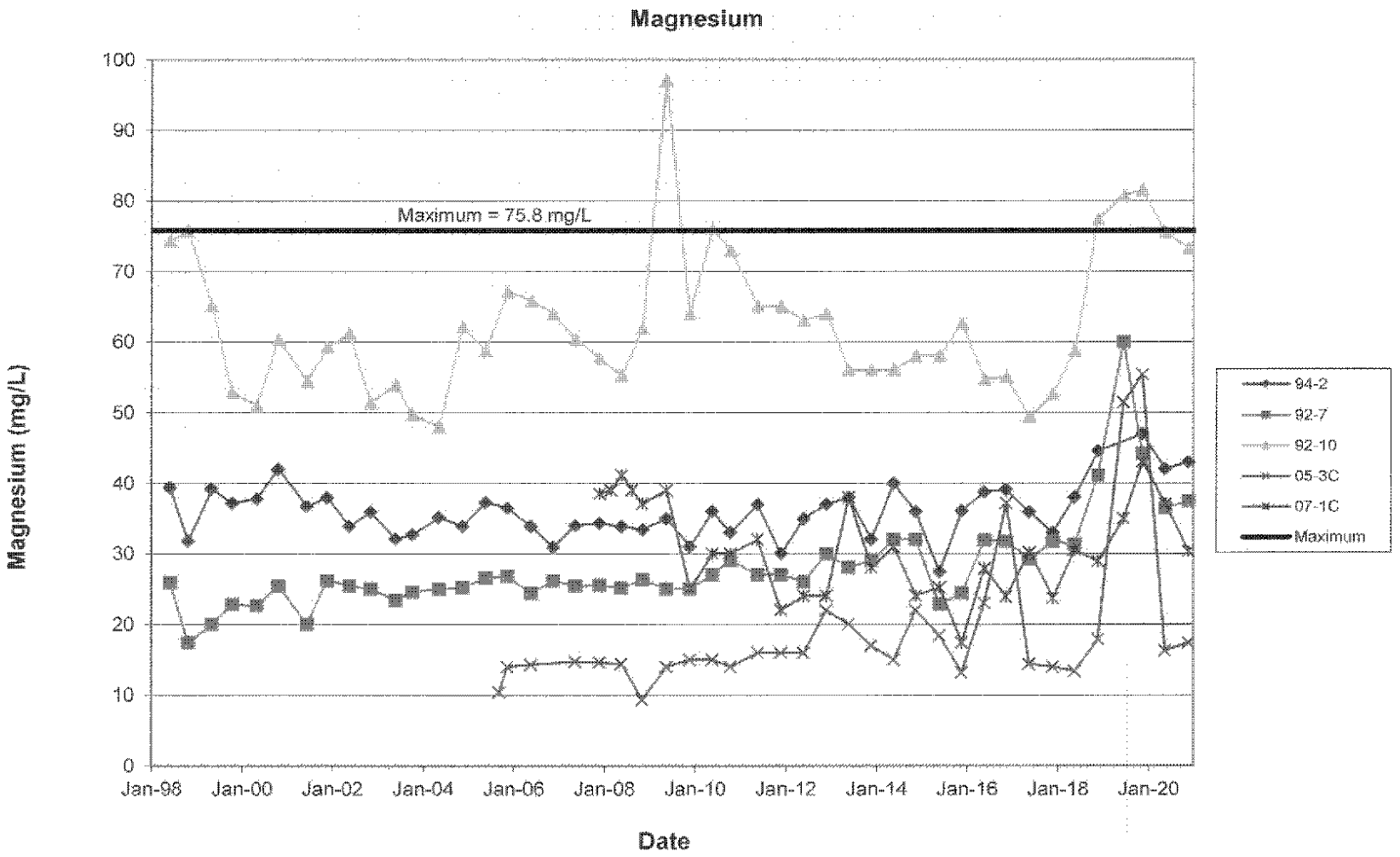

FIGURE FB6

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

001314

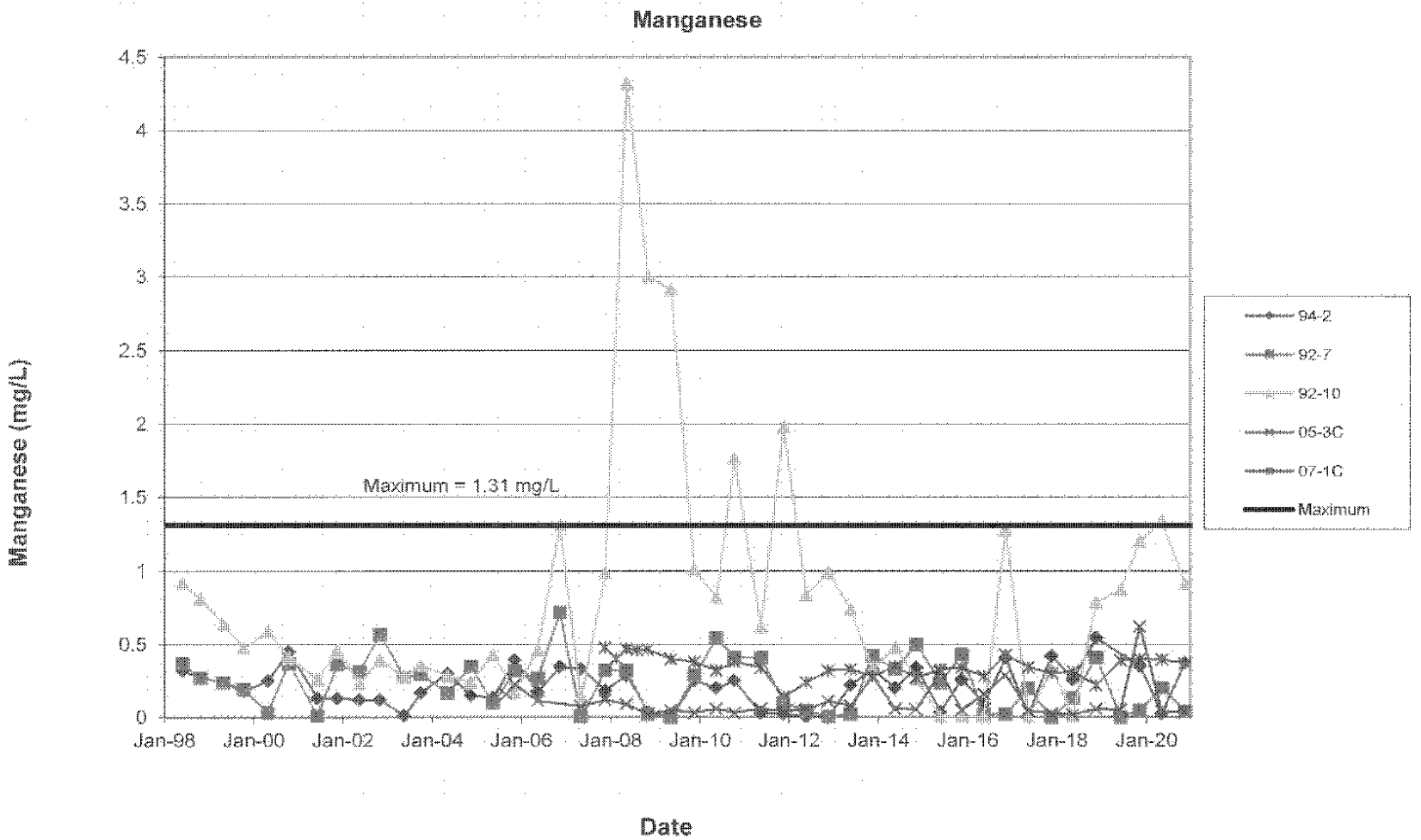

FIGURE FB7

Project No. 20412275

Prepared by: ETB

Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

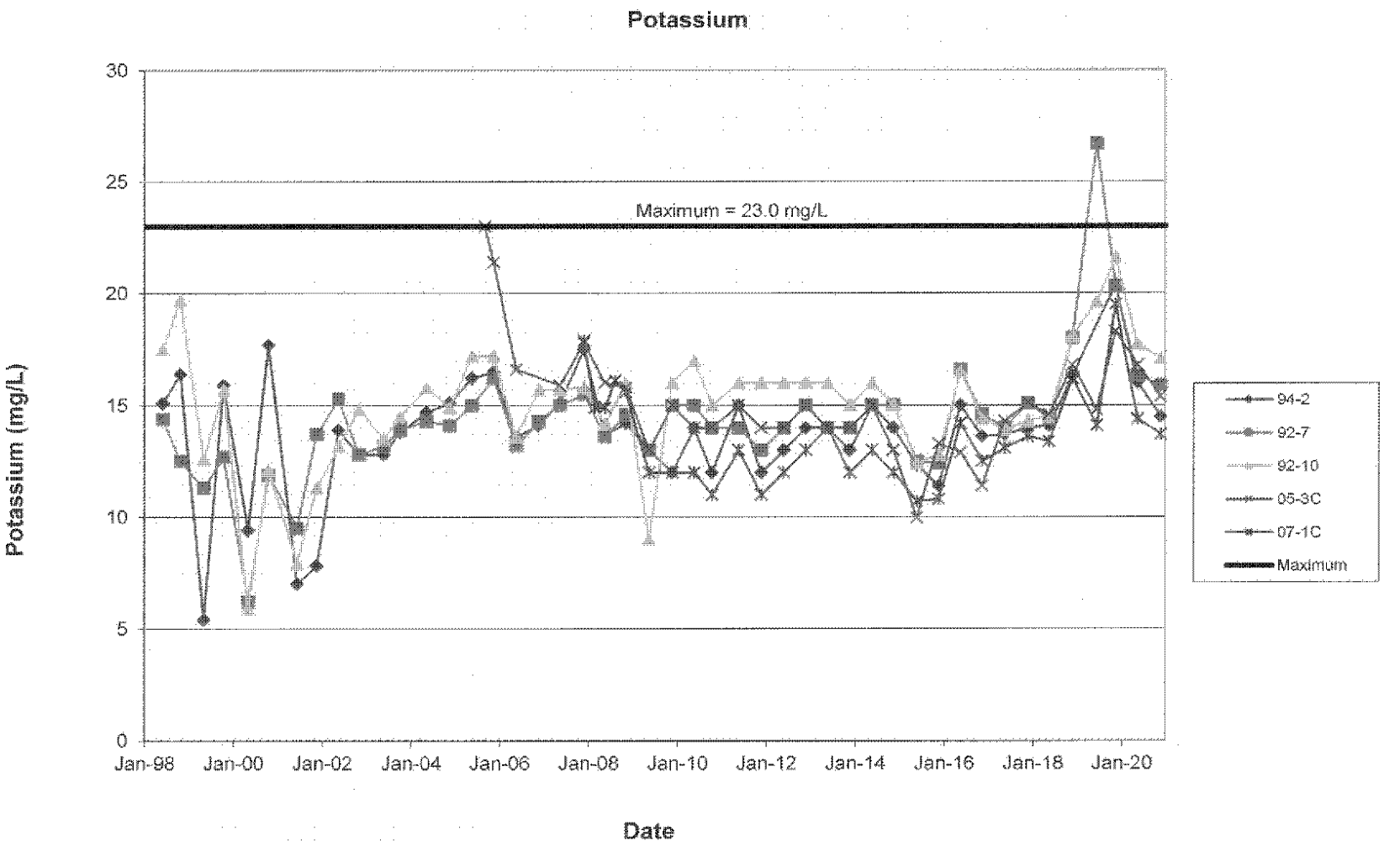

FIGURE FB8

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

APPENDIX F-C

Intact Clay Deposit

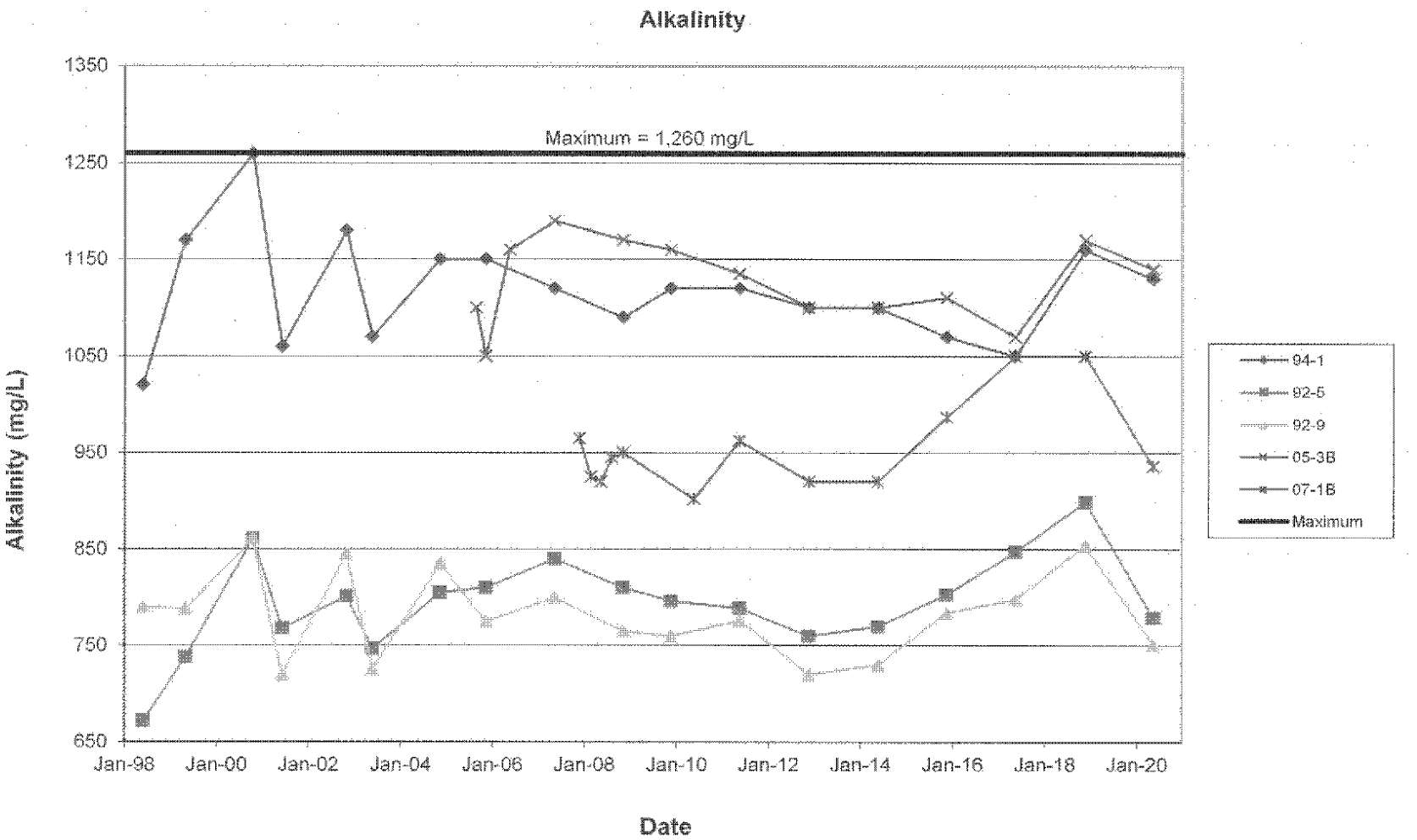

FIGURE FC1

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

001319

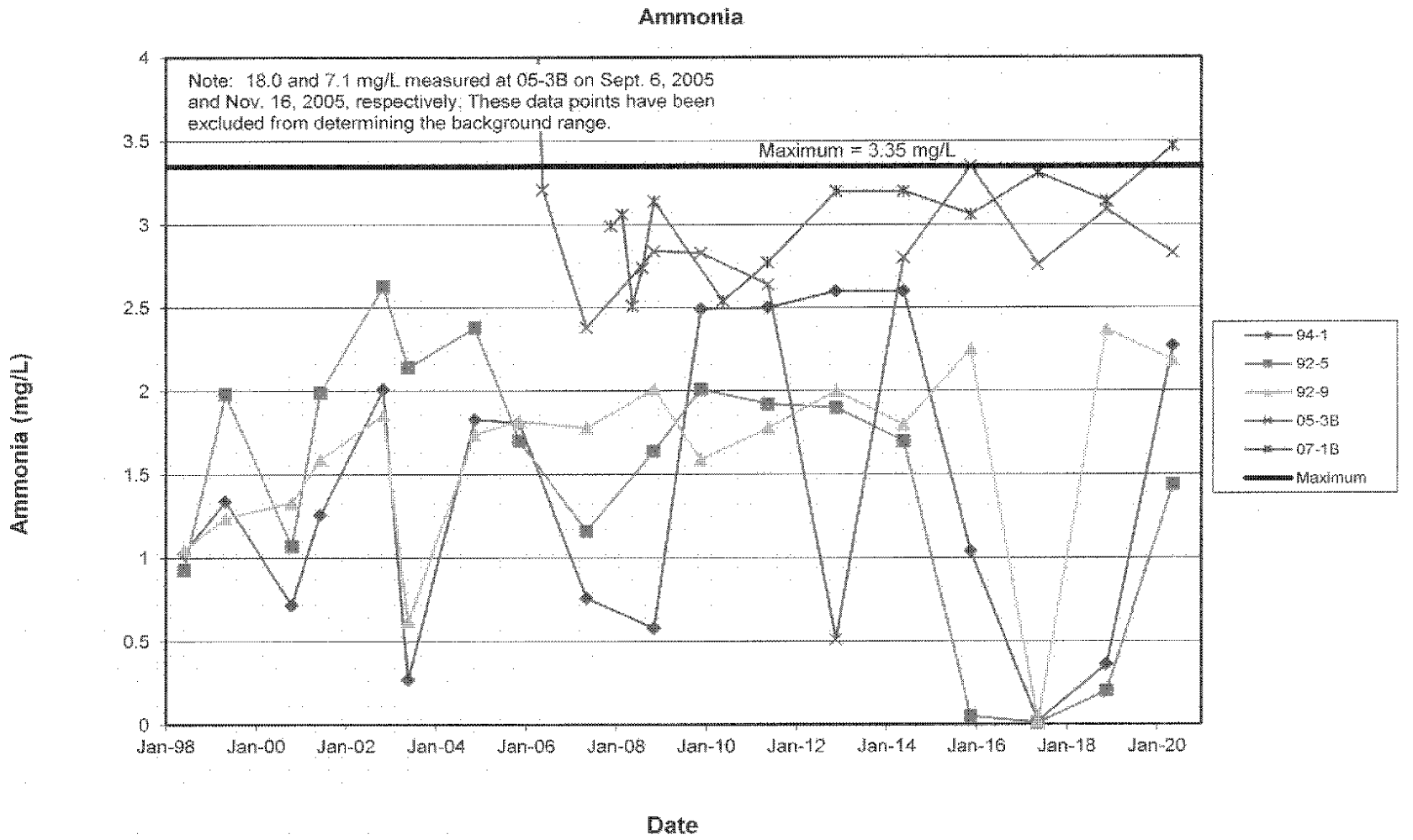

FIGURE FC2

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

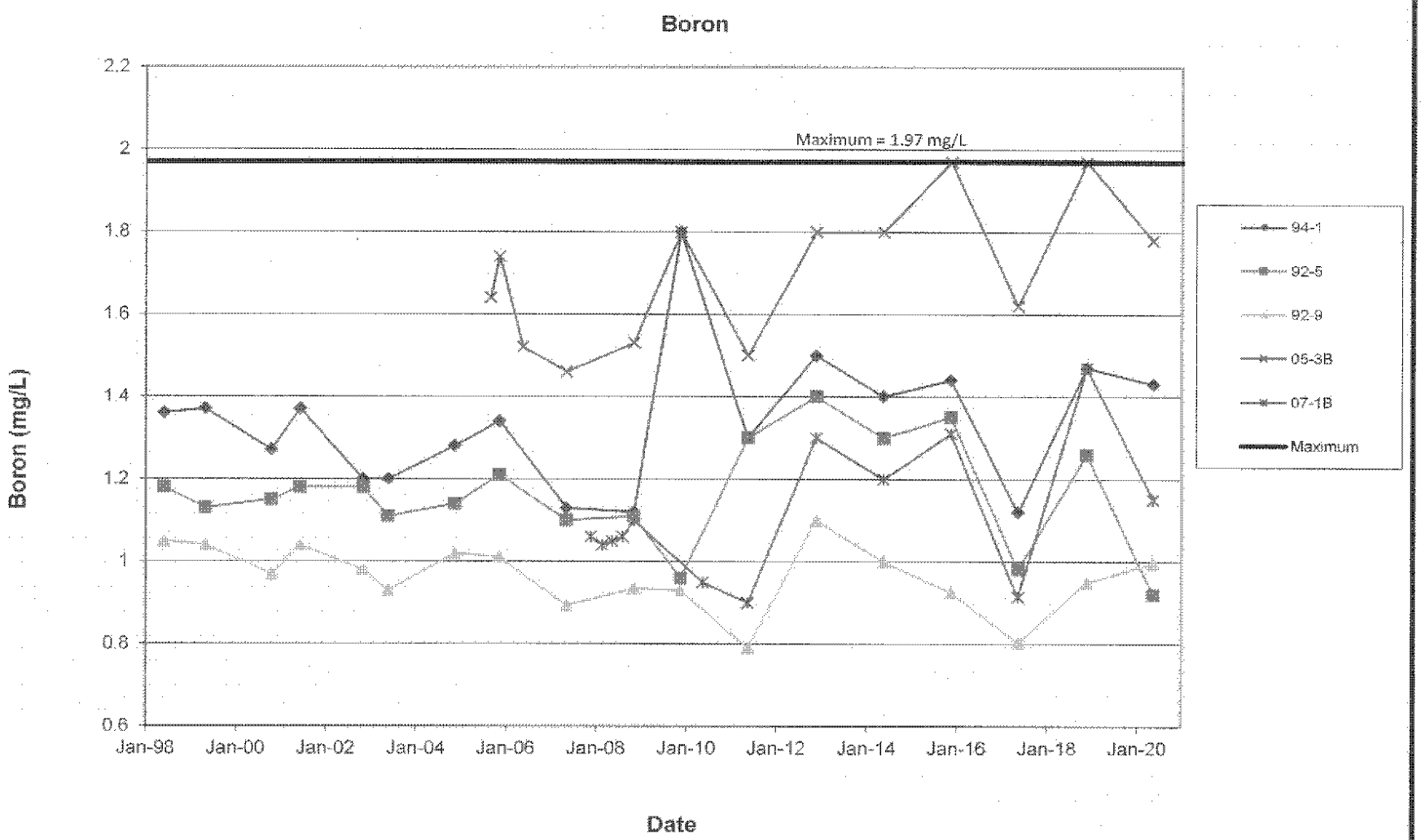

FIGURE FC3

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY
GROUNDWATER
INTACT CLAY

GOLDER

001321

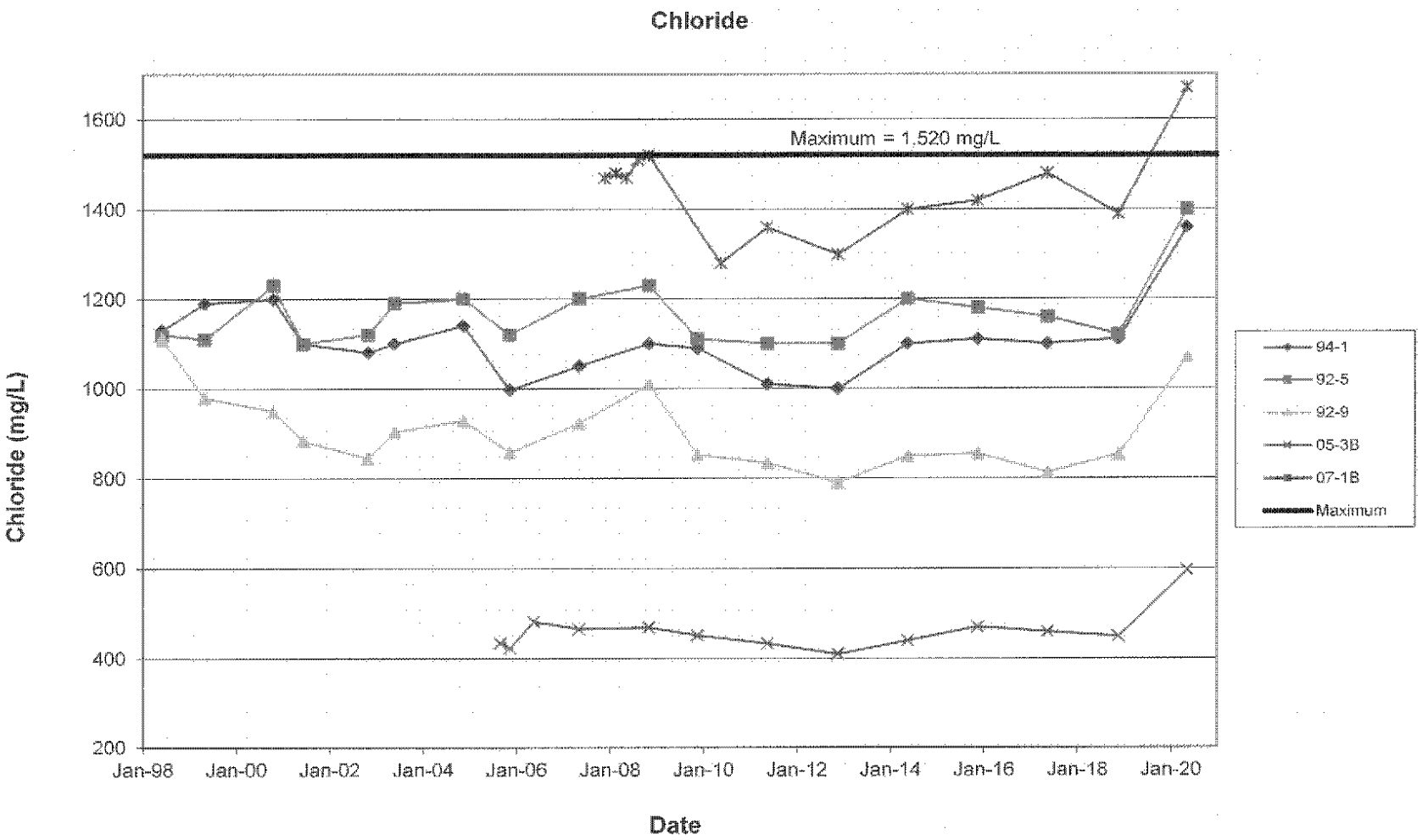

FIGURE FC4

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

001322

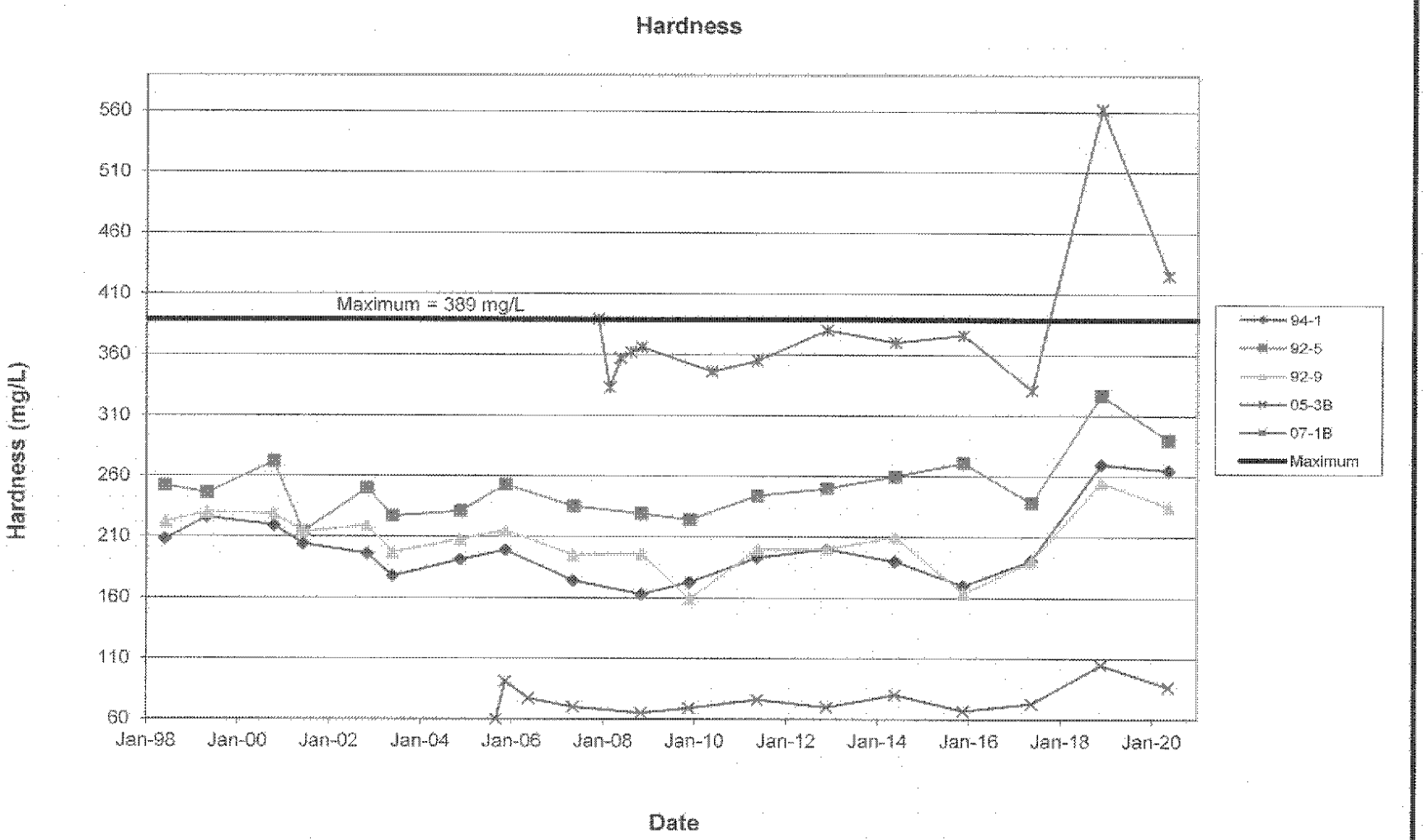

FIGURE FC5

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY
GROUNDWATER
INTACT CLAY

GOLDER

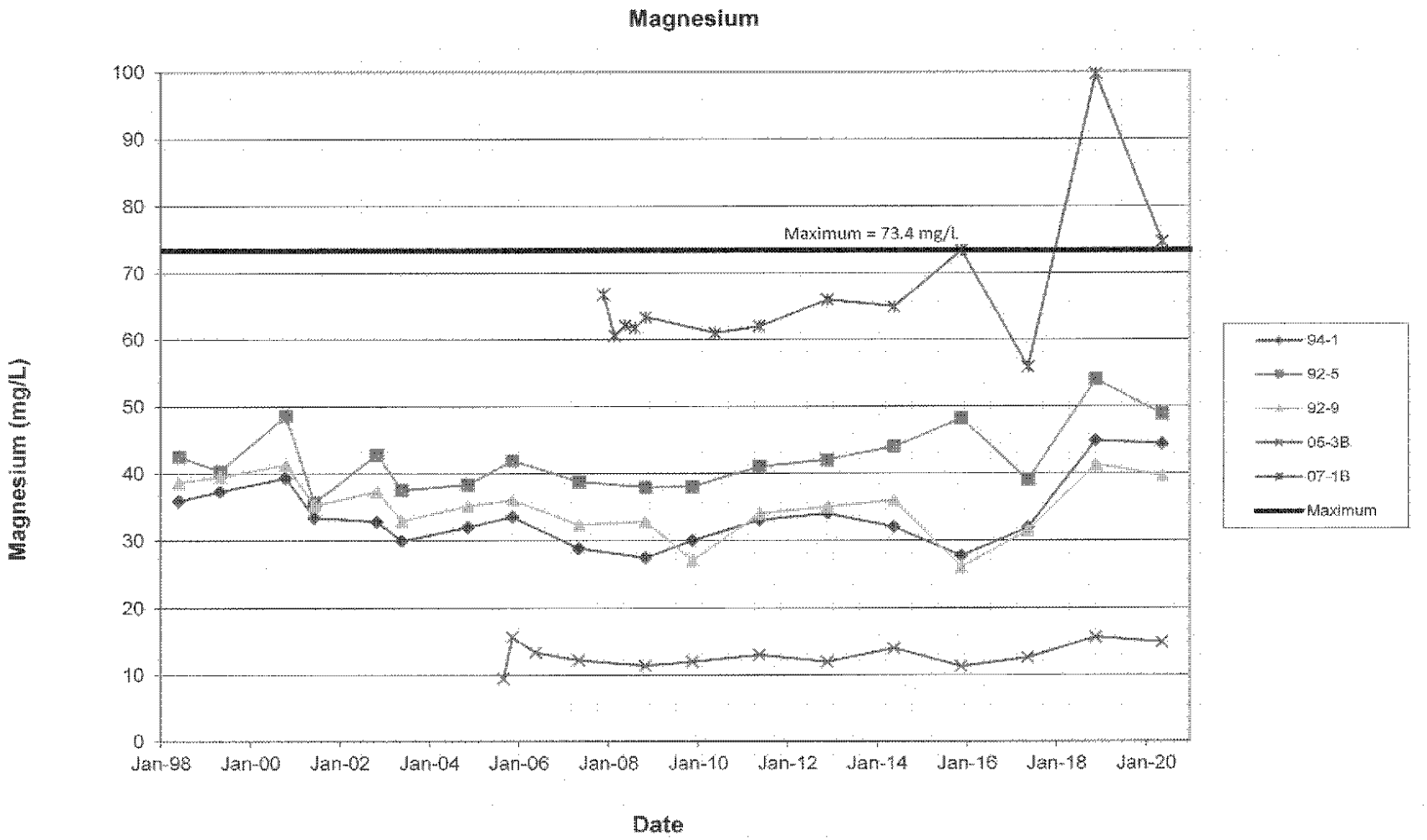

FIGURE FC6

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

001324

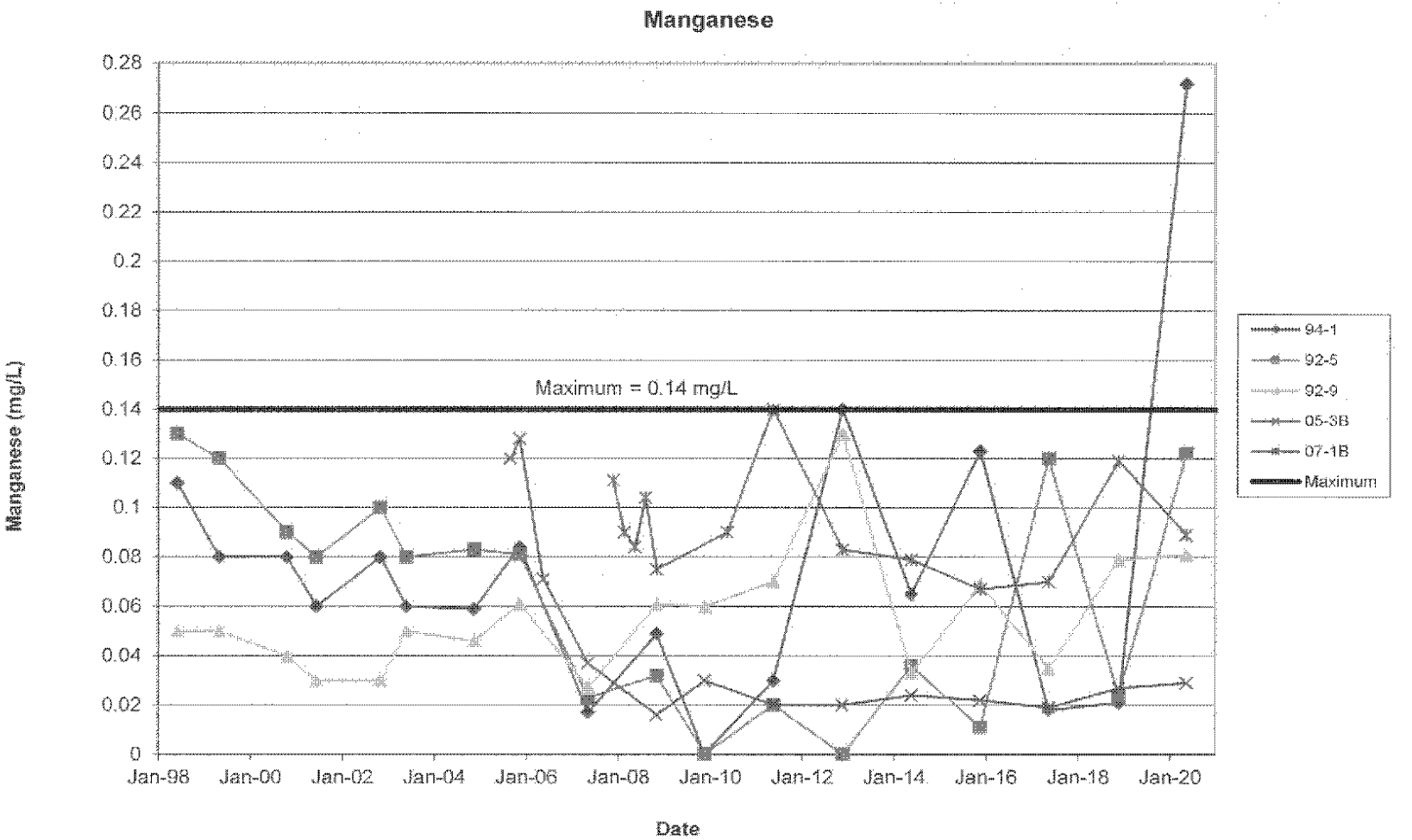

FIGURE FC7

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

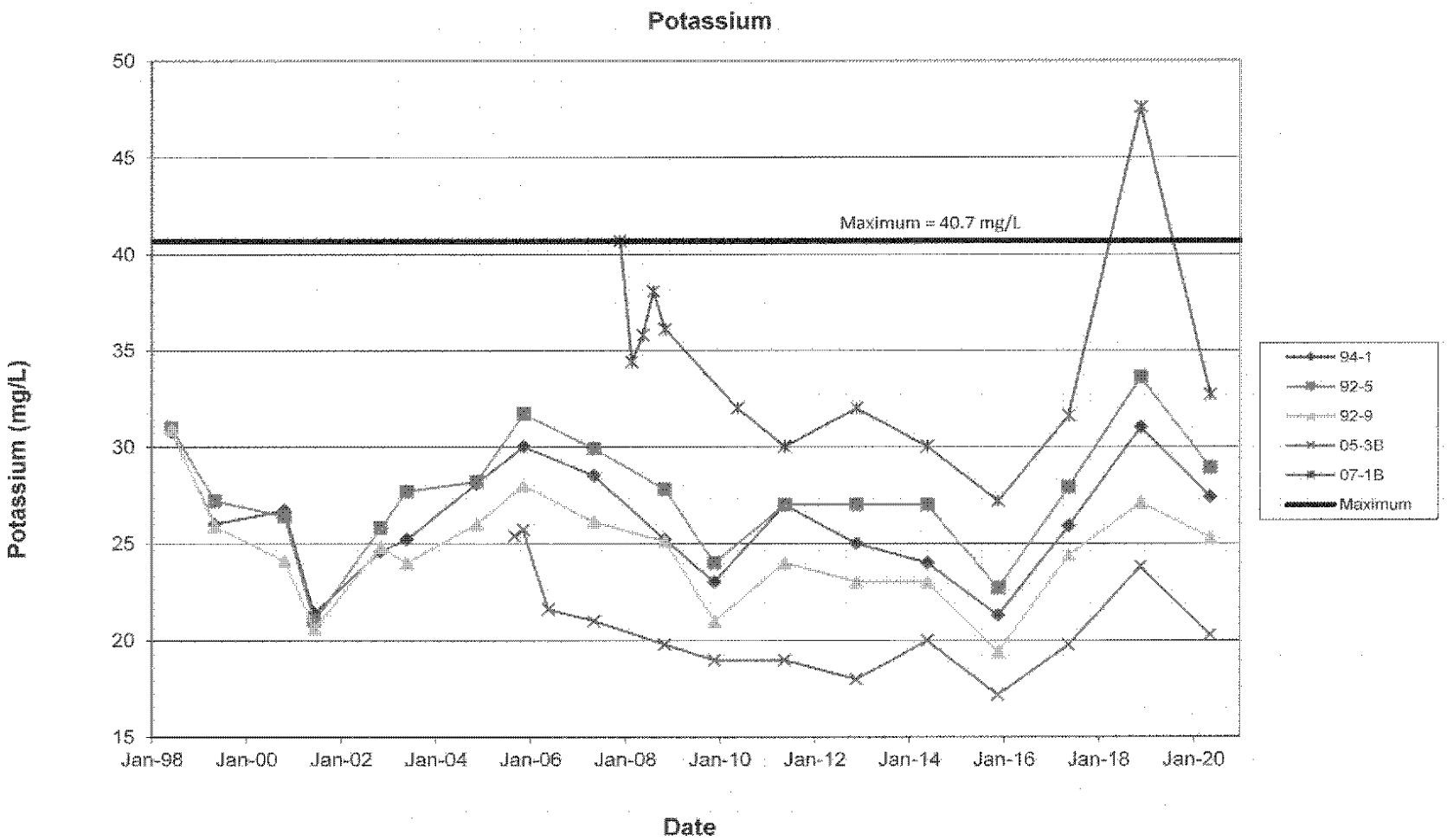

FIGURE FC8

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

001326

APPENDIX F-D

Glacial Till/Upper Bedrock Zone

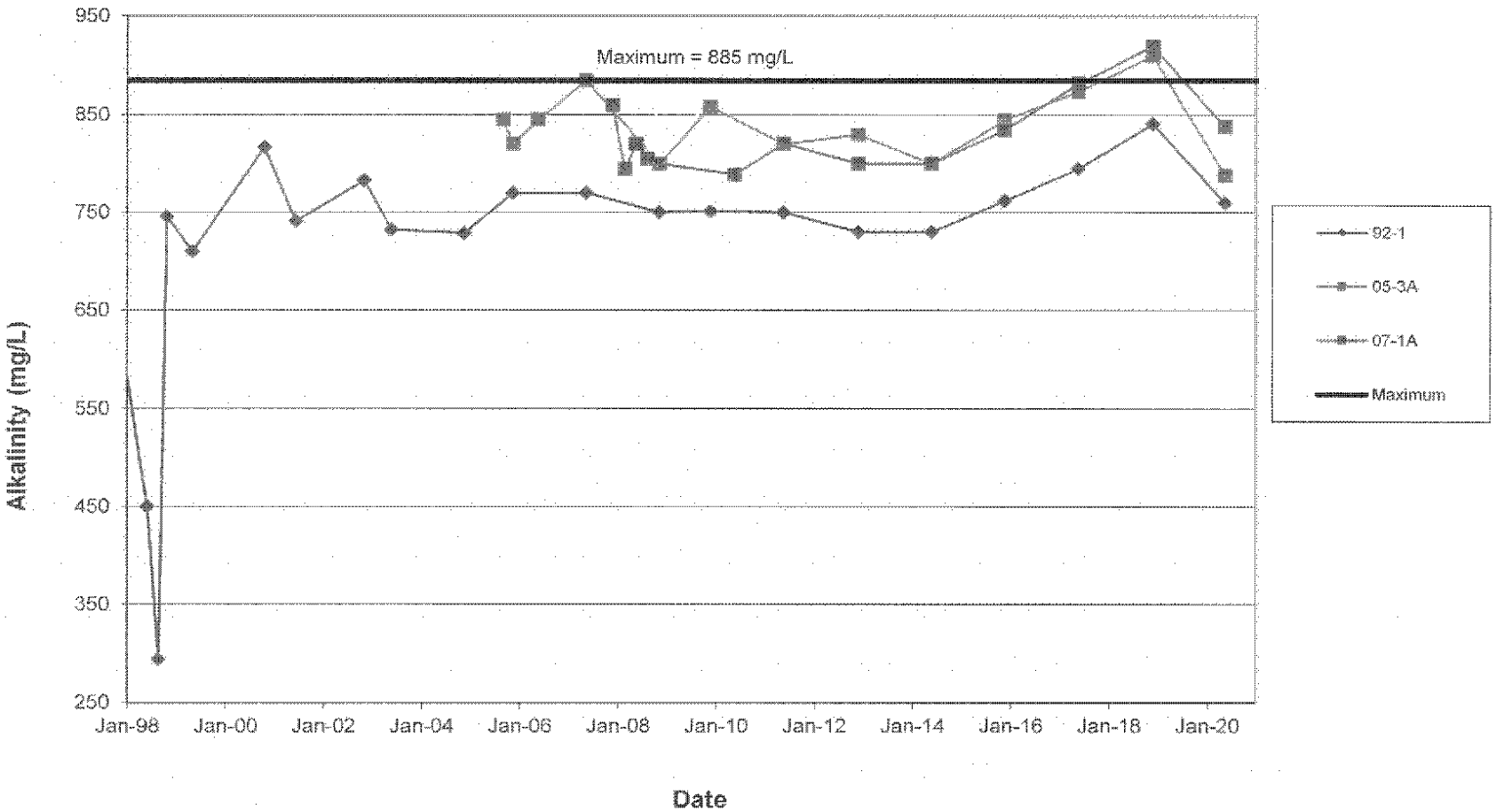

FIGURE FD1

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
GLACIAL TILL/UPPER BEDROCK

GOLDER

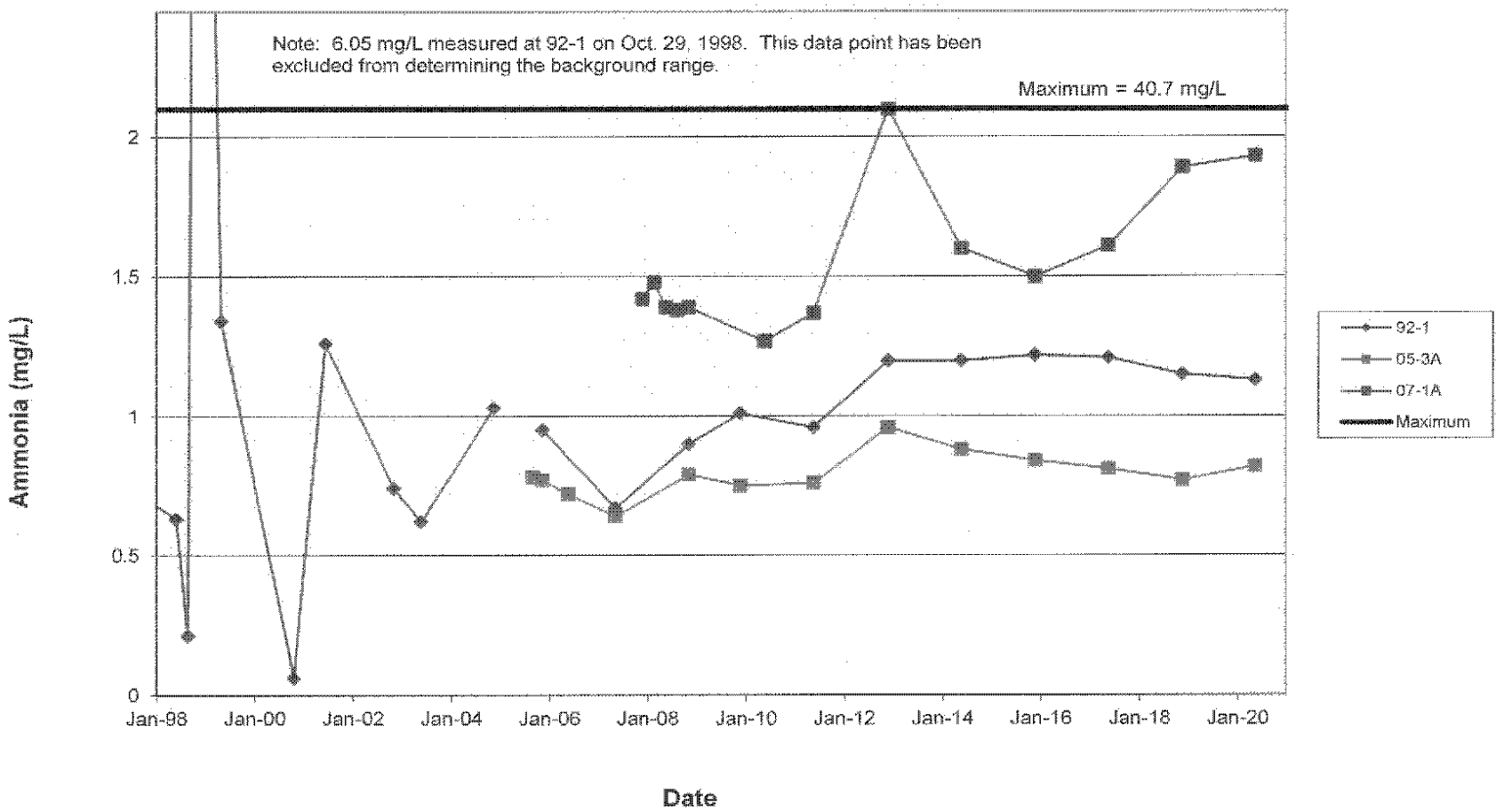

FIGURE FD2

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
GLACIAL TILL/UPPER BEDROCK

GOLDER

001330

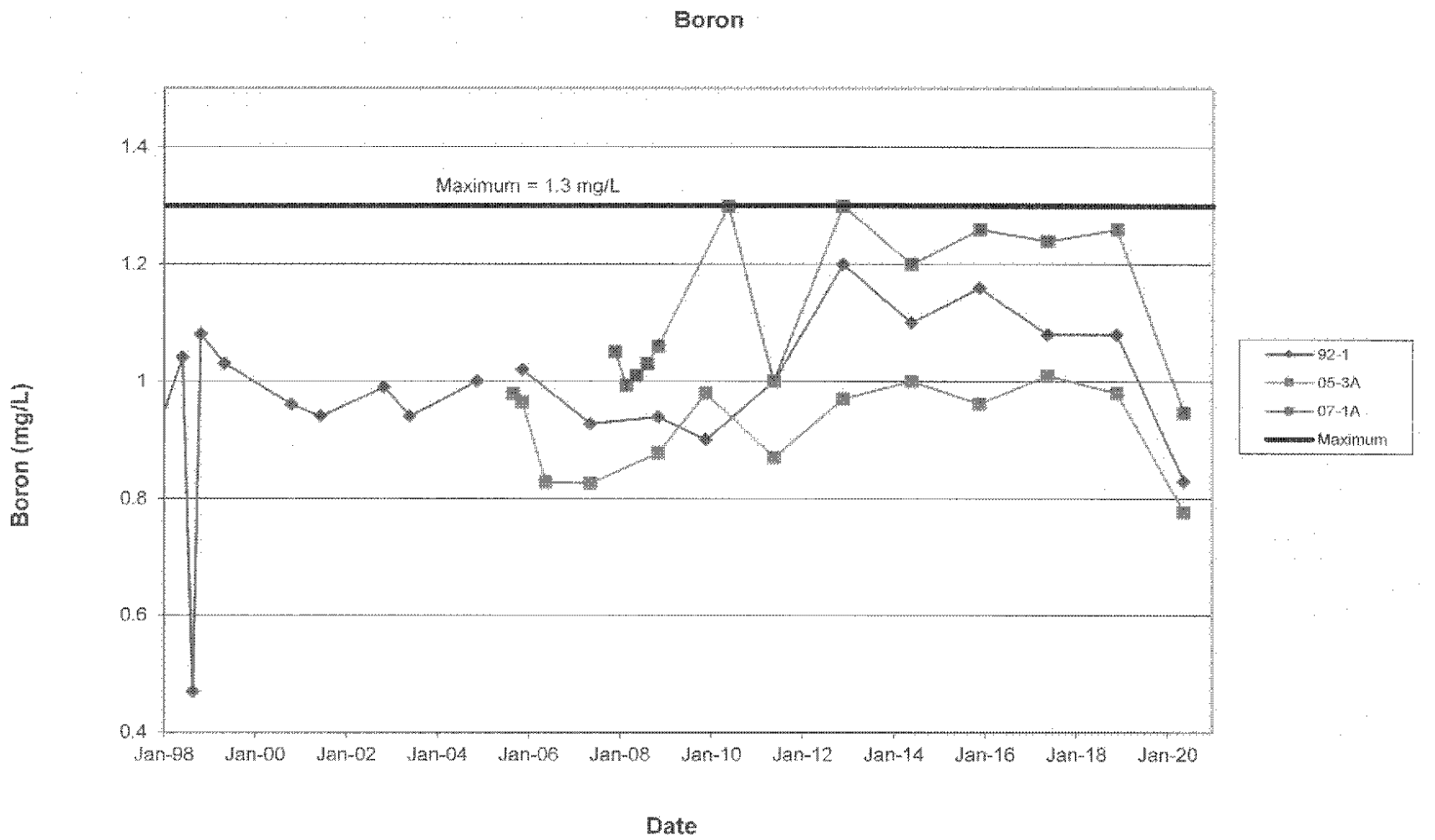

FIGURE FD3

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY
GROUNDWATER
GLACIAL TILL/UPPER BEDROCK

GOLDER

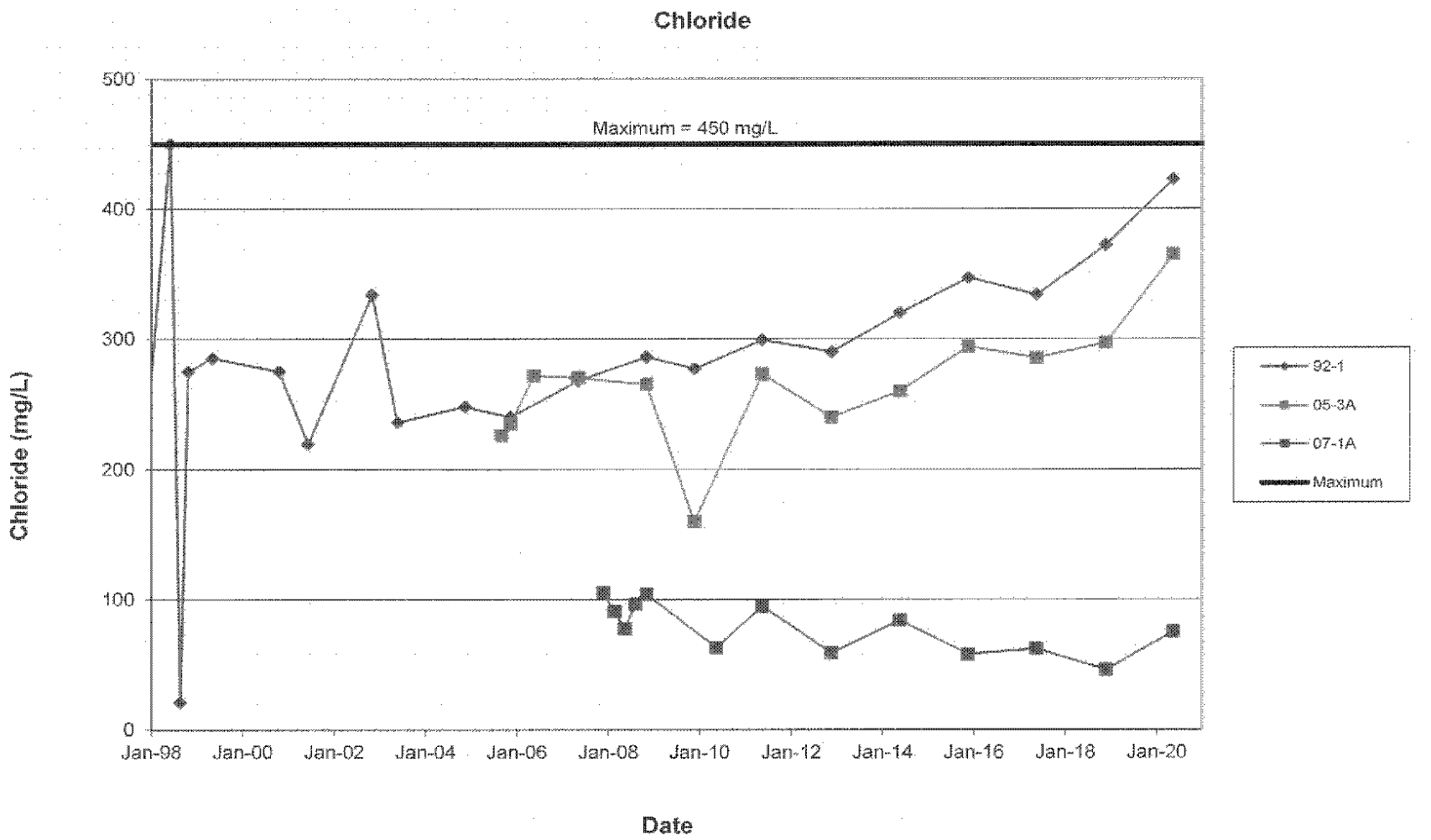

FIGURE FD4

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
GLACIAL TILL/UPPER BEDROCK

GOLDER

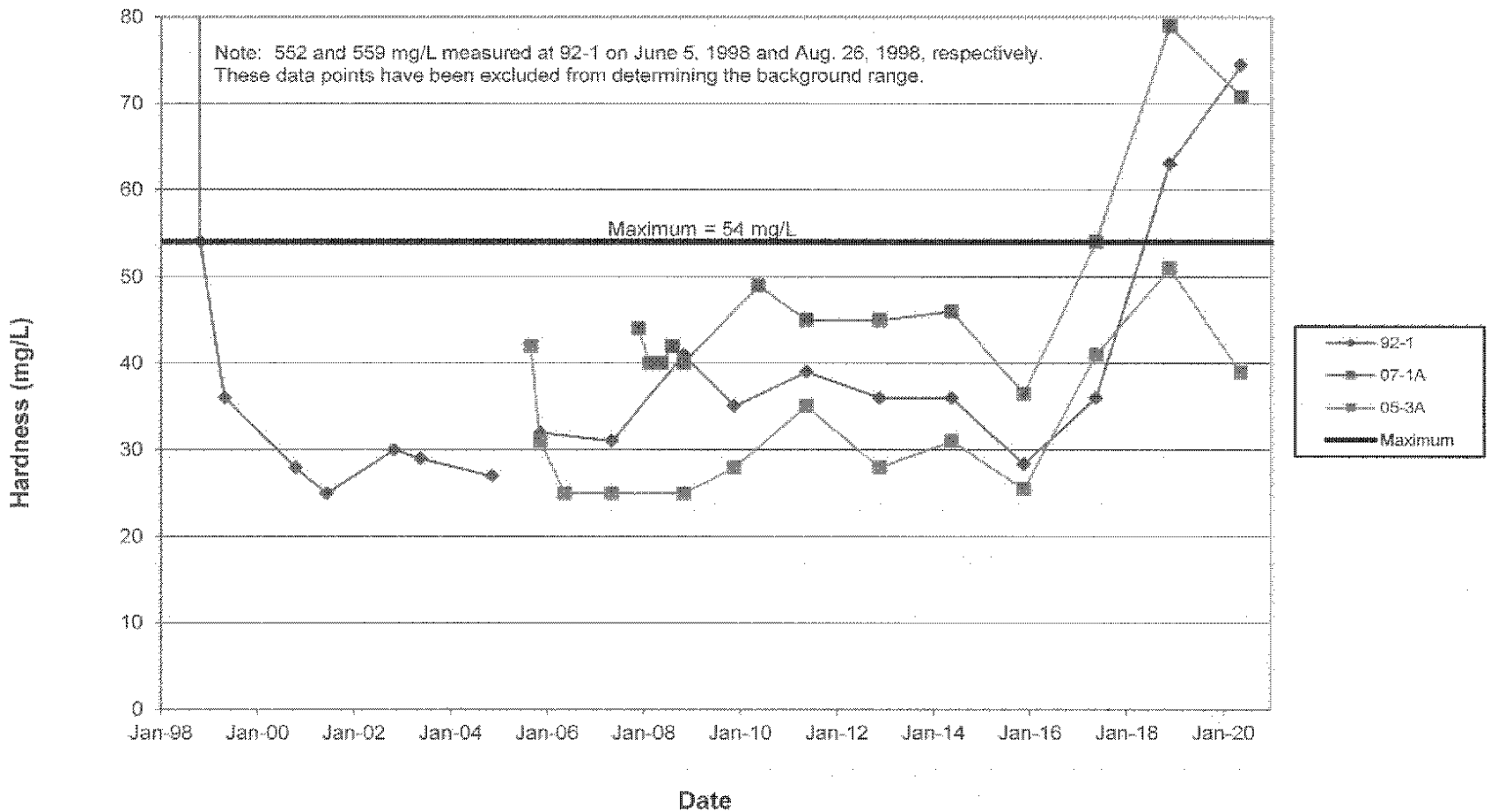

FIGURE FD5

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY
GROUNDWATER
GLACIAL TILL/UPPER BEDROCK

GOLDER

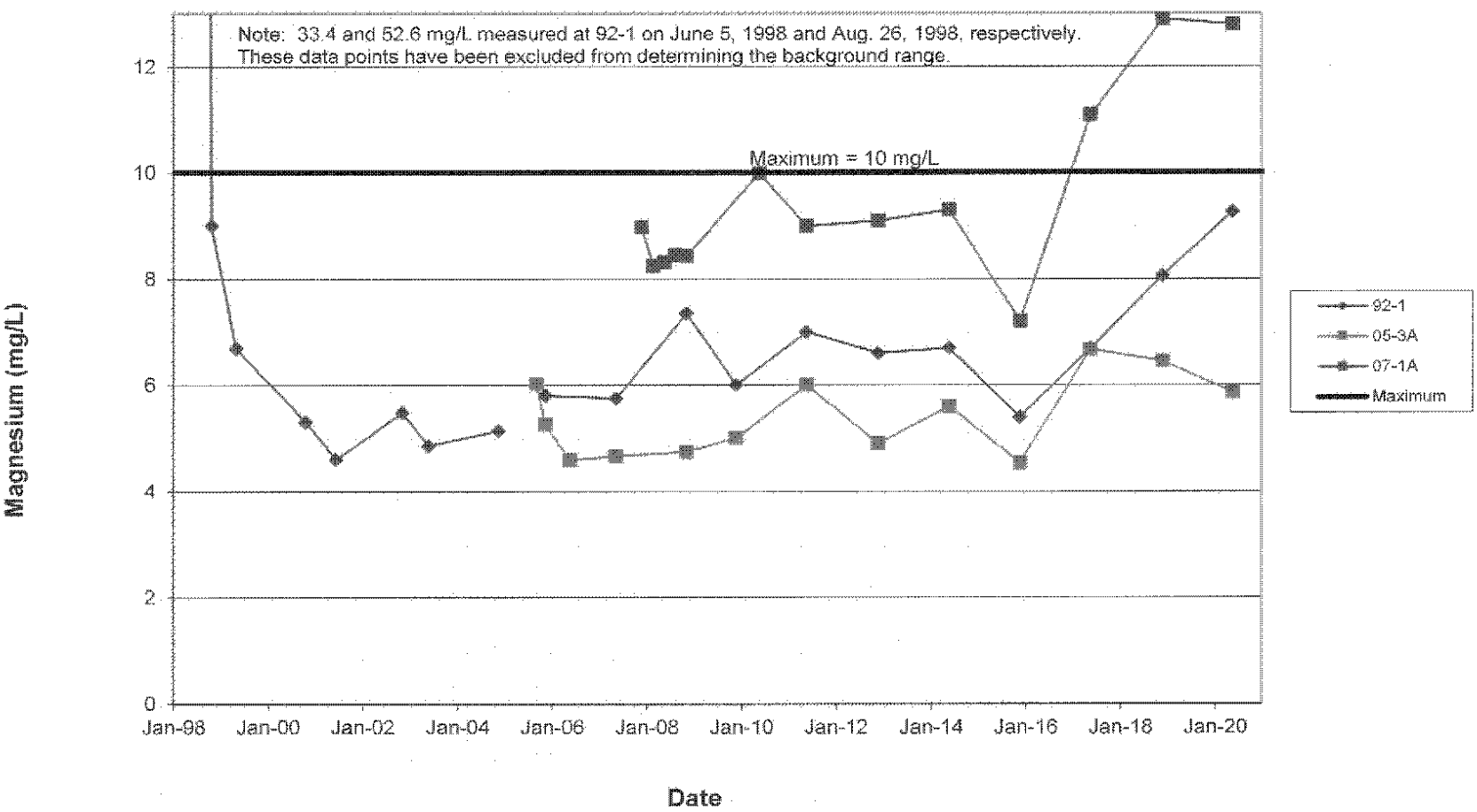

FIGURE FD6

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER
GLACIAL TILL/UPPER BEDROCK

GOLDER

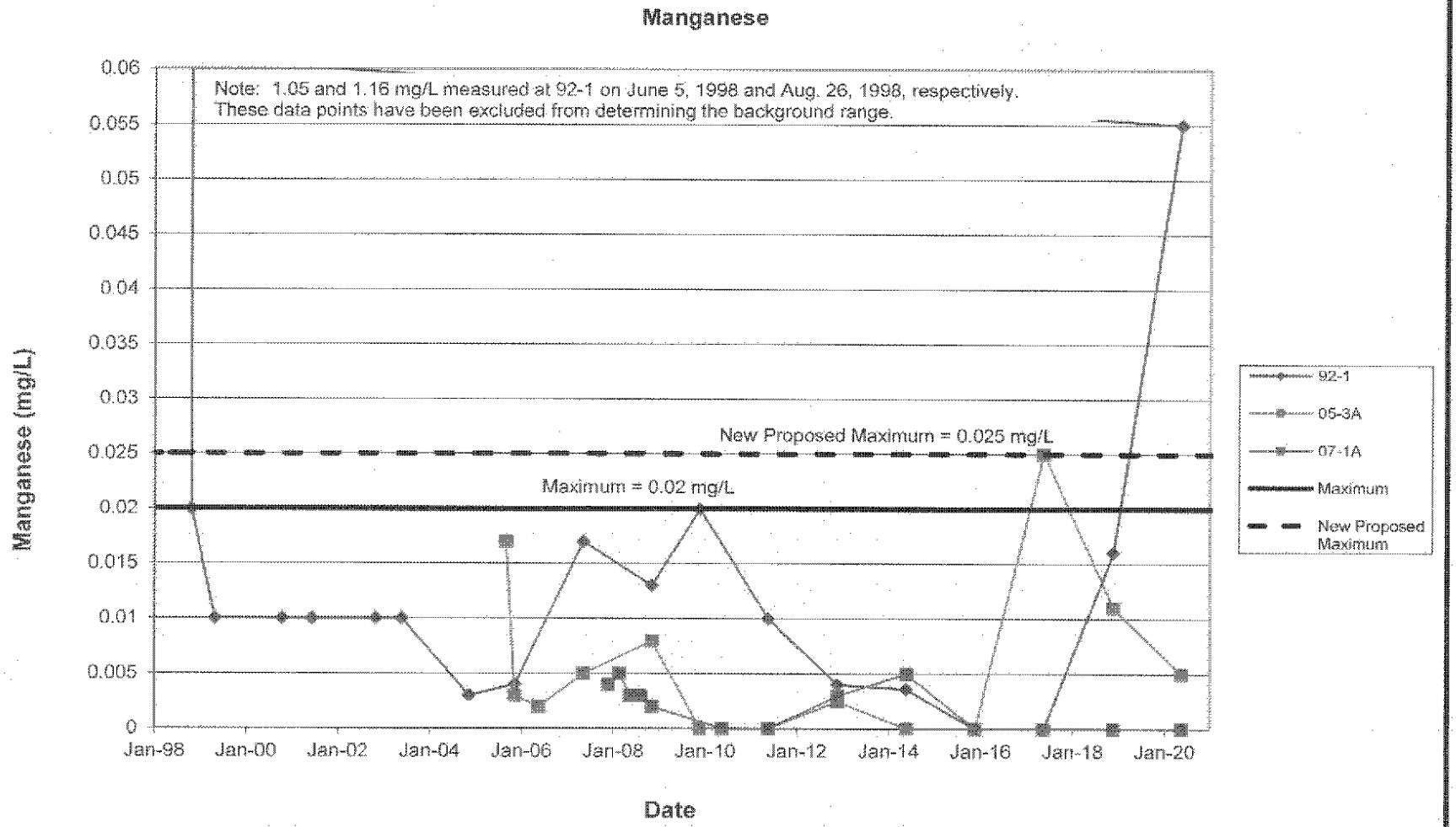

FIGURE FD7

Project No. 20412275

Prepared by: ETB

Checked by: YJM March 2021

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

GOLDER

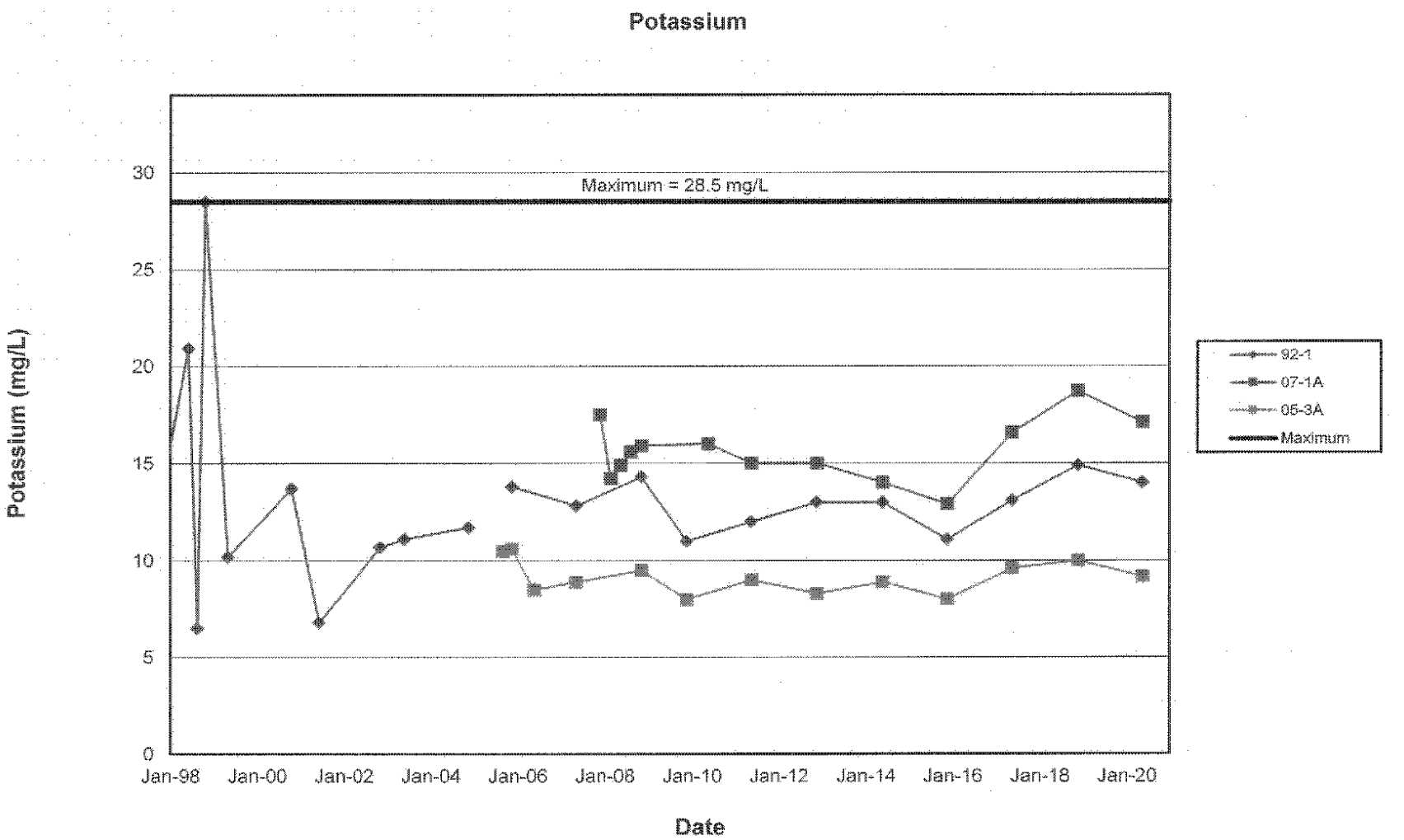

FIGURE FD8

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2021

WCC NAVAN FACILITY
GROUNDWATER
GLACIAL TILL/UPPER BEDROCK

GOLDER

APPENDIX G

Surface Water Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX H

MECP Correspondence

Pages 1343 to / à 1344

are not relevant

sont non pertinentes

Appendix '2'

Golder 2020 Landfill Gas Monitoring Report

GOLDER

REPORT

2020 Landfill Gas Monitoring Report

Waste Connections of Canada
Navan Waste Recycling and Disposal Facility
Ottawa, Ontario

Submitted to:

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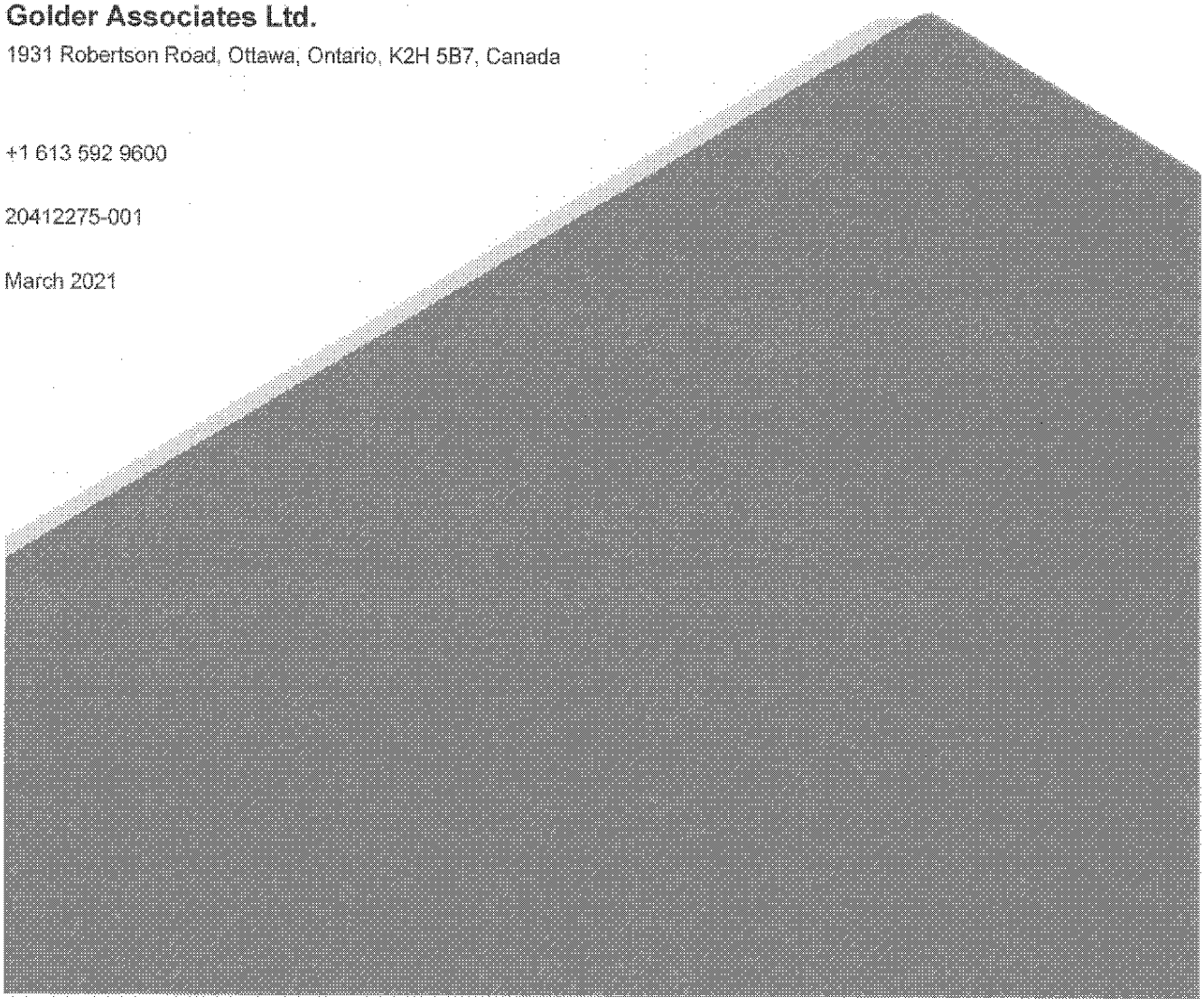
20412275-001

March 2021



Distribution List

10 copies	Waste Connections of Canada
1 e-copy	Golder Associates Ltd.

Executive Summary

This report serves as the landfill gas (LFG) monitoring portion of the 2020 site operations and monitoring report and presents the results of LFG monitoring activities carried out during 2020 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility). This report has been prepared to fulfill the reporting requirements outlined in Condition 110 of Environmental Compliance Approval No. A460702 dated April 16, 2009.

The following executive summary highlights key points only; for complete information and findings it is necessary for the reader to examine the complete report.

LFG monitoring was undertaken in May, August and December 2020. At most locations monitored, methane gas was less than 5 percent (%) of the Lower Explosive Limit (LEL). Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 25% LEL (or 1.25% by volume) at the following locations:

- MH-9 (G3-a), MH-5 (G11-a), MH-4 (G12-a), and MH-2 (G18-a) in May 2020
- MH-8 (G4-a), monitoring well OW-92-8 (G15), and pipeline clean out (G82-a) in August 2020
- Monitoring well OW-92-8 (G15) in December 2020

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the WCC Navan Facility based on the 2020 monitoring results. Although no monitoring locations are available below surface at the property boundary, it is anticipated that the WCC Navan Facility met the property boundary requirements in 2020.

Hydrogen sulfide was not detected at any location during the 2020 monitoring events, with the exception of the following location, which reported a relatively low detection:

- Collector MH (G-26i) in May 2020

It is noted that an interim LFG odour control system (refer to Section 3.4) was installed in 2011 and commissioned in April 2012. The system was extended in 2016, 2017, and 2019. In 2020, one horizontal well was added at the north-west corner of Phase 1. The purpose of this system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells.

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APPENDICES

APPENDIX A
2009 Landfill Gas Characterization

1.0 INTRODUCTION

This report serves as the landfill gas (LFG) monitoring portion of the 2020 site operations and monitoring report and presents the results of LFG monitoring activities carried out by Golder Associates Ltd. (Golder) during 2020 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility).

The WCC Navan Facility is located at 3354 Navan Road on part of Lots 2, 3, and 4, Concession IV, Ottawa Front, in the City of Ottawa as shown in Figure 1. This site is operated under Environmental Compliance Approval (ECA) No. A460702 (dated April 16, 2009) and ECA (air) No. 6141-59XKF9 (dated May 10, 2002, authorizing the use of a mobile wood grinder to process wood waste), No. 6733-7BYS9A (dated April 16, 2009, authorizing the permanent LFG Collection and Treatment System) and No. 3536-8APNZD (dated November 24, 2010, authorizing the Interim Landfill Gas Odour Control System).

This report has been prepared to fulfill the reporting requirements outlined in Condition 110 of ECA No. A460702.

2.0 CHARACTERISTICS OF LANDFILL GAS AT THE WCC NAVAN FACILITY

The presence of typical LFG is indicated by a reduction in nitrogen (N_2) and oxygen (O_2) and elevated concentrations of carbon dioxide (CO_2), methane (CH_4) and hydrogen sulfide (H_2S) when compared to atmospheric air as described in the table below. The main constituents of typical LFG are CO_2, CH_4 and H_2S. Other parameters such as mercaptans and volatile organic compounds can be present in LFG but at lower concentrations. LFG at the WCC Navan Facility was characterized in 1994, in 2002 and in 2009. The average composition of WCC LFG at the monitored locations is provided in the table below. It is noted that the LFG composition presented herein is not representative of the composition in the LFG collection and flaring system. The raw data from the 1994 and 2002 characterizations is provided in Table 1 and the data from the 2009 characterization is provided in Appendix A.

Select Gases	Sea-Level Composition of Air[1] (15°C and 101 kPa) (% by Volume)	Average WCC LFG Composition November 1994 (% by Volume)	Average WCC LFG Composition June 2002 (% by Volume)	Average WCC LFG Composition 2009* (% by Volume)
Nitrogen, N_2	78.1	77.5	78.4	NM
Oxygen, O_2	20.9	19	20.6	14.6
Carbon Dioxide, CO_2	0.03	2.7	0.5	12.6
Methane, CH_4	0.0002	1.3	0.2	14.1
Trace Elements	<0.01	NM	NM	NM

Notes:
[1] Source: CRC Handbook of Chemistry and Physics by David R. Lide, Editor-in-Chief, 1997 Edition.
* The averages were calculated using data from all Maintenance Holes and cleanouts (both measured with tubing) over the six monitoring sessions.
NM – not monitored

3.0 ENGINEERING SYSTEMS

From a hydrogeological perspective, the WCC Navan Facility is favourably situated on a thick deposit of low permeability, Champlain Sea clay (Leda Clay). The site is characterized by a shallow groundwater table. This is overlain by a thin sand cover, through which gas migration can occur. The west and south perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends to the water table. This drainage system, combined with the natural subsoil conditions, a perimeter buffer area and constructed low permeability barrier systems are considered to have significantly reduced the potential for off-site migration of LFG. The engineering systems in place at the WCC Navan Facility to safeguard against off-site migration of methane gas are discussed below.

3.1 Buffer Area and Natural Barrier System

The WCC Navan Facility is designed with a buffer area and natural barriers. The site has a favourable hydrogeological setting whereby the site is underlain and surrounded by a thick clay deposit of low permeability. The depth below grade to the water table at the perimeter of the site is shallow. The depth of the landfill between the ground surface and the water table is less than 2.5 metres. The Ministry of the Environment, Conservation and Parks (MECP) *Guideline for Assessing Methane Hazards from Landfill Sites* (Ministry of Environment, 1987) considers that methane gas migration of any significance may extend for a distance of ten times the depth of the landfill between the ground surface and the water table. Based on site conditions, this 10:1 general rule would suggest that methane migration could extend for a distance of 25 metres. The north, west, south and east sides of the landfill footprint are surrounded by buffer zones of 30 to 70 metres, 100 metres, 10 metres and 140 metres, respectively. Note that on the south side of the landfill a 10-metre buffer zone exists between the south limits of the waste mound and the VIA Rail right-of-way (ROW) and an additional buffer strip with a width of 100 metres exists to the south of the VIA Rail ROW. These buffers would therefore provide adequate natural venting. The natural barriers and the provision of adequate buffer area present at the WCC Navan Facility are the preferred method of dealing with potential LFG migration.

3.2 Constructed Barrier System

In addition to natural barriers and buffer area, WCC has constructed low permeability clay cut-off walls, clay berms and intervening drainage trenches at the perimeter of the waste footprint. At the edge of the fill area, native sand and other pervious materials have been removed and replaced with less permeable compacted clay. These clay barriers, designed to minimize and contain the flow of leachate, also act as a barrier against the lateral migration of LFG. Presently, the constructed clay barriers exist along the northwest, west, southwest and southeast perimeters of the fill area. As development of the landfill progresses, clay barriers will be constructed along the east and northeast perimeters. In 2020, WCC continued to construct the east buffer adjacent to the waste limit and WCC started construction of the north clay buffer wall. An intervening trench or excavated drainage ditch with its base at an elevation lower than the base of the waste pile and/or water table is also present at the perimeter of the waste footprint and will intercept and force any methane to the atmosphere. Construction of the leachate drainage layer on the north and northeast slope in Phase 6 was completed in 2020 (refer to Section 3.3).

3.3 Passive Ventilation System

The leachate collection system constructed along the west, south and east limits of the existing waste area, also serves as a passive ventilation system. A passive ventilation system is a system that prevents the subsurface migration of LFGs beyond the landfill property by altering the path of flow without the use of mechanical components.

It can be used as a general barrier to gas movement or as a protective measure for structures and/or vegetation. Maintenance Holes (MHs), installed at intervals of approximately 100 metres are effective in venting LFG as indicated by the results of the field monitoring (as discussed in Sections 4.4 and 5.0).

3.4 Interim Landfill Gas Odour Control System

As part of their commitment to control potential odorous emissions from the site, WCC has installed an interim LFG odour control system which will operate until the full-scale LFG collection system is installed at the site in the near future.

The interim LFG odour control system, which has been constructed within the existing landfill footprint, includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells, as well as the installation of lateral and header piping, condensate management facilities, an outdoor skid-mounted abstraction plant, and a candlestick flare. During construction, some 15 leachate collection system cleanouts were excavated and the perforated pipe replaced with solid pipe and air tight connections. Tees were installed in the header pipe to allow for expansion of the interim odour control system, if required.

The interim LFG odour control system was installed in 2011 and has been operating since April 2012. Extensions to the LFG odour control system were installed in 2016, 2017 and the fall of 2019. The additional vertical wells installed in 2017 and 2019 are intended to be part of the future permanent LFG collection system.

To date, these systems have performed satisfactorily and have assisted in minimizing potential LFG problems related to the landfill operations. A permanent LFG collection system will be installed as part of the expansion of the WCC Navan Facility as the landfill cells are completed to their final elevation.

4.0 LANDFILL GAS ASSESSMENTS

4.1 Olfactive Assessment

The WCC Navan Facility is a dry waste facility and wet organic waste is not permitted for processing or disposal. Consequently, few odours are emitted from the waste pile at this site. Odours from the waste pile, when detected, are in isolated locations occurring generally from fugitive emissions at ground surface in areas of recent landfilling activity, i.e. three to ten months following waste placement. Clay cover material is regularly placed over areas where the final fill heights have been reached. The waste and daily/interim cover materials in areas where no clay cover has been placed are sufficiently pervious to provide good ventilation at the surface thereby preventing the accumulation of LFG. The leachate collection system constructed at the south and west perimeters of the waste footprint behave as a passive gas ventilation system. Odours resulting from LFG are, on occasion, noticeable at some of the MH openings located along the leachate collection system. These odours dissipate rapidly and are barely noticeable only a short distance from the source of the odours.

It is important to note that in compliance with the amended ECA dated April 16, 2009, the WCC Navan Facility is no longer receiving materials for composting.

Evaluation of odour is based on the subjective interpretations of WCC's on-site personnel and observations by Golder and WCC staff during site visits as well as documentation of odour complaints received from the public nearby. The site practice, when odour complaints are received at the time of the occurrence, is to carry out an investigation of the source of odour regardless of the source of origin and to follow up with the caller with the corrective measures taken or to notify them of the potential source of odour if it is deemed to be originating from an off-site source.

4.2 Visual Assessment

There are no discernible impacts on vegetation at the surface of the landfill resulting from LFG. WCC has undertaken a landscaping program at the site including seeding berms and planting trees and significant efforts have been made at the site to preserve and relocate existing vegetation. The top surface of the waste pile has not been seeded.

In the past, venting of LFG could be observed at ground surface along the west side of the landfill between MHs. The LFG venting was only noticeable once the ground surface was covered with snow. In 2020, venting of LFG at ground surface was not noticeable to Golder technicians.

4.3 Ongoing Gas Monitoring in On-Site Buildings

Gas monitors have been installed in three on-site buildings. The monitors, that are calibrated annually, measure carbon monoxide (CO), nitrogen dioxide (NO_2) and CH_4 in the main site building, H_2S and CH_4 in the scale house, and H_2S and CH_4 in the pump station building. To date, the monitors have not detected any of these gases in the buildings.

4.4 Field Monitoring

Field monitoring with the use of portable field instruments was carried out on May 15, 2020, on August 27, 2020 and on December 10, 2020. The locations where monitoring of LFG and air quality was conducted during the last monitoring session are indicated on Figure 2. Shallow monitoring wells located along the south and north boundaries of the site were included in the monitoring program. Monitoring was also carried out at site facilities such as the leachate pump station, the maintenance garage, the weigh scale station and the leachate collection system. Other on-site locations were selected based on an olfactive and visual inspection of the site, and active landfilling operations. Some locations were selected at random. MHs that are part of the leachate collection system were included.

Monitoring for LFG was also carried out in buildings within close proximity to the landfill. These buildings are the following:

- The on-site maintenance garage
- The on-site pump station
- The on-site scale house
- WCC office at 3354 Navan Road

The ambient air at six addresses along Navan Road and two other off-site locations near the new subdivision adjacent to the site was also included in the LFG monitoring program.

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Weather data was obtained from the Ottawa Airport (OTTAWA INTL A, climate ID 6106001) in Ottawa, Ontario located 17 kilometres southwest of the WCC Navan Facility for the monitoring periods of May 15, 2020; August 26, 2020 and December 10, 2020. This weather data is summarized in the table below:

Date	Temperature (°C)			Relative Humidity (%)		Precipitation* (mm)			Station Pressure (kPa)			Wind During Working Hours	
	Max.	Min.	Mean	Max.	Min.	Rain	Snow	Total Precip.	Max.	Min.	Variability During Working Hours	Max Speed (km/h)	Prevail. Direct.
May 15, 2020	12.3	9.2	10.9	97	37	18.3	0.0	0.0	99.89	99.43	↓	21	E
Aug. 26, 2020	18.3	9	13.6	84	48	0.2	0.0	0.0	100.36	99.8	↓	26	W
Dec.10, 2020	-1.0	1.2	0.2	91	70	0.0	0.0	0.0	100.65	99.33	↑	25	W

Notes: * Precipitation data obtained from the Experimental Farm in Ottawa (CDA RCS, climate ID 6105978)

Entered by: ETB
Checked by: YJM

The instrument used to detect and measure LFG concentrations during the various sampling events was a LANDTEC GEM-5000 Infrared Gas Analyzer.

The LANDTEC GEM-5000 is designed for analyzing LFG composition and calculating flow. It is a handheld device which can measure percentages of CH_4, CO_2, CO, H_2S and O_2, relative and atmospheric pressure. Methane and carbon dioxide concentrations are measured by infrared gas analyzer and oxygen is measured by the galvanic cell principle. The LANDTEC GEM-2000 Plus, which has historically been used at the site to measure LFG composition, can measure combustible methane Lower Explosive Limit (LEL, equivalent to 5 percent (%) by volume in air for methane gas). Since the LANDTEC GEM-2000 Plus is being phased out and replaced with the LANDTEC GEM-5000, the LEL for all locations were not reported during this monitoring year (see Tables 2 through 4). Interpretation related to LEL is therefore not possible for the 2020 results. Concentrations of CH_4 greater than 1.25% by volume are instead discussed in the next Section.

5.0 LANDFILL GAS FIELD MONITORING RESULTS

Results of the monitoring program undertaken in 2020 are presented in Table 2 for May, Table 3 for August and Table 4 for December. Non-Methane Organic Compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 1.25% at the following locations:

- MH-9 (G3-a), MH-5 (G11-a), MH-4 (G12-a), and MH-2 (G18-a) in May 2020
- MH-8 (G4-a), monitoring well OW-92-8 (G15), and pipeline clean out (G82-a) in August 2020
- Monitoring well OW-92-8 (G15) in December 2020

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met at the WCC Navan Facility based on the 2020 monitoring results. Although no monitoring locations are available below surface at the property boundary, based on the discussion in Section 3.1 of this report it is anticipated that the WCC Navan Facility met the property boundary requirements in 2020.

Hydrogen sulfide was not detected at any location during the 2020 monitoring events, with the exception of the following location, which reported a relatively low concentration:

- Collector MH (G-26i) in May 2020

During the 2020 winter monitoring session, no odours were noted at the site, strong odours were noted in August, and faint odours were noted in May by the Golder field technician. As previously mentioned, gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2020, WCC personnel responded to three odour related complaints. One horizontal well was installed on site in 2020 as part of the permanent LFG collection system which will help mitigate some of the odour present once connected to the current system.

6.0 ODOUR CONTROL

To ensure the WCC Navan Facility is operated in a manner that minimizes the impact from odour on the public and the natural environment, the following program is in place at the WCC Navan Facility to deal with odour issues.

6.1 Odour Monitoring

WCC has a comprehensive program for monitoring odours and for taking remedial action in the event that odours become at all problematic in the operation of the WCC Navan Facility. Any unusual odour events and any measures taken to deal with odour at the site are recorded and filed on-site.

There are no Ontario Government standards for odour. There are no agreed-upon, empirical measurement protocols or odour thresholds that may be used in the operation of a landfill or processing facility. Consequently, the ultimate test of an effective odour-control strategy for any facility can only be that it produces no odour complaints from the surrounding community over an extended period of operation. The operators of the facility need to take preventative and other control measures to ensure that odours never reach a threshold where they can generate complaints. The best odour monitoring program available is to give responsibility to all staff working at the site to use their own senses to constantly monitor for excessive levels of odour on-site. While some level of on-site odour is normal and acceptable, it can become a problem when these same odours register off the

property. As well, the character of the odour is significant. Many 'aerobic' odours may be very inoffensive, even at a significant concentration, while even very low levels of the types of odour associated with anaerobic activity may be deeply offensive.

It is normal practice at the site to monitor odours in the following way. Every morning, when staff first arrives on the site, a general inspection is undertaken of the facility. While the site manager is looking for anything untoward, the presence of any odours likely to extend beyond the perimeter of the site will be of special concern. In addition, whenever any material at the site is being disturbed by the equipment used at the facility, staff on-site periodically stand downwind of the work that is being done, and assure themselves that any odours being created are mild, indicative of fully aerobic activity, and are not likely to be carried off the property.

In the event that staff on-site believe any odours may have some potential for off-site impact, they will drive to a location off-site and downwind from the work at the facility to determine at that moment if any off-site impact can be detected. If there is a detectable off-site impact, work on the site will be stopped immediately and remedial measures will be taken (see below). If no off-site impacts are detectable, work at the site will proceed with caution, with further periodic inspections off-site. Remedial measures will again be taken as appropriate.

The key to this approach is that all staff are constantly vigilant for even mild odours produced on-site and will take actions to deal with those odours well before they become evident off-site.

A windsock and flag is installed on the site. This provides a strong visual reminder to site staff of existing wind conditions, such that they can make judgments as to the potential for off-site odours, given that day's planned activities.

No odour monitoring program is of much value unless there is a companion program to control those same odours, once they are detected. What follows is a stepped program, capable of dealing effectively with everything from the mildest odours to the most offensive. It should be noted that all of the measures described below can and are just as likely to be applied to only sections of a site, rather than to the entire site. The source of odour problems can commonly be quite localized.

6.2 Prevention

The best odour control strategy is odour prevention. If experienced staff early in the process makes the correct, preventative decisions, odour will not be an issue. Although mild odours are experienced on-site from time to time, they are mild in nature and should not be noticeable off-site.

A perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends below the water table. This drainage system has significantly reduced, if not eliminated, the potential for off-site migration of LFG.

Monitoring of methane gas at the landfill site is performed on three occasions per year generally during the spring, summer and late fall or winter. Results of the monitoring programs and interpretation of the data are presented in the annual Operations & Monitoring report.

A leachate pumping station has been constructed in the southeast corner of the landfill site and a forcemain connection to the municipal sewage treatment plant commenced in 2007. Presently, the disposal method of choice for leachate generated by the WCC Navan Facility is treatment at the Robert O. Pickard Environmental Centre, a waste water treatment plant. The use of leachate retention ponds has been discontinued. This eliminates the possibility of odours emanating from on-site treatment and leachate retention ponds.

As discussed in Section 3.4, an interim LFG odour control system was installed in 2011 and commissioned in April 2012. The purpose of the interim LFG odour control system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells. The system was extended in 2016, 2017, and 2019. In 2020, one horizontal well was added at the north-west corner of Phase 1.

6.3 Masking the Odour

Principally, these additional measures will consist of using physical, biological and/or chemical methods to mask the odours on the surface of the odour source, so that none of the odours contained within are released to the environment. A number of proven masking techniques are available and can be used at the discretion of the site manager:

- Physically covering the surface of the odour source with a 15 centimetre layer of bulking material is often enough to block the release of most odours for a period of a day or more while remedial work is done;
- A number of biological inoculants are available commercially. These substances, when applied to the surface in a water solution, are felt to effectively reinforce aggressive aerobic activity on the surface by out-competing any anaerobic colonies that may be present in the near surface area. In effect, this creates a bio-filter, and biologically processes anaerobic gases as they are released; and/or,
- A number of chemical/nutrient mixtures are also available commercially. These substances, when applied to the odour source in much the same manner used with the biological inoculants, can have a very similar or even stronger effect. Manufacturers of these products claim that their compounds rapidly stimulate the growth of one desirable family of microorganisms or another, again to create a bio-filter effect.

Whatever the actual mechanism, these products have been proven effective in the field. In all cases, odour control strategies used at this level can be applied within minutes of the decision to use them, and the effects will be largely felt within 10-15 minutes of that application, if not sooner.

6.4 Isolating an Odour Source

The last strategy will consist of using additional measures to isolate and neutralize the offending odour source material. The offensive material may be removed from the problem area, landfilled and covered immediately. This isolation strategy will be used at the discretion of the site manager.

6.5 Complaints Response

In the event that an odour complaint is received, either by the City of Ottawa or the MECP, it is expected that those parties will immediately contact WCC site staff and notify them of the problem. WCC staff will take immediate steps to determine the extent of the problem and whether or not it is caused by the facility. If the source of the odour is deemed to be originating from the WCC Navan Facility, appropriate measures as described above will be taken to mitigate the odour problem and to stop the detection of odours off-site. Again, all such measures taken will be documented and a record kept on-site. If the identity of the complainant is made known to WCC staff, staff will contact the complainant that day, listen to their description of the problem, advise them in detail of the measures taken to rectify the problem, and invite them to visit the facility at some point to see for themselves how the site is operated. WCC will also call them back in a week's time to determine whether or not they have been aware of any other odours at their location.

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WCC staff has found in the past that this kind of immediate and personal attention goes a long way to building community support for a facility and builds community confidence in the management of the site.

7.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Waste Connections of Canada. The report, which specifically includes all tables and figures, is based on data and information collected by Golder Associates Ltd. and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder Associates Ltd. as described in this report.

Golder Associates Ltd. has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Air quality conditions may vary from these sampled locations.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

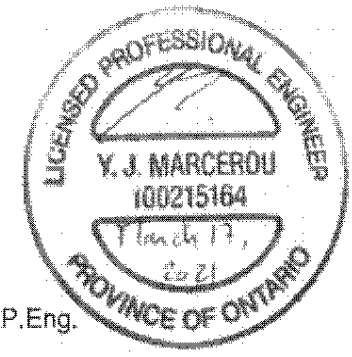
Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

8.0 CLOSURE

We trust this report satisfies your current requirements. If you have any further questions regarding this report, please contact the undersigned.

Golder Associates Ltd.



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ETB/YJM/PLE/sg
https://golderassociates.sharepoint.com/sites/136820/project files/6 deliverables/1000_2020 amr/rpt 02 - ifg monitoring/20412275-001-r-rev 0- wcc landfill gas 2020_mar2021.docx

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PARAMETER	November 29, 1994					June 13, 2002				
	MDL	MH-12	G.L. Q-7	MH-7	MH-0	MDL	Ambient (Parking)	Passive Vent F-4	MH-9	Pump Station
		SMP1	SMP2	SMP3	SMP4		SMP1	SMP2	SMP3	SMP4
Nitrogen, N_2 (%)	0.1	77	75	79	79	0.1	77.6	80.1	77.7	78.2
Oxygen, O_2 (%)	0.1	20	15	20	21	0.1	21.6	17.6	21.4	21.7
Carbon Dioxide.CO_2 (%)	0.1	1.8	7.8	1	ND	0.1	ND	1.5	0.3	ND
Methane, CH_4 (%)	0.1	0.7	3.8	0.6	ND	0.1	ND	ND	0.5	ND
Carbon Monoxide, CO (%)	0.1	ND	ND	ND	ND	0.1	ND	ND	ND	ND
Carbon Disulfide (PPM)	0.02	*	ND	-	-	0.04	ND	ND	ND	ND
Dimethyl Disulfide (PPM)	0.03	ND	ND	-	-	0.05	ND	ND	ND	ND
Ethyl Mercaptan / Dimethyl Sulfide (PPM)	0.03	0.4	ND	-	-	0.1	ND	ND	ND	ND
Hydrogen Sulfide / Carbonyl Sulfide (PPM)	0.02	120	0.4	-	-	0.05	ND	ND	ND	-
						2.1	-	-	-	2.2*
Methyl Mercaptan (PPM)	0.03	1	ND	-	-	0.05	ND	ND	ND	ND
Propyl Mercaptan / Ethyl Methyl Sulfide (PPM)	0.03	ND	ND	-	-	0.1	ND	ND	ND	ND
Sulfur Dioxide (PPM)	0.1	ND	ND	-	-	0.4	ND	ND	ND	ND
1,1,1-Trichloroethane (ppb)	0.2	0.1	ND	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene (ppb)	-	-	-	-	-	1	8	ND	9	ND
1,4-Dichlorobenzene	-	-	-	-	-	1	ND	5	6	<1
Benzene (ppb)	0.1	0.1	ND	-	-	1	ND	ND	ND	7
Cyclohexane (ppb)	0.1	0.1	0.1	-	-	-	-	-	-	-
Ethylbenzene (ppb)	-	-	-	-	-	1	ND	3	2	15
Hexane (ppb)	0.1	ND	0.2	-	-	-	-	-	-	-
m,p-Xylene (ppb)	-	-	-	-	-	2	ND	9	2	35
Naphthalene (ppb)	-	-	-	-	-	10	40	ND	48	ND
Other VOC parameters analysed (refer to lab report)	-	-	-	-	-		ND	ND	ND	ND
o-Xylene (ppb)	-	-	-	-	-	1	<1	4	3	11
Styrene (ppb)	-	-	-	-	-	1	11	5	3	6
Toluene (ppb)	0.1	0.7	0.1	-	-	1	15	29	19	170
Total VOCs - EPA 624 (ppb)		4.1	0.4	-	-	-	-	-	-	-
Total Volatile Organics (ppb)	-	-	-	-	-	0.1	0.43	0.24	0.46	0.51
Trichloroethene (ppb)	-	-	-	-	-	1	ND	ND	ND	7
Trichlorofluoromethane (ppb)	0.5	3.1	ND	-	-	-	-	-	-	-

MDL - Method Detection Limit
ND - Not Detected

Created by: BLB
Checked by: PLE

Table 2: Field Monitoring Results - May 2020
WCC - Navan Waste Recycling and Disposal Facility
2020 Landfill Gas Monitoring - Spring Session

	Monitoring Location		Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.1	0.5	20.9	0	0	1001
		b	OW-95-8 Ambient Air	0.0	0.1	21.0	0	0	1001
	G2	a	MH-10	0.4	0.4	21.0	0	0	1001
		b	MH-10 Ambient Air	0.0	0.1	21.1	0	0	1001
	G3	a	MH-9	2.2	1.4	20.4	1	0	1001
		b	MH-9 Ambient Air	0.0	0.1	21.1	0	0	1001
	G4	a	MH-8	0.0	0.1	21.2	0	0	1001
		b	MH-8 Ambient Air	0.0	0.1	21.1	0	0	1001
	G5	a	MH-7	0.0	0.2	21.2	0	0	1001
		b	MH-7 Ambient Air	0.0	0.1	21.3	0	0	1001
	G6	a	MH-6	0.1	1.6	21.0	0	0	1002
		b	MH-6 Ambient Air	0.0	0.1	21.4	0	0	1002
	G7		OW-94-1	0.0	0.1	21.4	0	0	1002
	G8		OW-94-2	0.0	0.1	21.3	0	0	1002
	G9		05-R3	0.0	0.9	20.8	0	0	1002
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.1	21.3	0	0	1002
	G11	a	MH-5	4.7	4.7	18.3	1	0	1002
		b	MH-5 Ambient Air	0.0	0.1	21.3	0	0	1002
	G12	a	MH-4	9.3	6.0	18.7	0	0	1002
		b	MH-4 Ambient Air	0.0	0.1	21.3	0	0	1002
	G13	a	MH-3	0.6	0.8	20.9	0	0	1002
		b	MH-3 Ambient Air	0.0	0.1	21.2	0	0	1002
	G14		OW-92-7	0.0	0.1	21.1	0	0	1002
	G15		OW-92-8	0.0	0.2	21.1	0	0	1002
	G16		05-8	0.0	0.6	21.1	0	0	1002
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.1	21.2	0	0	1002
	G18	a	MH-2	1.6	2.3	19.9	0	0	1002
		b	MH-2 Ambient Air	0.0	0.1	21.2	0	0	1002
	G19	a	MH-1	Sealed					
		b	MH-1 Ambient Air	0.0	0.1	21.2	0	0	1002
	G20		05-11	0.0	0.5	21.0	0	0	1002
	G21		OW-92-9	0.1	0.1	21.0	0	0	1002
	G22		OW-92-10	0.0	0.6	21.0	0	0	1002
	G23		OW-92-11	0.0	0.6	21.7	0	0	1002
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.1	21.3	0	0	1002
	G25	a	Pump House Ambient	0.0	0.1	21.2	0	0	1001
		b	Air Vent Along Pump House	0.0	0.1	21.2	0	0	1001
		c	pump House (inside)	0.0	0.1	21.2	0	0	1001
	G26	a	Wet Well MH	0.0	0.6	21.0	0	0	1001
		b	Blower Shed	0.0	0.1	21.1	0	0	1001
		c	Sea can (blue trailer - inside)	0.0	0.1	20.8	0	0	1000
		d	Primary Tank #1	0.0	2.0	20.4	0	0	1000
		e	Primary Tank #2	0.0	2.4	20.2	0	0	1000
		f	Secondary Tank #1	0.0	0.8	20.6	0	0	1000
		g	Secondary Tank #2	0.0	0.8	20.6	0	0	1000
		i	Collector MH	0.0	0.1	21.1	0	6	1001
	G27		Grid Line (R-19)	0.0	0.1	21.2	0	0	1001
	G81	a	Pipeline Ambient Air	0.0	0.1	21.1	0	0	1001
		c	Pipeline Clean Out	0.0	0.1	21.1	0	0	1001
	G82	a	Pipeline Clean Out	0.0	0.1	21.1	0	0	1001
		b	Pipeline Ambient Air	0.0	0.1	21.2	0	0	1001
	G83	a	Pipeline Ambient Air	0.0	0.1	21.4	0	0	1001
		b	Pipeline Clean Out MH	Sealed					
	G84	a	Tank Truck loading station MH	0.0	0.1	21.4	0	0	1001
		b	Ambient Air Tank Truck loading station MH	0.0	0.1	21.4	0	0	1001
	G96	a	MH-0	0.0	0.1	21.4	0	0	1001
		b	MH-0 - Ambient Air	0.0	0.1	21.4	0	0	1001
OFF GROUND AREA	G29	a	Garage	0.0	0.1	20.9	0	0	1001
		b	Garage (outdoors)	0.0	0.1	20.9	0	0	1001
	G28		Lunch Room	0.0	0.1	20.9	0	0	1001
	G31	a	Gate Clerk	Removed					
		b	New Scale (outside)	0.0	0.1	21.0	0	0	1001
		c	New Gate Clerk (inside)	0.0	0.1	21.0	0	0	1001
	G32		Henri's Office	0.0	0.1	20.9	0	0	1001
	G34		OW-92-18	0.0	0.1	20.8	0	0	1001
	G35		OW-92-19	0.0	0.2	20.8	0	0	1001
	G26		Ambient Air (OW92-18, 92-19)	0.0	0.1	20.9	0	0	1001
	G100		Small Vehicle Drop-Off Area	0.0	0.2	20.4	0	0	1001

Table 2: Field Monitoring Results - May 2020
WCC - Navan Waste Recycling and Disposal Facility
2020 Landfill Gas Monitoring - Spring Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (mBars)
AIR VENTS	G39	a	Passive Air Vent	0.0	0.1	21.0	0	0	1001
		b	Ambient Air	0.0	0.1	21.0	0	0	1001
	G50	a	New Passive Air Vent	0.0	0.7	20.6	0	0	1001
		b	Ambient Air	0.0	0.1	21.4	0	0	1001
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.1	21.3	0	0	1001
		b	Manhole	Sealed					
FORMER COMPOST AREA	G52		Compost Area East Side	0.0	0.1	21.5	0	0	1001
	G53		Compost Area North Side	0.0	0.1	21.5	0	0	1001
	G54		Compost Area South Side	0.0	0.1	21.5	0	0	1001
	G55		Compost Area West Side	0.0	0.1	21.5	0	0	1001
AMBIENT AIR COLLECTOR PIPES	G59	a	Pipe F/G-6/7	Sealed					
		b	Ambient Air Collector Pipe F/G-6/7	0.0	0.1	21.4	0	0	1002
	G60	a	Pipe F-7/8	Sealed					
		b	Ambient Air Collector Pipe F-7/8	0.0	0.1	21.4	0	0	1002
	G61	a	Pipe E/F-9	Sealed					
		b	Ambient Air Collector Pipe E/F-9	0.0	0.1	21.4	0	0	1002
	G62	a	Pipe E-10	Sealed					
		b	Ambient Air Collector Pipe E-10	0.0	0.1	21.4	0	0	1002
	G63	a	Pipe E-11	Sealed					
		b	Ambient Air Collector Pipe E-11	0.0	0.1	21.4	0	0	1002
EAST AND NORTH FACES	G85	a	E-12 Ambient Air	0.0	0.1	21.4	0	0	1002
		b	E-12 Passive Air Vent	Sealed					
	G86	a	E-13 Ambient Air	0.0	0.1	21.4	0	0	1002
		b	E-13 Passive Air Vent	Sealed					
	G91	a	G-17 Ambient Air	0.0	0.1	21.4	0	0	
		b	G-17 Passive Air Vent	Part of new landfill cell					
	G200	a	D/E-14 Ambient Air	0.0	0.0	20.9	0	0	1002
		b	D/E-14 Passive Air Vent	Sealed					
	G201	a	D/E-15 Ambient Air	0.0	0.1	21.4	0	0	1002
		b	D/E-15 Passive Air Vent	Sealed					
	G202	a	D-15/16 Ambient Air	0.0	0.1	21.5	0	0	1002
		b	D-15/16 Passive Air Vent	Sealed					
	G203		Pipe Cleanout	0.0	0.1	21.2	0	0	1001
	G204		Pipe Cleanout	0.0	0.1	21.2	0	0	1001
	G205		Pipe Cleanout	0.0	0.1	21.2	0	0	1001
	G206		Pipe Cleanout	0.0	0.1	21.2	0	0	1001
	G207		Pipe Cleanout	0.0	0.1	21.2	0	0	1001
	G208		Pipe Cleanout	0.0	0.1	21.2	0	0	1001
CENTRE AREA - MISCELLANEOUS	G64		New Recycling Area	0.0	0.1	21.3	0	0	1001
	G65		Cont. Soil @ O-16	0.0	0.1	21.5	0	0	1001
	G66		Cont. Soil @ M-6	0.0	0.1	21.3	0	0	1001
	G67	a	M.H.	Sealed					
		b	M.H. Ambient Air	0.0	0.1	21.5	0	0	1001
	G68		Active Face (location=K-17)	0.0	0.1	21.4	0	0	1001
	G69		Recycling Area (old)	0.0	0.1	21.5	0	0	1001
	G70		Grid Line Location G-2	0.0	0.1	21.0	0	0	1001
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.1	20.7	0	0	1000
	G74		NEAR MONTE BLUE	0.0	0.1	20.7	0	0	1000
NAVAN ROAD	G75		3516 Navan Road	0.0	0.1	20.7	0	0	1000
	G76		3546 Navan Road	0.0	0.1	20.7	0	0	1000
	G77		Between 3550 and 3588 Navan Road	0.0	0.1	20.7	0	0	1000
	G78		3602 Navan Road	0.0	0.1	20.7	0	0	1000
	G79		3626 Navan Road	0.0	0.1	20.7	0	0	1000
	G80		3650 Navan Road	0.0	0.1	20.7	0	0	1000
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.1	21.5	0	0	1001
	GW-2		Gas Extraction Well - Ambient Air	0.0	0.1	21.5	0	0	1001
	GW-3		Gas Extraction Well - Ambient Air	0.0	0.1	21.5	0	0	1001
	GW-4		Gas Extraction Well - Ambient Air	0.0	0.1	21.5	0	0	1001

Notes:		
	The day was:	✔ overcast; sunny; cloudy; ✔ wet; during the ✔ morning; ✔ afternoon
	Temperatures ranged from:	9 to 12 degrees Celsius.
	Winds were from:	___ North; ✔ East; ___ West; ___ South and: __ Mild; ✔ Moderate; ___ Strong
	Odours were:	___ not noticeable; ✔ faint but noticeable; __ moderate but not offensive; _ strong
	Date: May 15, 2020	ETB RPM

Table 3: Field Monitoring Results - August 2020
WCC - Navan Waste Recycling and Disposal Facility
2020 Landfill Gas Monitoring - Summer Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.1	0.2	21.9	0	0	995
		b	OW-95-8 Ambient Air	0.0	0.1	22.0	0	0	995
	G2	a	MH-10	0.6	1.1	21.2	0	0	996
		b	MH-10 Ambient Air	0.0	0.1	21.9	0	0	996
	G3	a	MH-9	0.4	0.9	21.3	0	0	996
		b	MH-9 Ambient Air	0.0	0.1	21.9	0	0	996
	G4	a	MH-8	2.6	1.3	21.0	0	0	996
		b	MH-8 Ambient Air	0.0	0.1	21.9	0	0	996
	G5	a	MH-7	Sealed					
		b	MH-7 Ambient Air	0.0	0.1	21.9	0	0	995
	G6	a	MH-6	0.0	3.2	19.3	0	0	995
		b	MH-6 Ambient Air	0.0	0.1	21.1	0	0	995
	G7		OW-94-1	0.1	0.5	21.0	0	0	995
	G8		OW-94-2	0.0	0.3	21.0	0	0	995
	G9		05-R3	0.0	1.1	20.9	0	0	995
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.1	21.1	0	0	995
	G11	a	MH-5	0.0	1.3	20.8	0	0	995
		b	MH-5 Ambient Air	0.0	0.7	21.3	0	0	995
	G12	a	MH-4	0.0	0.2	21.4	0	0	995
		b	MH-4 Ambient Air	0.0	0.1	21.1	0	0	995
	G13	a	MH-3	0.0	0.9	21.1	0	0	995
		b	MH-3 Ambient Air	0.0	0.1	21.5	0	0	995
	G14		OW-92-7	0.0	0.1	21.6	0	0	995
	G15		OW-92-8	2.2	5.0	19.7	0	0	995
	G16		05-8	0.3	0.7	21.3	0	0	995
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.1	21.5	0	0	995
	G18	a	MH-2	0.0	7.8	18.4	0	0	995
		b	MH-2 Ambient Air	0.0	0.1	21.7	0	0	995
	G19	a	MH-1 (sealed)						
		b	MH-1 Ambient Air	0.0	0.0	21.7	0	0	995
	G20		05-11	0.0	2.4	20.4	0	0	995
	G21		OW-92-9	0.0	0.2	21.4	0	0	995
	G22		OW-92-10	0.0	0.3	21.3	0	0	995
	G23		OW-92-11	0.3	2.5	18.6	0	0	995
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.1	21.6	0	0	995
	G25	a	Pump House Ambient	0.0	0.1	21.6	0	0	995
		b	Air Vent Along Pump House	0.0	0.1	21.7	0	0	995
		c	pump House (inside)	0.0	0.1	21.7	0	0	995
	G26	a	Wet Well MH	0.0	0.1	21.7	0	0	995
		b	Blower Shed	0.0	0.1	21.7	0	0	995
		c	Sea can (blue trailer - inside)	0.0	0.1	21.7	0	0	995
		d	Primary Tank #1	0.0	0.1	21.7	0	0	995
		e	Primary Tank #2	0.0	0.1	21.7	1	0	995
		f	Secondary Tank #1	0.0	0.1	21.7	2	0	995
		g	Secondary Tank #2	0.0	0.1	21.7	0	0	995
		i	Collector MH	0.0	0.1	21.7	0	0	995
	G27		Grid Line (R-19)	0.0	0.1	21.8	0	0	995
	G81	a	Pipeline Ambient Air	0.0	0.1	21.9	0	0	996
		b	Pipeline Clean Out	0.0	0.1	21.9	0	0	996
	G82	a	Pipeline Clean Out	1.7	1.4	21.1	0	0	996
		b	Pipeline Ambient Air	0.0	0.1	21.8	0	0	996
	G83	a	Pipeline Ambient Air	0.0	0.1	21.7	0	0	996
		b	Pipeline Clean Out MH	0.0	1.5	20.1	0	0	996
	G84	a	Tank Truck loading station MH	0.0	0.1	21.8	0	0	996
		b	Ambient Air Tank Truck loading station MH	0.0	0.1	21.8	0	0	996
	G98	a	MH-0	0.0	0.1	21.7	0	0	996
		b	MH-0 Ambient Air	0.0	0.1	21.7	0	0	996
OFFICE/BUILDING AREA	G28	a	Garage	0.0	0.2	21.2	0	0	995
		b	Garage (outdoors)	0.1	0.1	21.2	0	0	995
	G29		Lunch Room	0.1	0.2	21.2	0	0	995
	G31	a	Gate Clerk	Removed					
		b	New Scale (outside)	0.0	0.1	21.2	0	0	995
		c	New Gate Clerk (Inside)	0.0	0.1	21.2	0	0	995
	G32		Henri's Office	0.0	0.2	21.2	0	0	995
	G34		OW-92-18	0.1	0.2	21.2	0	0	995
	G35		OW-92-19	0.1	0.3	21.1	0	0	995
	G36		Ambient Air (OW92-18, 92-19)	0.1	0.2	21.3	0	0	995

Table 3: Field Monitoring Results - August 2020
WCC - Navan Waste Recycling and Disposal Facility
2020 Landfill Gas Monitoring - Summer Session

Monitoring Location		Description	Methane CH_4, %	Carbon Dioxide CO_2, %	Oxygen O_2, %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (mBars)
	G100	Small Vehicle Drop-Off Area	0.0	0.1	21.2	0	0	995
FORMER AIR VENTS	G99 a	Passive Air Vent	Not found					
	G99 b	Ambient Air	Not found					
	G50 a	New Passive Air Vent	Not found					
	G50 b	Ambient Air	Not found					
	G101 a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.1	21.9	0	0	996
	G101 b	Manhole	Sealed					
FORMER COMPOST AREA	G52	Compost Area East Side	0.0	0.1	21.8	0	0	996
	G53	Compost Area North Side	0.0	0.1	21.9	0	0	996
	G54	Compost Area South Side	0.0	0.1	21.9	0	0	996
	G55	Compost Area West Side	0.0	0.1	21.9	0	0	996
AMBIENT AIR COLLECTOR PIPES	G59 a	Pipe F/G-6/7	Sealed					
	G59 b	Ambient Air Collector Pipe F/G-6/7	0.0	0.1	21.2	0	0	995
	G60 a	Pipe F-7/8	Sealed					
	G60 b	Ambient Air Collector Pipe F-7/8	0.0	0.1	21.2	0	0	995
	G61 a	Pipe E/F-9	Sealed					
	G61 b	Ambient Air Collector Pipe E/F-9	0.0	0.1	21.2	0	0	995
	G62 a	Pipe E-10	Sealed					
	G62 b	Ambient Air Collector Pipe E-10	0.0	0.1	21.3	0	0	995
	G63 a	Pipe E-11	Sealed					
	G63 b	Ambient Air Collector Pipe E-11	0.0	0.1	21.3	0	0	995
EAST AND NORTH FACES	G65 a	E-12 Ambient Air	0.0	0.1	21.3	0	0	995
	G65 b	E-12 Passive Air Vent	Sealed					
	G56 a	E-13 Ambient Air	0.0	0.1	21.4	0	0	995
	G56 b	E-13 Passive Air Vent	Sealed					
	G91 a	G-17 Ambient Air	Part of new landfill cell					
	G91 b	G-17 Passive Air Vent						
	G200 a	D/E-14 Ambient Air	0.0	0.1	21.4	0	0	995
	G200 b	D/E-14 Passive Air Vent	Sealed					
	G201 a	D/E-15 Ambient Air	0.0	0.1	21.4	0	0	995
	G201 b	D/E-15 Passive Air Vent	Sealed					
	G202 a	D-15/16 Ambient Air	0.0	0.1	21.5	0	0	995
	G202 b	D-15/16 Passive Air Vent	Sealed					
	G203	Pipe Cleanout	0.0	0.1	21.8	0	0	995
	G204	Pipe Cleanout	0.0	0.1	21.8	0	0	995
	G205	Pipe Cleanout	0.0	0.1	21.8	0	0	995
	G206	Pipe Cleanout	0.0	0.1	21.8	0	0	995
	G207	Pipe Cleanout	0.0	0.1	21.8	0	0	995
	G208	Pipe Cleanout	0.0	0.1	21.8	0	0	995
CENTRE AREA - MISCELLANEOUS	G64	New Recycling Area	0.0	0.1	21.9	0	0	995
	G66	Cont. Soil @ L-16	0.0	0.1	21.8	0	0	995
	G68	Cont. Soil @ M-6	0.0	0.1	21.9	0	0	996
	G67 a	M.H.	Sealed					
	G67 b	M.H. Ambient Air	0.0	0.1	21.6	0	0	996
	G69	Active Face (location=E-16)	0.0	0.1	21.7	0	0	995
	G69	Recycling Area (old)	0.0	0.1	21.6	0	0	995
	G70	Grid Line Location G-2	0.0	0.1	21.8	0	0	995
OFF SITE	G73	NEAR PAGE STREET @ new subdivision	0.0	0.1	21.1	0	0	996
	G74	NEAR MONTE BLUE	0.0	0.0	21.1	0	0	996
NAVAN ROAD	G75	3516 Navan Road	0.0	0.1	21.4	0	0	996
	G76	3546 Navan Road	0.0	0.1	21.4	0	0	996
	G77	Between 3550 and 3588 Navan Road	0.0	0.1	21.3	0	0	996
	G78	3602 Navan Road	0.0	0.1	21.3	0	0	996
	G79	3628 Navan Road	0.0	0.1	21.3	0	0	996
	G80	3650 Navan Road	0.0	0.1	21.2	0	0	996
Gas Extraction Wells	GW-1	Gas Extraction Well - Ambient Air	0.0	0.1	21.6	0	0	996
	GW-2	Gas Extraction Well - Ambient Air	0.0	0.1	21.7	0	0	996
	GW-3	Gas Extraction Well	0.0	0.1	21.7	0	0	996
	GW-4	Ambient Air	Buried - Not found					

Notes:		
	The day was:	✔ overcast; ___ sunny; ___ cloudy; __ wet; during the ✔ morning; ✔ afternoon
	Temperatures ranged from:	11 to 18 degrees Celsius
	Winds were from the:	✔ North; ___ East; ✔ West; ___ South and: ✔ Mild; __ Moderate; __ Strong
	Odours were:	__ not noticeable; faint but noticeable; __ moderate but not offensive; ✔ strong
	Date: August 27, 2020	ETB RPM

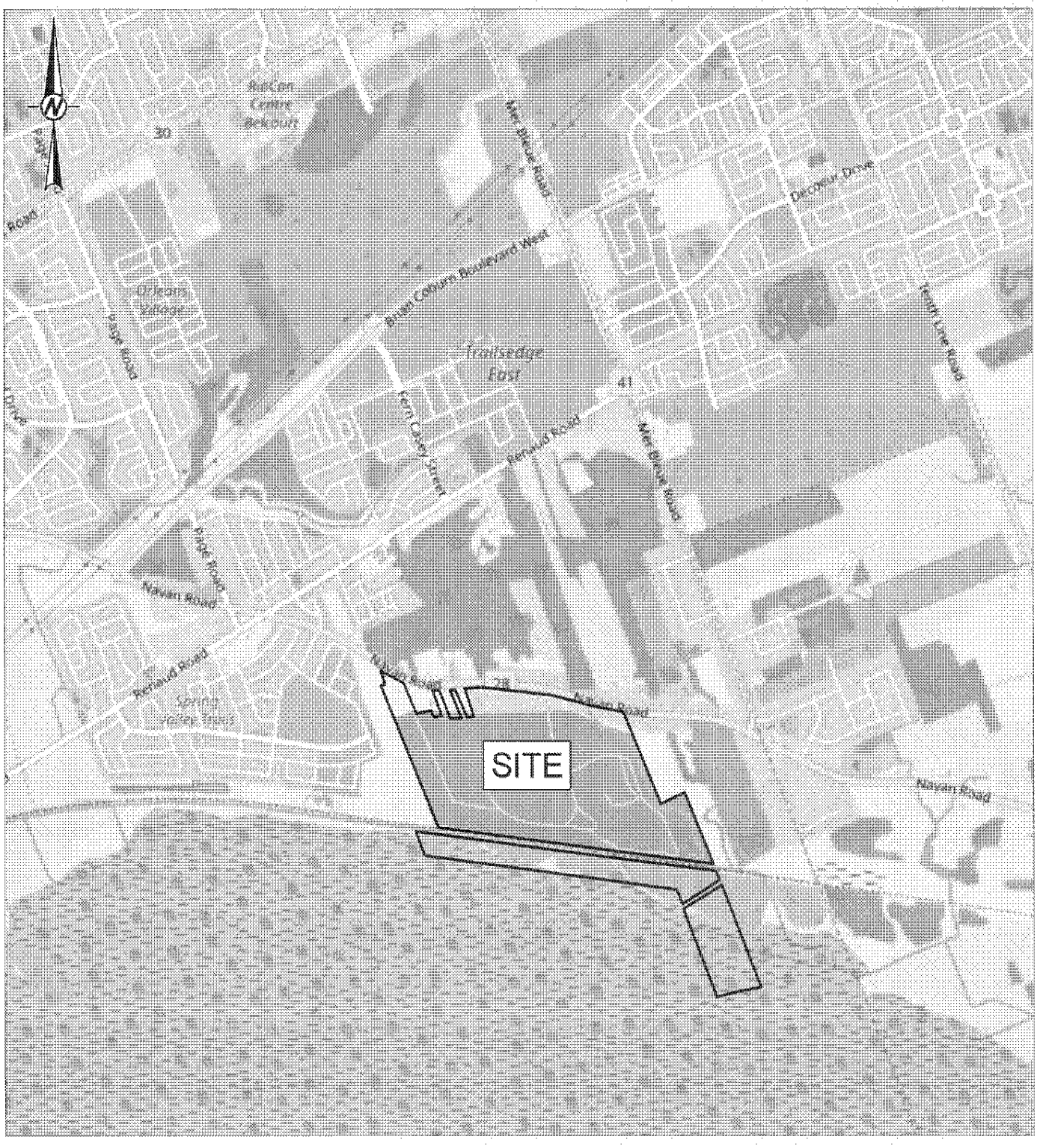
Table 4: Field Monitoring Results - December 2020
WCC - Navan Waste Recycling and Disposal Facility
2020 Landfill Gas Monitoring - Winter Session

	Monitoring Location		Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.2	0.6	22.7	0	0	1007
		b	OW-95-8 Ambient Air	0.1	0.2	22.7	0	0	1007
	G2	a	MH-10	0.2	0.2	22.7	0	0	1007
		b	MH-10 Ambient Air	0.1	0.2	22.7	1	0	1007
	G3	a	MH-9	0.2	0.3	22.7	0	0	1007
		b	MH-9 Ambient Air	0.2	0.2	22.7	0	0	1007
	G4	a	MH-8	0.2	0.3	22.7	0	0	1007
		b	MH-8 Ambient Air	0.2	0.2	22.7	0	0	1007
	G5	a	MH-7	0.3	0.3	22.6	0	0	1007
		b	MH-7 Ambient Air	0.1	0.2	22.7	0	0	1007
	G6	a	MH-6	0.3	1.4	22.5	0	0	1007
		b	MH-6 Ambient Air	0.1	0.2	22.8	0	0	1007
	G7		OW-94-1	0.1	0.3	22.6	1	0	1007
	G8		OW-94-2	0.1	0.2	22.7	1	0	1007
	G9		05-R3	0.1	0.5	22.6	0	0	1007
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.1	0.2	22.6	0	0	1007
	G11	a	MH-5	0.1	0.7	22.4	0	0	1007
		b	MH-5 Ambient Air	0.1	0.2	22.6	1	0	1007
	G12	a	MH-4	0.1	0.3	22.6	0	0	1007
		b	MH-4 Ambient Air	0.1	0.2	22.7	0	0	1007
	G13	a	MH-3	0.1	0.8	22.5	0	0	1007
		b	MH-3 Ambient Air	0.1	0.2	22.7	0	0	1007
	G14		OW-92-7	0.1	0.2	22.6	0	0	1007
	G15		OW-92-8	6.3	5.8	19.3	0	0	1007
	G16		05-8	0.9	1.2	22.5	1	0	1007
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.2	22.5	1	0	1007
	G18	a	MH-2	0.6	5.3	21.5	1	0	1007
		b	MH-2 Ambient Air	0.1	0.2	22.6	0	0	1007
	G19	a	MH-1 (sealed)	Sealed					
		b	MH-1 Ambient Air	0.0	0.2	22.5	0	0	1007
	G20		05-11	0.1	0.9	22.3	0	0	1007
	G21		OW-92-9	0.1	0.3	22.4	0	0	1007
	G22		OW-92-10	0.1	0.5	22.3	0	0	1007
	G23		OW-92-11	0.1	0.9	22.6	0	0	1007
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.2	22.4	0	0	1007
	G25	a	Pump House Ambient	0.0	0.2	22.3	0	0	1007
		b	Air Vent Along Pump House	0.0	0.2	22.2	0	0	1007
		c	pump House (inside)	0.0	0.2	22.2	0	0	1007
	G26	a	Wet Well MH	0.0	0.2	22.3	0	0	1007
		b	Blower Shed	0.0	0.2	22.2	0	0	1007
		c	Sea can (blue trailer - inside)	0.0	0.2	22.3	1	0	1007
		d	Primary Tank #1	0.0	0.7	22.2	0	0	1007
		e	Primary Tank #2	0.1	0.7	22.1	0	0	1007
		f	Secondary Tank #1	0.1	0.4	22.2	0	0	1007
		g	Secondary Tank #2	0.0	0.3	22.2	0	0	1007
		i	Collector MH	0.1	1.3	22.1	0	0	1007
	G27		Grid Line (R-19)	0.0	0.2	22.3	0	0	1007
	G81	a	Pipeline Ambient Air	0.1	0.2	22.7	1	0	1007
		b	Pipeline Clean Out	0.2	0.2	22.7	0	0	1007
	G82	a	Pipeline Clean Out	0.2	0.2	22.7	0	0	1007
		b	Pipeline Ambient Air	0.2	0.2	22.7	0	0	1007
	G83	a	Pipeline Ambient Air	0.1	0.2	22.6	0	0	1007
		b	Pipeline Clean Out MH	Sealed					
	G84	a	Tank Truck loading station MH	0.2	0.3	22.4	0	0	1007
		b	Ambient Air Tank Truck loading station MH	0.1	0.2	22.4	0	0	1007
	G88	a	MH-0	0.1	0.2	22.4	0	0	1007
		b	MH-0 Ambient Air	0.1	0.2	22.4	0	0	1007
OFFICE/BUILDING AREA	G28	a	Garage	0.1	0.2	22.6	6	0	1007
		b	Garage (outdoors)	0.1	0.2	22.4	0	0	1007
	G29		Lunch Room	0.1	0.2	22.6	1	0	1007
	G31	a	Gate Clerk	Removed					
		b	New Scale (outside)	0.0	0.2	22.5	0	0	1007
		c	New Gate Clerk (Inside)	0.0	0.2	22.4	0	0	1007
	G32		Henri's Office	0.1	0.2	22.6	0	0	1007
	G34		OW-92-16	0.0	0.2	22.6	0	0	1007
	G35		OW-92-19	0.1	3.4	22.5	0	0	1007
	G36		Ambient Air (OW92-16, 92-19)	0.0	0.2	22.6	0	0	1007
	G100		Small Vehicle Drop-Off Area	0.0	0.2	22.4	0	0	1007

Table 4: Field Monitoring Results - December 2020
WCC - Navan Waste Recycling and Disposal Facility
2020 Landfill Gas Monitoring - Winter Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (mBars)
FORMER AIR VENTS	G39	a	Passive Air Vent	0.1	0.2	22.7	1	0	1007
		b	Ambient Air	0.1	0.2	22.7	0	0	1007
	G50	a	New Passive Air Vent	0.1	0.2	22.4	0	0	1007
		b	Ambient Air	0.1	0.2	22.4	0	0	1007
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.1	0.2	22.6	0	0	1007
		c	Manhole	Sealed					
	G102	a	Passive Air Vent	0.0	0.2	22.5	0	0	1007
		b	Passive Air Vent - Ambient Air	0.1	0.2	22.5	0	0	1007
FORMER COMPOST AREA	G52		Compost Area East Side	0.1	0.2	22.4	0	0	1007
	G53		Compost Area North Side	0.1	0.2	22.5	0	0	1007
	G54		Compost Area South Side	0.1	0.2	22.5	0	0	1007
	G55		Compost Area West Side	0.1	0.2	22.5	0	0	1007
AMBIENT AIR COLLECTOR PIPES	G59	a	Pipe F/G-6/7	Sealed					
		b	Ambient Air Collector Pipe F/G-6/7	0.1	0.2	22.8	0	0	1010
	G60	a	Pipe F-7/8	Sealed					
		b	Ambient Air Collector Pipe F-7/8	0.0	0.2	22.9	0	0	1010
	G61	a	Pipe E/F-9	Sealed					
		b	Ambient Air Collector Pipe E/F-9	0.0	0.2	21.0	0	0	1010
	G62	a	Pipe E-10	Sealed					
		b	Ambient Air Collector Pipe E-10	0.1	0.2	21.2	0	0	1010
	G63	a	Pipe E-11	Sealed					
		b	Ambient Air Collector Pipe E-11	0.0	0.2	21.4	0	0	1010
EAST AND NORTH FACES	G85	a	E-12 Ambient Air	0.1	0.2	21.5	1	0	1010
		b	E-12 Passive Air Vent	Sealed					
	G86	a	E-13 Ambient Air	0.0	0.2	21.5	0	0	1010
		b	E-13 Passive Air Vent	Sealed					
	G91	a	G-17 Ambient Air	Monitoring location inadvertently missed during December monitoring session					
		b	G-17 Passive Air Vent	Part of new landfill cell					
	G200	a	D/E-14 Ambient Air	0.0	0.2	21.7	0	0	1010
		b	D/E-14 Passive Air Vent	Sealed					
	G201	a	D/E-15 Ambient Air	0.1	0.2	21.8	0	0	1010
		b	D/E-15 Passive Air Vent	Sealed					
	G202	a	D-15/16 Ambient Air	0.1	0.2	21.9	0	0	1010
		b	D-15/16 Passive Air Vent	Sealed					
	G203		Pipe Cleanout	0.1	0.2	22.8	0	0	1007.3
	G204		Pipe Cleanout	0.1	0.2	22.8	1	0	1007.3
	G205		Pipe Cleanout	0.1	0.2	22.7	0	0	1007.3
	G206		Pipe Cleanout	0.1	0.2	22.6	0	0	1007.3
	G207		Pipe Cleanout	0.1	0.2	22.6	0	0	1007.3
	G208		Pipe Cleanout	0.1	0.2	22.5	0	0	1007
CENTRE AREA - MISCELLANEOUS	G64		New Recycling Area	0.1	0.2	22.7	0	0	1007
	G65		Cont. Soil @ L-16	0.1	0.2	22.4	0	0	1007
	G66		Cont. Soil @ M-5	0.1	0.2	22.6	0	0	1007
	G67	a	M.H.	Sealed					
		b	M.H. Ambient Air	0.1	0.2	22.5	0	0	1007
	G68		Active Face (location=G19)	0.1	0.2	22.4	0	0	1007
	G69		Recycling Area (old)	0.1	0.2	22.4	0	0	1007
	G70		Grid Line Location G-2	0.1	0.2	22.7	0	0	1007
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.2	22.1	0	0	1010
	G74		NEAR MONTE BLUE	0.1	0.2	22.5	0	0	1010
NAVAN ROAD	G75		3516 Navan Road	0.1	0.2	22.6	0	0	1010
	G76		3546 Navan Road	0.1	0.2	22.8	0	0	1010
	G77		Between 3550 and 3588 Navan Road	0.1	0.2	22.7	0	0	1010
	G78		3602 Navan Road	0.1	0.2	22.7	0	0	1010
	G79		3626 Navan Road	0.1	0.2	22.7	0	0	1010
	G80		3650 Navan Road	0.1	0.2	22.6	0	0	1010
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.1	0.2	22.5	0	0	1007
	GW-2		Gas Extraction Well - Ambient Air	0.1	0.2	22.5	0	0	1007
	GW-3		Gas Extraction Well - Ambient Air	0.1	0.2	22.6	0	0	1007
	GW-4		Ambient Air	0.1	0.2	22.5	0	0	1007

Notes:	The day was:	✔ overcast; __sunny; __cloudy; __wet; during the ✔ morning; ✔ afternoon
	Temperatures ranged from:	-0.2 to 1.0 degrees Celsius
	Winds were from the:	__ North; __ East; ✔ West; __ South and: __ Mild; ✔ Moderate; __ Strong
	Odours were:	✔ not noticeable; __faint but noticeable; __ moderate but not offensive; strong
	Date: December 10, 2020	ETB RPM



WASTE CONNECTIONS OF CANADA

0 500 1,000
1:25,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

CLIENT
WASTE CONNECTIONS OF CANADA

CONSULTANT
GOLDER

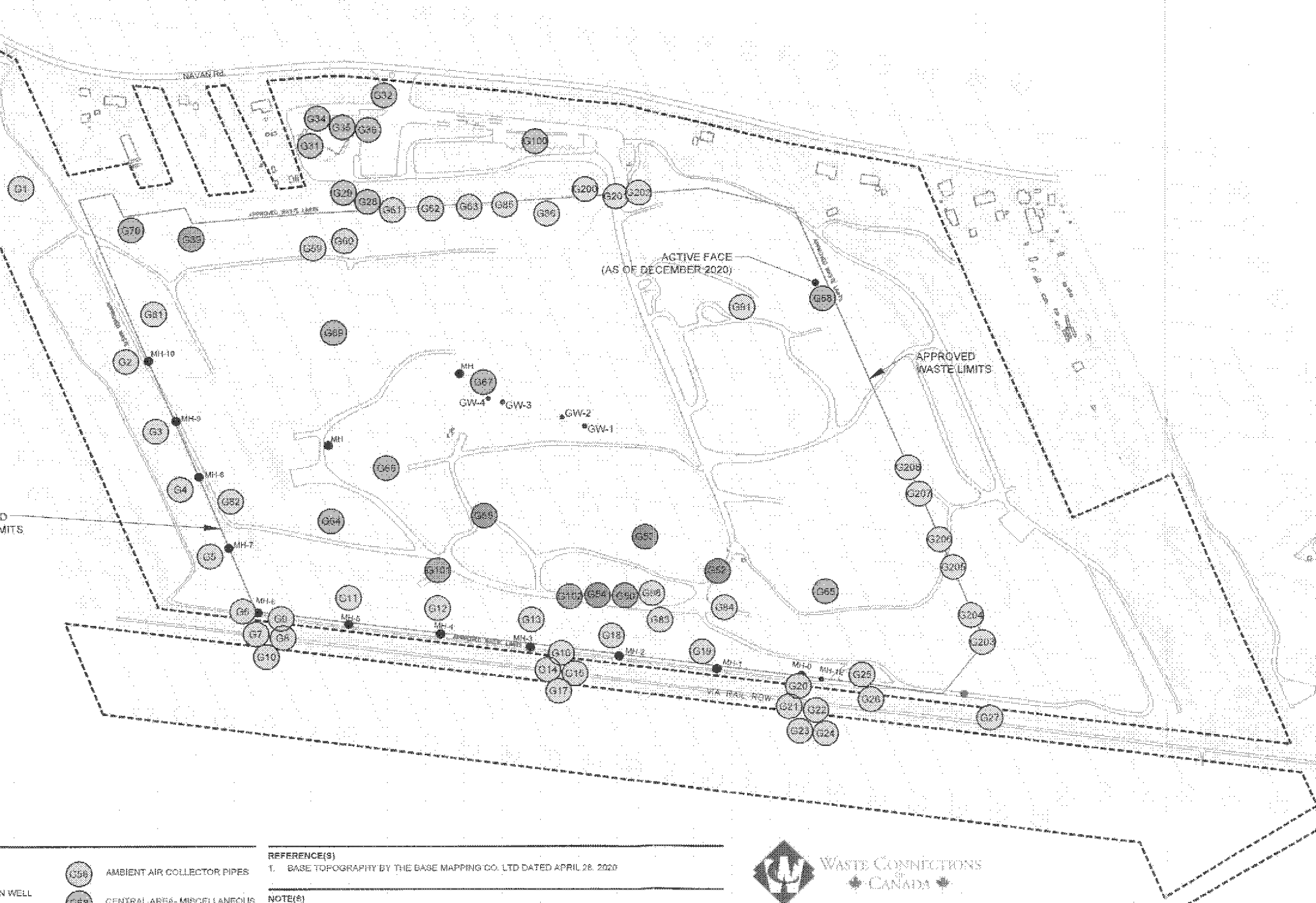
YYYY-MM-DD	2021-02-15
DESIGNED	ETB
PREPARED	JM
REVIEWED	YJM
APPROVED	PLE

PROJECT
REPORT ON 2020 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
20412275	0001	0	001369

25 mm



REFERENCE(S)

1. BASE TOPOGRAPHY BY THE BASE MAPPING CO. LTD DATED APRIL 28, 2020

NOTE(S)

1. G73 TO G80 ARE LOCATED OFF-SITE
2. LOCATION G68 MOVES THROUGHOUT THE YEAR. SEE TABLES 2 TO 4 FOR EXACT LOCATION

WASTE CONNECTIONS CANADA

CLIENT
WASTE CONNECTIONS OF CANADA

PROJECT
REPORT ON 2020 LAND
NAVAN WASTE RECYCL
3354 NAVAN ROAD, OT

001370

APPENDIX A

2009 Landfill Gas Characterization

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-6 (tubing inside manhole)	0.1	1.1	20.5	22.6	2	0	3	1	984	76.2	-8.5
Manhole MH-6 (ambient air)	0.0	0.1	20.9	22.1	0	0	0	0	984	77.8	-5.1
Manhole MH-5 (tubing inside manhole)	0.1	1.1	20.9	22.1	2	0	3	0	984	76.7	-6.2
Manhole MH-5 (ambient air)	0.0	0.1	20.5	21.6	0	0	0	0	984	78.3	-2.7
Manhole MH-4 (tubing inside manhole)	0.9	2.3	19.5	20.7	1	0	21	18	985	76.1	-1.5
Manhole MH-4 (ambient air)	0.0	0.1	20.7	22.1	1	0	0	0	984	77.8	-5.1
Manhole MH-3 (tubing inside manhole)	0.1	0.7	20.5	21.7	0	0	0	2	984	77.5	-3.9
Manhole MH-3 (ambient air)	0.1	0.1	20.9	22.3	0	0	0	0	984	77.5	-6.1
Manhole MH-2 (tubing inside manhole)	0.7	0.9	20.4	21.9	1	0	30	0	984	76.5	-5.6
Manhole MH-2 (ambient air)	0.0	0.0	20.9	22.2	0	0	0	0	984	77.8	-5.5
Manhole MH-1 (tubing inside manhole)	10.7	8.2	17.5	18.0	0	0	>100	>60	984	63.1	-4.4
Manhole MH-1 (ambient air)	0.0	0.0	20.9	22.3	0	0	0	0	984	77.7	-5.9
Cleanout E-12 (ambient air)	0.1	0.1	20.9	22.3	0	0	2	1	983	77.5	-6.1
Cleanout E-12 (tubing inside cleanout)	53.5	47.3	2.2	0.2	39	169	43	>60	983	-1.0	-1.8
Cleanout E-13 (ambient air)	0.0	0.1	20.9	22.4	0	0	0	0	983	77.5	-6.5
Cleanout E-13 (tubing inside cleanout)	55.0	48.2	20.9*	0.5	7	161	>100	>60	983	-3.7	-5.6
Cleanout I-17 (ambient air)	0.0	0.1	20.9	22.4	0	0	0	0	984	77.5	-6.5
Cleanout I-17 (tubing inside cleanout)	0.8	3.6	17.8	18.5	0	0	32	16	983	77.1	7.7
Cleanout K-17 (ambient air)	0.0	0.0	20.9	22.4	0	0	0	0	984	77.6	-6.4
Cleanout K-17 (tubing inside cleanout)	48.7	34.3	5.7	2.8	12	15	>100	>60	983	14.2	3.7
Cleanout L-17 (ambient air)	0.0	0.0	20.9	22.4	0	0	0	0	983	77.6	-6.4
Cleanout L-17 (tubing inside cleanout)	20.4	20.1	11.4	11.1	2	0	>100	>60	983	48.4	6.8
Cleanout M-17 (ambient air)	0.0	0.0	20.9	22.5	0	0	0	0	983	77.5	-6.9
Cleanout M-17 (tubing inside cleanout)	0*	0.0	18.0	19.0	0	168	>100	>60	983	81.0	9.8
Cleanout G-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	983	77.4	-7.3
Cleanout G-17 (tubing inside cleanout)	0.2	0.4	20.3	22.1	0	0	5	3	984	77.3	-5.6
Cleanout N-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	983	77.4	-7.3
Cleanout N-17 (tubing inside cleanout)	N/A (monitoring location blocked/clogged)										
Cleanout H-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	992	77.4	-7.3
Cleanout H-17 (tubing inside cleanout)	N/A (monitoring location blocked/clogged)										
Cleanout E-16 (ambient air)	0.0	0.1	20.9	22.5	0	0	0	0	1000	77.4	-7.0
Cleanout E-16 (tubing inside cleanout)	51.3	50.8	2.4	0.6	58	169	>100	>60	1000	-2.7	-4.9
Cleanout F-16 (ambient air)	0.0	0.3	20.9	22.3	0	0	1	0	1000	77.4	-6.2
Cleanout F-16 (tubing inside cleanout)	8.2	11.1	12.9	13.1	0	0	>100	>60	1000	67.6	18.5
Cleanout F-17 (ambient air)	0.0	0.1	20.9	22.5	0	0	0	0	999	77.4	-7.0
Cleanout F-17 (tubing inside cleanout)	0.0	3.1	18.6	20.1	0	0	0	0	999	76.8	1.4
Cleanout G-16 (ambient air)	0.0	0.1	20.9	22.6	0	0	0	0	999	77.3	-7.4
Cleanout G-16 (tubing inside cleanout)	0.0	1.8	19.5	21.1	0	0	0	0	999	77.1	-2.0
Central Manhole (tubing inside)	54.6	38.4	2.4	1.8	19	168	>100	>60	983	5.2	-1.6
Central Manhole (ambient air)	0.0	0.0	20.9	22.5	0	0	0	0	983	77.5	-6.9

te: * Possible erroneous reading based on other measurement at this monitoring location

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	10.5	4.6	17.7	16.9	0	0	>100	>60	997	68.0	4.6
Manhole MH-10 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	997	79.4	2.5
Manhole MH-9 (tubing inside manhole)	15.1	6.6	16.2	15.4	56	0	>100	>60	996	62.9	5.2
Manhole MH-9 (ambient air)	0.0	0.1	20.9	20.3	0	0	0	0	996	79.6	3.5
Manhole MH-8 (tubing inside manhole)	18.6	9.8	14.5	13.5	12	0	>100	>60	997	58.1	7.5
Manhole MH-8 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	997	79.5	3.0
Manhole MH-7 (tubing inside manhole)	0.7	0.5	20.9	20.1	0	0	33	15	997	78.7	3.3
Manhole MH-7 (ambient air)	0.1	0.2	20.9	20.3	0	0	0	1	997	79.4	3.3
Manhole MH-6 (tubing inside manhole)	0.0	0.8	20.3	19.7	22	0	0	1	1001	78.5	5.8
Manhole MH-6 (ambient air)	0.0	0.1	20.9	20.2	0	0	0	0	1001	79.7	4.0
Manhole MH-5 (tubing inside manhole)	1.1	4.0	18.3	17.7	9	0	47	22	1001	77.2	10.8
Manhole MH-5 (ambient air)	0.0	0.1	20.9	20.2	0	0	0	0	1001	79.7	4.0
Manhole MH-4 (tubing inside manhole)	0.0	0.9	20.5	19.9	28	0	7	2	1001	79.2	4.6
Manhole MH-4 (ambient air)	0.0	0.1	20.9	20.3	0	0	0	0	1001	79.6	3.5
Manhole MH-3 (tubing inside manhole)	0.6	1.4	20.2	19.7	0	0	26	13	1001	78.3	4.4
Manhole MH-3 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	1001	79.5	3.0
Manhole MH-2 (tubing inside manhole)	10.3	9.3	16.7	15.7	20	0	>100	>60	1001	64.7	5.8
Manhole MH-2 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	1001	79.4	2.6
Manhole MH-1 (tubing inside manhole)	0.0	0.8	20.5	20.2	0	0	0	1	1001	79.0	3.3
Manhole MH-1 (ambient air)	0.0	0.1	20.9	20.6	0	0	0	0	1001	79.3	2.1
Cleanout E-12 (ambient air)	46.0	3.2	20.9	18.6	0	28	>100	>60	996	32.2	-37.6
Cleanout E-12 (tubing inside cleanout)	N/A (gas odours too strong; measurements not recorded due to safety)										
Cleanout E-13 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	996	79.5	3.0
Cleanout E-13 (tubing inside cleanout)	>60	53.0	2.4	0.4	30	157	>100	>60	996		
Cleanout I-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	999	79.5	3.0
Cleanout I-17 (tubing inside cleanout)	1.1	6.1	13.9	13.6	8	0	54	23	999	79.2	28.2
Cleanout K-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	1	999	79.5	3.0
Cleanout K-17 (tubing inside cleanout)	59.3	39.3	3.4	0.1	9	1	>100	>60	999	1.3	0.9
Cleanout L-17 (ambient air)	0.0	0.1	20.9	20.0	0	0	0	1	999	79.9	4.9
Cleanout L-17 (tubing inside cleanout)	9.6	10.6	14.8	13.6	25	0	>100	>60	999	66.2	15.2
Cleanout M-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	999	79.5	3.0
Cleanout M-17 (tubing inside cleanout)	9.0	6.0	17.2	16.5	1	160	>100	>60	999	68.5	6.6
Cleanout G-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	1	998	79.5	3.0
Cleanout G-17 (tubing inside cleanout)	0.4	1.6	19.0	18.6	0	0	0	9	998	79.4	9.7
Cleanout N-17 (ambient air)	N/A										
Cleanout N-17 (tubing inside cleanout)	N/A										
Cleanout H-17 (ambient air)	N/A										
Cleanout H-17 (tubing inside cleanout)	N/A										
Cleanout E-16 (ambient air)	0.2	0.2	20.9	20.4	0	0	0	1	996	79.2	2.7
Cleanout E-16 (tubing inside cleanout)	> max. limit	52.4	2.4	0.5	51	59	>60	>60	996		
Cleanout F-16 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	1	996	79.4	2.5
Cleanout F-16 (tubing inside cleanout)	0.0	5.6	15.3	14.8	0	0	9	2	996	79.6	24.1
Cleanout F-17 (ambient air)	0.0	0.1	20.9	20.4	4	0	0	0	996	79.5	3.0
Cleanout F-17 (tubing inside cleanout)	18.6	20.7	2.4	3.1	35	0	>100	>60	996	57.6	46.0
Cleanout G-16 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	996	79.4	2.5
Cleanout G-16 (tubing inside cleanout)	0.0	7.2	3.0	14.5	0	0	14	0	996	78.3	23.9
Central Manhole (tubing inside)	56.2	43.0	2.7	0.3	26	160	>100	>60	999	0.5	-0.6
Central Manhole (ambient air)	0.0	0.2	20.9	20.3	0	0	0	2	999	79.5	3.4

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	4.0	2.0	19.9	20.0	13	0	>100	>60	1003	74.0	-1.0
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	12.1	5.3	17.5	17.4	23	0	>100	>60	1003	65.2	0.0
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	2.8	1.5	19.8	20.3	41	0	>100	>60	1003	75.4	-0.7
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.2	0.3	20.9	21.2	57	0	0	4	1003	78.3	-1.2
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.0	0.5	20.9	20.4	0	1	0	0	1005	79.1	2.6
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	0.5	1.8	19.6	19.9	63	0	14	11	1005	77.8	3.2
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	0.0	0.4	20.9	21.2	178	4	0	0	1005	78.4	-1.1
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	1.2	2.1	19.9	20.8	37	70	27	24	1005	75.9	-2.1
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	29.8	22.5	10.4	10.3	78	0	>100	>60	1005	37.4	-1.2
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	0.2	20.1	21.9	23	0	10	1	1005	77.9	-4.2
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	50.5	46.1	1.8	1.8	28	1	>100	>60	1003	1.6	-5.2
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	50.9	42.5	8.1	1.9	7	1	>100	>100	1003	4.7	-2.4
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.2	0.9	20.9	20.8	3	0	6	4	1005	78.1	0.1
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	33.8	24.1	10.8	8.8	65	7	>100	1	1005	33.3	0.3
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	0.7	1.2	19.5	20.7	40	0	41	15	1004	77.4	-0.2
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	1.2	1.3	20.2	20.8	33	3	38	25	1004	76.9	-0.3
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	45.7	50.3	5.9	7.7	45	196	>100	>60	1004	-3.7	-32.6
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	13.8	13.7	3.7	15.6	78	0	>100	>100	1003	56.9	-1.6
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	0.0	0.1	20.9	20.1	0	0	0	0	1003	79.8	4.4
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	8.6	10.8	11.6	13.0	44	0	>100	>100	1003	67.6	18.9
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	0.2	20.1	21.1	46	0	0	0	1003	78.7	-0.4
Central Manhole (tubing inside)	59.4	40.1	3.6	0.3	4	208	>100	>60	1002	0.2	-0.9
Central Manhole (ambient air)											

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)											
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	10.2	5.2		12.1						72.5	27.1
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	12.2	6.8		16.1						64.9	4.5
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)											
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)											
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)											
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)											
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)											
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)											
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)											
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)											
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)											
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)											
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)											
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)											
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)											
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)											
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)											
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)											
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)											
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)											
Central Manhole (tubing inside)											
Central Manhole (ambient air)											

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	0.4	0.5		21.0				8	1017	78.1	-0.7
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	0.2	1.2		20.9				4		77.7	-0.7
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	1.1	2.5		20.3				21		76.1	0.0
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.0	0.1		21.2				1		78.7	-0.8
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.1	2.4		20.3				2		77.2	1.1
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	2.1	6.5		18.6				42		72.8	3.1
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	0.0	0.0		21.3				0		78.7	-1.2
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	11.2	9.9		15.6				>100		63.3	4.8
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	2.5	3.9		19.6				51		74.0	0.5
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	0.8		21.0				0		78.2	-0.5
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	49.6	45.9		2.4				>100		2.1	-6.9
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	55.5	43.2		1.0				>100		0.3	-3.5
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.2	2.4		18.4				5		79.0	10.0
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	46.5	32.6		2.8				>100		18.1	7.6
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	3.2	1.0		13.1				64		82.7	33.6
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	2.6	2.5		19.6				53		75.3	1.8
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	0.0	0.9		20.0				0		79.1	4.1
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	52.6	46.3		0.9				>100		0.0	-3.4
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	12.5	17.5		4.7				>100		65.3	47.7
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	0.0	4.9		16.3				0		78.8	17.7
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	2.0		19.0				0		79.0	7.8
Central Manhole (tubing inside)	7.8	8.8		16.4				>100		67.0	5.5
Central Manhole (ambient air)											

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (inBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	0.7	0.7		21.3					1017	77.3	-2.6
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	0.5	1.8		21.1		0				76.6	-2.5
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	0.3	1.4		21.2		0				77.1	-2.4
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.0	0.2		21.7		0				78.1	-3.3
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.0	1.8		21.1		0				77.1	-2.0
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	2.0	6.6		18.7		0				72.7	2.6
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	12.8	9.7		15.7		0				61.8	2.9
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	24.0	19.3		10.0		0				46.7	9.2
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	2.6	5.0		19.5		0				72.9	-0.2
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	1.3		21.1		0					
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	48.9	46.4		2.8		204		>100		2.9	-7.6
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	54.2	45.5		0.2		204		>100	1024	0.1	-0.7
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.4	3.2		17.8		0				78.6	11.9
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	47.7	33.0		2.9		2				16.4	5.5
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	4.8	11.2		12.0		0				72.0	27.0
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	2.0	2.1		19.9		0				76.0	1.4
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	0.0	0.9		20.0		0				79.1	4.1
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	52.0	46.8		0.5		54		>100		0.7	-1.2
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	10.6	16.5		5.5		5		>100		67.4	46.8
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	0.0	4.5		17.1		0		0		78.4	14.3
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	2.0		19.5		0		0		78.5	5.4
Central Manhole (tubing inside)	6.6	7.6		17.2		0				68.6	4.1
Central Manhole (ambient air)											

Appendix '3'

Golder 2020 Noise Monitoring Memorandum

GOLDER

TECHNICAL MEMORANDUM

DATE January 4, 2021 **Project No.** 19130610

TO Henri Huneault, Landfill Site Manager
Waste Connections of Canada

CC joe_tomaselli@golder.com

FROM Mohammad Abushanab **EMAIL** mohammad_abushanab@golder.com

WASTE CONNECTIONS OF CANADA NAVAN FACILITY NOISE MONITORING 2020

Dear Mr. Huneault:

Golder Associates Ltd. (Golder) was retained to carry out annual noise monitoring for the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (WCC Navan Facility) in the eastern portion of Ottawa, Ontario. Noise monitoring was carried out to fulfill the requirements as outlined in Section 9.5 of the Design & Operations Report Navan Landfill Site Expansion Approvals (January 2008). This memorandum provides a summary of the noise monitoring results for 2020.

Site Operations

The WCC Navan Facility is a waste management facility that handles solid, non-hazardous industrial and commercial waste (including construction and demolition waste), asbestos waste, dry non-putrescible (i.e., non-organic) domestic waste and impacted soil. The facility operates six days a week, from 7:00 am to 5:00 pm on weekdays and 8:00 am to 1:00 pm on Saturday. The existing operations allow for a maximum of 234,750 tonnes of waste per year to be landfilled with an average daily maximum of 1,500 tonnes. Figure 1 (attached) shows a key plan of the site and surrounding area.

Methodology

An annual noise monitoring program was completed in 2020 using two Larson Davis 820 sound level meters located at the nearest residential receptors (i.e., points of reception (POR(s))) to the WCC Navan Facility. Noise data was logged every hour for the duration of the monitoring period. The monitoring was carried out from November 5 to November 13, 2020. Monitoring locations are shown in Figure 1 (attached). All monitoring data is summarized in Appendix A. Weather data during the monitoring program is provided in Appendix B.

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Results

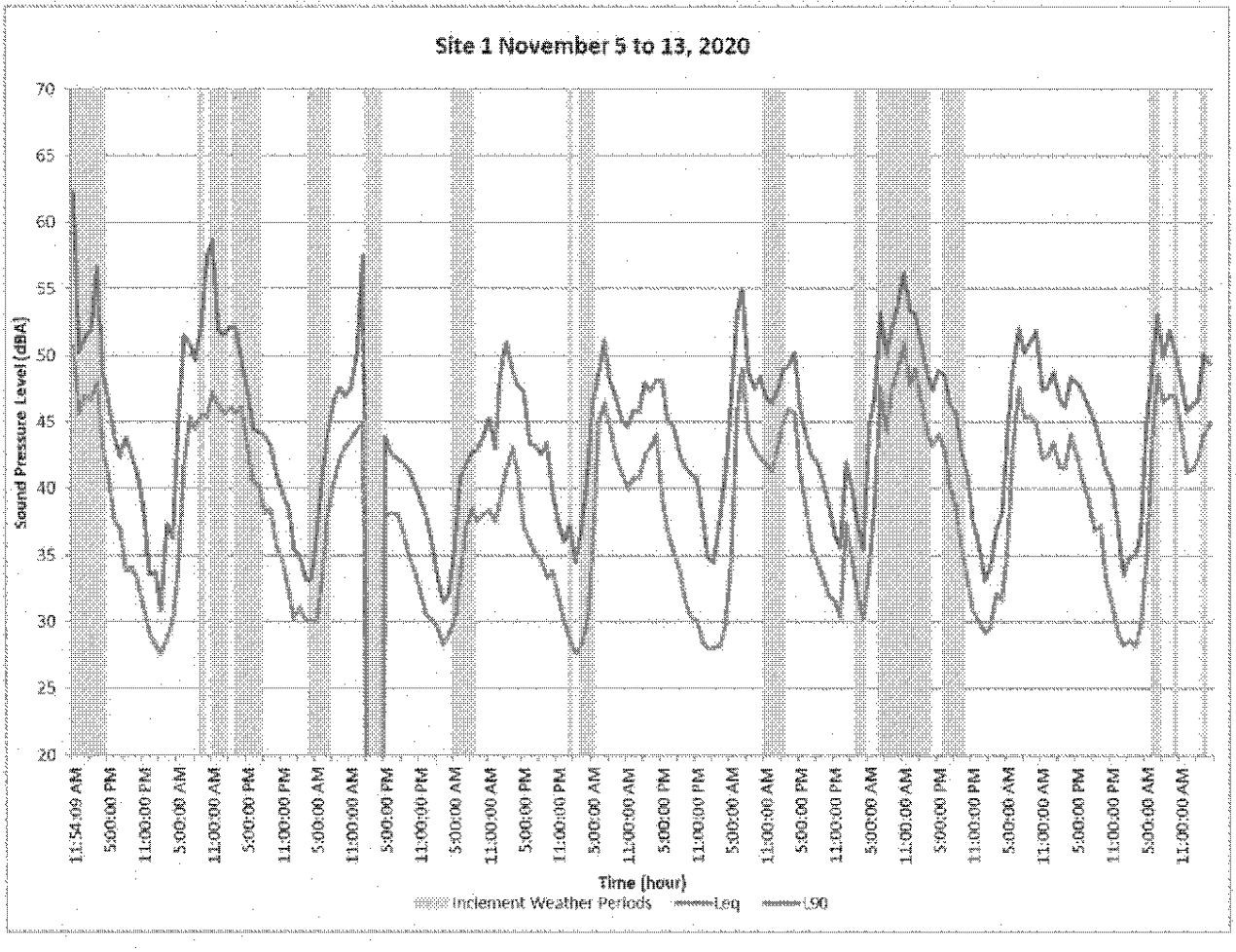
Table 1 summarizes the noise monitoring results for the 2020 monitoring program.

Table 1: Summary of Daytime Noise Levels

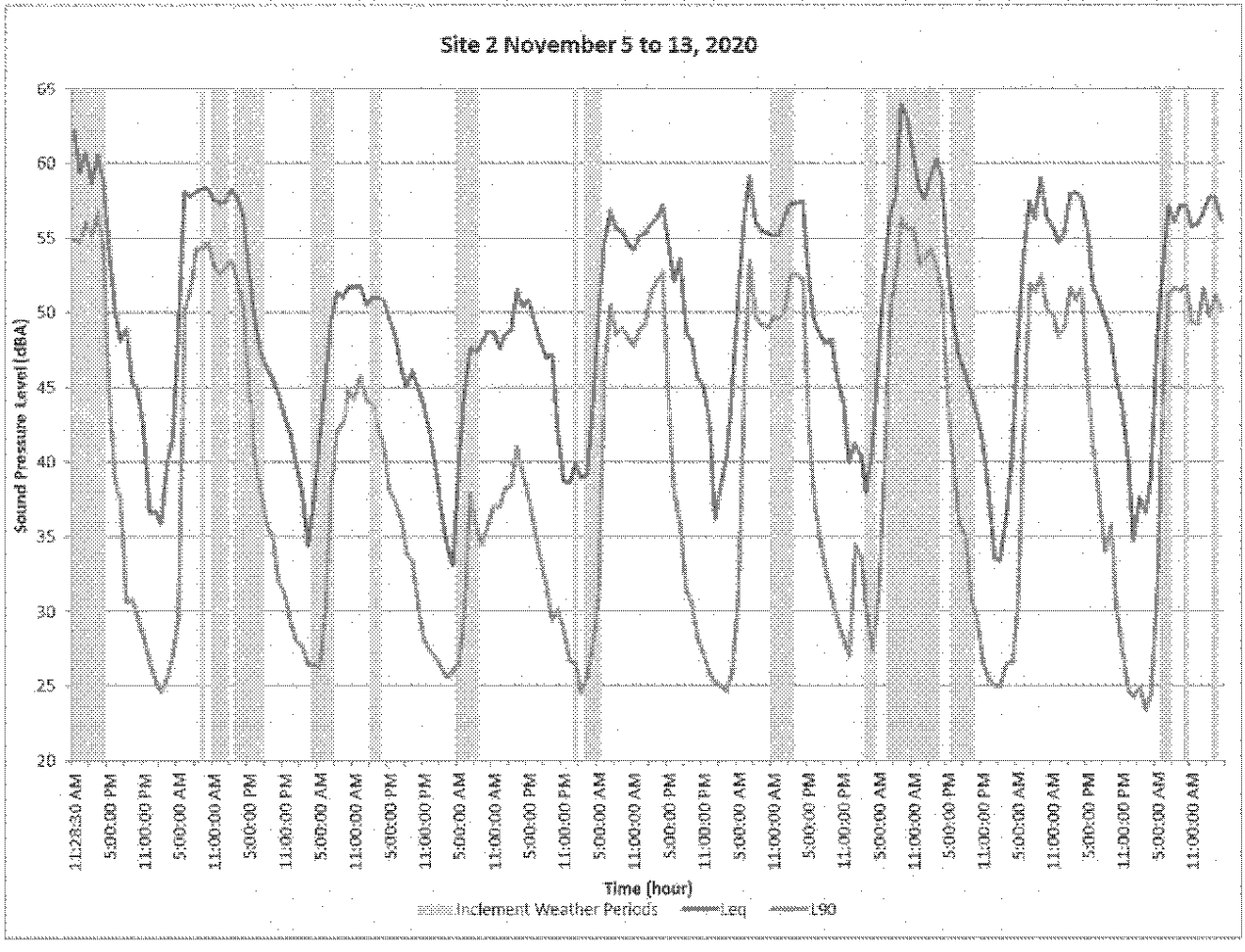
Monitoring Site	Minimum Daytime Hourly L_{eq} (dBA)	Minimum Daytime Hourly L_{90} (dBA)	Average Daytime Hourly L_{eq} (dBA)	Average Daytime Hourly L_{90} (dBA)
Monitoring Site 1	43	36	50	43
Monitoring Site 2	48	35	55	49

Notes: Data represents monitored levels over the entire monitoring period

Data collected during periods of inclement weather (i.e., rain and/or high wind speeds, in excess of 18 km/h, the limit described in International Standards Organization (ISO) 1996-2 (2007) Standard *Acoustics – Description, measurement and assessment of environmental Noise – Part 2: Determination of environmental noise levels for favourable sound propagation conditions*) were excluded from the calculated levels provided in Table 1. The periods of monitoring for which data was excluded from the calculation are shown in Plots 1 and 2 as shaded regions.



Plot 1: November 2020 Noise Monitoring Results – Monitoring Site 1



Plot 2: November 2020 Noise Monitoring Results – Monitoring Site 2

Criteria and Guidelines

The WCC Navan Facility and PORs are located on Parts of Lots 2, 3 and 4, Concession 4, Ottawa Front (formerly the City of Gloucester). The noise criteria for the WCC Navan Facility are based on the Ministry of Environment, Conservation and Parks (MECP) (formerly known as the Ministry of the Environment and Climate Change (MOECC)) Noise Guidelines for Landfill Sites (October 1998) and Noise Pollution Control (NPC) publication NPC 300 (August 2013). The Landfill Guideline outlines the sound level limit criteria for evaluating landfill site operations (i.e., landfilling activities) and NPC 300 provides the criteria for on-site stationary noise sources (i.e., non-landfilling activities). Table 2 summarizes the sound level limits at a POR due to landfill site operations.

Table 2: Applicable Noise Limits

	Daytime (07:00 – 19:00)	Night-time (19:00 – 07:00)
Landfilling Operations – 1-Hour Equivalent Sound Level – L_{eq} (dBA)	55	45
Stationary Sources – 1-Hour Equivalent Sound Level – L_{eq} (dBA)	50	45

Discussion

Based on site observations, the noise levels at the two PORs are dominated by road traffic noise along Navan Road and with audible noise from landfilling operations of the WCC Navan Facility, as confirmed during Golder staff visits (i.e., deployment and collection of the monitoring equipment). Golder's January 2008 report predicted a noise impact level for the existing site operations of the WCC Navan Facility on the surrounding PORs to be between 27 and 37 dBA due to site operations. The measured average hourly noise levels were equal to 49 dBA and 55 dBA at Monitoring Location 1 and Monitoring Location 2, respectively. These levels are at or below the noise limits established in the MECP Landfill Guidelines for landfilling operations. During the site visit it was observed that noise levels at Monitoring Location 1 were predominantly influenced by traffic on the adjacent road with lesser contributions from the landfill. The noise level at Monitoring Location 2 was dominated by activities at the landfill (i.e., cell preparations) and contributions from traffic on the adjacent road.

Proposed Future Noise Monitoring

As discussed above, the noise levels in the area are dominated by traffic along Navan Road. Based on the findings from the 2020 and previous monitoring programs, Golder recommended that the noise monitoring at the WCC Navan Facility continue to be conducted on an annual basis with one monitoring session per year. It is understood landfill operations at the WCC Navan Facility have been substantially completed in various areas within the landfill. It is further understood, in 2021, the activities will be occurring in the north-east area, potentially closer to the identified receptor. Accordingly, Golder recommends monitoring to continue in 2021.

Closure

Golder Associates Ltd. was retained to carry out noise monitoring for Waste Connections Canada (WCC) at the WCC Navan Facility in the eastern portion of Ottawa, Ontario. The monitoring results and site observations indicate that the landfilling noise levels, expressed in average 1-hour Leq is observed to be at or below the noise limit at both monitoring sites. Based on these results, the operations of the WCC Navan Facility are expected to be operating in compliance with the MECP Landfill Guideline and NPC 300 limits as summarized in Table 2, where applicable.

If you have any further questions or concerns, please do not hesitate to contact the undersigned at your earliest convenience.

Golder Associates Ltd.

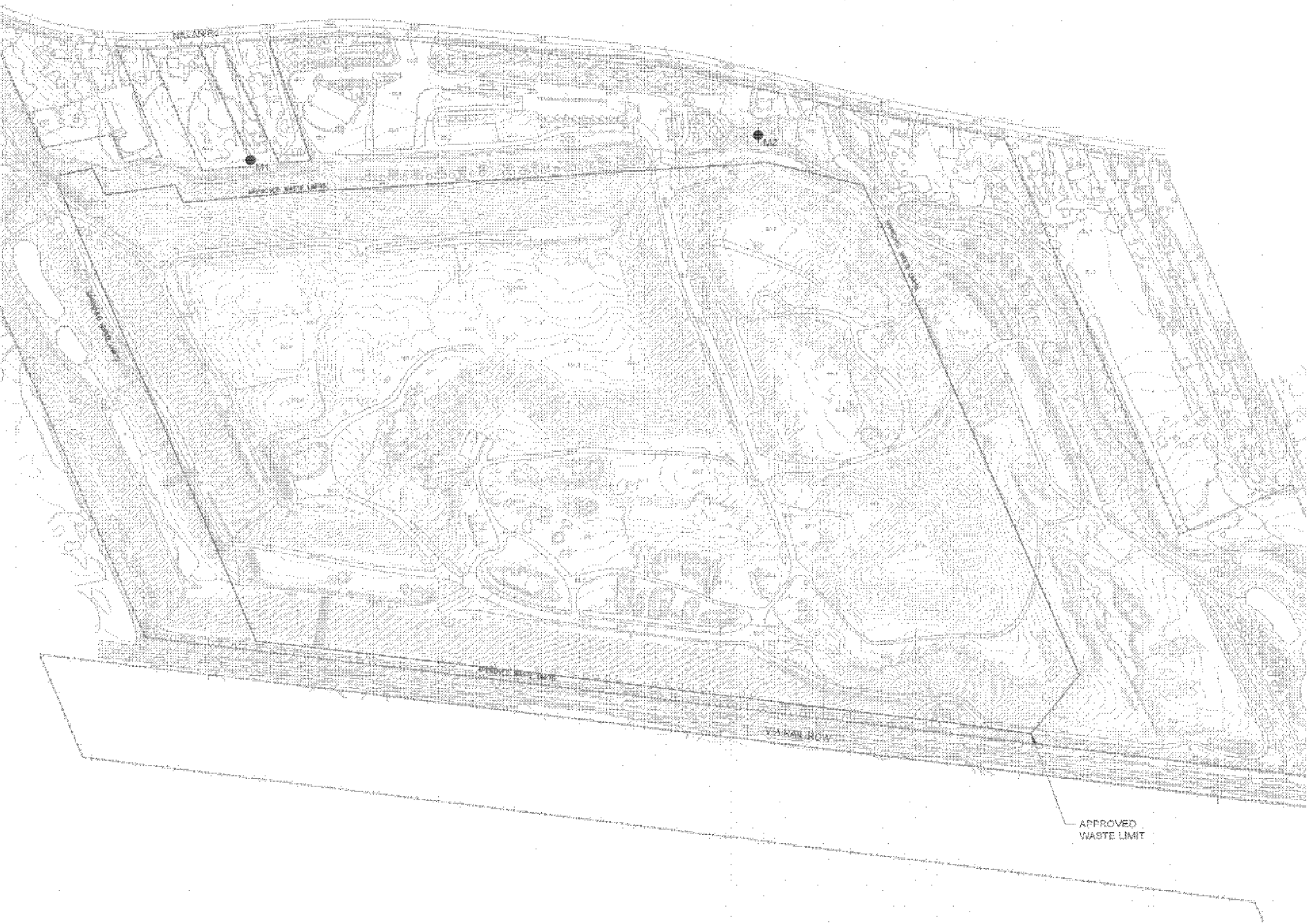
Mohammad Abushanab, M.Eng.
Acoustics, Noise and Vibration EIT

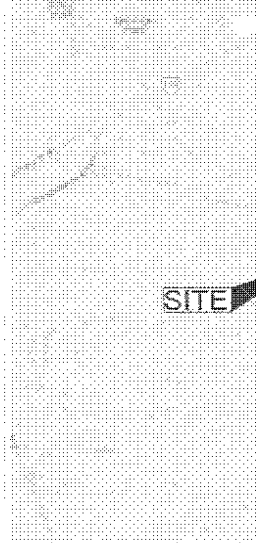
Joe Tomaselli, M.Eng., P.Eng.
Associate/Senior Acoustics, Noise and Vibration Engineer

MA/TN/sg
https://golderassociates.sharepoint.com/sites/115684/project files/6 deliverables/1200_noise monitoring/19130610 -tm-rev0 waste connections of canada navan_4jan2021.docx

Attachments: Figure1 – Noise Monitoring Locations
Appendix A – Noise Data
Appendix B – Weather Data November 3 to 15, 2020

FIGURE





LEGEND

- MONITORING
- VERTICAL / HO
- INDEX / INTERM
- SPOT ELEVATI
- HEDGE LINE
- GUARD RAIL
- RETAINING WA
- FENCE LINE
- WOODED ARE
- SINGLE TREE
- SHORELINE AN DITCH / STREA MARSH
- BUILDING
- POST
- AREA OUTLINE
- PAVED / LOOSE
- PROPERTY BO

REFERENCE(S)

1. PROPERTY LINE PROVIDED IN DENIS SURVEYING LTD, FILE NO
2. BASE INFORMATION PROVIDED FORMAT FROM CONTRACT No.
3. COORDINATE SYSTEM NAD 83-

0

1:5,000

CLIENT

WASTE CONNECTIONS CANADA

PROJECT

NAVAN WASTE RECYC
3354 NAVAN ROAD, OT

001385

APPENDIX A

Noise Data

Table A1 summarizes noise levels measured at Monitoring Site 1 and Monitoring Site 2.

Table A1: Measured Noise Levels [dBA]

Date	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
2020-11-05	11:54	62.2	50.7	62.2	54.9
2020-11-05	12:00	50.2	45.7	59.4	54.7
2020-11-05	13:00	51.3	47	60.7	56.1
2020-11-05	14:00	51.9	46.7	58.7	55.1
2020-11-05	15:00	56.6	48	60.6	56.8
2020-11-05	16:00	48.9	43.3	58.9	54.2
2020-11-05	17:00	46.6	41	54.3	44.2
2020-11-05	18:00	43.8	37.5	50.1	38.6
2020-11-05	19:00	42.4	37.1	48.1	37.4
2020-11-05	20:00	43.8	33.8	48.9	30.6
2020-11-05	21:00	42.4	34.1	45.3	30.8
2020-11-05	22:00	41.1	33.2	44.9	29.6
2020-11-05	23:00	38.6	31.2	42.3	28.2
2020-11-06	0:00	33.5	29.1	36.6	26.5
2020-11-06	1:00	33.7	28.3	36.7	25.2
2020-11-06	2:00	30.8	27.6	35.9	24.6
2020-11-06	3:00	37.3	28.7	39.8	25.6
2020-11-06	4:00	36.3	30	41.7	27.2
2020-11-06	5:00	44.5	33.6	48.3	29.6
2020-11-06	6:00	51.4	41.6	58.1	50.2
2020-11-06	7:00	50.8	45.4	57.7	51.6
2020-11-06	8:00	49.7	44.5	58.1	54.2
2020-11-06	9:00	52	45.6	58.3	54.3
2020-11-06	10:00	57.4	45.4	58.3	54.7
2020-11-06	11:00	58.6	47.2	57.6	53.2
2020-11-06	12:00	51.8	46.3	57.3	52.5
2020-11-06	13:00	51.5	45.6	57.4	53.1
2020-11-06	14:00	52.1	46.1	58.2	53.5
2020-11-06	15:00	52.1	45.7	57.8	52
2020-11-06	16:00	49.5	46.1	56.6	50.4
2020-11-06	17:00	47.1	43.1	52.7	44.5

Date	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
2020-11-06	18:00	44.4	40.5	49.7	40.2
2020-11-06	19:00	44.2	40.3	47.4	38
2020-11-06	20:00	43.9	38.2	46.3	35.7
2020-11-06	21:00	43.2	38.5	45.7	35
2020-11-06	22:00	41	35.7	44.6	32
2020-11-06	23:00	39.6	34.6	43.2	31.2
2020-11-07	0:00	38.6	32.4	41.9	29.2
2020-11-07	1:00	35.5	30.2	40	28
2020-11-07	2:00	34.9	31.1	38.1	27.7
2020-11-07	3:00	33.1	30.1	34.4	26.4
2020-11-07	4:00	33.1	30.1	37	26.5
2020-11-07	5:00	36.6	30	41.2	26.2
2020-11-07	6:00	41.3	33.6	45.4	30.1
2020-11-07	7:00	44.1	38.1	49.3	38.1
2020-11-07	8:00	46.7	40.4	51.4	42.1
2020-11-07	9:00	47.6	42.3	51	42.6
2020-11-07	10:00	46.9	43.1	51.7	44.7
2020-11-07	11:00	47.5	43.6	51.7	44.2
2020-11-07	12:00	50.2	44.4	51.8	45.8
2020-11-07	13:00	57.5	44.9	50.5	44.1
2020-11-07	14:00	_[a]	_[a]	50.9	44
2020-11-07	15:00	_[a]	_[a]	51	42.4
2020-11-07	16:00	_[a]	_[a]	50.8	41.1
2020-11-07	17:00	43.9	38.1	49.6	38.1
2020-11-07	18:00	42.6	38.2	48.5	37.4
2020-11-07	19:00	42.2	38.1	46.3	36.2
2020-11-07	20:00	42	36.9	45	34
2020-11-07	21:00	41.4	35.1	46.1	33.3
2020-11-07	22:00	40.3	33.8	44.9	30.2
2020-11-07	23:00	39.3	32.4	43.8	28.2
2020-11-08	0:00	38	30.5	42	27.4
2020-11-08	1:00	35.9	30.2	39.6	26.9
2020-11-08	2:00	33.1	29.4	36.5	26.1
2020-11-08	3:00	31.5	28.3	34.4	25.6
2020-11-08	4:00	32.1	29.1	33.1	26
2020-11-08	5:00	35.8	30.2	40.1	26.5
2020-11-08	6:00	40.7	33.4	44.5	29.7

Appendix A Noise Data

Date	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
2020-11-08	7:00	41.8	37.1	47.6	37.9
2020-11-08	8:00	42.7	38.6	47.4	35.6
2020-11-08	9:00	42.9	37.5	47.9	34.5
2020-11-08	10:00	43.8	38.1	48.7	35.7
2020-11-08	11:00	45.3	38.4	48.7	37.1
2020-11-08	12:00	43	37.5	47.6	37
2020-11-08	13:00	48.7	39.4	48.5	38.2
2020-11-08	14:00	51	41.5	48.8	38.4
2020-11-08	15:00	48.9	43.1	51.5	41
2020-11-08	16:00	47.7	41.1	50.4	39.4
2020-11-08	17:00	47.3	37.1	50.8	37.7
2020-11-08	18:00	43.4	36	49.3	35.5
2020-11-08	19:00	43.2	35.2	48.1	33.7
2020-11-08	20:00	42.6	34.7	47	31.8
2020-11-08	21:00	43.4	33.3	47.2	29.4
2020-11-08	22:00	40	33.8	42.2	30.1
2020-11-08	23:00	37.5	31.9	38.7	28.8
2020-11-09	0:00	36	29.9	38.6	26.7
2020-11-09	1:00	37.2	28.6	39.9	26.5
2020-11-09	2:00	34.5	27.7	38.9	24.5
2020-11-09	3:00	36.8	28.3	39.2	25.5
2020-11-09	4:00	40.9	30.2	44.2	27.9
2020-11-09	5:00	46.4	35.6	49.9	30.7
2020-11-09	6:00	48.5	45	54.9	46.4
2020-11-09	7:00	51.1	46.5	56.8	50.5
2020-11-09	8:00	48.1	44.7	55.6	48.5
2020-11-09	9:00	46.9	42.5	55.5	49
2020-11-09	10:00	45.2	41.1	54.5	48.3
2020-11-09	11:00	44.6	40	54.2	47.8
2020-11-09	12:00	45.8	40.8	55.1	48.8
2020-11-09	13:00	45.8	40.8	55.3	49.2
2020-11-09	14:00	47.9	42.6	56	51.4
2020-11-09	15:00	47.3	43.1	56.3	52.1
2020-11-09	16:00	48.1	44.1	57.2	52.7
2020-11-09	17:00	48.1	39.1	54.4	43.9

Date	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
2020-11-09	18:00	45.2	36.8	52.1	38
2020-11-09	19:00	44.7	35.3	53.6	35.9
2020-11-09	20:00	42.7	33.9	48.5	31.4
2020-11-09	21:00	41.7	31.7	48.2	30.6
2020-11-09	22:00	41.1	30.4	45.6	28.2
2020-11-09	23:00	40.8	30.1	45.1	27.1
2020-11-10	0:00	37.9	28.5	42.6	25.8
2020-11-10	1:00	34.8	28	36.2	25.2
2020-11-10	2:00	34.5	28.1	38.4	25
2020-11-10	3:00	37.8	28.2	40.5	24.6
2020-11-10	4:00	40.7	29.7	44.9	26
2020-11-10	5:00	46.5	34.6	51.2	31.1
2020-11-10	6:00	53.2	46	56.5	45.6
2020-11-10	7:00	54.9	49.1	59.1	53.4
2020-11-10	8:00	48.8	44	56	49.7
2020-11-10	9:00	47.5	43.1	55.5	49.2
2020-11-10	10:00	48.4	42.3	55.3	49
2020-11-10	11:00	46.9	42	55.1	49.7
2020-11-10	12:00	46.4	41.3	55.2	49.6
2020-11-10	13:00	47.4	43.1	56.5	50.2
2020-11-10	14:00	48.8	45	57.3	52.6
2020-11-10	15:00	49.3	46	57.3	52.6
2020-11-10	16:00	50.2	45.7	57.4	52.2
2020-11-10	17:00	46.2	41.4	52.8	42.9
2020-11-10	18:00	44	38.6	49.5	37.4
2020-11-10	19:00	42.4	35.6	48.5	34.6
2020-11-10	20:00	42.1	34.6	47.9	32.8
2020-11-10	21:00	40.5	33.3	48.2	31
2020-11-10	22:00	38.7	32	45.5	29.3
2020-11-10	23:00	36.4	31.5	43.9	28
2020-11-11	0:00	35.6	30.4	40	27
2020-11-11	1:00	42	37.5	41.2	34.5
2020-11-11	2:00	40	34.8	40.4	33.6
2020-11-11	3:00	37.4	32.1	38	30
2020-11-11	4:00	35.4	30.3	40.9	27.4
2020-11-11	5:00	44.8	34.3	46.8	31.4
2020-11-11	6:00	46.9	38.9	52	38.9

Date	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
2020-11-11	7:00	53.2	47.7	56.5	50.2
2020-11-11	8:00	50	44.2	57.8	52.5
2020-11-11	9:00	52.1	47.5	63.9	56.3
2020-11-11	10:00	53.7	49	63	55.6
2020-11-11	11:00	56.3	50.9	60.6	55.6
2020-11-11	12:00	53.4	47.8	58.2	53.2
2020-11-11	13:00	53.1	49	57.6	53.6
2020-11-11	14:00	50.9	46.6	59.2	54.3
2020-11-11	15:00	48.7	44.2	60.3	53
2020-11-11	16:00	47.4	43.2	59.1	51.4
2020-11-11	17:00	48.9	44.1	53	43.4
2020-11-11	18:00	48.5	43.1	49.2	39.5
2020-11-11	19:00	46.4	40.3	47.1	35.8
2020-11-11	20:00	45.8	38.8	46	35.1
2020-11-11	21:00	42.8	35.5	44.6	30.7
2020-11-11	22:00	40.9	33.1	43.1	29.3
2020-11-11	23:00	37.6	30.9	41.4	26.6
2020-11-12	0:00	35.8	30	37.9	25.4
2020-11-12	1:00	33.1	29.2	33.6	25
2020-11-12	2:00	34.1	29.5	33.4	25
2020-11-12	3:00	36.9	32.1	36.2	26.5
2020-11-12	4:00	38.2	31.7	40.3	26.6
2020-11-12	5:00	44.1	35.5	47.6	30.1
2020-11-12	6:00	49.2	43.3	53.7	42.4
2020-11-12	7:00	52	47.6	57.4	51.9
2020-11-12	8:00	50.2	45.4	56.3	51.4
2020-11-12	9:00	51	45.5	59	52.5
2020-11-12	10:00	51.8	44.9	56.4	50.2
2020-11-12	11:00	47.4	42.3	55.7	49.9
2020-11-12	12:00	47.6	42.5	54.7	48.4
2020-11-12	13:00	48.8	43.5	55.3	49.1
2020-11-12	14:00	46.7	41.6	57.9	51.7
2020-11-12	15:00	46.2	41.6	58	50.9
2020-11-12	16:00	48.3	44.1	57.7	51.6
2020-11-12	17:00	47.9	42.5	55.6	44.9

Date	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
2020-11-12	18:00	47.3	40.7	51.8	41.1
2020-11-12	19:00	46.2	39.2	50.8	37.6
2020-11-12	20:00	45.1	36.9	49.6	34
2020-11-12	21:00	43.2	37.2	48.4	35.8
2020-11-12	22:00	41.5	33.2	45.5	30.3
2020-11-12	23:00	40.5	31.4	43.8	27.4
2020-11-13	0:00	37.2	29.1	40.1	24.6
2020-11-13	1:00	33.5	28.3	34.7	24.3
2020-11-13	2:00	34.8	28.7	37.6	24.9
2020-11-13	3:00	35	28.2	36.6	23.4
2020-11-13	4:00	36.4	29.6	38.9	24.4
2020-11-13	5:00	45	34.9	48.2	31.2
2020-11-13	6:00	49.2	44.2	53.2	45.2
2020-11-13	7:00	53.1	48.6	57.1	51.1
2020-11-13	8:00	49.8	46.5	56.1	51.7
2020-11-13	9:00	51.9	47	57.2	51.5
2020-11-13	10:00	50.2	47	57.1	51.8
2020-11-13	11:00	48.3	44.6	55.8	49.4
2020-11-13	12:00	45.8	41.3	56	49.3
2020-11-13	13:00	46.4	41.5	56.8	51.6
2020-11-13	14:00	46.6	42.3	57.7	49.8
2020-11-13	15:00	50.1	44.1	57.7	51.1
2020-11-13	16:00	49.4	44.8	56.2	50.3

Notes: Rows highlighted in yellow represent data monitored during the Facility daytime period of operations.
[a] Noise data not available for this period of measurement

APPENDIX B

Weather Data November 5 to 13, 2020

Station Name	OTTAWA INT'L
Province	ONTARIO
Latitude	45.32
Longitude	-75.67
Elevation	114
Climate Identifier	6106001
WMO Identifier	71628
TC Identifier	YOW

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Table B1: Weather Data November 5 to November 13, 2020

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2020-11-05 11:00	17.2	6	47	21	30	100.56	NA
2020-11-05 12:00	18.1	6.4	46	21	29	100.53	NA
2020-11-05 13:00	19	6.4	43	21	21	100.5	Clear
2020-11-05 14:00	18.6	6.5	45	22	28	100.47	NA
2020-11-05 15:00	17.3	6.3	48	20	28	100.46	NA
2020-11-05 16:00	16.2	6.4	52	20	21	100.47	Mostly Cloudy
2020-11-05 17:00	14.8	6.1	56	20	15	100.53	NA
2020-11-05 18:00	13.8	6	59	19	14	100.56	NA
2020-11-05 19:00	13	5.8	62	20	14	100.56	Mostly Cloudy
2020-11-05 20:00	12.6	6.1	64	20	15	100.55	NA
2020-11-05 21:00	12.7	6.4	65	21	11	100.59	NA
2020-11-05 22:00	12.3	6.5	68	20	9	100.62	Cloudy
2020-11-05 23:00	12.1	6.5	68	20	7	100.6	NA
2020-11-06 0:00	12.2	6.4	67	19	11	100.58	NA
2020-11-06 1:00	11.7	6.2	69	19	8	100.55	Cloudy
2020-11-06 2:00	11.1	6	71	18	10	100.47	NA
2020-11-06 3:00	11.3	6.3	71	20	14	100.45	NA
2020-11-06 4:00	9.9	6.1	77	21	10	100.5	Mostly Cloudy
2020-11-06 5:00	9	5.8	80	19	9	100.47	NA
2020-11-06 6:00	8.3	5.8	84	20	7	100.53	NA
2020-11-06 7:00	8	5.5	84	21	10	100.53	Clear
2020-11-06 8:00	10	6.7	80	21	17	100.53	NA
2020-11-06 9:00	12	7.2	73	23	20	100.52	NA
2020-11-06 10:00	13.4	7.7	68	22	18	100.49	Mostly Cloudy

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2020-11-06 11:00	15.3	8.2	62	22	20	100.5	NA
2020-11-06 12:00	15.4	8.2	62	22	20	100.43	NA
2020-11-06 13:00	16.6	8.5	59	22	21	100.36	Mostly Cloudy
2020-11-06 14:00	17.6	8.5	55	23	17	100.3	NA
2020-11-06 15:00	18.1	8.1	52	22	23	100.29	NA
2020-11-06 16:00	16.5	8.5	59	20	23	100.28	Mostly Cloudy
2020-11-06 17:00	15.7	8.6	62	21	22	100.3	NA
2020-11-06 18:00	14.4	8.2	66	21	19	100.34	NA
2020-11-06 19:00	13.7	8.2	69	22	21	100.35	Mainly Clear
2020-11-06 20:00	12.9	8.3	74	23	17	100.36	NA
2020-11-06 21:00	12.3	8.4	77	23	13	100.4	NA
2020-11-06 22:00	12	8.3	78	21	13	100.42	Mainly Clear
2020-11-06 23:00	11.7	8.2	79	22	15	100.43	NA
2020-11-07 0:00	11.4	8.4	81	21	14	100.44	NA
2020-11-07 1:00	10.9	8.2	83	22	11	100.48	Mainly Clear
2020-11-07 2:00	10.3	7.8	85	22	10	100.55	NA
2020-11-07 3:00	9.7	7.8	88	20	13	100.58	NA
2020-11-07 4:00	9	7.6	91	21	14	100.61	Mainly Clear
2020-11-07 5:00	8.8	7.4	91	20	11	100.62	NA
2020-11-07 6:00	8.7	7.6	93	20	13	100.64	NA
2020-11-07 7:00	8.9	7.7	92	19	16	100.67	Mostly Cloudy
2020-11-07 8:00	9.9	8.2	89	19	16	100.72	NA
2020-11-07 9:00	12.3	8.8	79	21	16	100.7	NA
2020-11-07 10:00	14.6	9.5	71	20	18	100.69	Mostly Cloudy
2020-11-07 11:00	17	9.9	63	22	17	100.69	NA
2020-11-07 12:00	18.4	10.2	59	23	18	100.62	NA
2020-11-07 13:00	20.2	10.8	54	22	17	100.59	Mostly Cloudy
2020-11-07 14:00	20.3	10.6	53	22	22	100.54	NA
2020-11-07 15:00	19.9	10.6	54	21	21	100.52	NA
2020-11-07 16:00	18.6	10.5	59	21	17	100.57	Mostly Cloudy
2020-11-07 17:00	16.8	10.3	65	19	15	100.58	NA
2020-11-07 18:00	15.3	9.7	69	18	13	100.65	NA
2020-11-07 19:00	14.3	9.3	72	21	14	100.67	Mostly Cloudy
2020-11-07 20:00	14.4	8.9	70	22	14	100.72	NA
2020-11-07 21:00	13.6	8.6	72	21	11	100.77	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2020-11-07 22:00	12.8	8.3	74	21	11	100.82	Mainly Clear
2020-11-07 23:00	12.4	8.2	75	20	8	100.84	NA
2020-11-08 0:00	11.6	8.1	79	19	9	100.88	NA
2020-11-08 1:00	11	7.9	81	20	10	100.9	Clear
2020-11-08 2:00	10.1	7.8	85	20	8	100.95	NA
2020-11-08 3:00	9.5	7.3	86	19	10	101.01	NA
2020-11-08 4:00	8.4	6.7	89	19	12	101.04	Clear
2020-11-08 5:00	7.3	6	91	20	12	101.06	NA
2020-11-08 6:00	6.7	5.6	93	20	11	101.12	NA
2020-11-08 7:00	6.6	5.7	93	20	13	101.16	Mainly Clear
2020-11-08 8:00	7.9	6.6	91	21	10	101.23	NA
2020-11-08 9:00	10.8	7.9	82	21	13	101.25	NA
2020-11-08 10:00	13.9	8.2	68	20	15	101.27	Mainly Clear
2020-11-08 11:00	16.9	8.6	58	22	14	101.25	NA
2020-11-08 12:00	18.7	8.3	50	21	13	101.2	NA
2020-11-08 13:00	20.2	8.4	46	22	18	101.16	Clear
2020-11-08 14:00	21.3	8.6	44	21	17	101.13	NA
2020-11-08 15:00	21.1	8	42	22	18	101.14	NA
2020-11-08 16:00	19.1	8.2	49	20	13	101.15	Clear
2020-11-08 17:00	16.8	8.2	56	20	13	101.17	NA
2020-11-08 18:00	14.9	7.6	61	20	9	101.2	NA
2020-11-08 19:00	13.2	7.5	68	20	13	101.19	Clear
2020-11-08 20:00	11.6	7.2	74	19	11	101.2	NA
2020-11-08 21:00	10.7	7.2	79	20	10	101.21	NA
2020-11-08 22:00	10.2	7	80	20	9	101.22	Clear
2020-11-08 23:00	8.8	6.6	86	22	10	101.18	NA
2020-11-09 0:00	7.6	6.2	90	19	9	101.18	NA
2020-11-09 1:00	7.8	6.4	91	20	12	101.16	Clear
2020-11-09 2:00	8.4	6.7	89	18	13	101.15	NA
2020-11-09 3:00	7.2	6	92	19	11	101.16	NA
2020-11-09 4:00	6.3	5.2	93	20	10	101.18	Clear
2020-11-09 5:00	7.3	6	91	22	11	101.2	NA
2020-11-09 6:00	8.2	6.5	89	17	7	101.19	NA
2020-11-09 7:00	8.3	6.4	88	21	5	101.21	Mostly Cloudy
2020-11-09 8:00	8.8	6.8	88	16	5	101.19	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2020-11-09 9:00	11.2	7.9	80	17	10	101.2	NA
2020-11-09 10:00	14.3	8.4	68	18	10	101.13	Mainly Clear
2020-11-09 11:00	18.3	9	54	20	13	101.07	NA
2020-11-09 12:00	20.4	10	51	18	13	100.98	NA
2020-11-09 13:00	20.5	9.1	48	19	17	100.9	Mostly Cloudy
2020-11-09 14:00	22.1	9.2	43	19	16	100.84	NA
2020-11-09 15:00	21.2	9.6	47	20	18	100.81	NA
2020-11-09 16:00	19.7	9.2	50	18	13	100.78	Mostly Cloudy
2020-11-09 17:00	17.3	8.7	56	18	12	100.79	NA
2020-11-09 18:00	17	8.1	55	19	10	100.8	NA
2020-11-09 19:00	15.5	7.3	58	19	9	100.75	Mostly Cloudy
2020-11-09 20:00	14.9	6.5	57	17	8	100.71	NA
2020-11-09 21:00	13.8	6.5	61	18	10	100.68	NA
2020-11-09 22:00	12.6	5.8	63	15	11	100.63	Mainly Clear
2020-11-09 23:00	11.7	5.8	67	18	7	100.56	NA
2020-11-10 0:00	11.9	5.7	66	18	11	100.52	NA
2020-11-10 1:00	11.9	5.7	66	18	9	100.48	Clear
2020-11-10 2:00	11.4	5.7	68	17	10	100.44	NA
2020-11-10 3:00	10.3	5.8	73	17	14	100.39	NA
2020-11-10 4:00	9.8	5.7	76	18	12	100.37	Clear
2020-11-10 5:00	9.3	5.9	79	17	12	100.33	NA
2020-11-10 6:00	9.3	6.5	82	18	13	100.35	NA
2020-11-10 7:00	9.7	7.5	86	19	10	100.32	Clear
2020-11-10 8:00	11.7	9	83	19	12	100.32	NA
2020-11-10 9:00	14.5	10.4	76	18	13	100.28	NA
2020-11-10 10:00	16.1	10.6	70	20	14	100.22	Mostly Cloudy
2020-11-10 11:00	19.9	11.3	58	21	21	100.16	NA
2020-11-10 12:00	21.8	11.6	52	20	22	100.1	NA
2020-11-10 13:00	23.1	11.8	49	21	24	100.03	Mostly Cloudy
2020-11-10 14:00	22.6	11.9	51	21	22	100	NA
2020-11-10 15:00	21.4	12.1	55	20	13	99.99	NA
2020-11-10 16:00	20	11.6	58	20	13	99.99	Mostly Cloudy
2020-11-10 17:00	19.1	11.6	61	19	14	99.99	NA
2020-11-10 18:00	17.8	11.2	65	18	16	99.98	NA
2020-11-10 19:00	16.5	11.1	70	18	9	99.94	Clear

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2020-11-10 20:00	15.9	11.1	73	18	10	99.92	NA
2020-11-10 21:00	16.1	11	71	17	9	99.88	NA
2020-11-10 22:00	16.8	11.7	71	17	13	99.84	Mostly Cloudy
2020-11-10 23:00	16.9	11.7	71	20	9	99.78	NA
2020-11-11 0:00	17.4	11.8	70	20	12	99.72	NA
2020-11-11 1:00	17.2	12.1	72	20	12	99.68	Mostly Cloudy
2020-11-11 2:00	17	12.5	75	20	13	99.65	NA
2020-11-11 3:00	17.1	12.9	76	19	19	99.57	NA
2020-11-11 4:00	17.1	12.9	76	18	22	99.53	Mostly Cloudy
2020-11-11 5:00	16.9	12.9	77	19	17	99.55	NA
2020-11-11 6:00	16.6	13.5	82	19	16	99.48	NA
2020-11-11 7:00	16.8	13.9	83	19	22	99.48	Rain
2020-11-11 8:00	15.9	14.8	93	19	20	99.45	Rain
2020-11-11 9:00	16.2	15.2	93	20	20	99.46	NA
2020-11-11 10:00	16.3	15.4	94	19	25	99.4	Rain
2020-11-11 11:00	17.1	15.6	91	20	32	99.36	Rain
2020-11-11 12:00	17.9	15.7	87	21	27	99.3	Rain
2020-11-11 13:00	18.1	15.4	84	21	23	99.29	Mostly Cloudy
2020-11-11 14:00	18.9	14.9	77	21	30	99.26	NA
2020-11-11 15:00	19	14.5	75	21	24	99.26	NA
2020-11-11 16:00	17.6	13.4	76	21	17	99.28	Mainly Clear
2020-11-11 17:00	16.3	12.4	78	22	18	99.36	NA
2020-11-11 18:00	14.8	2.5	43	29	23	99.53	NA
2020-11-11 19:00	11.9	2	51	29	31	99.65	Mostly Cloudy
2020-11-11 20:00	9.1	2.3	62	30	31	99.82	NA
2020-11-11 21:00	7.4	1.1	64	29	19	99.94	NA
2020-11-11 22:00	6.5	0.5	66	28	17	100.02	Mostly Cloudy
2020-11-11 23:00	4.4	0.4	75	28	17	100.05	NA
2020-11-12 0:00	2.7	-0.9	77	24	12	100.14	NA
2020-11-12 1:00	2.4	-0.7	80	24	10	100.21	Mainly Clear
2020-11-12 2:00	1.6	-1	82	25	12	100.25	NA
2020-11-12 3:00	1.8	-0.8	82	27	14	100.31	NA
2020-11-12 4:00	2.2	-1.6	76	27	16	100.38	Clear
2020-11-12 5:00	1.1	-2	79	27	14	100.45	NA
2020-11-12 6:00	0.2	-2.4	82	26	11	100.52	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2020-11-12 7:00	2	-1.4	78	28	12	100.59	Mostly Cloudy
2020-11-12 8:00	2.6	-1.1	76	23	7	100.68	NA
2020-11-12 9:00	4.2	-0.9	69	25	7	100.75	NA
2020-11-12 10:00	5.3	-2.3	58	28	16	100.77	Mainly Clear
2020-11-12 11:00	5.8	-2.2	56	28	14	100.78	NA
2020-11-12 12:00	5.9	-2.8	53	29	10	100.69	NA
2020-11-12 13:00	7.5	-1.8	52	29	13	100.68	Mainly Clear
2020-11-12 14:00	7.1	-2.6	50	30	7	100.67	NA
2020-11-12 15:00	7.2	-2.6	49	28	8	100.71	NA
2020-11-12 16:00	6	-2.6	54	24	10	100.77	Mostly Cloudy

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Appendix '4'

Schedule 'A' – 2020 Complaints Summary
Schedule 'B' – 2020 Material Tonnage Summary
Schedule 'C' – Brief Site History

Schedule 'A'

Complaints Summary

Schedule 'A'
2020 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	1/02/2020	1 complaint Received an e-mail complaint from a neighbor (EC) about odours @ 5:30 pm	A strong sewage like odour was noticeable approaching Renaud & Joshua (heading east on Renaud). I turned into Bradley Estates / Spring Valley Trails and the odour got weaker but is still present. Winds E-SE 5 – 9 km/hr, -8 °C, HH and ST with WCC independently inspected the area and the landfill following the complaint and the following morning. No odours were noticeable at time of the visits.
2	07/06/2020	1 complaint Received an e-mail complaint from a neighbor (RK) about odours @ ~8:00 am	There was an awful smell of sewer this morning in our neighborhood (Nature View Estates) and I suspect it came from the landfill as we are on septic and it wasn't a septic smell (it was in the whole neighborhood). Winds from NW, 15 km/hr, 14 °C, HH and RM with WCC inspected the area at a later date. Winds that morning were from the NW and home is located west of the landfill. RM contacted the complainant by e-mail. With NW winds, the odours observed would be from a source located to the west north-west and not the landfill to the east. RM provided hi cell # and indicated he could be reached at any time if he had any further concerns.
3	18/06/2020	1 complaint Received an e-mail complaint from a neighbor (A P-E) about odours @ ~8:00 am	There was an awful smell of sewer this morning in our neighborhood (Nature View Estates) and I suspect it came from the landfill as we are on septic and it wasn't a septic smell (it was in the whole neighborhood). Winds from S-SW, 7 km/hr, 13 °C, HH with WCC inspected the area at around 10 am and did not notice any odours. Winds that morning were from the S-SW, from the opposite direction of the landfill which is approximately 2 km from the location. It was also noted that the neighboring Millen site had approximately 4,000 tonnes of uncovered waste which could be causing issues.

Schedule 'B'

2020 Tonnage Summary

SCHEDULE "B"

Month	Total Inbound Monthly Tonnage	2020 Outbound and Re-Used Monthly Tonnage													Total Outbound and Re-Used Monthly Tonnage	Total Tonnage Landfilled
		Cardboard	Tires	Glass	Drywall	E-Waste	Shingles	Wood	Metals&WG	Aggregate	Asphalt	Rock/Concrete	Cont Soil (cover/treated)	Clean Fill	Wet Waste	
Jan-20	19,550.10	(0.90)	(1.82)	(378.67)	-	(2.58)	(3.63)	(378.72)	(52.96)	(181.09)	(2.21)	(28.23)	(4,632.74)	-	(3.00)	(5,666.55)	13,883.55
Feb-20	20,608.00	-	-	(176.11)	-	-	(0.25)	(37.73)	(48.07)	(632.87)	-	(46.07)	(8,346.78)	(4.42)	(3.00)	(9,295.30)	11,312.70
Mar-20	25,443.90	(0.62)	-	(233.02)	-	-	(25.76)	(37.25)	(58.76)	(1,434.07)	(8.35)	(285.98)	(9,647.70)	(6.70)	(3.00)	(11,741.21)	13,702.69
Q1	65,602.00	(1.52)	(1.82)	(787.80)	-	(2.58)	(29.64)	(453.70)	(159.79)	(2,248.03)	(10.56)	(360.28)	(22,627.22)	(11.12)	(9.00)	(26,703.06)	38,898.94
Apr-20	19,767.30	-	(1.94)	(64.75)	-	(4.11)	(95.04)	(129.77)	(40.47)	(840.87)	(405.22)	(250.00)	(5,405.00)	(37.29)	(3.00)	(7,277.46)	12,489.84
May-20	27,396.10	(0.42)	-	(98.01)	(14.40)	(1.99)	(345.04)	(30.00)	(4.45)	(991.69)	(1,074.27)	(187.27)	(10,925.51)	(148.66)	(3.00)	(13,824.71)	13,571.39
Jun-20	52,706.50	-	(1.86)	(159.74)	-	(4.61)	(615.13)	(182.67)	(86.53)	(1,054.70)	(2,116.88)	(270.59)	(31,979.59)	(327.34)	(3.00)	(36,802.64)	15,903.86
Q2	99,869.90	(0.42)	(3.80)	(322.50)	(14.40)	(10.71)	(1,055.21)	(342.44)	(131.45)	(2,887.26)	(3,596.37)	(707.86)	(48,310.10)	(513.29)	(9.00)	(57,904.81)	41,965.09
Jul-20	49,100.70	(0.83)	-	(162.69)	-	(2.01)	(643.19)	(375.01)	(68.98)	(709.41)	(1,612.07)	(662.75)	(26,187.77)	(275.67)	(3.00)	(30,694.38)	18,406.32
Aug-20	41,876.40	(0.34)	(2.86)	(191.35)	-	(17.22)	(521.84)	(349.56)	(18.45)	(549.89)	(335.72)	-	(21,485.18)	(207.53)	(3.00)	(23,682.94)	18,193.46
Sep-20	35,103.90	(1.11)	-	(259.79)	-	(1.39)	(693.92)	(466.15)	(33.90)	(460.14)	(312.89)	(411.05)	(5,989.84)	(343.23)	(3.00)	(8,975.41)	26,128.49
Q3	126,081.00	(2.28)	(2.86)	(613.83)	-	(20.62)	(1,858.95)	(1,189.72)	(121.33)	(1,719.44)	(2,260.68)	(1,073.80)	(53,662.79)	(826.43)	(9.00)	(63,352.73)	62,728.27
Oct-20	27,076.20	(0.04)	-	(78.29)	-	(3.40)	(582.74)	(434.40)	-	(377.94)	(196.18)	(2,031.45)	(6,794.41)	150.94	(3.00)	(10,350.91)	16,725.29
Nov-20	61,872.60	-	-	(33.32)	-	(1.16)	(445.33)	(568.28)	(6.67)	(431.00)	(206.23)	(7,382.00)	(10,274.48)	(74.77)	(3.00)	(19,426.24)	42,446.36
Dec-20	29,633.50	-	(2.10)	-	-	(2.31)	(199.38)	(492.53)	(210.56)	(516.28)	(35.58)	(1,890.75)	(4,211.74)	(335.86)	(3.00)	(7,900.09)	21,733.41
Q4	118,582.30	(0.04)	(2.10)	(111.61)	-	(6.87)	(1,227.45)	(1,495.21)	(217.23)	(1,325.22)	(437.99)	(11,304.20)	(21,280.63)	(259.69)	(9.00)	(37,677.24)	80,905.06
Total:	410,135.20	(4.26)	(10.58)	(1,835.74)	(14.40)	(40.78)	(4,171.25)	(3,481.07)	(629.80)	(8,179.95)	(6,305.60)	(13,446.14)	(145,880.74)	(1,610.53)	(36.00)	(185,637.84)	224,497.36

Schedule 'C'

Brief Site History

Schedule 'C'
BRIEF SITE HISTORY

Landfilling at the Site started in the early 1960s and served, at the time, as a rural dump operation for local residents. In 1971, the Ministry of Environment and Climate Change (MOECC), formerly the MOE, issued a Provisional Certificate of Approval (CofA No. 460702) to Mr. D. J. Huneault for disposal of industrial waste including construction and demolition waste. Currently the site receives all types of solid, non-hazardous waste for disposal excluding putrescible waste. In 1995, the CofA was amended for the operation of waste processing and composting facilities at the site. Composting operations were suspended with the issuance of the CofA amendments in April 2009. In 2016, the CofA, now an Environmental Compliance Approval (ECA) was amended to permit the treatment of contaminated soils.

Annual monitoring of groundwater and surface water was initiated in 1987 and has evolved into a comprehensive monitoring program that is reported to the MOECC on an annual basis. In 1992, a leachate collection system was constructed along the down-gradient toe of the landfill and surface water diversion ditches were constructed up-gradient within the north buffer zone. Leachate was initially collected in retention ponds and re-circulated onto and into the landfill following treatment through a peat filter and constructed wetland system. Transport of leachate by tanker truck to the municipal wastewater treatment plant was initiated in 1997 and used for 11 years. Construction of the existing leachate pre-treatment/pumping station and forcemain connection to the City of Ottawa sanitary sewer system was completed in 2007 and commissioned in early 2008.

In 2001, a landfill gas collection and flaring system was constructed as an interim odour control system. This system was commissioned in April of 2012 and has remained operational since then.

Construction for the last landfill cell was completed in 2019.

A detailed record of milestones in the site's history is presented as follows:

1960s The site was established to serve the local resident population, operating as a rural dump operation.

1971 The first Ministry of Environment (MOE) Provisional Certificate of Approval (CofA No. A460702) was issued to D.J. Huneault and revised in 1980.

1981 Detailed inspections, surveys and water samplings were undertaken. Monitoring wells were installed. Ownership of the site was transferred to Huneault Waste Management (474299 Ontario Ltd.). An application was submitted to update the CofA.

1983 The CofA was re-issued to 474299 Ontario Ltd. for a 100-acre landfill site limited to construction rubble and inert materials.

1984 Following an Ontario Municipal Board hearing, the site was re-zoned to permit landfilling.

1987 An annual monitoring program for groundwater and surface water was initiated.

1989 Four groundwater-monitoring stations were installed along the south property boundary.

1991 A land use agreement was entered into between the City of Gloucester (now City of Ottawa) and 474299 Ontario Ltd. Monitoring of surface water, groundwater and leachate was increased from annual to semi-annual monitoring events.

1992 A leachate collection system was constructed along the down-gradient toe of the landfill. Surface water diversion ditches were constructed up gradient within the north buffer zone. A leachate retention pond was constructed in the southeast corner of the landfill area. The first of two large cells was excavated in the northwest quadrant.

1993 A second leachate retention pond was constructed in the southeast corner of the landfill area. The CofA was re-issued. Waste types were limited to construction and demolition debris, asbestos; non-hazardous solid industrial waste including impacted soil. The second of two large cells was excavated in the northwest quadrant.

1994 The company changed its name from 474299 Ontario Ltd. to Huneault Waste Management Ltd.

1995 Landfilling continued in the west half of the landfill. Landfill gas monitoring was carried out and passive ventilation trenches were constructed. A large peat filter for leachate treatment was constructed east of the leachate retention ponds. The CofA was amended to permit the processing (recycling) and composting of waste materials (leaf and yard waste).

1996 The CofA was amended to allow for the receipt and composting of wet waste. Constructed wetlands were used for on-site treatment of leachate. A compost pad was constructed within the landfill area with recycled asphalt. In the fall, composting of leaf and yard waste as well as composting of mixed organics began.

1997 Due to complaints from neighbouring residents related to odour issues at the Site during the spring and summer, the use of leachate retention ponds and the composting of wet waste were suspended. Leachate was trucked by tanker to the municipal wastewater treatment plant (ROPEC) in compliance with a field order issued by the MOE. Updates to the 1994 Water Management Systems Report were submitted to the MOE for approval and included a design for a long-term leachate pumping station.

1998 Leachate continued to be trucked by tanker to the municipal wastewater treatment plant (ROPEC). The CofA was amended to insure the company submit a revised compost management plan for approval by the MOE prior to receiving mixed organics at the composting site.

1999 In July of 1999, ownership of the landfill changed. Leachate continued to be trucked by tanker to the municipal wastewater treatment plant (ROPEC). The 1994 Water Management Systems Report (1998 Revisions – Leachate Management) and the Huneault Landfill Leachate/Effluent Pumping Station Design prepared by Totten Sims Hubicki Associates Ltd., both dated December 1998, were approved by the MOE and the CofA was amended.

2000 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Construction of a new leachate wet well and pump station was completed. The leachate loading station was relocated to the top of the waste pile near Grid Line P-13 following the construction of the pump station. In September 2000 the corporation changed its name from Huneault Waste Management Ltd. to Waste Services Inc. (WSI).

2001 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). A second scale house was added at the entrance to the site to better serve WSI clients and to improve inbound and outbound traffic control. Active landfilling was being carried out in the southeast quadrant of the Site.

2002 Waste Services Inc. (WSI) was acquired by Capital Environmental Services Inc. (CERI), a publicly traded company. An amendment to the CofA was approved to allow foundry sand, wood chips and contaminated soil to be used as alternative daily cover, to allow recycled asphalt and inert granular materials to be used as road base, and to increase the service area to include the Province of Ontario. A CofA (Air) No. 6141-XKF9 was approved to permit the use of a tub grinder on site. A new scale and scale house were constructed at the entrance to the landfill to ease traffic congestion on Navan Road. Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Active landfilling was being carried out in the southeast quadrant of the Site.

2003 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Ainley Graham and Associates, a municipal engineering firm, completed a preliminary design for a leachate forcemain connection to the City of Ottawa sanitary sewer system. A small parcel of land referred to as the Larivière property and running the length of the Site's east property line was acquired in late 2003.

2004 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). A land exchange agreement was completed with the National Capital Commission giving WSI ownership of a 6.91 hectare parcel of land being a 100 metre strip south of the VIA right of way (ROW) in exchange for an 8.43 hectare parcel south of land owned by WSI (Plan 4R-19707) bringing its total land mass in and around the landfill Site to 69.05 hectares.

2005 Leachate continued to be trucked by tanker to ROPEC. A compliance order was received from the City of Ottawa to pre-treat the leachate and reduce the concentrations of hydrogen sulphide discharged at the wastewater treatment plant. The engineering firm Ainley Graham and Associates completed a Stage 1 Detailed Design for the Leachate Pre-Treatment/Pump Station and Forcemain with connection to the City of Ottawa sanitary sewer system. A small parcel of land referred to as the Robert property, running along the landfill Site's east property line, and a residential property located at 3516 Navan Road were acquired. Golder Associates Ltd. was retained to undertake geotechnical and slope stability analysis for the Site as well as monitoring for landfill gas, groundwater, surface water, leachate and sediment. Golder was also retained to undertake a leachate pre-treatment study. In November, WSI announced to the public that it was undertaking a project to expand the capacity of the landfill and extend its operational life by at least 10 years beyond 2011. The first public Open House was held on December 8, 2005.

2006 In May 2006 the MOE issued an amended CofA No. A460702 consolidating previous Certificates of Approval and associated notices and updating the CofA to the current standards. An updated Design and Operations Report prepared by Gartner Lee Ltd. was adopted. Also in May, a proposed Terms of Reference for the expansion of the landfill in accordance with the Environmental Assessment Act was submitted to the MOE and these were approved in October 2006. Leachate continued to be trucked by tanker to ROPEC. Chemical treatment of leachate to reduce H_2S concentrations began in the spring. An approval for the Leachate Pre-Treatment/Pumping Station and another to install a leachate forcemain within the Navan and Renaud Road allowances were obtained from city council with construction commencing in early December. Additional property to the east of the landfill located at 3326, 3548, 3560 and 3578 Navan Road were acquired by WSI bringing its total land mass in and around the landfill site to 90 ha.

2007 WSI considered and used the results of an environmental assessment (EA) to identify a preferred landfill expansion alternative for the Site thereby extending its operational life. The expansion of the WSI Navan Waste Recycling and Disposal Facility received approval under the Ontario Environmental Assessment Act (EAA) on August 3, 2007. Construction of the leachate forcemain and associated site modifications were completed in August. At the request of the City of Ottawa, modifications to the leachate pre-treatment and sampling system were undertaken with design and construction completed during the later part of 2007.

2008 A revised D&O Report was prepared by Golder Associates Ltd. (January, 2008) to meet the regulatory requirements described in the Landfill Standards (MOE, 1998) and the associated Ontario Regulation 232/98 to address the related Conditions of Approval for the proposed landfill expansion under the EAA. The proposed expansion of the Navan Waste Recycling and Disposal Facility required approval under the Ontario *Environmental Protection Act* (EPA) as well as other legislation. In early 2008, WSI presented submissions to the MOE to satisfy both the conditions of the approved EA and the requirements of the EPA and OWRA. Commissioning of the leachate pre-treatment/pump station was completed in February with leachate being pumped via forcemain to the City of Ottawa sewer system. Construction of new weigh scales, scale house and access roads began in the fall.

2009 Expansion of the Navan Landfill under the Ontario Environmental Protection Act (EPA) received approval with the issuance of the revised CofA No. A460702 (Waste Disposal Site) on April 16, 2009 along with CofA No. 4816-7C7M6C (Industrial Sewage Works) and CofA No. 6733-7BYS9A (Air). CofA No. A460702 was subsequently amended by Notice 1 on October 9th 2009. Significant facility improvements were completed at the entrance to the Site consisting of new scales and scale house, new Site entrance, new office/maintenance facilities, a new small vehicle unloading area and a new wheel wash station. An east diversion ditch c/w fish habitat features was constructed along the east edge of the property and commissioned in the fall following South Nation Conservation Authority approval. A 963 m^2 segment of property bordering Navan Road and west of the new site entrance was severed and transferred to the City of Ottawa for the future widening of Navan Road. Leachate continued to be pre-treated and discharged via forcemain to the City of Ottawa sewer system.

2010 In July, Waste Services Inc (WSI) merged with BFI Canada Inc., a Progressive Waste Solutions company, to become the third largest provider of waste services in North America. This merger had no impacts on the operations of the Navan Waste Recycling and Disposal Facility. Facility improvements continued to be made throughout 2010 and included completing the pavement structure for the main entrance and access to the site, the small vehicle unloading area and office/maintenance facility parking area and fire route. Berm construction and landscaping east of the wheel wash station and west of the site entrance were also completed. The design for modifications to the leachate pre-treatment/pumping station was approved by the MOE and the Certificate of Approval (Industrial Sewage Works) was amended (CofA # 5616-86NKNW). The design for an interim odour control system at the site was approved by the MOE and the Certificate of Approval (Air) was amended (CofA # 3536-8APNZD). Construction of the landfill gas forcemain and flaring system was started in November. Cell development continued in the Phase 2 area of the site with active landfilling being carried out in Phases 3 and 4.

2011 Construction of the landfill gas forcemain and flaring system was completed and awaiting approval by the Technical Standards and Safety Authority (TSSA). Construction of the leachate pre-treatment and pumping station improvements were completed. Monitoring well MW11-1 was installed to replace monitoring well OW92-8. E-waste recycling services were introduced for the benefit of the local community. The east stormwater management pond was completed in the fall. Cell development was completed in the area of Phase 2. Landfill was carried out in Phases 2, 3, and 4.

2012 An interim odour control system comprising of a landfill gas collection and flaring system was commissioned and approval by the Technical Standards and Safety Authority (TSSA) was received in April. The west stormwater management pond and east diversion ditch were completed in the fall. A new access road to the recycling facility and active landfill areas was constructed along the top of the existing waste mound just west of the East Cell expansion area. Landfilling was carried out in the area of Phases 3 and 4.

2013 An interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation. Leachate collection and pre-treatment was continued throughout 2013. A forcemain obstruction causing a cleanout flange failure resulting in a spill along Navan Road was experienced in December. The event was reported to the MOE and the City, the spill was cleaned up and the system repaired and returned to regular operations. Efforts were concentrated in completing the north facing waste slope west of the site access and the west facing waste slope. Landfilling was carried out in the area of Phases 3 and 4. In 2013 BFI partnered with a third party to develop a market for recycled drywall. Other materials recycled and re-used consist of glass, tires, cardboard, e-waste, shingles, wood, metals and white goods, aggregate, asphalt, rock and concrete, clean fill and impacted soils for re-use as cover material.

2014 An interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells. Leachate collection and pre-treatment was continued throughout 2014. Construction of the east expansion cell (Phase 1) drainage system was started in 2014 with completion anticipated in early 2015. Waste placement efforts were concentrated in completing the west facing slope (Phase 3). In 2014 BFI continued to recycle and re-use materials such as glass, tires, cardboard, e-waste, shingles,

wood, metals and white goods, aggregate, asphalt, rock and concrete, clean fill as well as impacted soils re-used as cover material.

2015 In 2015, the company changed its operating name from BFI Canada Inc. to Progressive Waste Solutions Canada Inc. Leachate collection and pre-treatment was continued throughout 2015. Construction of the east expansion cell (Phase 1) and drainage system which was started in 2014 was completed in 2015 and landfilling within the cell began in mid December. Waste placement efforts focused on completing the Phase 3 fill area and the west end of Phases 4 and 5 prior to starting waste placement in the new east cell. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells. In addition to recycling various waste materials, PWS in 2015 received MOECC approval for the treatment of contaminated soils.

2016 Leachate collection and pre-treatment was continued throughout 2016. Waste placement efforts continued in the new east cell (Phase 1). Contaminated soil placement to raise the grades to final elevations continued in the Phase 3 fill area and the west end of Phases 4 and 5. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells at the west end of Phase 5. Recycling and treatment of hydrocarbon impacted soils were on-going operations throughout 2016. Treated soils were used as final cover and to raise the grades in the east buffer adjacent the waste column. Cell construction continued in the north half of the east cell (Phase 6) and consisted of excavation work. A screening plant was added to the processing operations for the screening of oversize materials and rock. Amended Environmental Compliance Approval number 2427-AETKQ5 issued by the MOECC dated November 2016 was received for the construction and operation of an enclosed flare.

2017 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2017. In 2017, two Notices of Violation were issued by the City. One for over strength parameters in the leachate that were later addressed and the second for elevated volatile organic readings in a sampling manhole that was also addressed. Waste placement efforts continued in the east cell (Phase 1). The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of a horizontal collection well in the active fill area and seven permanent vertical wells. Recycling and treatment of hydrocarbon impacted soils were on-going operations throughout 2017. Treated soils were used as final cover and to raise the grades in the east buffer adjacent the waste column. Cell construction continued in the north half of the east cell (Phase 6) and consisted of excavation work. Design of the final and permanent landfill gas flaring system was completed and submitted in December by Golder Associates Ltd. to the Technical Standards and Safety Authority (TSSA) for review and approval. In the spring of 2017, the company changed it's name to Waste Connections of Canada Inc.

2018 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2018. In 2018, one Notice of Violation was issued by the City for a leachate spill along Renaud Road. An obstruction to the discharge pipe inside the sampling manhole located on Renaud Road caused the manhole to fill and overflow onto Renaud Road. The event was reported to the MOE and the City, the spill was cleaned up and the system cleaned out and returned

to regular operations. Waste placement efforts continued in the east cell (Phase 1) and in October resumed in the Phase 4 area of the landfill. Excavation of the north east cell in Phase 6 was continued and construction of the leachate collection and drainage system was substantially completed. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the connection of three vertical wells installed in late 2017. Recycling and treatment of hydrocarbon impacted soils were on-going operations throughout 2018. Treated soils were used as fill to raise the grades in the east buffer adjacent the waste column in the Phase 6 area..

2019 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2019. Construction of a new cell in Phase 6 was completed and an as-built report prepared by Golder Associates Ltd. was submitted to the Ministry of the Environment, Conservation and Parks. Waste placement efforts continued in Phase 1, in the area of Phase 4 and then in the new cell (Phase 6) for the last quarter of the year. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of four permanent vertical wells in the area of Phase 4. Recycling and treatment of hydrocarbon impacted soils were on-going operations throughout 2019. Treated soils were used to raise the grades in the east buffer adjacent the waste column. An existing stormwater ditch along the north edge and the northwest edge of the new cell in Phase 6 was replaced by a large diameter culvert complete with concrete headwalls.

2020 WCC continued discharging pre-treated leachate to the City of Ottawa sewer system via a forcemain located on the south shoulder of Navan Road and the east shoulder of Renaud Road connecting at the intersection of Page Road and Renaud Road. The interim landfill gas flaring system continued to be operational and effective in reducing odour causing fugitive gas emissions. In 2020, waste placement was concentrated on the east side of the waste footprint in the Phase 6 cell area. A ditch diversion culvert was constructed along the north and east perimeter of the waste cell located in the Phase 6 area by S.W. Farrell and Sons (1979) Ltd. The drainage layer on the sloped north and east walls of the waste cell in the Phase 6 area was also completed. Recycling, re-use and treatment of hydrocarbon impacted soils were on-going operations throughout 2020.

APPENDIX 5

EACMR

1.0 INTRODUCTION

1.1 Background

In August 2007, Waste Services (Canada) Inc. (WSI) now Waste Connections of Canada Inc. (WCC) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Condition 4 of that approval required that WSI (WCC) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WSI's (WCC's) compliance monitoring program. In accordance with Condition 3 of the EA approval, WSI previously submitted a separate document proposing an EA Compliance Monitoring Program.

In October 2008 WSI (WCC) submitted the first Environmental Assessment Compliance Monitoring Report (EACMR), which was intended to fulfill condition 4 of the EA approval conditions. The report addressed the period August 3, 2007 to August 2, 2008. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of the EACMR with submission of the Annual Operations and Monitoring Report which is submitted annually by March 31st. Accordingly, this EACMR is submitted as an Appendix to the Annual Report and covers the period January 1st to Dec. 31st, 2020.

The Ministry's EAAB File # is EA 02 08 02.

1.2 Report Organization

- The EACMR comprises six sections as follows:
- Introduction – provides an overview of the purpose, context of submission and structure of the report as well as the proponent's contact information and an overview of significant activities at the Navan Landfill during the reporting period;
- Physical Works/Mitigation Measures – are presented in Table A, which lists WCC's commitments to make physical improvements to the site and in-design mitigation measures made during the EA and subsequent review, and provides a discussion on WCC's progress in meeting the commitments;
- Studies and Other Commitments – during the EA and review of the EA, WCC made commitments to other studies or activities, such as developing an end use plan and property value protection plan. These and other commitments are listed in Table B and WCC's progress in meeting these requirements is assessed;

- Public Consultation – is presented in Table C, which lists commitments and conditions of approval involving public consultation. A discussion is provided summarizing consultation activities during the reporting period and assessing WCC's fulfillment of these requirements;
- EA Conditions of Approval – the conditions of EA approval contained in the Minister's letter are listed in Table D and WCC's progress in meeting these conditions is described.
- Compliance Status – the final section of the report summarizes the findings in Tables A – D and provides concluding remarks on the overall status of compliance with the EA. Potential non-compliance issues, if any, are discussed in this section.

1.3 Proponent Contact Information

Waste Connections of Canada Inc. (WCC) is a multi-regional, integrated solid waste services company providing collection, transfer, recycling, composting, and disposal services to its customers. WCC is committed to excellence in environmental management and to conducting its business in a manner which protects the environment, health and safety of its employees, customers and communities in which it operates. Waste Connections of Canada Inc. is the owner and operator of the Navan Waste Recycling and Disposal Facility. WCC's contact information is as follows:

Waste Connections of Canada Inc.

3354 Navan Road

Ottawa, ON

K4B 1M9

Attn: Mr. Henri Huneault, Landfill Manager

2.0 PHYSICAL WORKS/MITIGATION MEASURES

There were thirteen (13) commitments made by WSI (WCC) during the EA and subsequent review process. These commitments relate to installation of physical works and/or implementation of mitigation measures. WSI (WCC) made the majority of the commitments during the EA as documented in the EA Study Report (EASR). Table A provides a listing of the outstanding commitments during the current reporting period. For each commitment a reference is provided regarding the documented source of the commitment, the time frame in which it is expected to be implemented and comments on WCC's progress in fulfilling the commitment such as 'completed', 'in progress', 'ongoing' etc.

WCC has now completed nine (9) of the original thirteen (13) commitments in Table A and the remaining four (4) are ongoing. There are no non-compliance issues.

Table A: EA Compliance Status for Physical Works and Mitigation Measures

Commitments	Where Commitment Made	Implementation Schedule	Status
A-5: WCC will install an active gas management system consistent with the requirements of Ontario Regulation 232/98.	▪ Section 8.3 of the EASR.	Landfill gas/odour control system will begin construction in 2010 and the remainder phased in as the landfill is developed.	**Ongoing** Studies for landfill gas completed in 2009. Approved interim LFG odour control system header pipe and connections abstraction plant and candlestick flare equipment was completed in 2011 and commissioned in early 2012. The operation and expansion of the system as required is on-going. Final Design of the permanent enclosed flaring system was completed by Golder Associates Ltd. in 2017 and modified in 2020. In 2020 WCC retained Perennial Energy Inc. to fabricate the enclosed flare and extraction plant for the permanent system to be installed at the site.
A-6: WSI will undertake best management practices (BMP) for dust control.	▪ Section 8.3 of the EASR.	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and ongoing during operations.	**Ongoing** Best management practices for dust control have been implemented in 2009 and will continue over the operating life of the landfill. A wheel wash system was constructed and commissioned in late 2009 and operated from April to November, 2020 to reduce dirt and mud drag out onto paved roads (internal roads and Navan Road). A Best Management Practices Plan for Fugitive Dust Control was completed by Dillon Consulting dated October 2015 and submitted to the MECP in accordance with the requirement of an amendment for the treatment of contaminated soils.

Table A: EA Compliance Status for Physical Works and Mitigation Measures

Commitments	Where Commitment Made	Implementation Schedule	Status
A-7: WSI will vegetate side slopes and berms in order for the landfill to blend in as much as possible with the environment. Species native to Site area will be used wherever possible.	▪ Section 9.1 of the EASR	Following receipt of all necessary approvals to allow expansion of the Navan Landfill. Vegetation planting will be ongoing during operations. Details of vegetation planting will be refined during the EPA approval process.	**Ongoing** Approvals have been received. In 2020 vegetation was maintained and preserved where possible. The south, north and west facing waste slopes have been covered with final cover and seeded. Additional tree planting at the top of the landfill as closure progresses is on-going.

Commitments	Where Commitment Made	Implementation Schedule	Status
A-12: Best management practices (BMP) will be used to mitigate dust from activities at the Navan landfill application.	▪ Response to MOE GRT Comments, p. 24 ▪ MOE EA Approval Condition # 10.5	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and ongoing during operations.	**Ongoing** Approvals received.

3.0 STUDIES AND OTHER COMMITMENTS

WSI (WCC) agreed to undertake a total of thirty one (31) studies and additional tasks/commitments during the course of the EA and subsequent review. Table B lists the outstanding commitments during the reporting period along with a brief description of their status. Of the thirty one (31) original commitments listed in Table B, WCC has completed all but three (3) with one (1) not yet started, one (1) ongoing and one (1) in progress. Most of the completed commitments relate to providing additional information and detail during the EPA approval process.

There are no issues with non-compliance associated with any of the Table B commitments.

Table B: EA Compliance Status for Studies and Other Communication

Commitments	Where Commitment Made	Implementation Schedule	Status
B-1: WSI will undertake an evaluation of end-use alternatives.	▪ EASR Table 8.3-1, p. 120d	Three years prior to the landfill closure.	**Not yet started** The evaluation of end use alternatives will be undertaken and documented as part of a closure plan to the MECP as required by Regulation 232/98. Status of the development of the end use plan will be reported in the EACMR section of the annual O&M Report to the MECP starting three years prior to site closure.
B-3: WSI will continue to pursue further waste diversion programs as appropriate.	▪ EASR p.120e	Schedule is based on economic and technical viability and approvals.	**Ongoing** Treatment of hydrocarbon contaminated soils along with the recycling and re-use of other landfill materials such as glass, wood, metals, roofing shingles, aggregates, tires and other materials was on-going throughout 2020.
B-11: WSI will maintain sufficient financial assurance for proper decommissioning of the site in keeping with MOE requirements, community plans and input from the PAC.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**In Progress** Financial assurance plan is in place and will be maintained throughout the life of the landfill site.

4.0 PUBLIC CONSULTATION

WSI (WCC) agreed to seven (7) commitments regarding public consultation during the EA, including the formation of a Public Advisory Committee (PAC). The status of these commitments is provided in Table C. All four (4) of the commitments remaining are ongoing.

Table C: EA Compliance Status for Public Consultations

Commitments	Where Commitment Made	Implementation Schedule	Status
C-3: WSI will work with the PAC on an ongoing basis to consider enhanced opportunities to improve re-cycling and diversion at the Navan Road Landfill to work towards the diversion goals articulated by the City of Ottawa and the province.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and completion of the City's study.	**Ongoing** Treatment of hydrocarbon contaminated soils along with the recycling and re-use of other landfill materials such as glass, wood, metals, roofing shingles, aggregates, tires and other materials was on-going throughout 2020. WCC continues to add marketable materials to its recycling efforts.
C-4: WSI will work with the PAC on an ongoing basis to consider other opportunities to reduce odour, dust and road dirt.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**Ongoing** A wheel wash station was constructed and commissioned at the end of 2009. Construction of an interim odour control system was completed in 2011 and commissioned in early 2012. Final design of a permanent landfill gas system was completed in 2017 and modified in 2020. WCC, in 2020, retained Perennial Energy Inc. to fabricate the flare and extraction plant.
C-5: WSI is prepared to address new issues arising from the EA or detailed EPA assessment work and will work with the PAC on these issues.	▪ WSI – Friends of Mer Bleue Agreement	As these issues become known.	**Ongoing**

Table C: EA Compliance Status for Public Consultations

Commitments	Where Commitment Made	Implementation Schedule	Status
C-7: WSI will work with the City of Ottawa, the Friends of the Mer Bleue and the PAC to identify and develop community projects to enhance and improve the community and its public spaces	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**Ongoing** An agreement for a funding mechanism by WCC for community projects was included in the Terms of Reference for the PAC. A number of community projects were funded in 2020 by the WCC-PAC fund.

5.0 EA CONDITIONS OF APPROVAL

In the Notice of Approval to Proceed with the Undertaking, the Minister of the Environment listed forty three (43) conditions grouped into ten (10) categories of which sixteen (16) remain, as listed in Table D. Many of these conditions result from commitments made by WSI (WCC) during the EA review and are listed in Tables A, B or C. For convenience to the reader, cross-references have been provided to the corresponding WSI (WCC) commitment listed in Tables A, B or C. Where no cross-reference is available (i.e., this is a new condition), "not applicable" (n/a) is recorded in Table D. It should be noted that many of the conditions are the same as WSI (WCC) commitments contained in Tables A, B and C.

No non-compliance issues have been identified.

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
1. General Requirements			
1.1 The proponent shall comply with the provisions in the EA which are hereby incorporated in this approval by reference except as provided in these conditions and as provided in any other approval or permit that may be issued for the site.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
1.2 The proponent shall implement any additional commitments made by them and recorded in their response and attachments as noted above, except as provided for in these conditions or as provided for under other approvals, authorizations or permits required for the undertaking.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
1.3 These conditions do not prevent more restrictive conditions being imposed under other statutes.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
2. Public Record			
2.1 Where a document is required for the public record, the proponent shall provide two copies of the document to the Director, one copy for filing within the specific public record file maintained for the undertaking and one copy for staff use.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.2 The proponent shall provide additional copies of such documents at the request of the: • Regional Director; • Clerk of the City of Ottawa; and, • PAC.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.3 The proponent shall quote EAAB file number EA 02 08 02 on the documents.	n/a	Throughout the operation of the landfill in accordance with the EA approval	**Ongoing**
2.4 The proponent may also provide these documents through other means as it considers appropriate.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
3. Compliance Monitoring Program			
3.6 The proponent shall carry out the monitoring program as amended by the Director.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing**
3.7 The proponent shall make the documentation available to the ministry or it's designate upon request in a timely manner when so requested by the ministry during an on-site inspection, audit, or response to a pollution incident report or when information concerning compliance is requested by the ministry.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing**
4. Compliance Reporting			
4.1 The proponent shall prepare an annual compliance report which describes compliance with the conditions of approval set out in this notice and which describes the results of the proponent's EA compliance monitoring program.	n/a	The EACMR is required annually, until all conditions have been met. MOE has agreed for EACMR to be submitted annually April 1 with the Annual O & M Report.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
4.2 The proponent shall issue the first compliance report no later than one year following the date of this approval, and in each subsequent year shall issue a compliance report covering the previous year, on the date that is the anniversary of this approval or the proponent can coordinate the timing of its reporting with its annual Design and Operations report required under the EPA.			**Ongoing**
4.3 The proponent shall submit the annual compliance report to the Director for placement on the public record.			**Ongoing**
4.4 The proponent shall submit annual compliance reports until all conditions of this approval are satisfied.	n/a	Beginning in 2008 and annually during the operation of the landfill until all conditions have been satisfied.	**Ongoing** The first annual EACMR was submitted in 2008 and are provided annually attached to the Operations and Monitoring Report.
4.5 When all conditions have been satisfied, the proponent shall indicate in the annual compliance report that this is its final submission.	n/a		**Ongoing**
4.6 The proponent shall retain either on site or in another location approved by the Director, copies of the annual compliance reports for each reporting year and any associated documentation of compliance monitoring activities.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing** In 2008, WSI established a library on site where EACMR and associated documentation is available for viewing by the public.

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
4.7 The proponent shall make the documentation available to the ministry or it's designate upon request in a timely manner when so requested by the ministry during an on-site inspection, audit, or in response to a pollution incident report or when information concerning compliance is requested by the ministry.	n/a		**Ongoing**
5. Public Advisory Committee			
5.4 The proponent may dispense with the PAC if, after a period of time and after giving sufficient notice, there is no interest from the public in continuing with it. The proponent shall review the need for such a PAC yearly.	n/a	Ongoing throughout operational life of landfill expansion	**Ongoing**
6. Planting Plan			
6.3 The proponent shall make best efforts to protect existing mature trees and vegetation on site that could be used to screen the construction of the landfill berms, where appropriate.			**Ongoing** On-going throughout life of the landfill.

6.0 COMPLIANCE STATUS

WSI (WCC) made a total of 51 commitments during the EA and subsequent review as listed in Tables A, B and C. Eleven (11) commitments remain "ongoing" or "in progress". In other words, about 78% of the original commitments have now been fulfilled and some will remain in ongoing throughout the operating life of the Site.

The Minister listed fourty three (43) conditions in her Notice of Approval to Proceed with the undertaking, which are listed in Table D. Several conditions (13) were derived from WSI commitments made during the EA and subsequent review. Eighteen (18) conditions remain at the end of the reporting period and will remain ongoing throughout the operating life of the landfill. WCC continues to make progress in all of the remaining conditions.

No non-compliance issues were identified during the report period.

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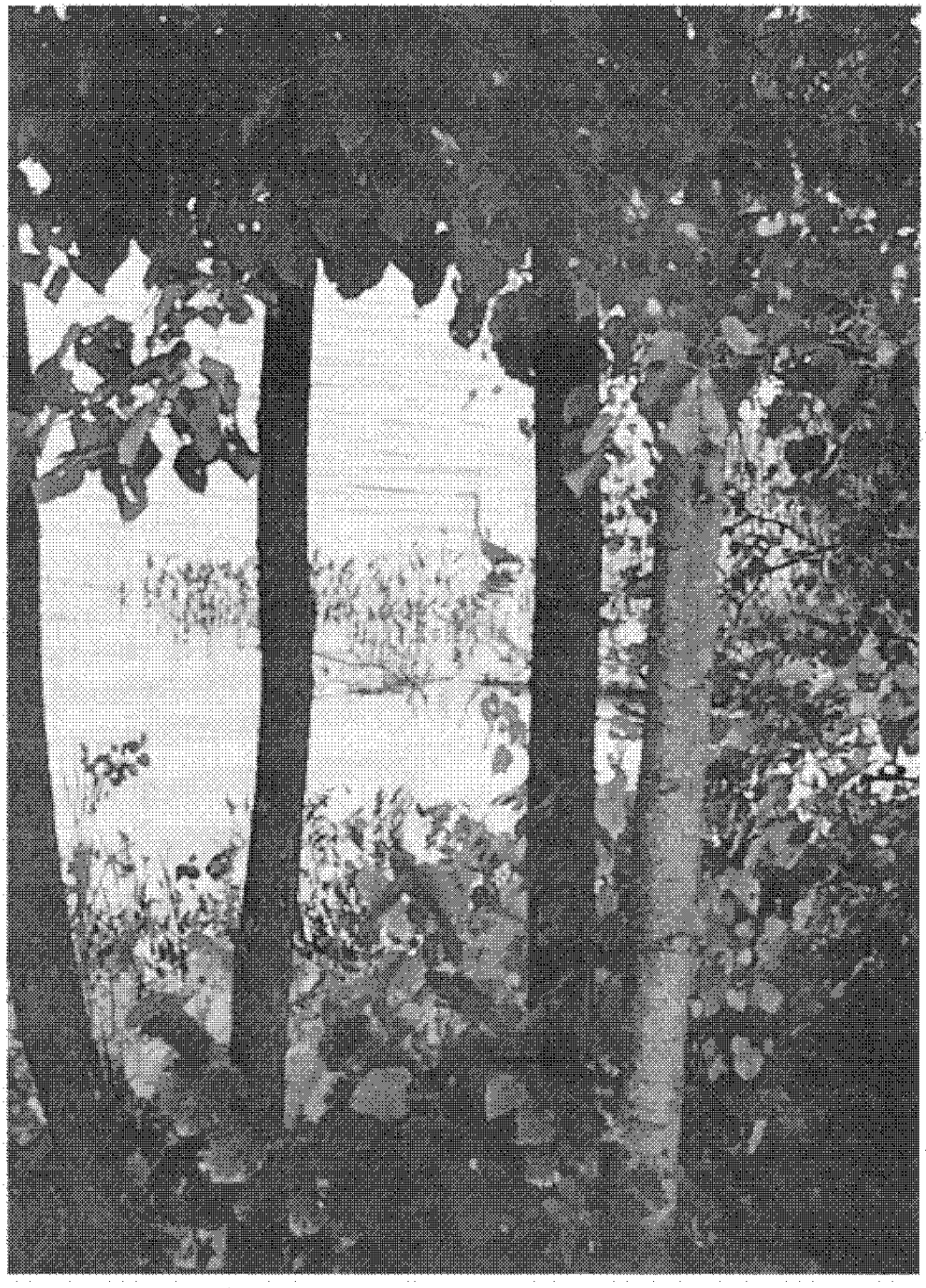
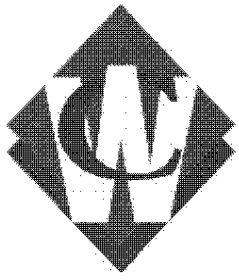
WASTE CONNECTIONS CANADA

NAVAN WASTE RECYCLING AND DISPOSAL FACILITY

3354 NAVAN ROAD, OTAWA, ON K4B 1H9



OPERATIONS AND MONITORING REPORT 2020



WASTE CONNECTIONS OF CANADA

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2020
OPERATIONS AND MONITORING REPORT

Waste Connections of Canada Inc.
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 Navan Road, Ottawa, Ontario

March, 2021

EXECUTIVE SUMMARY

The Navan Waste Recycling and Disposal Facility is a 91.87 ha waste management facility that includes a 40 ha landfill as well as processing (recycling) operations. The Site is located in the east end of the City of Ottawa (formerly the City of Gloucester) and is owned and operated by Waste Connections of Canada Inc. (WCC).

The site currently operates under amended Environmental Compliance Approval (ECA) for a waste disposal site (ECA # A460702) re-issued April 16th, 2009 with subsequent amendments (Notices 1 through 11) as well as an ECA for Industrial Sewage Works, ECA # 5616-86NKNW amendment dated June 29th, 2010 and ECA Air # 3536-8APNZD amendment dated November 24th, 2010 and ECA # 4024-9WFQE5 dated June 8th, 2015 and ECA # 2427-AETKQ5 dated November 14, 2016. The waste ECA also incorporates and makes reference to the Design and Operations (D&O) Report for the Site prepared by Golder Associates and dated January 2008.

The Facility is approved to receive solid non-hazardous and asbestos waste, excluding putrescible waste. Landfilling is restricted to waste generated within the Province of Ontario, excluding the City of Toronto. The site includes a processing facility for the recycling of waste materials and treatment of hydrocarbon impacted soils. The processing site is approved to receive solid non-hazardous waste, excluding putrescible waste, generated within the Outaouais Region of the Province of Quebec and within the Province of Ontario, excluding the City of Toronto. The site is also approved to host household hazardous waste (HHW) day events whereby the waste is received by a carrier approved through valid certificates of approval to receive, temporarily store and transport HHW to an approved waste disposal site. Other than during HHW events, no hazardous or liquid industrial wastes, as defined in O. Reg. 347, R.R.O. 1990, are permitted at the site. Most of the waste handled at the Site is generated within the City of Ottawa and neighbouring municipalities.

In 2020, a total of 410,135 tonnes of materials entered the site. Of this total, 224,497 tonnes (54.74%) were received as landfill material; 6,017 tonnes (1.47%) were recycled and removed from the site; and an estimated 36 tonnes (0.01%) were waste materials rejected and removed from the site by WCC for alternative disposal at another licensed facility. Other materials received for re-use on site included 25,788 tonnes (6.29%) of rock, brick, shingles, concrete and rubble re-used as aggregate for road construction; 7,916 tonnes (1.93%) of clean fill, topsoil, and asphalt re-used on site for final grading, road/pad construction and engineered fill; 35,881 tonnes (8.75%) of treated soils or soils re-used on site; and 110,000 tonnes (26.82%) of special materials such as storm sewer screenings and impacted non-hazardous soils received at the site for re-use as daily cover material.

Golder Associates Ltd. estimated the air space used by measuring the volumetric changes between topographic mapping generated from aerial photography obtained on April 28th 2020 and the previous year on April 30th 2019. The net estimated air space used (ASU) between the last two aerial survey dates was reported to be 308,130 m^3. Records indicate that the ASU during that period of time was consumed by approximately 338,399 tonnes of waste, daily cover material and other materials resulting in a density calculation of 1.10 tonnes/m^3 and a five year average density of 1.43 tonnes/m^3. Air space used was also calculated based on assigning assumed waste densities to the various waste streams received and

landfilled, cover material and re-used materials placed within the air space from May 1st to December 31st, 2020. Using this approach, it is estimated that approximately 191,776 m^3 of remaining air space was used and excludes materials diverted off site for recycling and some materials re-used outside the air space. Based on this approach, the weighted average of the in-place density for all of the materials used in the air space calculation was estimated to be 1.19 tonnes/m^3. The variance in density calculations could be attributed to factors such as cell excavation and settlement which influence the year over year volume calculations. The air space remaining as of January 1st, 2021 was estimated to be 1,624,753 m^3.

Under the present Environmental Compliance Approval (ECA), the life expectancy remaining for the Navan Waste Recycling and Disposal Facility as of January 1st, 2021 is estimated to be 5.6 yrs (2026) to 6.6 years (2027) based on future projected maximum annual waste receipts for landfilling including daily cover of 344,750 tonnes and a waste density varying from 1.19 to 1.43 tonnes/m^3. The actual life of the landfill will vary based on annual fill rates, in-place waste densities, waste diversion and recycling initiatives at the Facility, and the rate of air space development.

Diversion through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the Navan Facility. For example, all daily and intermediate cover needs are met by substituting the use of virgin soils with the re-use of significant quantities of impacted soils. Brick, concrete, asphalt and rubble are also recovered for re-use each year in the construction of access roads. Roofing shingles free of paper and other debris are also re-used on site as a sub-base for roads and pads over which a base of aggregate or recycled asphalt is placed. In addition, steel, aluminum, wood, tires and white goods are recovered daily from the active face for recycling. Recycling of E-waste and drywall was continued in 2020 as a service to the local community. Hydrocarbon contaminated soils treated in 2020 were re-used at the site as final cover material and structural fill within the east buffer area.

Materials received by the Navan Waste Recycling and Disposal Facility are those which IC&I generators have generally deemed to be waste and of no further value (i.e., post diversion at the source). Many of the waste generators, serviced by waste collection contractors who bring waste to the Site, also divert materials from landfill at their place of business prior to collection. Recycling within the IC&I sector is regulated by the Ministry of the Environment, Conservation and Parks under Regulations 101, 103 and 104. While the Site receives post-diversion waste materials from the IC&I sector, WCC has procedures in place to screen the incoming waste for recyclable material in what is known as a "last chance harvest" which is a "positive" sort where the recyclable item must be removed from the mixed waste mass. In this case, the majority of the material is not recyclable (i.e. it is waste). This is very different than recycling from "source separated" material, which results in a "negative" sort, where the waste components are removed from what is predominantly recyclable material. WCC also encourages and receives "clean" recyclable materials such as drywall, metal, electronics and glass where such materials can be shipped to market in bulk in efforts to make the recycling of such materials more economically viable.

The Navan Waste Recycling and Disposal Facility diverted over 74,970 tonnes of material from disposal in 2020, and over 402,167 tonnes during the past 5 years. For 2020, this represents a "last chance harvest" diversion rate of 25.0 % and excludes the re-use of impacted soils for daily cover material. This is in addition to the diversion rate for IC&I waste considered to occur at the source. WCC will continue to improve waste diversion and recycling initiatives at the Navan Facility and pursue economically viable waste diversion opportunities to help the local community and WCC clients achieve a better IC&I recycling rate.

Significant activities and capital works undertaken between January 1st and December 31st, 2020 included active landfilling in Phase 6 (refer to Figure 2.4); completion of construction of the east cell (Phase 6) sloped

wall leachate drainage system; construction of the east cell (Phase 6) north and north-east perimeter clay wall and barrier; continued recycling operations at the facility with treatment of hydrocarbon impacted soils; screening of coarse granular soils to separate rock from soil for re-use; pre-treatment and disposal of collected leachate to ROPEC for off-site treatment; retained Dillon Consulting Limited to undertake Airborne Contaminant Discharge Monitoring and Reporting requirements for the landfill site as well as the National Pollutants Release Inventory and Green House Gas reporting; retained Golder Associates to carry out surface water, groundwater, leachate, gas and noise monitoring and reporting programs; added clay cover to completed fill areas of the landfill; retained Base Mapping to undertake aerial photos and prepare topographic mapping of the site; constructed one additional horizontal landfill gas wells in the north-west corner of Phase 1; and, retained Perennial Energy, LLC to manufacture, assemble, package, check, test, and deliver a Landfill Gas Extraction Plant and Enclosed Flaring System.

Leachate generated by the landfill is collected by a drainage system consisting of three separate components that gravity flow to a leachate treatment and pumping station located at the southeast corner of the waste pile and a fourth located in the east cell that is pumped to the on-site treatment station. Presently, the disposal method of choice for the pre-treated leachate is direct discharge to the City sewer system via approximately 2 km of forcemain. In 2020, a total of 132,775 m^3 of pre-treated leachate was discharged to the City of Ottawa wastewater system, a 10.8% reduction over 2019. The decrease is attributed to efforts to reduce the infiltration of surface water runoff into the waste. There were no issues reported with the operation of the leachate treatment and pumping system in 2020.

The WCC Facility is ideally situated on a thick deposit of Champlain Sea Clay (Leda Clay). The clay deposit at this site ranges from 22 metres to greater than 33 metres in depth. A clay ridge that cuts across the site rises approximately 18 m above the floor of an abandoned Ottawa River Channel. This results in surface water and shallow groundwater flowing in a southward direction. The Site is located on the northern fringe of the Mer Bleue Bog, a well-known salt-water bog that is an Area of National Scientific Interest (ANSI). These natural features are ideal for the control and monitoring of leachate at the site.

Environmental control systems and operational activities that include the operation and maintenance of an elaborate perimeter leachate collection system (LCS) and surface water diversion works are monitored in accordance with the conditions of the ECA. Monitoring carried out to identify areas of environmental concern includes measuring water quality parameters in surface water and in groundwater at the site's boundary as well as in the leachate generated by the landfill. Monitoring for the presence of landfill gas was also carried out. In addition, sediment quality monitoring at three locations within the Mer Bleue Bog that was started in 2000 at the request of the National Capital Commission (NCC) was continued. The monitoring program carried out in 2020 was a continuation of the monitoring program already in place for this site.

Based on the groundwater levels obtained during the 2020 monitoring program, no significant change in groundwater flow patterns has been observed.

Groundwater at the Navan Waste Recycling and Disposal Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (unweathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present in each of these units up-gradient, at the down-gradient edge of the waste pile (used to assess compliance) and further down-gradient of the landfill within the buffer zone.

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The objectives of the 2020 Environmental Monitoring Program were to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702; to assess any potential impacts on water quality at the site resulting from landfill operations; to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the Facility; to document the chemical composition of groundwater and surface water in the vicinity of the Facility; to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate; and to document the chemical composition of sediment at three locations in the Mer Bleue Bog.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2019 background range.

Leachate quality monitoring results for 2020 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Trigger concentrations exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

WCC's efforts were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented.

In 2020, no confirmed (continued increase in concentration beyond the background range) trigger exceedance of the background range was reported in any stratigraphic unit monitored. Some parameters' exceedance of background conditions will need to be confirmed during the 2021 monitoring sessions to determine if the trigger protocol needs to be implemented and/or the background range of that parameter should be considered to increase.

The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger

mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

In 2002/2003, an assessment of the WCC Navan Facility operations was undertaken in support of a WCC-NCC (WSI-NCC) exchange of land parcels located south of the Navan Facility along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

A Monitoring and Screening Checklist prepared and signed by a Competent Environmental Practitioner (CEP) is included with the Golder 2020 Landfill Monitoring Report attached as Appendix '1'.

The proposed 2021 Environmental Monitoring Program is the same as was conducted in 2020, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program and sediment monitoring which is proposed to be discontinued. As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or the fall depending on site conditions) as has been done between 2014 and 2020.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the May 2020 monitoring session and will be monitored again in the fall of 2021.

In 2020, Golder Associates Ltd. (GAL) was retained to carry out the landfill gas monitoring program. The monitoring program undertaken was a continuation of the monitoring program already in place for this site and the results of the monitoring events undertaken are presented in more detail in the GAL report provided in Appendix '2'.

LFG monitoring was undertaken in May, August and December 2020. At most locations monitored, methane gas was less than 5 percent (%) of the Lower Explosive Limit (LEL). Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 25% LEL (or

1.25% by volume) at MH-9 (G3-a), MH-5 (G11-a), MH-4 (G-12a), MH-2 (G18-a) in May 2020, MH-8 (G4-a), monitoring well OW92-8 (G15) and pipeline cleanout in August 2020, monitoring well OW92-8 (G15) in December 2020.

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the WCC Navan Facility based on the 2020 monitoring results. Although no monitoring locations are available below surface at the property boundary, it is anticipated that the WCC Navan Facility met the property boundary requirements in 2020.

Hydrogen sulfide was not detected at any location during the 2020 monitoring events, with the exception of the collector MH (G-26i) in May 2020.

It is noted that an interim LFG odour control system was installed in 2011 and commissioned in April 2012. Extensions to the LFG odour control system were installed in the fall of 2016, the fall of 2017 and in 2019. The additional wells installed in 2017 and 2019 are intended to be part of the future permanent LFG collection system. In 2020, one horizontal well was added at the north-west corner of Phase 1. The purpose of this system is to control potential odorous emissions from the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells.

During the 2020 winter monitoring events, no odours were detected at the site, strong odours were noted in August, and faint odours were noted in May by the Golder field technician. Gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2020, WCC personnel responded to three odour related complaints.

Dillon Consulting Limited (Dillon) was retained by Waste Connections of Canada Inc. (WCC) in 2020 to complete the following for the Navan Landfill:

- An assessment to determine the reporting requirements under the *National Pollutant Release Inventory* (NPRI) for the 2019 calendar year;
- Greenhouse Gas Reduction Reporting as required under *Ontario Regulation 347*;
- An assessment to determine the reporting requirements under *Ontario Regulation 390/18 – Greenhouse Gas Emissions: Quantification, Reporting and Verification (O.Reg. 390/18) and the Federal Government Greenhouse Gas Reporting for the 2019 calendar year;*
- An assessment to determine the reporting requirements under the Federal Government Greenhouse Gas Reporting Program (GHGRP) for the 2019 calendar year; and
- Assist with data input and submission for Environment Canada's online Single Window

Information Manager (SWIM) module, if required.

The Navan Landfill has reported in past years to the NPRI program under ID 10967 and the GHGRP program under ID G10975. Site operations are identified by NAIC code number 562210 – Waste Treatment and Disposal.

Based on Dillon's assessment of facility operations and material usage, the Navan Landfill was required to report to NPRI for the year 2019. The total annual on-site releases and off-site transfers of the reportable NPRI Part 1, Part 2, and Part 3 substances is Asbestos. And is summarized in Section 8 of the report. Annual air releases for the NPRI Part 4 and Part 5 reportable substances are CO, PM10 – particulate matter and PM2.5 and are also summarized in Section 8. The reports were made based on estimates and not measured values. Many of the parameters that are reportable are the result of handling high volumes of materials on site which are above the manufactured, processed or otherwise used reporting threshold, e.g. leachate and asbestos, but do not result in airborne emissions from the facility. The reporting of the emissions of PM10 was triggered by fugitive dust emissions from roads and is generally also reported by all industrial operations in Ontario due to very low thresholds.

Based on the Dillon assessment, The Navan Landfill met the GHG reporting requirements for the Federal reporting program and was therefore required to report for the 2020 calendar year. GHG emissions were reported for CO_2e and is summarized in Section 8 of this report.

In 2021, WCC will continue to develop the landfill in a manner consistent with their past operating practices and proceed with capital projects required for the site operations as presented in the revised D&O (Golder, 2008). Over the past number of years, landfilling has progressed in a counter-clockwise pattern starting in the northwest corner of the site (area indicated as north half of Phase 3 on Figure 10.1). To date waste has been placed over the entire permitted waste footprint of the landfill as shown on Figure 10.1 with Phases 2 and 3 having been completed. In areas where significant settlement has occurred, re-grading will be carried out. In 2021, landfilling will continue in the last completed cell identified as Phase 6. Closure work will be carried out on the north and east sides of Phase 6 where final waste grades will have been reached.

The development of the remaining landfill capacity in the area of Phase 6 (east cell expansion) requires the filling and compaction of approximately 7,200 m^3 of material (as of the last aerial photo taken April 28th 2020) along the east waste limit. Soil management practices will include the following:

- Excavation of clay from the Phase 5 and Phase 8 areas;
- Sediment control measures will be taken so that inactive areas such as soil stockpile side slopes are seeded; silt fences are installed as required around the perimeter of disturbed areas; and surface runoff from the stockpile areas will be channeled to the internal ditch system which will drain to the site's stormwater retention ponds.

Along with landfilling operations, other site operations expected to be carried out in 2021 will consist of the following:

- Provide additional landscaping to completed final cover areas on the north surfaces of Phase 4.
- Re-align surface runoff away from fill areas and cell construction areas.
- Raise grades at the east waste limit and grade to direct surface runoff away from waste.

- "Last Chance Harvest" of recyclable waste will continue in the active face using specialized heavy equipment as per present practice.
- Increase efforts to sort and divert waste from small vehicles at the small vehicle drop-off area and provide incentives to clients to sort materials at source, prior to arrival at the Site.
- Establish markets for new recyclable materials and increase the types of materials to be recycled at the site.
- Enhance treatment of hydrocarbon impacted soils.
- Construct a working pad in the area of Phase 1 for recycling activities.
- Expand the east end of the existing recycling pad north into Phase 8.
- Add additional wells (horizontal and/or vertical) to the landfill gas flaring system, if required, to enhance and control fugitive gas in fill areas and odours from the landfill.
- Construct the perimeter landfill gas forcemain along the south, the west and the north waste perimeter as designed by Golder Associates and connect to the existing landfill gas collection system.
- Install and commission the permanent enclosed flare and abstraction plant.
- Complete construction of the east perimeter access road and extend it onto the top of Phase 1.

The 30 m buffer at the northern, eastern and western perimeter of the landfill and the 10m buffer at the southern perimeter will continue to be maintained as required by the ECA. Aesthetic improvements at the site will continue to be an on-going objective.

In August 2007, WCC (WSI) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Approval under the Ontario Environmental Protection Act (EPA) as well as other legislation were also received which culminated in the issuance of the above noted Certificates of Approval for the Site. Condition 4 of the EAA approval required that WCC (WSI) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WCC's compliance monitoring program (EAAB File # is EA 02 08 02). In accordance with Condition 3 of the EA approval, WCC has previously submitted a separate document proposing an EA Compliance Monitoring Program. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of follow up EACMRs with submission of the Annual Operations and Monitoring Report. Accordingly, this EACMR is submitted as Appendix 5 to this Annual Report and covers the period January 1st to Dec. 31st, 2020. No non-compliance issues were identified during the reporting period.

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1. INTRODUCTION

The Waste Connections of Canada Inc. (WCC) Navan Waste Recycling and Disposal Facility operates under the Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) for a Waste Disposal Site number A460702 as amended. The site is approved to receive solid non-hazardous and asbestos waste, excluding putrescible waste. Landfilling is restricted to waste generated within the Province of Ontario, excluding the City of Toronto. The processing site is approved to receive solid non-hazardous waste, excluding putrescible waste, generated within the Outaouais Region of the Province of Quebec and within the Province of Ontario, excluding the City of Toronto. The site is also approved to host household hazardous waste (HHW) day events whereby the waste is received by a carrier approved through valid certificates of approval to receive, temporarily store and transport HHW to an approved waste disposal site. Other than during HHW events, no hazardous or liquid industrial wastes, as defined in O.Reg 347, R.R.O. 1990, are permitted at the site. Most of the waste handled at the site is generated within the City of Ottawa and neighbouring municipalities. The site is also approved to treat contaminated soils.

This report presents the annual operating and monitoring conditions for the site to the Ministry of the Environment , Conservation and Parks (MECP) pursuant to Conditions 135 and 136 of the ECA No. A460702. The site is located in the eastern portion of Ottawa, Ontario on Part of West Half of Lot 2, Part of Lots 3 and 4, Concession IV, Ottawa Front (Parts 1, 2 and 3 on Plan 4R-19707, Parts 1 and 2 on Plan 5R-13200, Parts 1, 2, 3, 5 and 6 on Plan 5R-11073, Parts 1 and 2 on Plan 5R-11716 also referred as Parts 1, 2 and 3 on Plan 4R-21920), 3354 Navan Road, Township of Gloucester, now in the City of Ottawa, UTM Easting: 460570, UTM Northing: 5030570 at the front entrance to the site (see Key Plan, Figure 1.1 and Survey Plan, Figures 1.2 and 1.3).

1.1 BACKGROUND

The site was formerly owned and operated by Huneault Waste Mangement Ltd. which changed name in 2000 to Waste Services Inc. (WSI). In 2002 WSI was acquired by Capital Environmental Services Inc. (CERI) who kept the operating name of WSI and in July 2010 merged with BFI Canada Inc. BFI Canada Inc. changed name to Progressive Waste Solutions Canada Inc. and later merged with Waste Connections Inc. now operating as Waste Connections of Canada Inc. The Site started operations in 1960, and is operated under the Environmental Compliance Approval (ECA) No. A460702 issued by the Ministry of the Environment, Conservation and Parks (MECP). This approval officially revoked and replaced the previous approval that was dated May 12, 2006 due to the site's expansion in 2009. The following summarizes the notices that have amended ECA No. 460702:

- Notice No. 1 dated October 9, 2009: Permitted construction of base liner and leachate collection system for the east cell expansion.
- Notice No. 2 dated August 4, 2010: Widening of Navan Road.
- Notice No. 3 dated November 1, 2010: Landfill Gas Odour Control System.
- Notice No. 4 dated April 29, 2011: Financial assurance update (processing site)

- Notice No. 5 dated June 13, 2012: Financial assurance update (processing site)
- Notice No. 6 dated April 19, 2013: Financial Assurance update (processing site)
- Notice No. 7 dated February 25, 2014: Financial assurance update (landfill)
- Notice No. 8 dated June 8, 2015: Soil Treatment Pad
- Notice No. 9 dated February 1, 2016: Financial assurance update (landfill)
- Notice No. 10 dated March 14, 2017: Landfill and Processing Facility Financial Assurance
- Notice No. 11 dated June 19, 2018: Landfill and Processing Facility Financial Assurance

The site also operates under an ECA for Industrial Sewage Works, ECA # 5616-86NKNW amendment dated June 29th, 2010 and ECA Air # 3536-8APNZD amendment dated November 24th, 2010, ECA # 4024-9WFQE5 dated June 8, 2015 and ECA # 2427-AETKQ5 dated November 14, 2016. The waste ECA also incorporates and makes reference to the Design and Operations (D&O) Report for the site prepared by Golder Associates dated January 2008.

The site occupies a 91.87 hectare (ha) property (blue and green areas on Fig. 1.2) that includes a 40 ha area currently approved for recycling and disposal (red area on Fig. 1.2). Figure 1.2 depicts the existing approved waste boundaries at the site including the total land area currently owned by WCC. The site receives solid, non-hazardous industrial, commercial and institutional (IC&I) waste including construction and demolition (C&D) waste, asbestos waste, dry non-putrescible (i.e., non-organic) domestic waste and impacted soil. The approved service area for the receipt of waste for disposal is the Province of Ontario excluding the City of Toronto. The approved service area for processing/recycling and transfer includes the Province of Ontario (excluding the City of Toronto) and the Outaouais Region of the Province of Quebec (consisting of Quebec Region 7 including La Vallée-de-la-Gatineau, Pontiac, les Collines-de-l'Outaouais, Papineau and the City of Gatineau). Solid non-hazardous industrial and commercial waste including C&D waste and dry domestic recyclable waste may be received for processing. In 2015 the site was approved for the treatment of contaminated soils (ECA Amendment Notice 8) as part of its processing operations.

The remaining operating life for the landfill disposal site is influenced significantly by a number of factors such as the waste mix, the annual waste receipts, materials recycled and re-used, and the density of the in-place waste to name a few. Consequently, the remaining life has been estimated to extend to the years 2026 - 2027 based on current site approvals and projected annual waste receipts (refer to Section 5).

The expansion of the Navan Waste Recycling and Disposal Facility received approval under the Ontario Environmental Assessment Act (EAA) in 2007 and approval under the Ontario Environmental Protection Act (EPA) as well as other legislation in 2009. Major amendments to the Environmental Compliance Approval for a waste disposal site (ECA # A460702) were issued as listed above. An Environmental Compliance Approval for Industrial Sewage Works, ECA # 4816-7C7M6C issued on April 16th, 2009 was amended by ECA # 5616-86NKNW on June 29th, 2010 and an Environmental Compliance Approval Air, ECA # 6733-7BYS9A issued on April 16th, 2009 was amended by ECA # 3536-8APNZD on November 24th, 2010, by ECA # 4024-9WFQE5 on June 8th, 2015 and by ECA # 2427-AETKQ5 dated November 14, 2016.

The site is situated on a thick deposit of Leda clay and is located immediately north of a large bog (Mer Bleue). The underlying clay deposit serves as a natural liner system. Leachate management activities include the operation of a leachate collection system that consists of a perimeter collector and an underdrain system. A leachate pre-treatment/pumping station and forcemain connection to the City of Ottawa sanitary sewer system was completed in 2007 and commissioned in early 2008. It continues to be used for the management of leachate generated by the facility. Surface water is diverted around the landfill footprint through a series of berms, swales and ditches. Landfill gas generated by the facility continues to be monitored and an interim landfill gas odour control system approved by the Technical Standards and Safety Authority (TSSA) was constructed and commissioned in early 2012. Design details for a permanent landfill gas collection and enclosed flaring system has been completed by Golder Associates Ltd. and continues to be revised and updated.

1.2 *PURPOSE AND ORGANIZATION OF REPORT*

This document is referred to as the Operation and Monitoring (O&M) Report. The O&M components specifically described in this document include the following:

- Zoning and surrounding land uses;
- Existing facilities and utilities;
- Geology;
- Hydrogeology;
- Surface water flow system;
- Mer Bleue Bog;
- Description of operations (2020);
- Waste quantities and characteristics;
- Site capacity and life expectancy;
- Surface water management;
- Leachate management;
- Landfill gas management;
- Groundwater quality assessment;
- Leachate water quality assessment;
- Surface water quality assessment;
- Sediment quality assessment;
- Landfill gas monitoring results;
- Diversion of waste and other materials from disposal; and
- Proposed 2021 operations.

All O&M components described in this report have been prepared to address the Conditions of the ECA for the Navan Waste Recycling and Disposal Facility, ECA No. A460702.

1.3 *WASTE QUANTITIES*

The maximum total amount of waste that may be received at the site for disposal is controlled by the site's approved final waste contour plan. Base on the final waste contour plan approved, the estimated total air space for the site was approximately 7.6 million cubic metres. Under the current ECA (#A460702), the maximum annual amount at which the site can receive waste for disposal (excluding daily and interim cover material) is 234,750 tonnes per year. The maximum daily rate, averaged over a year, at which the site can receive waste (including daily and interim cover material), is 1500 tonnes per day. The maximum amount of unprocessed material and residuals from the processing operation that may be stored on site at any one time is 225 tonnes.

Diversion, through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the Navan Waste Recycling and Disposal Facility. Management is constantly searching for on-site and off-site diversion or re-use opportunities to ensure that approved disposal capacity is preserved and used for the disposal of waste material of least commercial value. Given the provincial policy and regulations concerning waste diversion from landfill, the site will continue to provide critical support to the City and Province in their efforts to meet diversion targets while at the same time ensuring essential disposal capacity is available locally.

1.4 *ECA AMENDMENTS (2020)*

The site currently operates under amended Environmental Compliance Approval (ECA) for a waste disposal site (ECA # A460702) re-issued April 16th, 2009 with subsequent amendments (Notices 1 through 11). In 2020, no amendments to ECA #A460702 were required.

1.5 *ENVIRONMENTAL ASSESSMENT COMPLIANCE MONITORING REPORT (EACMR)*

In August 2007, WCC (formerly WSI) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Approval under the Ontario Environmental Protection Act (EPA) as well as other legislation were also received which culminated in the issuance of the above noted Environmental Compliance Approval for the site. Condition 4 of the EAA approval required that WCC (WSI) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WCC's compliance monitoring program. In accordance with Condition 3 of the EA approval, WCC had previously submitted a separate document proposing an EA Compliance Monitoring Program. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of follow up EACMRs with the submission of the annual Operations and Monitoring Report. Accordingly, this EACMR is submitted as Appendix 5 to this annual report and covers the period January 1st to Dec. 31st, 2020.

No non-compliance issues were identified during the 2020 reporting period.

The Ministry's EAAB File # is EA 02 08 02.

1.6 *HISTORY OF THE FACILITY*

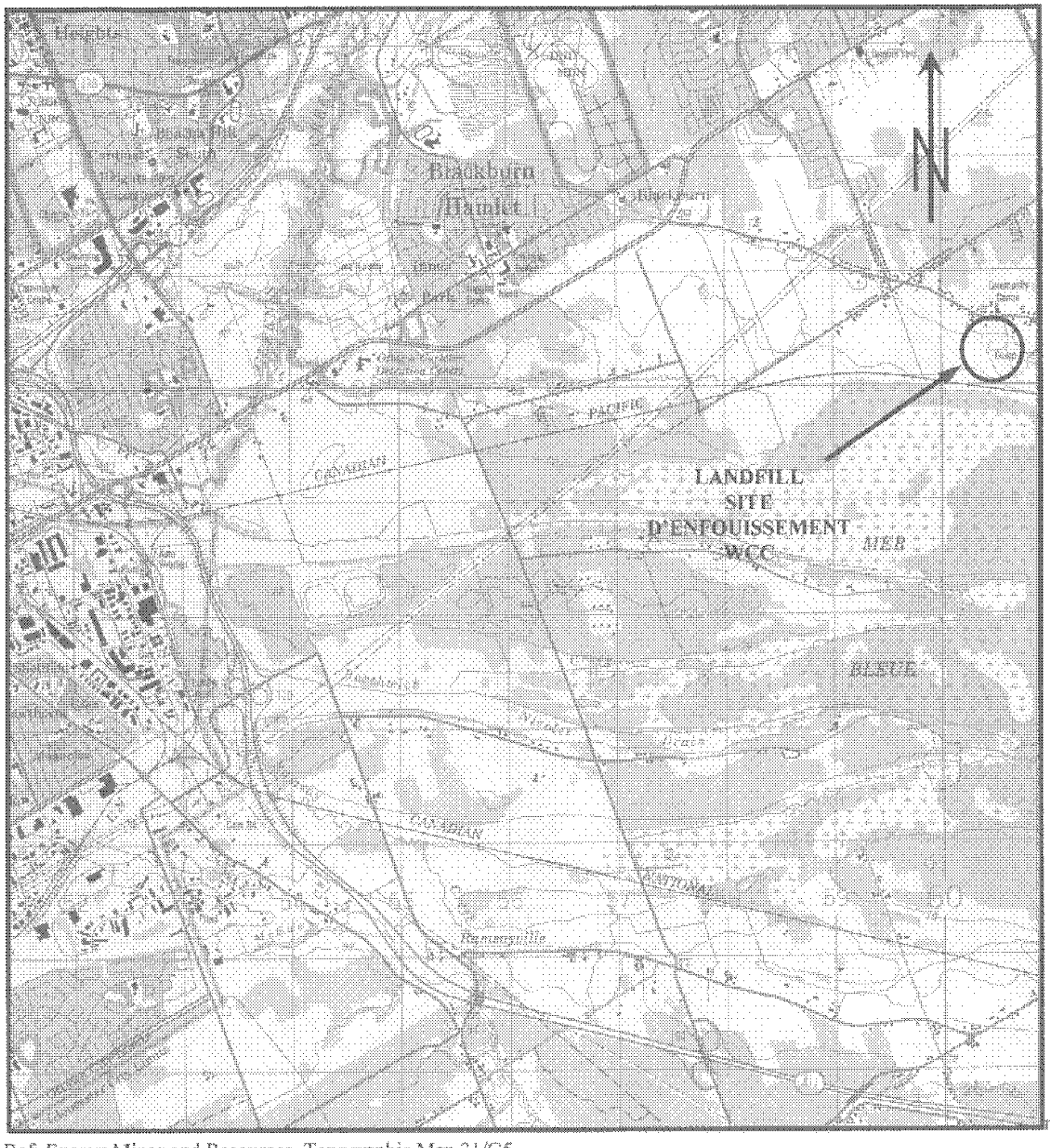
Landfilling at the site started in the early 1960s and served, at the time, as a rural dump operation for local residents. In 1971, the Ministry of the Environment (MOE) issued an Environmental Compliance Approval (CofA No. 460702) to Mr. D. J. Huneault for disposal of industrial waste including construction and demolition waste. Currently the site receives all types of solid, non-hazardous waste for disposal excluding putrescible waste. In 1995, the CofA was amended for the operation of waste processing and composting facilities at the site. Composting operations were later suspended with the issuance of the ECA amendments in April 2009 for the landfill expansion.

Annual monitoring of groundwater and surface water was initiated in 1987 and has evolved into a comprehensive monitoring program that is reported to the MECP on an annual basis. In 1992, a leachate collection system was constructed along the down-gradient toe of the landfill and surface water diversion ditches were constructed up-gradient within the north buffer zone. Leachate was initially collected in retention ponds and re-circulated onto and into the landfill following treatment through a peat filter and constructed wetland system. Transport of leachate by tanker truck to the municipal wastewater treatment plant was initiated in 1997 following odour issues related to leachate storage ponds. Presently, leachate is pre-treated on site and discharged to the City of Ottawa sewer system for treatment at the Robert O. Pickard Environmental Centre (ROPEC). Construction of the existing leachate pre-treatment/pumping station and forcemain connection to the sanitary sewer system was completed in 2007 and commissioned in early 2008.

In 2011, a landfill gas collection and flaring system was constructed as an interim odour control system. This system was commissioned and approved in April of 2012 by the Technical Standards and Safety Authority (TSSA) and has since remained operational. Permanent vertical gas wells were last added in the Phase 4 area of the landfill in 2019. In 2020, one horizontal gas well was added to the landfill gas collection system in the northwest corner of Phase 1.

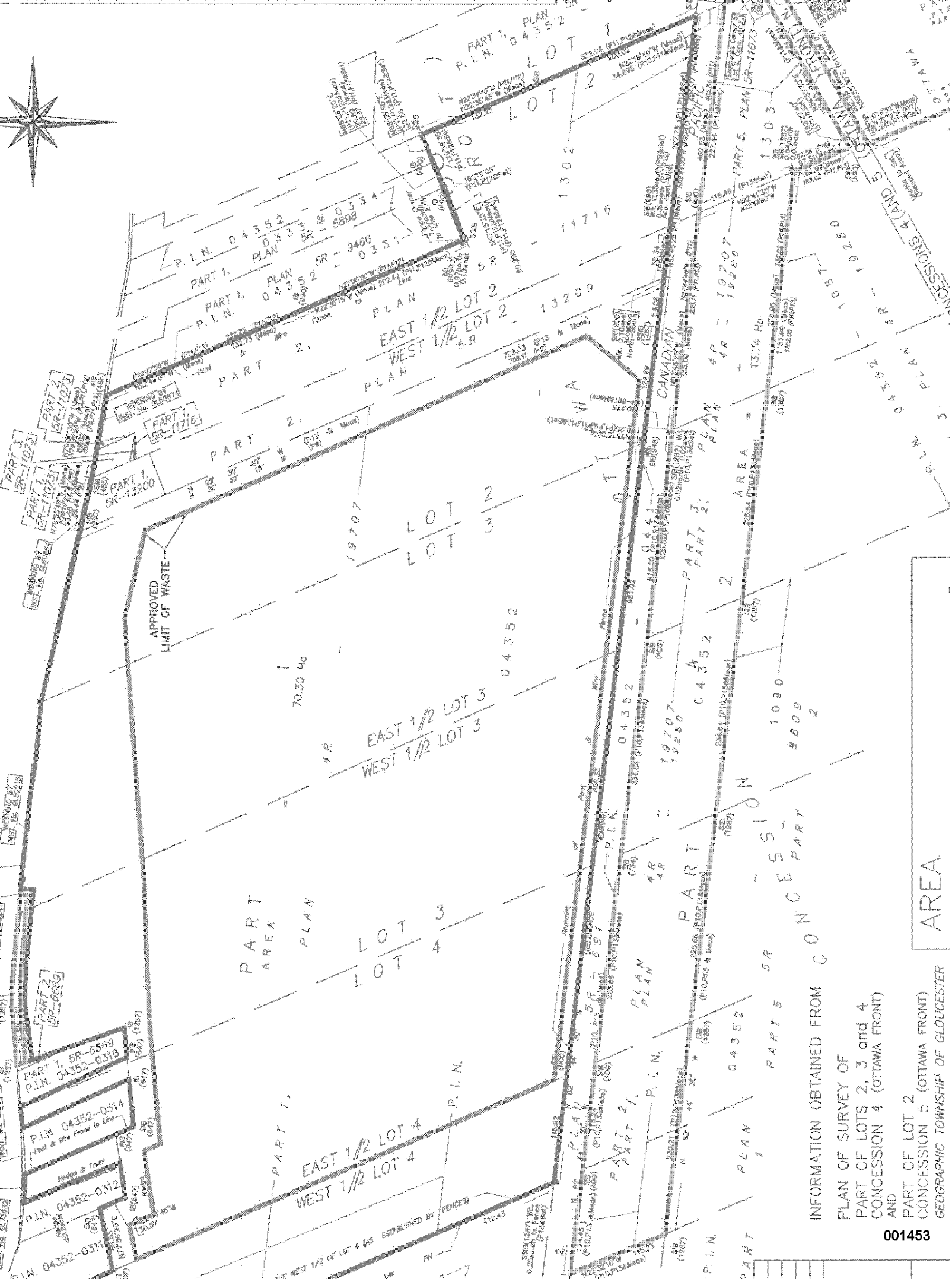
In June of 2015, the site was approved for the treatment of contaminated soils as part of the site's processing operations and treatment of hydrocarbon impacted soils has since been on-going.

A more detailed record of milestones in the site's history is presented in Appendix 4 – Schedule 'C'.



Ref: Energy Mines and Resources, Topographic Map 31/G5

FIGURE 1.1	**KEY PLAN**	WASTE CONNECTIONS OF CANADA


INFORMATION OBTAINED FROM
PLAN OF SURVEY OF
PART OF LOTS 2, 3 and 4
CONCESSION 4 (OTTAWA FRONT)
AND
PART OF LOT 2
CONCESSION 5 (OTTAWA FRONT)
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
AREA
001453
APPROVED
LIMIT OF WASTE
EAST 1/2 LOT 2
WEST 1/2 LOT 2
EAST 1/2 LOT 3
WEST 1/2 LOT 3
EAST 1/2 LOT 4
WEST 1/2 LOT 4
LOT 2
LOT 3
LOT 4
PART 1, 5R-5669
P.I.N. 04352-0318
P.I.N. 04352-0314
P.I.N. 04352-0312
P.I.N. 04352-0311
70.30 Ha
13.74 Ha
CANADIAN PACIFIC
CONCESSION 4 (OTTAWA FRONT)
CONCESSION 5 (OTTAWA FRONT)

F

A FRONT)

GLOUCESTER

SURVEYING LTD.

SCALE = 1:500

0 5 10 30 35 40 50

METRIC

BEARING NOTE

BEARINGS ARE GRID AND ARE DERIVED FROM THE EASTERLY LIMIT OF PART 2, PLAN 5R-6269, SHOWN ON PLAN R4-21820 AS HAVING A BEARING OF N16°39'15"W.

LEGEND

⊕	SURVEY MONUMENT FOUND
⊡	SURVEY MONUMENT SET
SIB	STANDARD IRON BAR
SSIB	SHORT STANDARD IRON BAR
IB	IRON BAR
ø	ROUND
CM	CROWN MONUMENT
acc.	ACCEPTED
WIT	WITNESS
---x---	FENCE
JGP/JGP	J.G. PAYETTE O.L.S.
1993/APR 30 /1992	PARLEY, SMITH & DENIS SURVEYING LTD.

NOTE: ALL BEARINGS, DISTANCES AND MONUMENTS ARE PER PLAN 4R-21820, UNLESS NOTED OTHERWISE.

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE AUGUST 18, 2009

Ronald A. Denis

RONALD A. DENIS
ONTARIO LAND SURVEYOR

SCHEDULE

Part	Lot	Concession	P.I.N.
1	Part of Lot 3	4 (O.F.)	PART of P.I.N. 04352-1302

PLAN 4R-23883

RECEIVED AND DEPOSITED

DATE August 18, 2009

Asst. Dep. C. Holloway

LAND REGISTRAR FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON No.4

R O A D REGIONAL ROAD No. 25

Y R V I L L E - N A Y A N

(AS WIDENED BY BY-LAW No. 1750, INST. No. GL73168)

CENTRELINE OF ROAD

P. I. N. 04352

0 4 3 5 2

EXISTING WIDENING BY INST. No. GL592239

WIDENING BY INST. No. GL591219

ROAD ASSUMPTION BY BY-LAW 16-87 INST. No. N378812

AREA = 963.0m²

PART 1

P A R T 1, P L A N 4 R - 2 1 8 2 0

P. I. N. 0 4 3 5 2 1 3 0 2

WEST LIMIT OF LOTS

EAST LIMIT OF LOTS

Southeast Corner of Lot 2, Conc. 4(O.F.)

ROAD ALLOWANCE BETWEEN CONCESSIONS 3 AND 4 (O.F.)

L O T 3 C O N C E S S I O N 4 (O T T A W A F R O N T)

SURVEYOR'S CERTIFICATE

I certify that:

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act, and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 12th day of August, 2009.

Date: AUGUST 18, 2009

RONALD A. DENIS
Ontario Land Surveyor

PARLEY, SMITH & DENIS SURVEYING LTD.
ONTARIO LAND SURVEYORS
CANADA LANDS SURVEYORS
1355 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J6
(613) 727-8126 FAX (613) 727-1813

METRIC NOTE: DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

FILE No. : 209-09 SCALE : 1:500

AUGUST 18, 2009 CAD FILE= G:\PROJECTS\PLANS\2009\P209-09_BOYVILLE-NAYAN ROAD_ROW-widening.dwg

001454

2. SITE SETTING

2.1 *Site Location and Legal Description*

The Navan Waste Recycling and Disposal Facility is located in the eastern portion of Ottawa, Ontario on Part of West Half of Lot 2, Part of Lots 3 and 4, Concession IV, Ottawa Front at 3354 Navan Road, City of Ottawa (formerly the Township of Gloucester), UTM Easting: 460570, UTM Northing: 5030570 at the front entrance to the site. The location is indicated on the Key Plan, Figure 1.1. The latest legal survey plan for the site was registered on April 13th, 2008 as Plan 4R-21920. Parts 1, 2 and 3 of this Plan are lands owned by WCC (refer to Fig. 1.2). A narrow section of land bordering Navan Road west of the site entrance and having an area of 963 m^2 referred to as Part 1 on Plan 4R-23883 dated August 18th, 2009 was severed from WCC property as part of a Site Plan Agreement for the development of the new site facilities (refer to Fig. 1.2 and 1.3) and transferred to the City of Ottawa for the future widening of Navan Road.

2.2 *Location, Zoning, and Surrounding Land Uses*

According to the City of Ottawa's Official Plan (City of Ottawa, 2003) (Schedule B), the site is designated as Solid Waste Disposal site and is located within the Developing Community designation of the Urban Area. The East Urban Community is the southeast portion of the Orléans Community bounded by Mer Bleue Road to the east, a former Canadian Pacific Railway line (VIA Rail ROW) bordering the Mer Bleue Bog and WCC Site to the south, the National Capital Commission (NCC) Greenbelt to the west and a hydro corridor to the north. Generally, it is Urban Area (Developing Community) to the north, west and east, and Significant Wetland to the south (refer to Fig. 2.1, 2.2 and 2.3). Designations in the vicinity of the Site include: General Urban Area, including Mixed Use and Employment Areas to the north, Significant Wetland Area to the south, Natural Environment Area to the immediate west and General Rural Area further to the east.

The Developing Communities designation is used by the City to identify those areas where the detail for the development of the lands requires additional study. The planning process for the Phase 1 lands was completed when City Council approved the Phase 1 Community Development Plan (CDP) document July 2005. The Landfill Site is located within the Phase 2 study area of the East Urban Community as shown on Figures 2.1 and 2.2. The landfill site was clearly identified during the work on each of these studies. The adopted CDP includes policies to protect the landfill site from sensitive land uses being established within 500 metres without a specific study to ensure compatibility. The CDP confirmed the Official Plan policies for road widening along Navan Road and also identified the need for future linkages that would be necessary to create the municipal infrastructure (water, sanitary and storm sewers) to complete the development of the community.

In 2006 a study of a 500 m buffer area around the WCC landfill site was initiated by the city. The purpose of the study was to fulfill the Official Plan requirements and to determine whether any land would be temporarily or permanently undevelopable due to its proximity to the WCC site. The peer reviewed buffer

study was completed in the late spring of 2008. It determined that the landfill posed no constraints to development of any Phase 2 lands. However, the peer review noted that where development occurs within the buffer zone, warning clauses should be placed in the purchase and sale agreements and on title. The clause should state that there is a possibility of occasional dust and odour episodes from the landfill operations.

The City of Ottawa has now adopted a Comprehensive Zoning By-law for the entire Amalgamated City (2001). By-law 250-2008 was adopted by Council in June of 2008 and was subject to numerous appeals, none related to the landfill. In November 2008 the Ontario Municipal Board provided an Order that brought the vast majority of the Zoning By-law into effect. All of the lands in the area of the site are now subject to the provisions of this By-law.

The existing adjacent lands are predominantly residential and rural residential with some scattered non-residential uses. The land is primarily open pasture, wooded areas and the Mer Bleue Bog. Existing land uses adjacent to the site boundaries are as follows:

- **To the North:** Navan Road, formerly known as Regional Road 28, residential and light commercial developments, and a former school now used as a senior's center, medical center and pharmacy.

  The north side of Navan Road is zoned Development Reserve in the Comprehensive Zoning By-law for the City of Ottawa. A Plan of Subdivision Proposal has been approved for approximately 23 hectares of largely undeveloped land, situated north of Navan Road and extending to Renaud Road (refer to Figure 2.2) . The eastern limit of the proposed development abuts the properties of the White Street residential enclave and other undeveloped lands. The lands to the west, known as Eastboro, continue to be under development for residential purposes and include two schools.

  The senior's center property directly across from the WCC Site is in a special Development Reserve Zone (DR) that identifies the community center as an additionally permitted use. A medical center and pharmacy also occupies this property presently.

- **To the East:** woodlots, a small scrap yard, and a small recycling business (abandoned and partially remediated). The lands to the east are also in the DR Zone.

  There was a rezoning for 3628 Navan Road to permit a recycling business to be recognized as a Temporary Use so that an Environmental Compliance Approval could be issued for the use of a portable wood chipper. This exception to the By-law is identified as DR [1616] and it is a Temporary Use permission which expired on December 7th, 2011. This property has been identified by the City of Ottawa as the preferred location for a large storm water management pond to service the Phase 2 CDP. The design for this pond has been approved by the City of Ottawa. This site remains dormant and covered with waste presently undergoing cleanup.

  The balance of the lands to the east is in the same Development Reserve Zone (DR) which replaces the former Future Growth zone;

- **To the South:** VIA Rail right-of-way (ROW) is currently used as a recreational trail, however, railway traffic may resume in the future. This ROW is used as the zoning boundary in the comprehensive by-law. A 100 m strip of land south of the ROW is owned by WCC.

The lands south of the ROW that are within the Provincially Significant Wetland are identified as Environmental Protection (EP) in the zoning by-law. The remaining lands south of the ROW are zoned Rural in the By-law;

- **To the West:** Immediately west is a composting and soil blending operation recently shut down which is zoned DR, while beyond that point are lands re-zoned and being developed for urban residential (R3VV[1286]), including Open Space (O1) and a portion that remains as a DR Exception [459]-h Zone.

Figure 2.3 summarizes the current zoning that is found in the area as shown in the Comprehensive Zoning By-law for the City of Ottawa.

The lands owned by WCC are within two defined zoning areas. The actual landfill being zoned as Heavy Industrial Exception [2] (IH[2]H(11)) and the buffer area being a separate Exception Zone to recognize its function as a buffer (IH[1483]H(11)). These are the zones found in the Comprehensive Zoning By-law. The WCC lands that lie south of the VIA Rail corridor are zoned as Environmental Protection and Rural as shown on Figure 2.3.

2.3 *Existing Site Design and Facilities*

The existing approved design and operation of the site is described in the Design and Operations report prepared by Golder Associates Ltd. for the site expansion (Golder, January 2008) and the approved Quality Assurance/Quality Control Plan and Specifications for the WSI Landfill Leachate Collection and Management System – Lateral Expansion Area (Golder, June 2009 and MOE reference Number 1851-7SUSJ9). The following sections summarize some of the current facilities and systems described therein.

2.3.1 Existing Facilities

A gated entrance from Navan Road at the north end of the site presently serves as the only access point into the landfill. The gate is locked after operating hours and monitored by security personnel. Access during operating hours is controlled by an attendant at the scales, operating from a scale house. The scale house is in close proximity to the equipment maintenance garage and administrative office building.

Internal roads are constructed and relocated as necessary to provide access to the active landfill areas and other site facilities. The internal roads are generally constructed using recycled asphalt, re-used screened rock, brick or crushed concrete over a sub-base of re-used shingles. The current approximate road network is illustrated in plan view on Figure 2.4.

A waste processing area has been built on interim-covered waste in the south-central part of the waste footprint to facilitate stockpiles of recycled and processed materials (refer to Figure 2.4). A small vehicle pad consisting of reinforced concrete retaining walls was constructed south of the scale house for the unloading and sorting of waste from small vehicles. Concrete block bunkers are available for the

separation of larger volumes of recyclable materials such as shingles, aggregates, clean fill, windshield glass, etc.

A minimum buffer width of 30 metres is maintained around the west, north and east sides of the approved waste disposal area. A 10 metre buffer is maintained between the southern limit of the waste footprint and the VIA rail corridor. Additional buffer lands owned by WCC exist to the east and west with a minimum 100 metres wide strip of land extending the full width of the site south of the VIA right-of-way (see Figure 2.4).

2.3.2 Leachate Management and Groundwater Protection System

The existing leachate management system at the Navan Waste Recycling and Disposal Facility includes an underdrain system in the northwest corner of the existing waste footprint north of Grid Line I and between Grid Lines 3 and 6 (refer to drawing 6.2). This area is connected via perforated HDPE pipe to a perimeter leachate collection trench. It consists of a granular-filled trench and perforated drainage pipe which runs along the west edge of the waste mound (Grid Line 1) and the south toe of the waste mound (between Grid Lines Q & R).

An underdrain leachate collection system also exists in the southeast corner of Phase 8 consisting of a combination of perforated collection pipes, French drains and sand drainage blanket. This drainage layer extends from Grid Line N to the south toe of the waste mound and between Grid Lines 14 and 16.

An underdrain leachate collection system also exists in the north central area of the waste footprint in the Phase 4 and 5 area of the site (refer to Fig. 2.4) consisting of a combination of perforated collection pipes, French drains and sand drainage blanket. This large drainage system extends from the north toe of the waste mound to Grid Line L and between Grid Lines 6 and 16.

The leachate drainage system in the east expansion cell (Phase 1) was constructed in 2014/2015 and consists of a network of perforated HDPE pipe, separation and filter geotextiles, a clear drainage stone layer and a sand protective layer. A similar system was constructed in 2018/19 for the cell to the north in Phase 6. A pump station was constructed at the northwest corner of Phase 1 to assist with the drainage of the east cells.

The existing leachate collection systems are illustrated in Figure 6.2 and discussed in greater detail in Section 6.3.

All leachate collected in the existing leachate collection system is designed to gravity drain or be pumped to a wet well and a pre-treatment/pump station located in the south buffer near Grid Lines R-16. Pre-treatment of leachate consists of air stripping hydrogen sulphide (H_2S) and Volatile Organic Carbons (VOCs) with the use of activated carbon filters prior to discharge. During 2020, all leachate was pre-treated and pumped via forcemain to the City of Ottawa sewer system for final treatment at the City's municipal sewage treatment plant. The leachate forcemain was flushed and cleaned twice during 2020. No operational issues with the treatment and pumping station were reported in 2020.

A vertical manhole, connected to the leachate collection system in the centre of the existing waste footprint (referred to as "the central manhole"), provides an alternative point of access to evacuate leachate from this part of the leachate collection system in the event that positive drainage to the wet well

and pump station cannot be maintained due to sub-grade settlement. This manhole has been raised to an elevation of 101 metres and will require that it be raised with additional MH sections in 2021.

Access to the leachate collection pipes in the Phase 4 and 5 area (refer to Fig. 2.4) is provided via a series of cleanouts along the north side of the existing waste footprint. Cleanouts are also provided along the east perimeter for leachate collection pipe access in the east cell expansion. Access to the west and south perimeter leachate collection system is provided via a series of manholes. The system was checked for drainage to ensure proper performance of the drainage/collection system. Low permeability cover soils are currently used to minimize infiltration of precipitation into the waste column. At present, clay soil cover is located on the north, west and south facing slopes as well as the surface of completed fill areas in Phase 3, the north part of Phase 4 and parts of Phase 1. Leachate containment is currently provided by a thick deposit of natural low-permeability clay soil which underlies the entire site and a constructed final clay cover.

2.3.3 Landfill Gas and Odour Management System

The Certificate of Approval (Air), ECA # 6733-7BYS9A issued on April 16th, 2009 was amended by ECA (Air) # 3536-8APNZD on November 24th, 2010 to add one (1) candlestick flare, used to combust a maximum of 0.24 actual cubic metres per second (500 scfm) of landfill gas (LFG) collected from three (3) vertical landfill gas wells and gas collected from the Leachate Collection System (refer to Fig. 8.1). Construction of the approved candlestick flare was completed at the end of 2011 and was commissioned and approved by the Technical Standards and Safety Authority (TSSA) in April of 2012. Horizontal and vertical wells were later added in the area of Phase 4, Phase 3 and Phase 1 to enhance the odour control system. Details are provided in Section 8.

A fixed line misting system powered by a portable generator was added at the end of 2017 to be on hand ready to be implemented as an emergency response system to assist in addressing odour issues and was utilized on occasion in 2020.

2.3.4 Surface Water Management System

The regional surface water flow system in the area of the landfill is discussed in sub-section 2.7 and existing surface water control features are shown on Figures 2.4 and 6.1. Existing controls can be summarized as follows:

a) Upstream flows originate north and northwest of the site. This flow is diverted around the landfill by ditches that exist along the north perimeter of the site buffer zones.

b) A diversion ditch has been constructed along the northern limits of the landfill that discharges into the east perimeter ditch at the northeast corner of the landfill. The east perimeter ditch conveys flows southward to storm water management ponds located at the south-east corner of the site. These ponds discharge into a perimeter ditch that flows south under the VIA ROW onto and through WCC property and drains to the Mer Bleue drainage basin.

c) Another diversion ditch has been constructed northwest of the site in the north buffer area. This ditch discharges further west into a natural drainage channel termed the west perimeter ditch

which is not well defined. Surface water from the completed west parts of the site is controlled and discharges into a storm water pond located at the northwest corner. This pond discharges into a ditch located on WCC property which drains into the west perimeter ditch. The west perimeter ditch conveys flows southward and then westward north of the VIA ROW to the Mud Creek drainage basin.

d) An east diversion ditch was constructed in accordance with South Nation Conservation Authority requirements for a fish habitat and was commissioned following approval in the fall of 2009.

e) Interim clay cover has been placed over inactive portions of the existing waste mound. Finished slopes are covered with clay soil and topsoil, graded and seeded. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control. To protect the perimeter clay slopes against erosion, clay diversion dikes and drainage swales have been constructed to collect surface run-off above the slope. Storm water collected by the swales is directed down the landfill side slopes via rip-rap lined drainage chutes. Culverts exist at the top of each drainage chute to provide surface runoff across the perimeter access road, with the access road itself serving as a berm.

2.4 *Climatic Setting*

The landfill is located 17 km northeast of the meteorological station located at the Ottawa International Airport (OTAWA INTL. A, climate ID 6106001). Climatic conditions at the site are presented on Figures 2.5 and 2.6 and summarized as follows:

a) The average monthly temperatures in 2020, obtained from Environment Canada Atmospheric Environment Service, varied from an average low of about -7.0°C in February to an average high of 24.0°C in July with an annual average temperature of 7.3°C. The 59 year average ranges from a low of -10.4°C to a high of 21.0°C and an annual average of 6.1°C.

b) The average (1961 to 2020) annual precipitation at the Ottawa International Airport station is 921.7 millimetres. The driest month is generally February at an average of 55.5 mm and the wettest month being July at an average of 92.3 mm. Total precipitation for 2020 was 886 mm and ranged from a low of 46.9 mm in November to a high of 135.0 mm in August.

c) The average annual water surplus (i.e. precipitation minus evaporation) for the Ottawa vicinity is in the order of 320mm (12.5 in.). The water surplus provides an estimate of the amount of water available for infiltration into the site and for surface run-off during a 12-month period.

2.5 *Geology*

Regionally, the site is located within the Ottawa Valley clay plain at the western edge of the Prescott and Russell sand plains. The lowland region is composed of unconsolidated glacial deposits of till, varved clays and marine beds of clay and sand from the post-glacial Champlain Sea. The region is bound to the north by Precambrian formations of the Canadian Shield and underlain by interbedded Paleozoic bedrock that outcrops in ridges and scattered exposures due to faulting and downdrop fault blocks. The WCC Facility is situated on the banks of the Ottawa River Channel. The post-glacial Ottawa River Channels,

east of Ottawa, are from 3 kilometres to 10 kilometres wide and up to 18 metres deep. They are floored with clay and silt and bordered by sand deltas. Figure 2.7 shows the surficial geology of the area.

Sand deposits cover the escarpment that runs through the site. Sands are found to be 0.6 metres to 2 metres deep in the area of the Facility above the escarpment. For the most part, the sand below the escarpment has been eroded, leaving behind only a thin sand blanket. A thick (20 to 35 m) marine clay deposit underlies the entire area and has been exposed by the deep erosion channels that have cut through the escarpment and wherever the thin sand deposit has been eroded. The bedrock beneath the site is shown to consist of shale of the Billings Formation (Figure 2.8). A review of MECP water well records within the site vicinity study area indicated that the Site is underlain by limestone or shale.

2.6 *Hydrogeology*

The regional groundwater flow direction in the deep bedrock is east (Charron, 1978). In the general area of the site, groundwater flows from a north to south direction, toward the Mer Bleue bog located south of the site. Figure 2.9 indicates the groundwater flow direction and the interpreted groundwater recharge, transitional and discharge areas as described in studies undertaken for this area (A.J. Robinson and Associates Inc., 1987, Gore & Storrie Limited, 1992).

The thick clay deposit which underlies the site and surrounding area acts as an acquitard, such that lateral flow is directed through the surface sand unit and the upper weathered clay (total thickness of a few metres). Shallow groundwater flow is strongly influenced by topography, the depth of the surficial sand layer, the underlying weathered clay, the natural drainage systems and recently constructed drainage systems. Shallow groundwater flow occurs at the site generally in a north to south direction, as shown schematically on Figure 2.10.

The results of water levels measured at up-gradient wells at the site indicate the shallow water table to be typically located approximately 1 to 2 metres below ground surface with only small fluctuations in water levels indicated for recent years. A downward hydraulic gradient has been profiled up-gradient to the site. The only variation in the direction of the hydraulic gradient is indicated in the upper 5.6 metres to 10.4 metres below ground surface, from a downward gradient to an upward gradient in the weathered clay. These results may be attributed to a perched water table at the interface of the weathered clay and the intact clay. The relatively weak downward gradient from the sand to the weathered clay suggests a hydraulic interconnection between these units. The downward gradient is quite pronounced from the weathered clay down to the lower reaches of the intact clay deposit. It is interpreted that the intact clay deposit at depth beneath the landfill site acts as a barrier to groundwater flow.

The results of the water levels measured at the down-gradient wells at the site indicate the shallow groundwater table lies within the sand deposit close to the original ground surface ranging in elevation from about 68.8 metres to 70.2 metres. Seasonal variations of nearly 1 metre have been observed. The high water levels generally occur during the wet spring whereas the lower water levels are recorded during the dry summer months and fall. Unlike the up-gradient groundwater level profiles, the down-gradient profiles generally indicate a slight upward vertical gradient, although a localized weak downward gradient is observed at times between the upper 6.3 metres to 7.6 metres within the weathered clay. The upper sand and fractured clay layers appear to be hydraulically connected with near vertical or hydrostatic water level profiles. A slight upward gradient at the down-gradient

boundary of the landfill suggests there is upward vertical flow of shallow groundwater at this location which would retard the potential for leachate migration into the deeper groundwater system.

Water levels obtained further down-gradient of the landfill indicate the shallow groundwater table is close to the ground surface within the upper sand or organic deposit with artesian conditions within the clay. Hydraulic head profiles illustrate an upward gradient through most of the profile with a weak downward gradient from the sand to the weathered clay. Historically, there has been an upward gradient through the entire profile. The presence of an upward gradient suggests upward groundwater flow is occurring south of the landfill. These results may also suggest upward leaching of pore water from the Champlain Sea clay, a brackish water deposit, may be occurring at the southern boundary of the landfill. North of the landfill, downward leaching of the clay pore water is indicated.

The horizontal hydraulic gradient in the shallow sand deposit and weathered clay at this site is consistent with the relief of the property which changes in elevation by approximately 15 metres to 18 metres between the up-gradient and down-gradient boundaries of the landfill. Since the shallow water table appears to be a reflection of the original surface topography, horizontal hydraulic gradients are expected to vary between 0.7% in the plateau above the escarpment and 1.4% in the valley below. Water levels measured south of the landfill indicate shallow groundwater is flowing in a south to southwest direction with a small hydraulic gradient ranging between 0.5% and 2%. The horizontal gradients in the bog area are influenced by seasonal fluctuations in the surface water levels. Hydraulic gradients could also be influenced by the leachate collection system (LCS) located along the south toe of the landfill. Keeping the LCS drained could result in a lowering of the water table by more than 3 metres below the original grade at the southeast corner of the landfill and by 2 metres at the southwest corner. This water table lowering could significantly influence the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient side of the LCS was constructed to alleviate any potential problems related to lowering of the groundwater table south of the landfill.

Water levels measured within the glacial till/upper bedrock up-gradient and down-gradient of the site indicate a difference in water levels of about 6 metres, which represents a hydraulic gradient of approximately 1% across the site within the glacial till/upper bedrock.

Many factors, such as mounding within the waste pile, the installation of the leachate collection system and the construction of waste cells with under drainage will influence the rate of groundwater flow across the site.

Within the study area MECP water well records indicate that former groundwater users obtained their groundwater from the overburden and bedrock interface. This interface is considered the main aquifer in the study area. Down-gradient of the landfill, in the direction of groundwater flow, there are no potential groundwater users and the marine clays present in the Mer Bleue bog area produce saline water.

2.7 Surface Water Flow System

The Navan Landfill is located on a watershed divide between two major drainage watersheds - the Rideau River watershed to the west and the South Nation River watershed to the east (see Figure 2.11). Surface runoff drains to both the east and west of the site. The east side of the site drains to the Bear Brook drainage basin, which is part of the South Nation River watershed. The west side drains into the Mud

Creek drainage basin which in turn drains into Green's Creek; part of the Rideau River watershed. The Mer Bleue bog, a unique and internationally recognized ecological feature, is located to the south of the landfill as seen on Figure 1.1.

2.8 *Mer Bleue Bog*

The Mer Bleue bog, located south of the site, is an important ecological and hydrologic feature in the Ottawa area. This 4,106 ha area was formed approximately 9,500 years ago, following the last ice age, (Frasier et al., 2001) when the Champlain Sea occupied the Ottawa Valley and laid down deep marine clay deposits. As the glaciers began to melt, a spillway channel formed south of the present day Ottawa River. Melt water flowing through the southern channel eroded the floor of the Champlain Sea. As the melt waters receded and isostatic rebound forced sea water eastward to the Atlantic Ocean, the southern channel ceased flowing and a lake formed in the present location of the Mer Bleue bog. Plant growth progressively filled in the lake, forming a raised peat dome Sphagnum bog. The peat thickness is reported to be about 6 to 7 m.

The Mer Bleue is underlain by Ordovician limestone and shale, deposited as marine sediments 445 million years ago (Brunton, 1984). The bedrock layer is deeply buried by organic deposits over the central portion of the Mer Bleue with marginal deposits of marine clay, and sand deposits along two prominent ridges. The marine clay deposits are very thick, ranging from 12 to 45 m in depth (Hobson et al., 1969). There are also sandy shoreline deposits located on the northern and southern margins of the Mer Bleue bog (Brunton, 1984).

The hydrologic features of the bog are very unusual. Being a domed bog, surface water drainage in the bog flows radially outwards from the centre towards the edges of the bog and then flows in the "lagg" along the perimeter of the bog. The elevation at the centre of the bog is approximately 70 m above sea level, sloping gradually down to about 67 m at the perimeter of the bog. Groundwater flow into the bog is very small given the low permeability of the underlying clay soils. Surface water inflow to the bog is also very limited because the contributing drainage watersheds are quite small; consequently the bog receives most of its water and nutrients in the form of atmospheric precipitation (for this reason the Mer Bleue is referred to as an "ombrotrophic bog").

Surface water flowing radially outwards from the centre of the bog enters the lagg around the perimeter of the bog which is basically a channel of standing or very slowly flowing water flowing along the perimeter of the bog. The lagg receives water from the bog and distributes it through the surrounding lands. On the western portion of the bog, drainage channels drain bog waters westward to Greens Creek. On the eastern portion of the bog, drainage from the bog ultimately discharges to Bear Brook Drain to the southwest.

Attempts were made in the late 1800's to drain portions of the bog for agricultural purposes; however, these drainage ditches no longer function because of the many beaver ponds which started up in the late 1950's. Now the water level in the Mer Bleue is at or near the surface of the bog for most of the year. The Savage Drain is an example of an agricultural drain which is quite visible in aerial photographs of the bog as a prominent linear feature on the eastern side of the bog. Flow in the drain in the northern part of the bog (nearest the landfill) is northward and then eastward along the lagg on the perimeter of the bog. There are a number of agricultural drains along the northern and eastern parts of the bog which receive surface water from the bog.

Shoreline erosion is not a concern as the surface water flow rates are nil to minimal. Flooding in the bog is also not a concern as water levels are controlled naturally through beaver dams and the ability of sphagnum to absorb large amounts of water.

In addition to its hydrologic function, the lagg is also a transition zone for plant communities and water quality, where the water regime changes from acid dominated waters in the bog to increasing calcium and basic waters.

Fraser et al., (2001) studied flow patterns and geochemistry in the peat in the Mer Bleue bog. The researchers found that vertical groundwater flow patterns in the bog alternated annually between periods of recharge and discharge in accordance with changes in precipitation, evapotranspiration and the differential head response of the lower peat layer to changes in water table. A sustained moisture deficit during the summer maintained a flow reversal for about a month until a significant rainfall raised the water table. One of the reasons that the researchers selected the Mer Bleue for their study of flow reversals was that the large peatland was isolated from the regional groundwater flow (Fraser, et al., 2001).

The surface vegetation in the Mer Bleue bog has, to some extent, become a shrub-rich bog as a result of the extensive drainage activities and peat mining of the 19th and early 20th centuries. These disturbances reduced the wetland size by 20%, accelerated the maturation of the peatland and accelerated the rate of tree establishment. The re-establishment of beaver populations along the margins of the peatland have helped restore pre-disturbance water levels, however many bog species have already been reduced (Brunton, 1992).

Ponding due to beaver activity has the potential to convert the bog vegetation to marsh communities. There is a concern about the spread of invasive and/or non-native plant species; in particular, purple loosestrife, grey birch, glossy buckthorn and European frog-bit (Wetlands International, 2001).

East Urban Community

COMMUNITY DESIGN PLAN

Communauté urbaine de l

PLAN DE CONCEPTION COMMUNAUTAIRE

- Proposed School / Ecole proposé
- Future Institutional Site / Futur emplacement
- 15m Overland Flow Corridor / Couloir d'éco
- Existing and Proposed Parks / Parc existant e
- Wooded Area / Zone boisée
- BFI Waste Disposal Site / Décharge de BFI
- Storm Water Management Pond / Bassin de
- Slope Stability Setback / Marge de reculeme
- Aquatic Habitat Setbacks from top of Bank / Marge de reculement des habitats aquatique à partir du haut de la rive
- Buffer to Mer Bleue Bog / Zone tampon de la tourbière de la Mer Bleu
- Proposed Street / Rue proposé
- Future Mixed Use Area /
- Phase 2 Area /

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Communauté urbaine G

PLAN DE CONCEPTION COMMUNAUTAIRE

LAND USE / UTILISATION DU SO

- School / Ecole
- Institutional / Institutionnel
- 15m Overland Flow Corridor / Couloir d'
- Park / Parc
- Wooded Area / Zone boisée
- BFI Waste Disposal Site / Décharge BFI
- Storm Water Management Pond Area / Zone de retention des eaux pluviales
- Slope Stability Setback / Marge de reculem
- Aquatic Habitat Setbacks from top of Ban Marge de recullement des habitats aquatic de la rive
- Exisiting Residential – Potential for long ter redevelopment to low/medium density re Résidentiel existaat – Potontiel, à long ter en résidentiel de densité faible à moyenn
- Future Residential – low/medium density Résidentiel futur – faible/moyenne densit
- Future Residential – medium/high density Résidentiel future – moyenne/haute densi
- Mixed Use – institutional, office, commer Secteur polyvalent – institutionnel, bureau
- Leisure/ recreational uses - Significant acc servicing constraints limit development po Utilisations de loisir et récréatives - Les co conduites pluviales et domestiques limite
- Future development potential to low dens and sanitary servicing constraints can be o Potentiel d'aménagement futur en lotisser densité, uniquement si les contraintes de domestiques peuvent être résolues
- Buffer zone from the rail corridor / Zone
- Proposed Street / Rue proposé

Waste Connections of Canada

Ottawa

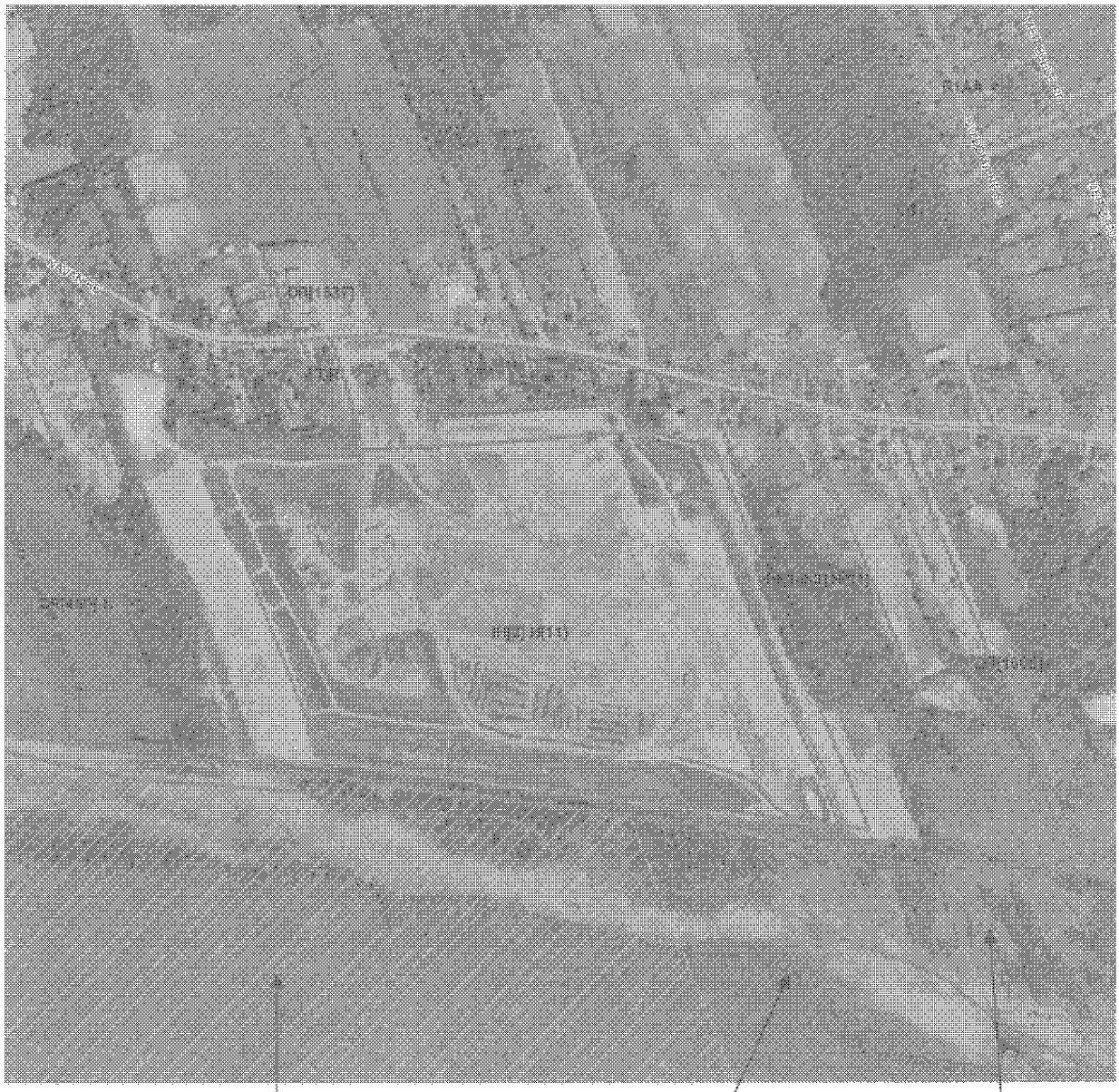
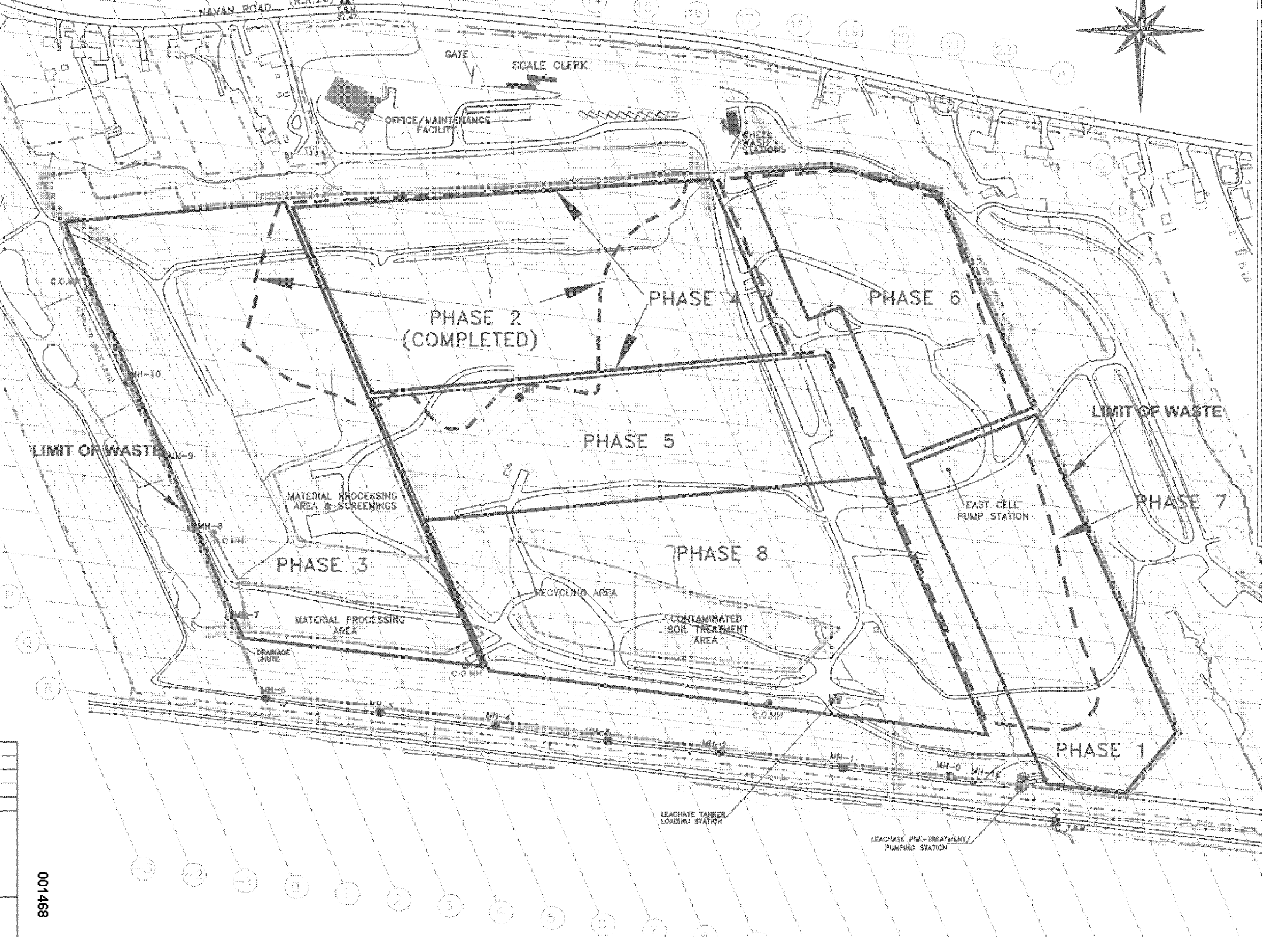
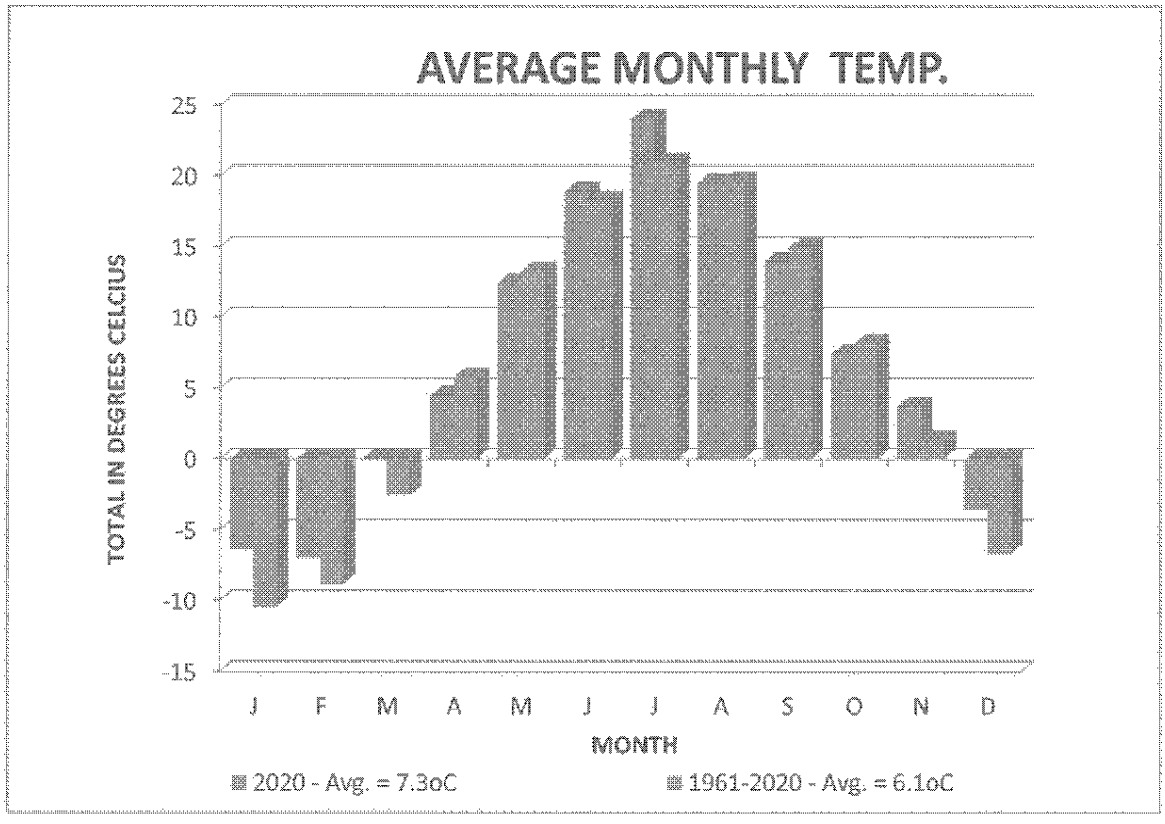


FIGURE 2.3	CURRENT ZONING OF SITE AND SUROUNDING AREA	WASTE CONNECTIONS OF CANADA


NAVAN ROAD
GATE
SCALE CLERK
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATIONS
PHASE 2 (COMPLETED)
PHASE 4
PHASE 6
PHASE 5
PHASE 7
PHASE 8
PHASE 3
PHASE 1
LIMIT OF WASTE
LIMIT OF WASTE
MH-10
MH-9
MH-8
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-1E
MH
C.O.MH
MATERIAL PROCESSING AREA & SCREENINGS
MATERIAL PROCESSING AREA
RECYCLING AREA
CONTAMINATED SOIL TREATMENT AREA
EAST CELL PUMP STATION
DRAINAGE CHUTE
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT/ PUMPING STATION
T.B.M.

001468



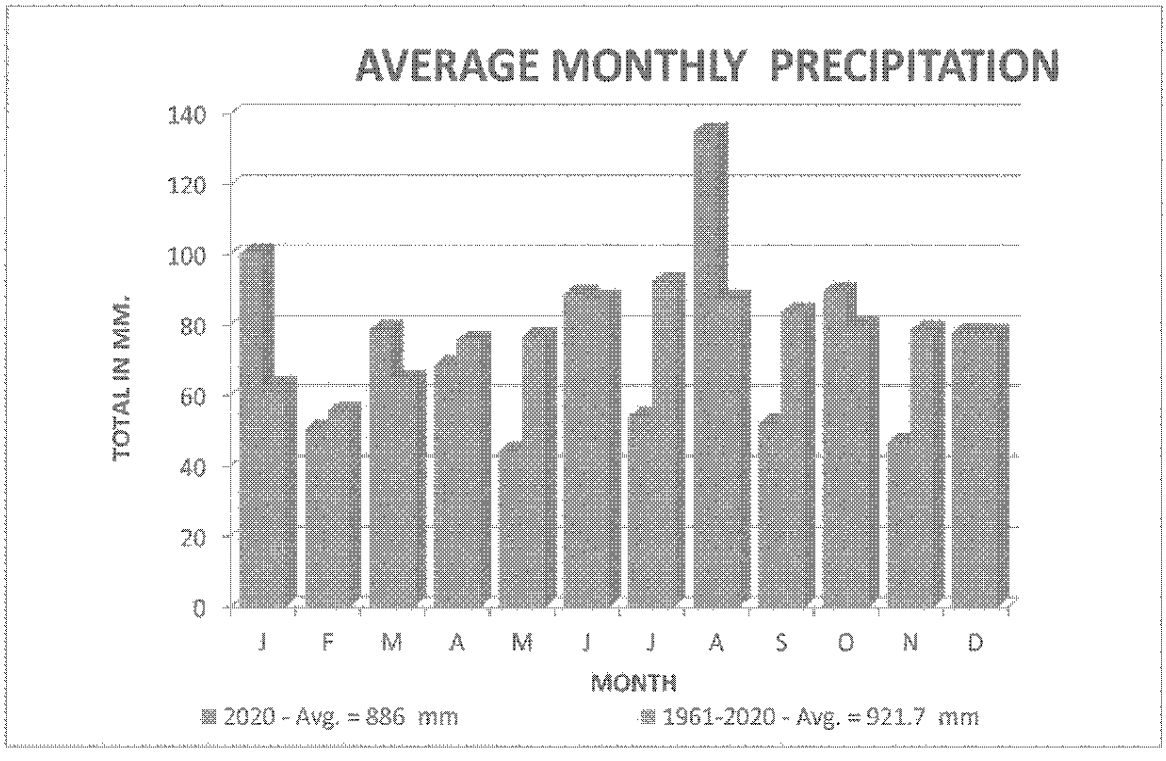
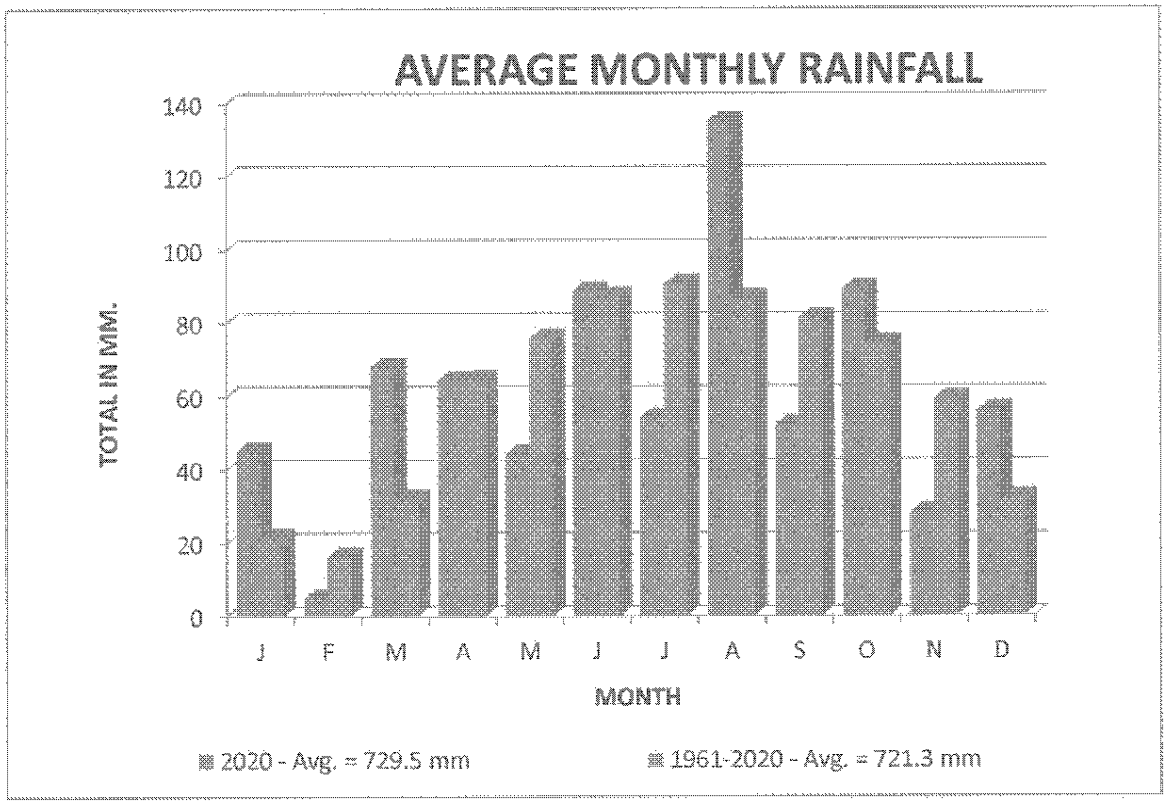


Figure 2.5: Average MonthlyTemperature and Precipitation for 2020



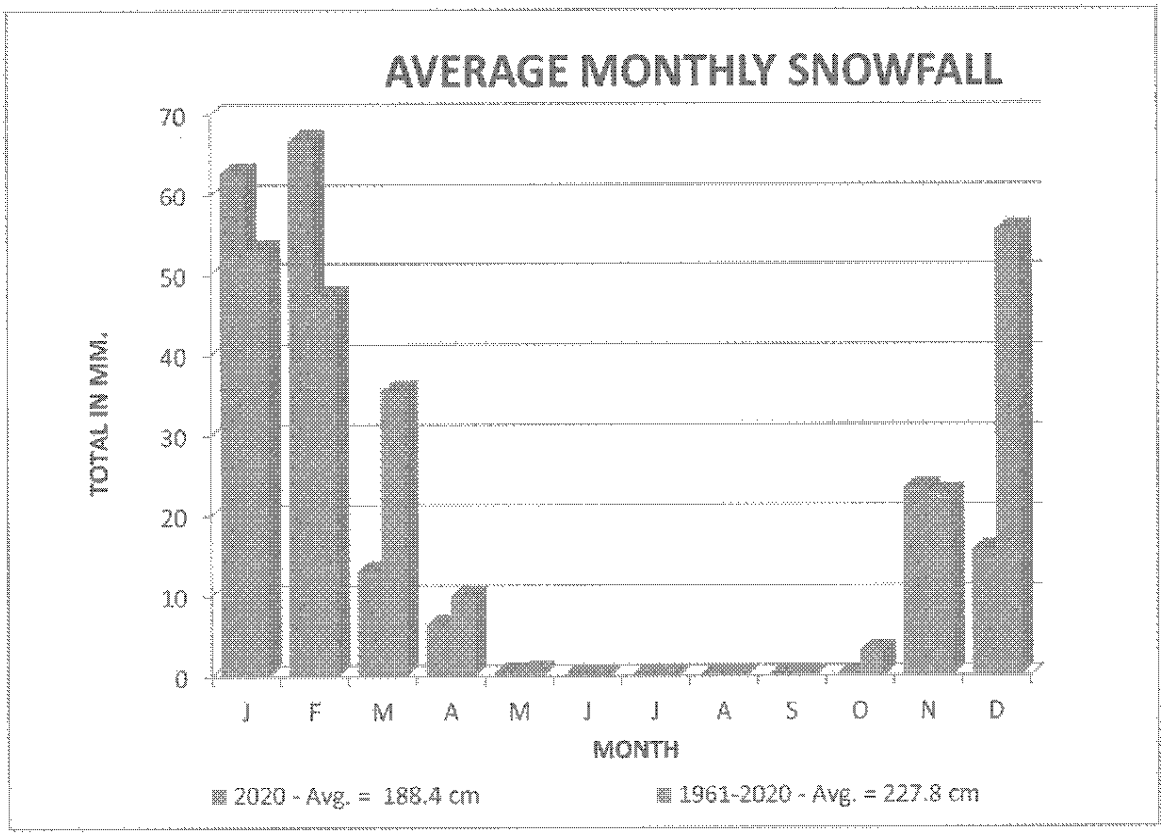


Figure 2.6: Average Monthly Rainfall and Snowfall for 2020

ANTHROPOGENIC — Very strongly to moderately weak, moderately coarse textured soil (where 1.0 to 25 cm) of slowly undifferentiated unit material overlying igneous and metamorphic bedrock

RESIDENTIAL/URBAN — Present allows soils on flat to gentle slopes in pastures, meadows, orchards in secure and poorly drained areas

MEADOWS — Natural, low lying flat land, shallow surrounding river channels subject to very high water table within a depth of 0 to 30 cm

CASTLE — Moderate to slightly acid, moderately coarse to medium textured, organic or humic-gley soils under LAS to TAS and overlying medium, moderately coarse to fine textured material

CHATEAUGUAY — Slightly acid to neutral, medium to moderately fine textured, imperfectly drained marine deposit (LFS to TAS) overlying fairly alkaline, moderately coarse textured, stony, grey till

DALHOUSIE — Neutral, fine to very fine textured marine materials, interbedded with thin layers of silty sediments within 2 m of the surface

Bedrock — Bedrock surface

EASTWOOD — Strongly acid, generally moderately fine textured, slightly gleyed soil (upper 30 to 100 cm) overlying fragmental shale bedrock, extensively wave modified

FRASER CHANNELS — Frozen gullied, steep valley walls and narrow creek beds

FARMINGTON — Neutral to mildly alkaline, moderately coarse to fine textured (where 10 to 50 cm) of mixed calcareous till over bedrock, overlying bedrock and occasionally exposed

GREENFIELD — Very slightly, moderately acid to medium textured stony, glacial till

Geologic Outcrop

Geological Unit

HUNTLEY — Poorly to well drained sands to loamy sand deposited from a regular, rarely tidal and riverine environment and in places that contain wood fragments and concretions

IRONSIDE — Medium to slightly acid, moderately coarse textured modified marine deposit (25 to 100 cm) overlying clayey glaciomarine, moderately coarse textured, stony glacial till

KENYON — Very slightly acid to neutral, moderately coarse to medium textured, moderately well drained, stony glacial till derived from limestone and dolomite

LOWBANK — Variable (0 to 40 cm) of acidic to neutral, moderately decomposed organic material over mineral marine and/or glaciomarine deposits

MAPLE — Slightly acid to neutral, gravelly and cobbly coarse to moderately coarse textured, well to poorly sorted, stratified, glaciofluvial materials. Surface frequently reworked by beach deposits

PEPPER — Strongly to medium acid, gravelly, cobbly to stony phase of variable (50 to 100 cm) overlying fragmental shale bedrock, extensively wave modified

Landfill

LANSDOWNE — Undifferentiated bedrock material, undulating to strongly sloping, moderately steep to very steep, composed of limestone and shale bedrock, interbedded with minor amounts of sandstone

MANOTICK — Strongly acid, acidic textured, moderately deep to bedrock, poorly drained organic deposits (40 to 160 cm) overlying neutral, moderately fine to fine textured mineral marine clays

NEW DEAL — Thin layer of fibrous decomposed moss peat overlying partially decomposed fen peat less than 40 cm thick, underlain by sandy marine deposits. Slope 0 to 2 percent

NEW LISKEARD — Acidic, coarse textured sand and gravel deposits, poorly sorted, stratified, glaciofluvial deposits

MARSHLAND — Low lying land under water or flooded with brackish water

NEPEAN — Medium to slightly acid, coarse to moderately coarse textured (less than 40 cm) of sandy, gravelly material, overlying neutral to mildly alkaline, moderately fine to coarse, stratified marine deposits (0 to 80 cm) overlying fine textured marine clay

NORTH GOWER — Neutral to mildly alkaline, moderately fine to coarse, stratified marine deposits (0 to 80 cm) overlying fine textured marine clay

NCV — NORTH GOWER

OSA

PERTH, LE

QUINTENKILL

REDEAU

ROCK OUTCROP
RO — Rock Outcrop
SP — Spot Pit
TP — Topsoil Removed
UPLANDS

UC — Urban Commercial Use
UI — Urban Industrial Use
UG — Urban Government and Institutional Use
UR — Urban Residential Use
EMBANKMENT

Scale 1:25,000

1 2 3 Kilometres

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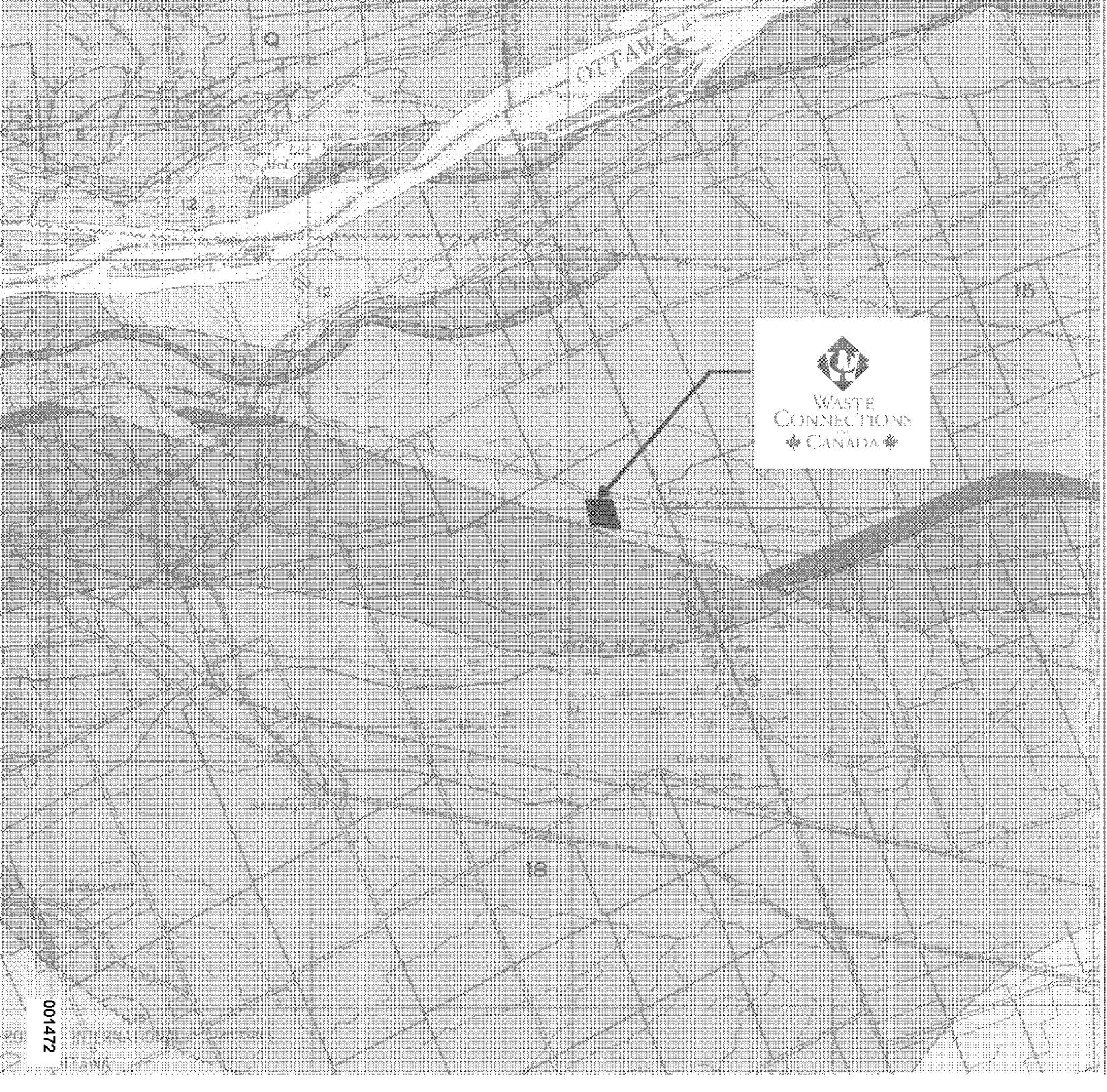


LEGEND

No information is available as the
these Quaternary deposits

ORDOVICIAN

QUEENSTON FORMATION: red

CARLSBAD FORMATION: grey
layers

BILLINGS FORMATION: black

FAIRVIEW FORMATION: dark g

OTTAWA FORMATION: limestone
sandstone in basal part

ST. MARTIN FORMATION: shale
dolomite

RUSSELL FORMATION: dark

OXFORD FORMATION: dolomite

MARCH FORMATION: limestone

ORDOVICIAN OR CAMBRIAN

NEPEAN FORMATION: sandstone

PALEOZOIC

Granite, quartz monzonite, granodi
and foliated; also aggregates of mega

Syenite, monzonite, diabase and

Pegmatite, white pegmatite dyke

PRECAMBRIAN

Gneiss, granite, granodiorite, metag

Marble, metasedimentary rocks, migm

Amphibolite, gneissoid, paleosom
garnet-bearing felsic leucosome, pr

Paragneiss, pelitic and psammopa
granites some layered amphibolit

Gneissic, banded and migmatitic

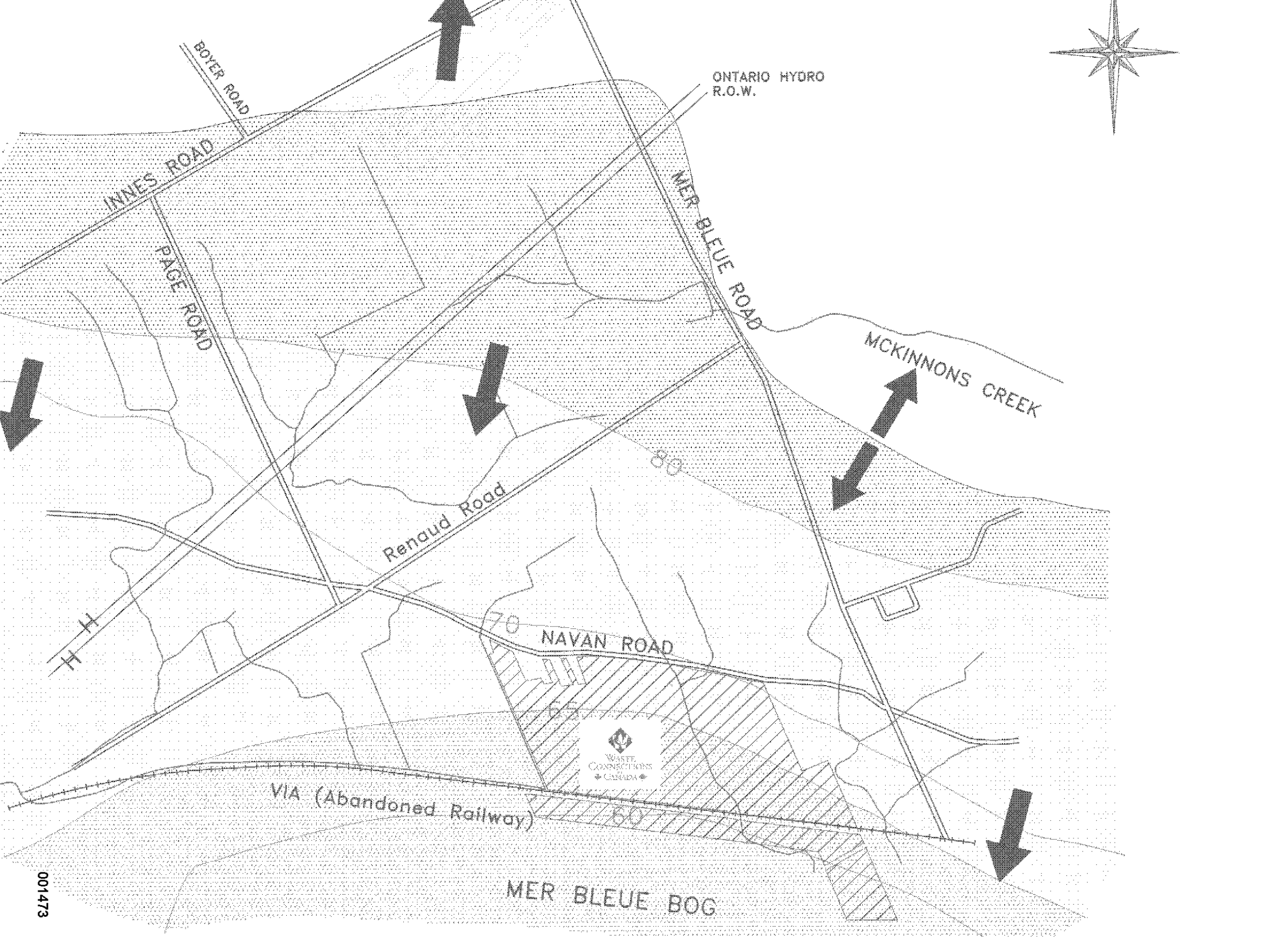
Undifferentiated Precambrian

Geological boundary, approximate, assumed

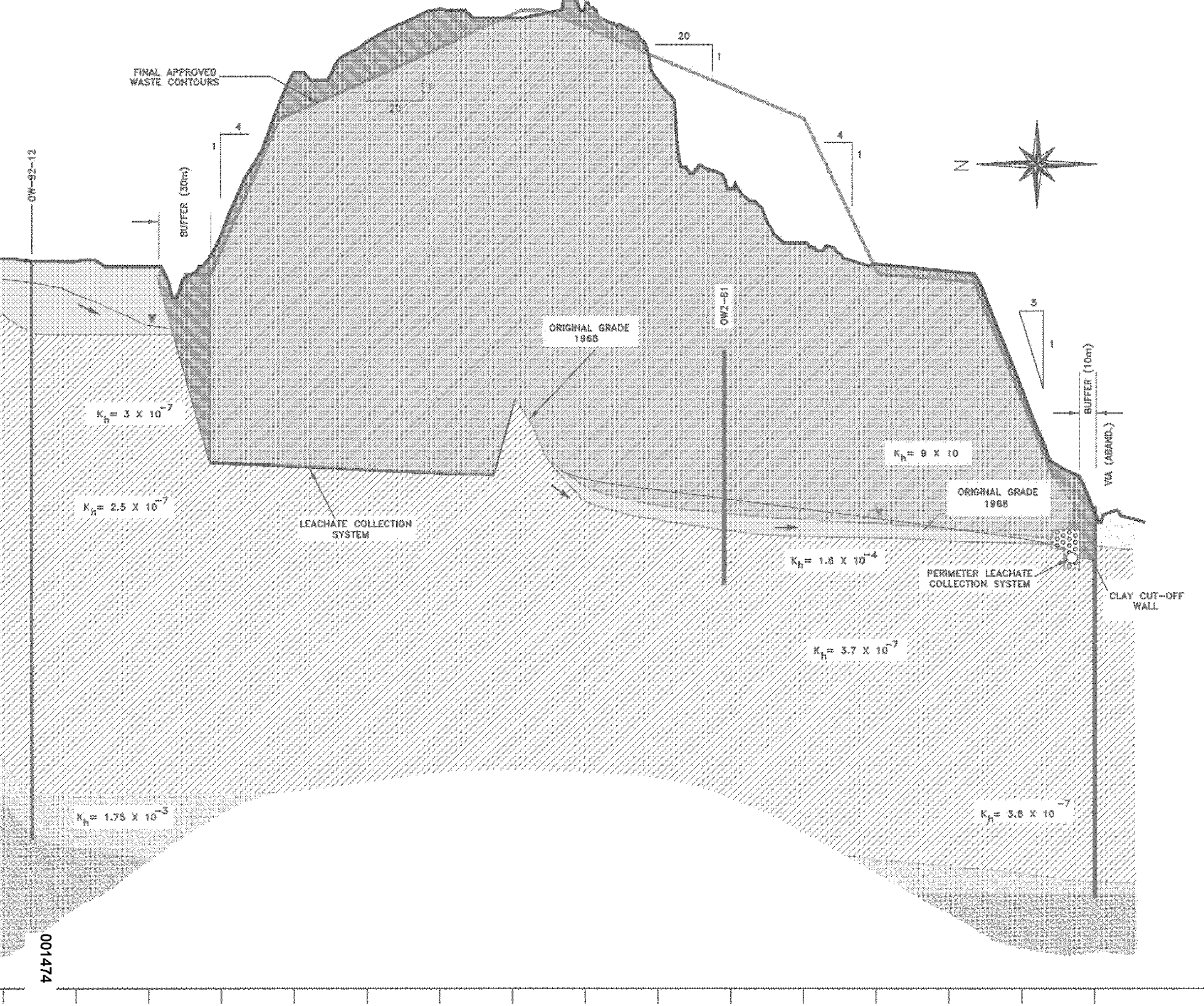
Fault (defined, approximate)

PROGRESSIVE WASTE SOLUTIONS (LAUREL) SITE – SEA

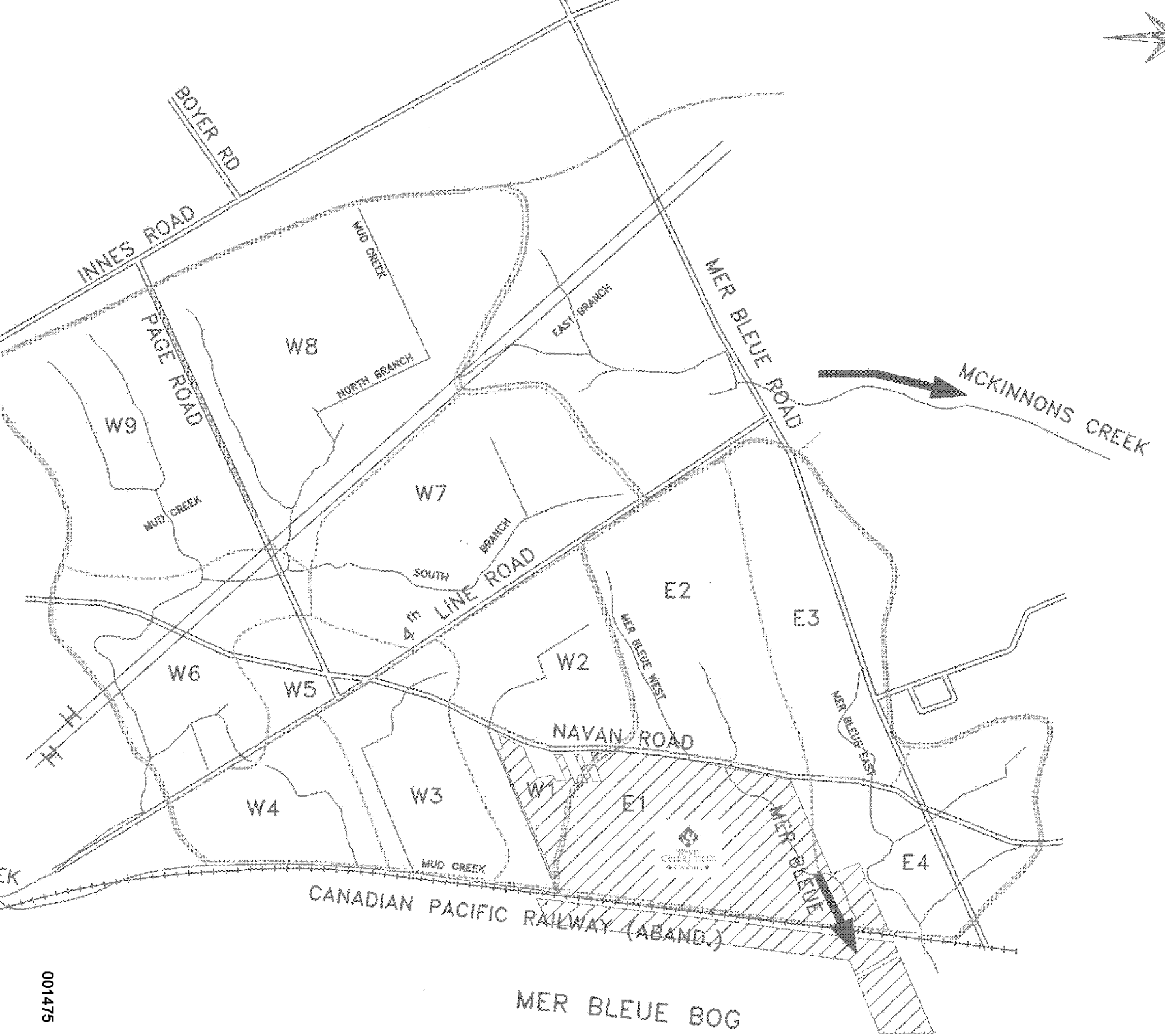
001472


BOYER ROAD
ONTARIO HYDRO
R.O.W.
INNES ROAD
PAGE ROAD
MER BLEUE ROAD
MCKINNONS CREEK
80
Renaud Road
70
NAVAN ROAD
WASTE
CONNECTIONS
CANADA
VIA (Abandoned Railway)
MER BLEUE BOG

001473


FINAL APPROVED WASTE CONTOURS
20
1
4
1
BUFFER (30m)
GW-92-12
ORIGINAL GRADE 1968
OW2-81
3
1
BUFFER (10m)
VIA (ABAND.)
N
K_h= 3 X 10^{-7}
K_h= 2.5 X 10^{-7}
LEACHATE COLLECTION SYSTEM
K_h= 9 X 10
ORIGINAL GRADE 1968
K_h= 1.8 X 10^{-4}
PERIMETER LEACHATE COLLECTION SYSTEM
CLAY CUT-OFF WALL
K_h= 3.7 X 10^{-7}
K_h= 1.75 X 10^{-3}
K_h= 3.8 X 10^{-7}

001474


BOYER RD
INNES ROAD
PAGE ROAD
MUD CREEK
W8
NORTH BRANCH
EAST BRANCH
MER BLEUE ROAD
MCKINNONS CREEK
W9
MUD CREEK
W7
SOUTH BRANCH
4th LINE ROAD
E2
E3
MER BLEUE WEST
W2
W6
W5
NAVAN ROAD
MER BLEUE EAST
W4
W3
W1
E1
MER BLEUE
E4
MUD CREEK
CANADIAN PACIFIC RAILWAY (ABAND.)
MER BLEUE BOG

001475

3. OPERATIONS - 2020

3.1 *Description of Operations*

The Navan Waste Recycling and Disposal Facility has evolved over the years from being simply a disposal site into an integrated waste management facility with increased focus on re-use and recycling.

Prior to 1981, landfilling was carried out by end-dumping over an existing east-west oriented ridge with minimal base preparation. Following an ownership change in 1981, the site was operated using an area method with waste being placed in the southern half of the landfill (i.e., below the escarpment). As-built survey information collected during the construction of the perimeter leachate collection system indicated the base elevation of the waste varied between 68 and 70 m ASL below the escarpment along the perimeter of the waste footprint. The landfill expansion approvals received in 2009 added 3,600,000 m^3 of air space bringing the total estimated waste capacity for the site to 7.6 million m^3, which included the previously approved capacity.

Prior to expansion, cell development in the northeast quadrant of the landfill footprint (Phases 4&5 on Drawing 2.4) consisted of stripping topsoil and excavating native sand and clay soils to the required elevations for the construction of a leachate collection system. These base grades varied from 69.5 m ASL at the low point of the system in the S-E corner of the cell (Grid M-16) to approximately 73.2 m ASL at the high point of the system in the N-W corner of the cell (Grid F-7). The base grades were sloped downward at 0.5% draining in a south-easterly direction to the S-E corner of the cell (Grid M-16). The cell construction maintained gravity flow of leachate to the pump station located southeast of the waste footprint (Grid Q/R-16) entering the pump station at about elevation 67 m. Construction of the east cell expansion (Phase 1) was completed in 2015 with a leachate collection system overlying a clay floor ranging in elevation from 70.1 m to 72.1 m. Construction of the east cell expansion (Phase 6) was completed in 2019. Both cells in Phase 1 and Phase 6 drain to a pump station near Grid J-17. The design of the leachate collection system is summarized in Section 6.3.

The landfill will continue to be developed until the upper approved final waste contours are achieved. Figure 3.1 presents the current approved top of waste grades. The final cover, which at a minimum will have a 1.0 m thickness, will be superimposed on top of the final grades. Generally, an interim clay cover is constructed immediately upon reaching the approved fill heights in an effort to reduce water infiltration and the volume of leachate generated at the site. Clay cover has been placed in areas such as the north, west, south and southeast slopes and the top of waste where final waste grades have been reached in the area of Phase 3 and the north half of Phase 4.

Active landfilling continued from January through December of 2020 in the Phase 6 east cell area.

Significant activities and capital works undertaken between January 1st and December 31st, 2020 included the following:

1. Active landfilling in the east cell (Phase 6);
2. Completion of excavation and drainage layer construction of the north and north-east cell walls in Phase 6;
3. Excavated clay from the Phase 5 and Phase 8 areas (grid Lines K-M/8-14) and used the excavated clay to construct the cell walls in Phase 6 along Grid Line D from Grid 16-19 and along Grid Line 19 from Grid D-G ;
4. On-going recycling operations at the facility;
5. Treatment of hydrocarbon contaminated soils in the material processing area of the site;
6. Screening of coarse granular soils to separate rock from soil for re-use;
7. Continued pre-treatment of collected leachate and disposal to ROPEC for off-site treatment;
8. Retained Dillon Consulting Limited to complete the reporting requirements under the National Pollutants Release Inventory (NPRI) for the 2019 calendar year; to assess the Greenhouse Gas Reduction Reporting as required under Ontario Regulation 347; to determine the reporting requirements under Ontario Regulation 390/18 – Greenhouse Gas Emissions Reporting and the Federal Government Greenhouse Gas Reporting Program;
9. Retained Golder Associates to carry out surface water, groundwater, leachate, gas and noise monitoring and reporting programs;
10. Added clay cover to completed fill areas of the landfill;
11. Constructed a horizontal landfill gas collection system in the area of Grids K-L/16-17 to mitigate odour causing fugitive gas emissions;
12. Retained Base Mapping Ltd. to undertake aerial photography and produce an updated topographic map of the site; and
13. Retained Perennial Energy, LLC to manufacture, assemble, package, check, test, and deliver a Landfill Gas Extraction Plant and Enclosed Flaring System.

A brief description of the major activities and capital works follows.

3.1.1 Active Landfilling

From January through to the end of December of 2020, active landfilling was carried out in the east cell in Phase 6. Operations in this area focused on constructing an access road and a receiving pad for haul trucks and placing lifts over the drainage layer. Construction of the east buffer wall against which waste could be placed was achieved with the use of treated soils placed along the east waste limit in Phase 6. Access to the active fill area was provided by a north-south access road along the west edge of the east cell area running along the east side of grid line 14 then turning east at Grid Line J and down into the cell. An additional access was constructed late in the year entering the Phase 6 cell near Grid E-15.

3.1.2 Cell Development

On-going cell wall construction of the east cell defined as Phase 6 was carried out concurrently as other landfilling operations progressed. Excavated clay from the Phase 5 and Phase 8 areas (grid Lines K-M/8-14) was used to construct the cell walls along Grid Line D from Grid 16-19 and along Grid Line 19 from Grid D-G. Construction of the leachate collection system on the constructed sloped walls of the cell was completed by WCC personnel and inspected and approved by Golder Associates Ltd..

3.1.3 Processing (recycling)

Recycling operations continued throughout 2020 making use of an excavator equipped with a grappler and magnet for the removal of metals, wood and bulky items from the waste stream received at the active face. Wood and metals recovered were moved to a recycling area located on site within the waste footprint where metals and wood are stored for further processing and/or bulk removal. A resident mobile wood grinder is used on site to reduce the wood into chips suitable for use as bio-fuel at a local mill or re-used at a local organic waste composting facility. A Duratech EJ100 Wood Grinder was used for the grinding of recycled wood into wood chips. A refrigerant recovery program established at the site continued to assist clients wanting to properly dispose of their appliances containing refrigerants. Materials such as brick, concrete, rubble, clean roofing shingles and asphalt continued to be separated for beneficial re-use in the construction of access roads, turn areas at the active face and storage pads. Other materials recycled and/or re-used at the site consist of cardboard, drywall, glass, tires, electronic waste, batteries and propane cylinders found within the waste. Further details on recycling and material volumes are provided in Section 9.

3.1.4 Contaminated Soil Treatment

The treatment of hydrocarbon contaminated soils was on-going throughout 2020 in the soil processing area of the landfill along Grid Line O between Grid Lines 9 and 13 (refer to Dwg 2.4). A total of 28,320 tonnes of treated soils meeting the target parameters were received at the treatment area and re-used as a construction fill material in the east buffer along Grid Line 19 between Grid Lines D and P in accordance with ECA conditions for the site. A total of 7,561 tonnes of impacted soils were re-used as construction material within the waste footprint of the landfill.

3.1.5 Soil Screening Plant

A METSO rock screening plant was used for the screening of rock and rubble greater than 50 mm. This plant separates materials 150 – 600 mm and 50 – 150 mm. The rock was re-used as general fill and as construction materials such as rip-rap for drainage chutes and erosion control. Material, finer than 50 mm, was landfilled or re-used as cover material. A total of 12,855 tonnes of rock was re-directed from landfill airspace.

3.1.6 Leachate Management

Leachate generated by the landfill continued to be collected through a leachate collection system and directed to an on-site leachate pre-treatment/pumping station. In 2020, leachate from the cells in Phases 1 & 6 was collected and re-directed for pre-treatment and discharge to the City of Ottawa sewer system. In 2020, a total of 132,775 m^3 of leachate was pre-treated and pumped via force main to the City of Ottawa sewer system for final treatment at the Robert. O. Pickard Environmental Centre (ROPEC), the City of Ottawa wastewater treatment plant. The forcemain conducting leachate to the sewer system was flushed and cleaned twice in 2020. No operational problems were experienced with the leachate discharge operations at the landfill in 2020.

3.1.7 Stormwater Management

Stormwater and snow melt water at the site is managed to direct surface runoff to the east and west watersheds using a series of natural and constructed ditches, swales, chutes, culverts and stormwater ponds. In 2019, a 237 m long culvert was constructed at the north and northeast corner of the cell in Phase 6. The culvert consists of a 900 mm diameter corrugated smooth interior HDPE pipe joined with bell and spigot c/w gasket and pre-fabricated concrete headwalls at both ends. A sediment trap was also constructed in front of the inlet structure. Construction of the north and north-east clay walls over the culvert in the Phase 6 cell was completed in 2020.

3.1.8 Landfill Gas Monitoring

Monitoring of methane gas at the landfill site was performed by Golder Associates Ltd. on three separate occasions in 2020. Results of the monitoring programs and interpretation of the data are presented in Section 8 and Appendix '2' of this report. Construction of the candlestick flaring system for the Interim Odour Control System designed by Golder and approved by the MECP was completed in late 2011. In early 2012 the flaring system was commissioned and approved by the Technical Standards and Safety Authority (TSSA) and has since been in continuous operation.

In 2014, the landfill gas collection system was expanded to collect gas from the central manhole and from horizontal wells constructed at the top of the Phase 3 area in efforts to mitigate fugitive emissions from these areas. In 2016, additions to the gas collection system were required and five horizontal collectors were constructed. In 2017, seven vertical wells and one horizontal well were added. In 2019, four additional vertical wells were constructed in Phase 4. In 2020, one horizontal well was added at the north-west corner of Phase 1.

Dillon Consulting Limited was retained to complete the previous year (2019) reporting requirements under the National Pollutants Release Inventory (NPRI); to assess the Greenhouse Gas Reduction Reporting as required under Ontario Regulation 347; to determine the reporting requirements under Ontario Regulation 390/18 – Greenhouse Gas Emissions Reporting and the Federal Government Greenhouse Gas Reporting Program.

3.1.9 Noise Monitoring

Monitoring of noise levels at the WCC Navan Facility was performed by Golder Associates Ltd. at two points of reception (POR) nearest residential receptors for the period of November 5th to November 13th, 2020. Monitoring results are presented in a Technical Memorandum provided in Appendix 3. The noise levels are predominantly influenced by traffic on the adjacent road with an audible noise from landfill operations of the WCC Navan Facility. The measured average hourly noise levels were equal to 49 dBA and 55 dBA at Monitoring Location 1 and Monitoring Location 2, respectively. These levels are at or below the noise limits established in the MECP Landfill Guidelines. In addition, landfill operations at the WCC Navan Facility have been substantially completed along the northwest and west areas and work at the landfill is progressing to the east, away from the receptors to the west. In 2021, landfilling will be predominantly in the northeast cell (Phase 6).

3.1.10 Surface Water, Groundwater and Leachate Monitoring

Water quality monitoring programs are carried out twice annually for groundwater, and three times per year for surface water and leachate by Golder Associates Ltd. Surface water quality monitoring events were carried out on May 14th, August 26th, and November 25th of 2020. Leachate was also sampled by Golder at the pump station on May 14th, August 27th, and November 25th 2020. Groundwater quality monitoring was carried out on May 21th and November 26th, 2020. Groundwater monitoring wells further in the Mer Bleue Bog were sampled in the fall of 2020 as frozen well conditions prevent winter sampling. Additional monitoring of surface water, groundwater and sediments requested by the National Capital Commission (NCC) in early 2000 was continued. Results of the monitoring programs and interpretation of the data reported by Golder Associates Ltd. are presented in Appendix '1' of this report and discussed in Section 7.

3.1.11 Closure

Closure consisting of placing clay fill material of at least 1.0m in thickness was continued where final waste grades were reached in the area of Phases 1 and 4. These areas are also used for staging excavated wet clay for drying and re-use purposes. Placing of topsoil and seeding will be carried out in these areas at a later date.

3.1.12 Aerial Photography

Base Mapping Co. Ltd. of Ottawa was again retained to undertake aerial photography of the Navan Waste Recycling and Disposal Facility. Digitized topographic maps of the site with 0.5 metre contour intervals were obtained for April 28th, 2020. The 2020 topography with 2 metre contour intervals is shown on most drawings. To date, a total of 221,100 m^2 of the waste footprint has received clay cover as shown of Figure 3.2.

3.2 *Daily Site Operations*

The site continues to be operated in accordance with the approved Design and Operations report (Golder, 2008) and the amended Certificate of Approval. Daily site operations are described in the following sub-sections.

3.2.1 Access

The site is well serviced by Regional Roads, being located on Regional Road 28, locally known as Navan Road (refer to Figure 1.1). Most of the traffic at the site is generated by commercial vehicles which access the site via Innes Road (Regional Road 30) and Navan Road. The Tenth Line Road (Regional Road 47) and Milton Road (Regional Road 31) also provide access from East Ottawa (Cumberland Township).

Access to the site is provided by one entrance located off Navan Road. The gate is kept locked after hours to restrict access. The access road is paved between Navan Road and a distance past the scale house and wheel wash station (Grid Lines C-15). A well-maintained all-weather road provides access to the designated unloading areas. Other access roads are provided throughout the site allowing access to water management systems, material stockpiles, site facilities and equipment storage areas (refer to the Site Features Plan - Figure 2.4).

3.2.2 Hours of Operation

Approved hours of operation for the receipt of waste are from 7:00 am to 6:00 pm Monday through Saturday, inclusive, however the site generally closes at 5:00 pm on week days and 1:00 pm on Saturdays and statutory holidays. The site does not receive waste prior to 7:00 am or after 6:00 pm on these days. Waste acceptance outside of these hours requires the approval of the MECP District Manager. Operating hours may vary within the approved hours. On occasion and as required, Landfill excavation and equipment/site maintenance may occur outside these hours.

The site is secured after operating hours and includes sporadic security patrols by a security services contractor. No scavenging is permitted at the site.

3.2.3 Site Staffing

WCC routinely reviews and monitors its staffing needs for the site and adjusts the staffing level accordingly. Currently 23 fulltime equivalent employees (FTE) are employed locally at the site including management, sales, administrative, clerical, and operations personnel.

The number of employees at the landfill site is variable from time to time and is based on the workload which can be seasonal and personnel turnover. Throughout the year, part time personnel or contractors are hired to perform general tasks such as grass cutting, general site clean-up, minor site maintenance work, surveying, traffic control, etc. Personnel from other WCC districts are also called upon from time to time to assist with landfill operations. When required, contractors are also hired for task specific work such as maintenance, security and landscaping.

3.2.4 Equipment

The following equipment was in use at the landfill site in 2020:

1) 1- 826G & 1- 826H CATERPILLAR WASTE COMPACTOR
   - levelling; compaction; grading of waste

2) D7R CATERPILLAR BULLDOZER (c/w LANDFILL PKG)
   - levelling; placing; grading of waste

3) D6N LGP CATERPILLAR BULLDOZER
   - Levelling; compaction; grading; earth works

4) D6T XW & D6T LGP CATERPILLAR BULLDOZER
   - Levelling; compaction; grading; earth works

5) Volvo EC340DL EXCAVATOR
   - excavating; levelling; ditching; grading; soil movement; berm construction

6) CAT 330 WH EXCAVATOR c/w GRAPPLER
   - recycling; excavating; levelling; ditching; grading; soil movement; berm construction; processing; box scrape outs

7) Volvo EC220 EL EXCAVATOR c/w GRAPPLER AND MAGNET
   - recycling; excavating; levelling; ditching; grading; soil movement; berm construction; processing; box scrape outs

8) JOHN DEERE 310J BACKHOE (c/w ATTACHMENTS)
   - excavating; recycling; levelling; ditching; grading; snow removal; box scrape outs

9) CAT 420F BACKHOE (c/w ATTACHMENTS)
   - excavating; levelling; ditching; grading; snow removal; box scrape outs; tree planting

10) 1 – 730 CAT ARTICULATED TRUCK
- 6-wheel drive truck / earthworks; daily cover

11) 2 - A25E VOLVO ARTICULATED TRUCK
- 6-wheel drive truck / earthworks; daily cover

12) 1 - CAT 950H LOADER
- material loading; snow removal; processing; road maintenance

13) 1 - CAT 950M LOADER
- material loading; snow removal; processing; road maintenance

14) DURATECH EJ100 WOOD GRINDER
- wood and drywall grinding

15) 2- MACK ROLL-OFF TRUCK
- on-site container management; dust control

16) PICK-UP TRUCKS AND ALL-TERRAIN VEHICLES
- site access; road sweeping; snow removal; magnetic sweeps; salting

17) 1 TON DUMP TRUCK (c/w SNOW PLOUGH)
- For general use and snow removal both on-site and off-site

18) 3-35 HP LEACHATE PUMPS
- available throughout the year for leachate management

19) 2- 100 MM GORMAN RUPP PUMPS AND ADDITIONAL GENERAL PURPOSE PUMPS
- available for the handling of leachate and surface water

20) TANKER 22.7 m^3 (5,000 GAL.)
- On-site water needs (dust control; clean roadways; flush leachate MHs etc.)

21) 100 KW GENERATOR, 40 KW GENERATOR AND 20KW GENERATOR
- Power supply for the candlestick flare
- Power supply for the odour misting system
- Pump Station backup power supply.

22) KUBOTA UTILITY VEHICLE
- Equipped with snow blowing and lawn mowing equipment.

23) ARGO UTILITY VEHICLE C/W TRACKS
- All terrain vehicle.

24) LIGHT TOWERS
- Landfill and recycling area lighting and power supply for equipment.

25) METSO SCREENING PLANT
- Screening of oversize materials from soil and rubble.

Vehicles are equipped with 2-way radio equipment along with hand held portable 2-way radios utilized for on-site communication between equipment operators, supervisors, spotter, weigh scale attendants, maintenance personnel and site office.

The size and type of equipment available on site handles the every day and long-term operation of this engineered facility. Additional equipment is brought on site as required to supplement or replace the WCC heavy equipment during repair programs or for special projects.

3.2.5 Equipment Maintenance

A maintenance building completed in 2009 is used for equipment repairs and storage of parts, tools and supplies. A comprehensive preventative maintenance program is in place and equipment maintenance is fully documented. A maintenance schedule is followed in a strict manner. WCC's own staff mechanics perform all lubrication and oil changes as well as most vehicle repairs. Qualified equipment dealers perform major repairs and warranty work when required. A daily pre-trip and post-trip inspection of all equipment in use is performed by equipment operators.

All machinery is equipped with fire suppressant and first aid equipment. First-aid stations are located at various locations on site.

On-site personnel are able to perform routine maintenance on all machinery and employees are trained to operate and maintain different pieces of equipment. A daily, weekly and monthly equipment inspection is carried out and documented for each piece of equipment. Daily records of fuel, lubrication consumption, and hours of operation are maintained.

3.2.6 Scale House and Small Vehicle Pad

Two full-time employees operate the scale house. Two 100 tonne Rice Lake scales installed in early 2009 are in operation to reduce traffic congestion on Navan Road. All vehicles are weighed upon entering and leaving the landfill. Drivers must exit their vehicle and sign the weigh bill at the scale house. The scale clerk records the name of the client, the origin of the waste (customer), the type of waste, driver identification, truck identification and notes using a grid system where the waste was placed within the landfill. All records from these transactions are maintained at the site office and recorded in WCC's computer records.

The scale clerk has contact with the site office, spotter and equipment operators at all times. The site cannot be opened unless the scale clerk and an operator/spotter are present. Rejected loads of waste are recorded and reported to the MECP and a record is kept on site.

A small vehicle unloading area was built southeast of the weigh scales to service small vehicles and promote recycling. The paved area is maintained and kept clean at all times. Concrete bunkers were added in 2012 west of the small vehicle pad to add capacity for small loads of aggregate, shingles, asphalt, metals, wood and recyclable windshield glass. These bunkers are also used to accommodate small waste

vehicles preventing them from entering the landfill where commercial and heavy equipment activity is occurring.

3.2.7 Site Office

Management and administrative staff work in an office/maintenance building constructed in 2009 located north of the landfill near the Navan Road site entrance. The site office is open Monday to Friday during working hours of the landfill. All records are maintained at the site office. The site office is equipped with several computers to maintain landfill records, employee information and site operation manuals. Areas of active landfilling are recorded daily and referenced to a grid system. The daily operation of the landfill is carried out from this office.

3.2.8 House Keeping and Controls

(a) Site safety

All employees have been instructed in safety procedures and a Joint Occupational Health and Safety Committee meets monthly to discuss health and safety issues at the site. Managers have been tasked as Site Safety Leaders dedicating time to safety related programs, training and safety awareness. On-site employees have completed waste handling safety courses, GHS training (Global Harmonized System of Classification and Labelling of Chemicals), confined space entry, and CPR & basic first aid training courses. On-site first-aid stations are available on the equipment, maintenance facility, scale house, pump station and site office. On-site communication allows for quick response. Emergency spill kits are available at the maintenance garage and site office. All workers have been provided with personal protective equipment (PPE) and must wear hard hats, safety boots, reflective clothing and safety glasses. All vehicles have back-up alarms. A spotter directs all traffic and machinery at the working face of the landfill.

Employees have been instructed in the handling of special materials, in particular impacted soils and asbestos, a designated waste. All employees and haulers follow a documented protocol for the handling of these materials. In brief, the procedure is as follows:

No hauler is allowed to enter the site with these materials without prior approval. All haulers of these materials must give advance warning of their coming to the site. A time slot is then assigned for receipt of the material. A designated spot for the placement of the materials is prepared. Asbestos waste is landfilled and covered without any equipment coming into contact with the waste. Disposable safety coveralls, head covers and respirators are also available on site for the handling of special wastes.

Employees have been instructed as to the types of waste allowed and materials not allowed to be received at the site. All containers must be open and void of any liquid material before they can enter the site. Closed containers are refused. Waste that is inadvertently dumped at the site is either placed back in the hauler vehicle or stored in one of WCC's boxes for later removal. Hauled materials are inspected for any banned waste and the above procedure followed. Materials rejected from the landfill are reported to the MECP district office. Records of rejected waste and materials removed from the site are kept at the landfill site office.

(b) Scavenging control

No scavenging is permitted at the site. The spotter and equipment operators working at the active face strictly enforce this. On-site personnel carry out recycling of wood, metals and white goods in a controlled and manageable manner at the active face using heavy equipment specially equipped with a grappler and magnet. A small vehicle receiving pad is provided where waste from small vehicles can be received safely and materials can be sorted for recycling by the vehicle operator. Concrete bunkers were added to this area to further assist with the recycling of materials such as asphalt, aggregates, shingles, wood, metals and windshield glass. A program for the recovery of refrigerants is available and this service continued throughout 2020.

(c) Litter control

Litter has not been a problem at the Navan Waste Recycling and Disposal Facility because of the use of daily cover. Periodic checks are made of the finished and active areas of the site for litter. Litter fencing is maintained at the active working face and temporary fencing is maintained in areas of the landfill perimeter as a supplementary litter control measure. Fencing is cleaned of litter as required. At least twice each year WCC personnel collect litter accumulated in the ditches along Navan Road for a distance of 1 km to the east and west of the site entrance. No complaints related to litter were received in 2020.

(d) Vector and vermin control

The presence of vermin and vectors is not a problem at the site primarily due to the dry, non-putrescible nature of the waste stream. Periodic checks have proven that no problems with vermin exist at the site due to proper landfilling procedures. If vermin are detected at the site, a registered pest control company is retained to control the problem. Although some seagulls and crows do frequent the site in summer months, this is not considered a health or environmental problem because of the small numbers present. A bird scare permit has been obtained from the Ministry of Natural Resources. When required, pellet whistlers are shot into the air to control birds during business hours. Abell Pest Control was hired in 2018 to set up bait control stations at various locations throughout the landfill to monitor activity on site and continued their work throughout 2020. No complaints were received in 2020.

(e) Dust management plan

The landfill has the potential to generate fugitive dust emissions. Fugitive dust sources have been assessed in accordance with MECP guidelines. In order to minimize the potential for off-property impacts due to fugitive dust, the following practices are implemented at the site:

- Aggregate (e.g., gravel, crushed limestone) is spread over unpaved roads to reduce silt loading. Repeat applications of aggregate are done on an as-needed basis, dependent on the condition of the roads.
- Watering of unpaved roads is carried out to increase the moisture content of the surface material and reduce the potential for fugitive dust generation. Dust suppressants (e.g., calcium

chloride, wood chips) are also used, depending on the ability of watering to appropriately control dust. The frequency of application of water or dust suppressants to roadways is adjusted based on road conditions, weather conditions and traffic loadings. In 2020, watering of access roads for dust suppressant with the use of an on-site water truck was carried out on 113 separate occasions throughout the dry weather months. The company also owns a backhoe equipped with a road brush for sweeping asphalted surfaces. In addition to the use of on-site equipment, mud and dirt was removed from Navan Road and on-site paved roads by a subcontractor retained to vacuum sweep/flush paved surfaces on 8 separate occasions.

- A speed limit of 15 km/h is enforced while vehicles are traveling on unpaved roads. This limit is posted on site and communicated to users of the unpaved roads.
- Where possible, travel distances to material transfers and drop points are kept as short as practical to reduce dust generation.
- A wheel wash station was constructed in 2009 east of the weigh scales and scale house to wash vehicles exiting the landfill and to reduce mud drag-out onto Navan Road. The wheel wash station is operational during the non-freezing months of the year.

The site maintains a log to record the date and time of any fugitive dust complaints and a summary is provided in Appendix '4' – Schedule 'A'. This log also describes activities related to the investigation of the complaint and also records the mitigative measures implemented to address concerns raised. In 2020, WCC received no complaints related to dust or dirty roads.

(f) Noise control

The active face of the landfill operation is sufficiently set back from Navan Road to minimize disturbance resulting from noise. Berms and soil stockpiles are located between active fill areas and nearby homes and offices to act as a sound barrier. Landscaped berms have been constructed along Navan Road east and west of the site access as well as east of the wheel wash station. No complaints related to noise were received in 2020. Noise monitoring was carried out by Golder Associates Ltd. and results are presented in Appendix 3. The results and site observations indicate that elevated background noise levels exist at surrounding receptors due to road traffic noise along Navan Road. Based on these results, the operations of the Navan Landfill are considered to be in compliance with the MECP's Landfill Guideline and NPC-205.

(g) Aesthetic controls

Landscaped berms have been constructed along Navan Road and a tree planting program is in place to improve site aesthetics. Each year efforts are made to further improve site aesthetics. A fish habitat ditch was completed along the east limit of the site complete with vegetation, landscaping and other ditch features. In addition to drainage, the ditch also provides an aesthetic barrier to the landfill.

(h) Fire control

Fire control is maintained by the supervision of all staff including the scale staff, the spotter and equipment operators. A number of non-smoking signs have been erected throughout the site that warns users of the danger of fire in the landfill. Personnel have been instructed on the procedures of handling a

landfill fire. The use of the landfill compactor and soil as cover material does not allow a fire to persist. The excavator, compactor, loader and the dozers are available to isolate a fire. Spare cover material, available at the working face, will be used in conjunction with the landfill compactor to smother a fire. The proximity of the Ottawa Fire Department at Blackburn Hamlet (less than 5 kilometres) will allow any superficial fire to be put out in a timely manner. On-site security and the presence of employees who live adjacent to the site will allow for quick action in the event of fire after hours. All machinery is equipped with proper fire extinguishers.

(i) Odour Control (Odour Management Plan)

To ensure the WCC Navan Facility is operated in a manner that minimizes the impact from odour on the public and the natural environment, the following program is in place at the WCC Navan Facility to deal with odour issues.

(1) Odour Monitoring

WCC has a comprehensive program for monitoring odours and for taking remedial action in the event that odours become at all problematic in the operation of the WCC Navan Facility. Any unusual odour events and any measures taken to deal with odour at the site are recorded and filed on-site.

There are no Ontario Government standards for odour. There are no agreed-upon, empirical measurement protocols or odour thresholds that may be used in the operation of a landfill or processing facility. Consequently, the ultimate test of an effective odour-control strategy for any facility can only be that it produces no odour complaints from the surrounding community over an extended period of operation. The operators of the facility need to take preventative and other control measures to ensure that odours never reach a threshold where they can generate complaints. The best odour monitoring program available is to give responsibility to all staff working at the site to use their own senses to constantly monitor for excessive levels of odour on-site. While some level of on site odour is normal and acceptable, it can become a problem when these same odours register off the property. As well, the character of the odour is significant. Many 'aerobic' odours may be very inoffensive, even at a significant concentration, while even very low levels of the types of odour associated with anaerobic activity may be deeply offensive.

It is normal practice at the site to monitor odours in the following way. Every morning, when staff first arrives on the site, a general inspection is undertaken of the facility. While the site manager is looking for anything untoward, the presence of any odours likely to extend beyond the perimeter of the site will be of special concern. In addition, whenever any material at the site is being disturbed by the equipment used at the facility, staff on site periodically stand downwind of the work that is being done, and assure themselves that any odours being created are mild, indicative of fully aerobic activity, and are not likely to be carried off the property.

In the event staff on-site believes any odours may have some potential for off-site impact, they will drive to a location off-site and downwind from the work at the facility to determine at that moment if any off-site impact can be detected. If there is a detectable off-site impact, work on the site will be stopped immediately and remedial measures will be taken (see below). If no off-site impacts are detectable, work at the site will proceed with caution, with further periodic inspections off-site. Remedial measures will again be taken as appropriate.

The key to this approach is that all staff is constantly vigilant for even mild odours produced on-site and will take actions to deal with those odours well before they become evident off-site.

A windsock and flag is installed on the site. This provides a strong visual reminder to site staff of existing wind conditions, such that they can make judgments as to the potential for off-site odours, given that day's planned activities.

No odour monitoring program is of much value unless there is a companion program to control those same odours, once they are detected. What follows is a stepped program, capable of dealing effectively with everything from the mildest odours to the most offensive. It should be noted that all of the measures described below can and are just as likely to be applied to only sections of a site, rather than to the entire site. The source of odour problems can commonly be quite localized.

(2) Prevention

The best odour control strategy is odour prevention. If experienced staff early in the process makes the correct, preventative decisions, odour will not be an issue. Although mild odours are experienced on-site from time to time, they are mild in nature and should not be noticeable off-site.

A perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends below the water table. This drainage system has significantly reduced, if not eliminated, the potential for off-site migration of LFG.

Monitoring of methane gas at the landfill site is performed on three occasions per year generally during the spring, summer and late fall or winter. Results of the monitoring programs and interpretation of the data are presented in Section 8 of this report.

A leachate pumping station has been constructed in the southeast corner of the landfill site and a forcemain connection to the municipal sewage treatment plant commenced in 2007. Presently, the disposal method of choice for leachate generated by the WCC Navan Facility is treatment at the Robert O. Pickard Environmental Centre, a waste water treatment plant. The use of leachate retention ponds has been discontinued. This eliminates the possibility of odours emanating from on-site treatment and leachate retention ponds.

As discussed an interim LFG odour control system was installed in 2011 and commissioned in April 2012. The purpose of the interim LFG odour control system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells. A horizontal landfill gas collection system was added in 2020 in the north-west corner of Phase 1.

(3) Masking the Odour

Principally, these additional measures will consist of using physical, biological and/or chemical methods to mask the odours on the surface of the odour source, so that none of the odours contained within are released to the environment. A number of proven masking techniques are available and can be used at the discretion of the site manager:

- Physically covering the surface of the odour source with a 15 centimetre layer of bulking material is often enough to block the release of most odours for a period of a day or more while remedial work is done;

- A number of biological inoculants are available commercially. These substances, when applied to the surface in a water solution, are felt to effectively reinforce aggressive aerobic activity on the surface by out competing any anaerobic colonies that may be present in the near surface area. In effect, this creates a bio-filter, and biologically processes anaerobic gases as they are released; and/or

- A number of chemical/nutrient mixtures are also available commercially. These substances, when applied to the odour source in much the same manner used with the biological inoculants, can have a very similar or even stronger effect. Manufacturers of these products claim that their compounds rapidly stimulate the growth of one desirable family of microorganisms or another, again to create a bio-filter effect.

Whatever the actual mechanism, these products have been proven effective in the field. In all cases, odour control strategies used at this level can be applied within minutes of the decision to use them, and the effects will be largely felt within 10-15 minutes of that application, if not sooner.

(4) Isolating an Odour Source

The last strategy will consist of using additional measures to isolate and neutralize the offending odour source material. The offensive material may be removed from the problem area, landfilled and covered immediately. This isolation strategy will be used at the discretion of the site manager.

(j) Contingency for winter operations

The following contingency factors have been implemented in the event that very cold conditions cause operating problems:

- Snow removal equipment

A variety of equipment is available for snow removal. Two CAT 950 loaders are mainly used for this purpose. A John Deere and a CAT backhoe along with a one ton truck equipped with snow ploughing equipment are also used. A Kubota utility vehicle equipped with snow blowing equipment is available to assist with snow removal along walkways and vehicle restricted areas.

- Cover material stockpiles

Impacted soil reserved for re-use as daily cover material has been stockpiled in certain areas of the landfill. In case of frost, an excavator equipped with ripping tooth is available for ripping through the frost line. The excavator and 6-wheel drive articulated dump trucks are used to move and stockpile cover as a contingency.

(k) Complaints Procedure

In the event that an odour complaint is received, either by the City of Ottawa or the MECP, it is expected that those parties will immediately contact WCC site staff and notify them of the problem. WCC staff will take immediate steps to determine the extent of the problem and whether or not it is caused by the facility. If the source of the complaint is deemed to be originating from the WCC Navan Facility, appropriate measures as described above will be taken to mitigate the problem. Again, all such measures taken will be documented and a record kept on-site. If the identity of the complainant is made known to WCC staff, staff will contact the complainant that day, listen to their description of the problem, advise them in detail of the measures taken to rectify the problem, and invite them to visit the facility at some point to see for themselves how the site is operated. WCC will also call them back in a week's time to determine whether or not they have been aware of any other site related issues.

WCC staff has found in the past that this kind of immediate and personal attention goes a long way to building community support for a facility and builds community confidence in the management of the site.

The site maintains a log to record the date and time of any complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. A summary of complaints received in 2020 is provided as Schedule 'A' in Appendix '4'. In 2020, WCC personnel received 3 odour related complaints on 3 separate days. No other complaints were received by site personnel in 2020.

(l) Record Keeping

Record keeping is in accordance with the requirements of the ECA and as described in the D&O (Golder, 2008) as follows:

Site inspection records and daily waste records are retained at the site for a minimum period of two years. The records include the following information:

a. Type and estimated amount of waste received at the site for landfilling and processing;
b. Area of the site in which landfilling operations are taking place;
c. Type, source and amount of daily and intermediate cover used;
d. Waste types and quantities of recyclable wastes received at the site;
e. Source of their generation (e.g. customer);
f. Waste types and quantities of recyclable wastes transferred off the site;
g. Destination of recyclable wastes transferred off the site;
h. White goods tag numbers tagged at the site;
i. Types of wastes and quantity transferred from the processing area into the landfill area;
j. The calculated total quantity (including volume or weight) of waste remaining on-site at the end of each day;
k. Records of any dust suppression activities undertaken at the site;
l. Maintenance and repairs performed on the equipment used at the site;
m. Records of complaints received and actions taken to resolve them;
n. Summary of emergency situations and actions taken to address them; and
o. Any environmental and operational problems and any mitigative actions taken.

3.2.9 Waste Acceptance and Placement

The mechanics of waste placement at the active disposal face are described as follows:

1. Procedures are in place at the site to pre-screen all special waste materials prior to arrival at the site. Generators/haulers are required to provide information related to the type of waste to be delivered at the site and complete and sign a Special Waste Profile form (SWP) which is screened prior to approval by WCC staff. Once approved, an SWP number is provided and must be presented at the scale prior to entry to the site.

2. The gate clerk registers all vehicles entering the site at the weigh scale. Vehicles are weighed and directed to the active disposal face. Light vehicles are diverted to an unloading area near the entrance to the site and do not enter the working area of the landfill. Appropriate signs are posted to indicate clearly where vehicles are to unload.

3. Vehicles reach the active face via a well-maintained gravel surfaced access road. On arrival, they wait until a ground worker screens the load and directs them to back into the active working face. The working face length is confined to as small an area as possible, but generally is wide enough so that 6 to 8 trucks can operate safely in the working face area at any one time. After dumping, the trucks move a distance of several metres from the active working face where they can be cleaned by the truck operator.

4. Waste is placed and compacted on the active working face using a "push down method" and/or a "push up method" to an average depth of approximately 60 cm.

5. A landfill D7 dozer is used to spread and level the waste as it is received. An 826 CAT compactor works on top of the refuse and compacts and shapes the waste into place. Between 3 and 5 passes with this equipment are made before the required density is obtained. Additional waste is spread evenly by repeated passes of the dozer and compactor to a total average lift depth of 2.5 to 3 metres.

6. Cover material is placed daily and as required. Generally, impacted soil hauled to the active face is used as cover material and spread into a minimum 15 cm thick layer. Areas not visited for an extended period of time are covered with a minimum of 25 cm of interim cover material.

7. All weigh tickets are kept on site along with daily and monthly summaries which are available for review. All rejected waste loads are reported to the Ministry of the Environment, Conservation and Parks (MECP) district office in Ottawa and a record of the report is kept on site.

8. Asbestos waste is landfilled in accordance with Section 17 of Ont. Reg. 347. These procedures consist of the following:

    a. Personnel involved in the disposal of asbestos are trained to recognize the related hazards.
    b. Asbestos is accepted only in containers/bags and not in a loose form. Care is taken to ensure that staff and equipment do not come into contact with the asbestos.
    c. Asbestos is accepted only with 24 hour pre-notification.
    d. Personal protective equipment including disposable coveralls, head covers and respirators are available for the handling of special wastes.

e. Prior to the arrival of asbestos on-site, a trench is excavated to receive the material.
f. Other operations in the immediate vicinity of the trench are temporarily suspended while the containers are emptied in the trench.
g. The trench is immediately covered over with at least 1.25 metres of waste or cover soil.

9. Refrigerant containing appliances are received and handled in accordance with the following procedures:

   a. When refrigerant containing appliances are identified in the waste load, the client will be notified and given the opportunity to reclaim the unit(s) and remove it from the site and a rejected waste form shall be completed by scale personnel if the unit is reclaimed for removal;

   b. Should the client/driver not reclaim the refrigerant containing unit(s), scale personnel shall be notified immediately and the unit(s) shall be recorded on the weigh ticket and the unit(s) shall be removed by landfill and recycling personnel and taken to a designated area on the recycling pad taking all necessary precautions not to damage the refrigerant containing unit;

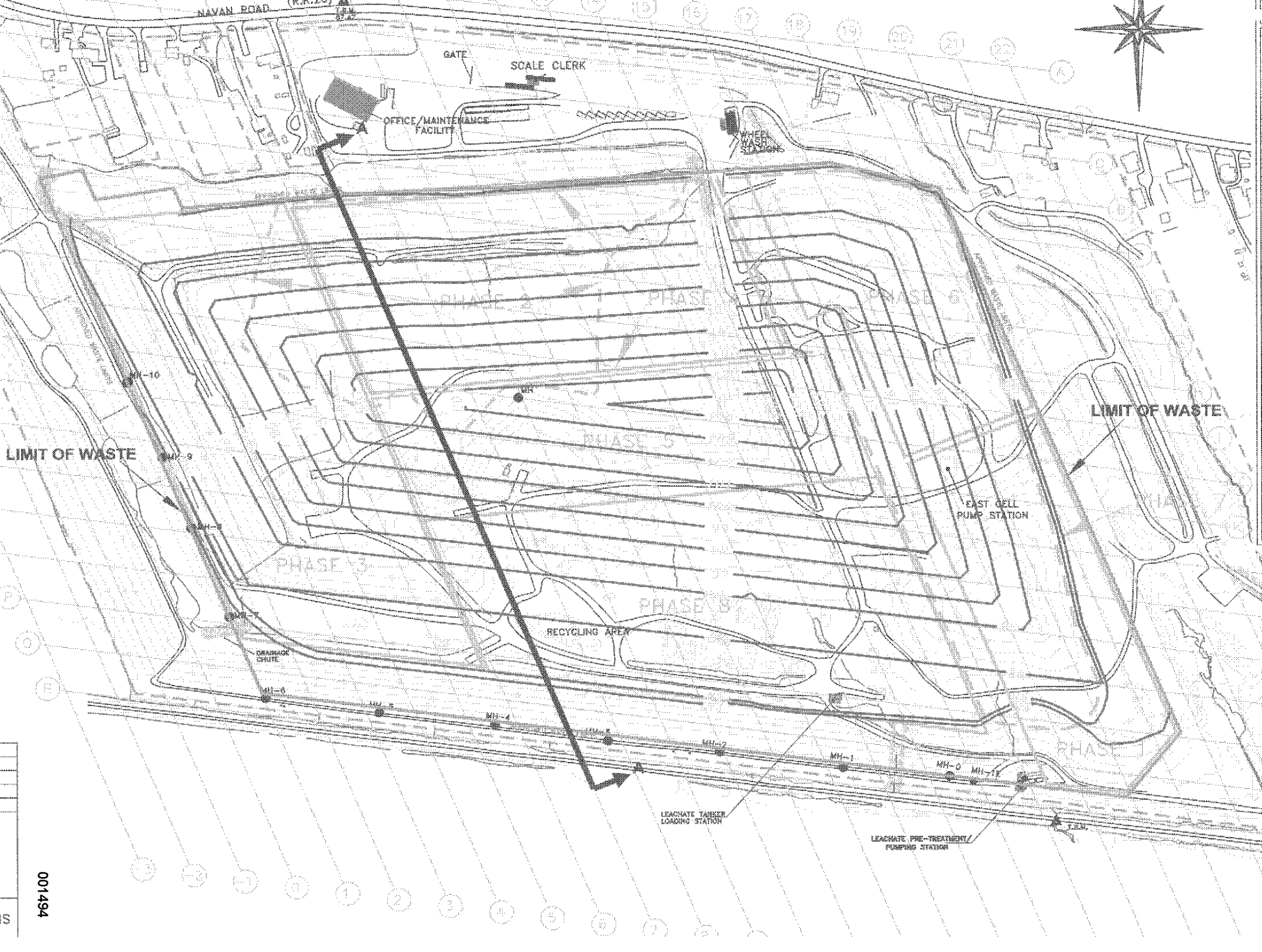
   c. Every effort shall be taken by personnel to store the refrigerant containing unit in the designated area on the recycling pad in an orderly manner that is accessible to the refrigerant removal technician and in an up-right position or, if not possible due to damage, in a manner to prevent damage to the refrigerant containing unit.

   d. Once a sufficient number of units have been stored for removal of refrigerants, or once quarterly, a certified technician shall be retained to safely remove all refrigerants and certify them as completed and a record of the certification shall be kept on file;

   e. Once the unit has been certified it shall be available for removal as scrap metal;

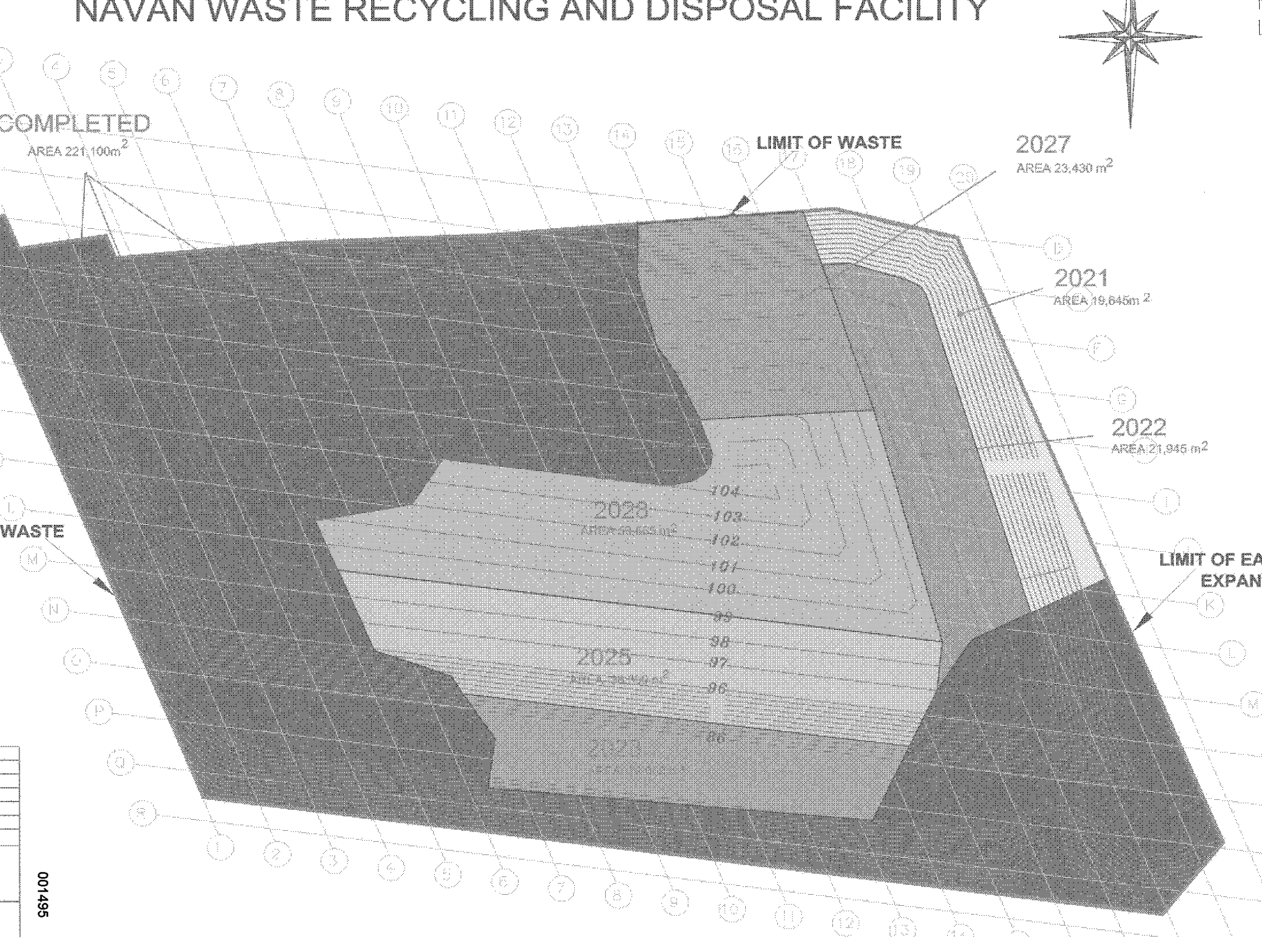
   f. The procedures noted above shall apply for all units received at the site that do not contain a refrigerant removal certificate, including those claimed to no longer contain refrigerant materials.

No waste is accepted, deposited or removed from the site unless the site supervisory personnel is present.


NAVAN ROAD (R.R.126)
GATE
SCALE CLERK
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
PHASE 2
PHASE 3
PHASE 4
PHASE 5
PHASE 6
PHASE 7
PHASE 8
MH-10
MH-9
MH-8
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-1R
MH
LIMIT OF WASTE
LIMIT OF WASTE
EAST CELL PUMP STATION
RECYCLING AREA
DRAINAGE CHUTE
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT/ PUMPING STATION
T.R.N.

001494

NAVAN WASTE RECYCLING AND DISPOSAL FACILITY



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4. WASTE QUANTITIES AND CHARACTERISTICS

Major private haulers as well as small haulers serving all segments of the Ottawa community, Eastern Ontario and the Outaouais are served by the Navan Waste Recycling and Disposal Facility. Materials processed at the site in 2020 consisted mainly of contaminated soils, construction and demolition waste, IC&I waste including asbestos waste as well as general dry waste and recyclable materials. Materials received at the site for re-use included brick, rubble and small concrete as aggregate, asphalt, granular materials and clean roofing shingles for road/pad construction material. Impacted non-hazardous soils were also received for re-use as cover material or treated for re-use outside the designated air space in accordance with approvals received for the site. Materials such as metals, wood, glass, drywall, cardboard, white goods, tires and electronics were also recycled and removed from the site.

All materials received at the site are weighed upon arrival on one of two scales located at the entrance to the facility. During 2020 a total of 410,135 tonnes of waste and other materials were received at the site of which 224,497 tonnes were landfilled. The total tonnage and number of loads are summarized in Table 4.1 below.

Table 4.1: WCC Material Tonnage, Jan.1 – Dec. 31, 2020

	Tonnage	No. of Loads
Total:	410,135	58,501
Total Landfilled:	224,497	N/A
Total Reused/recycled:	185,638	N/A
Monthly Average:	34,178	4,875
Daily Average:	1,319	188.1

The above material tonnage received in 2020 includes waste landfilled, recycled waste materials, treated contaminated soils, rejected waste removed from the site and other materials received for re-use at the site.

The material distribution is as follows:

- Tonnage landfilled totalled 224,497 tonnes (54.74%) and included IC&I waste, C&D waste and other materials that were received and directed to the active working face for landfilling;
- Recyclable materials such as cardboard, tires, glass, drywall, e-waste, wood, metals and white goods taken off-site to market totalled 6,017 tonnes (1.47%);

- Waste materials rejected and removed from the site by WCC for alternative disposal at a licensed facility totalled an estimated 36 tonnes (0.01%).

- Special materials such as storm sewer screenings and impacted non-hazardous soil received at the site for re-use as cover material totalled 110,000 tonnes (26.82%).

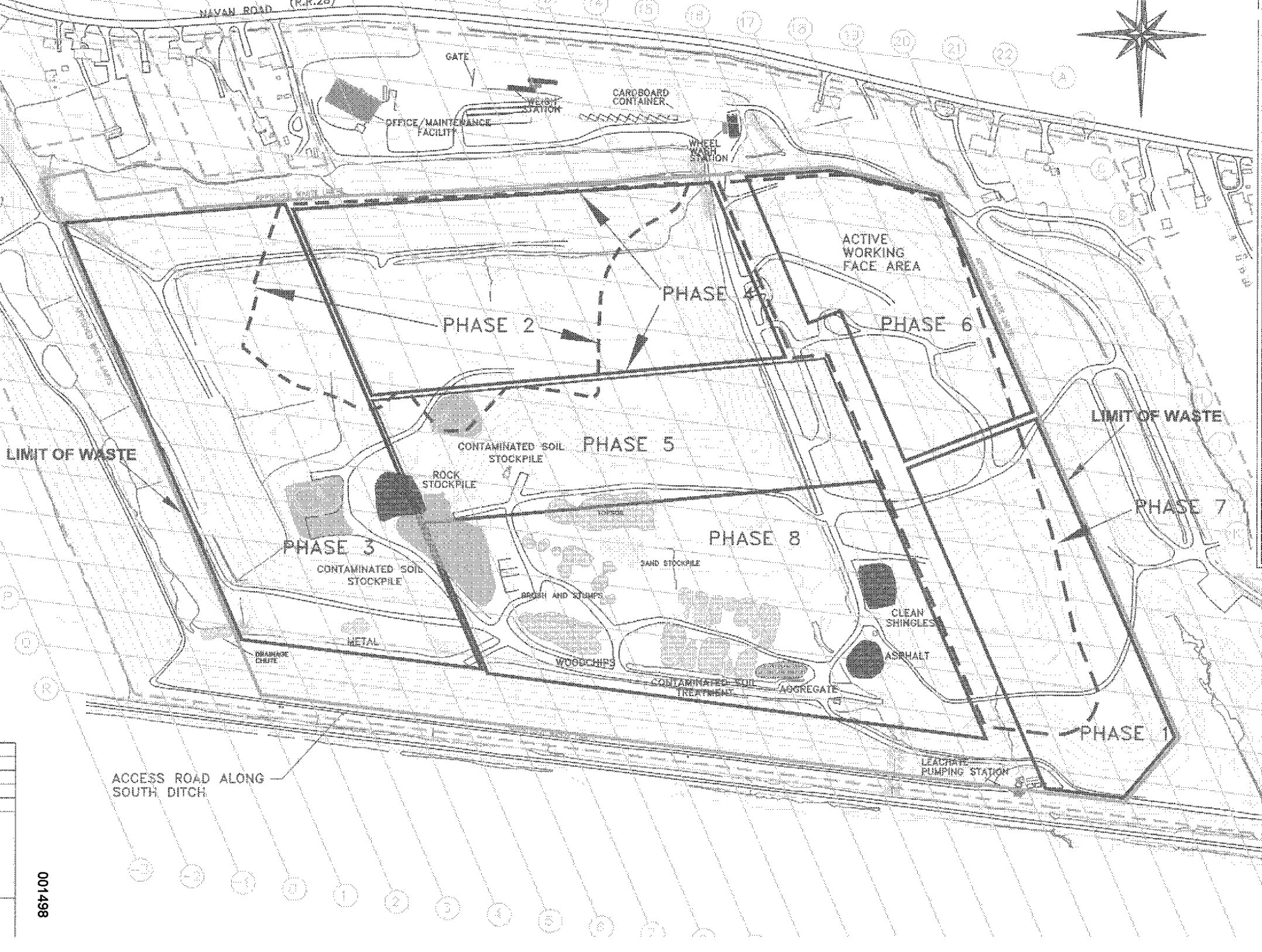
- Impacted soils treated or re-used on site totalled 35,881 tonnes (8.75%).

- Rock, brick, concrete, aggregate, shingles and rubble received and re-used on site as aggregate totalled 25,788 tonnes (6.29%); and

- Clean fill, topsoil and asphalt re-used on site for final grading, road/pad construction and engineered fill totalled 7,916 tonnes (1.93%).

Additional materials were recovered from cell development such as soil, concrete, boulders, stumps and metals and re-used on site or recycled. These materials however, were already on site and were not part of the inbound receipts.

All weigh tickets are kept on site along with daily and monthly summaries which are available for review. All rejected waste loads are reported to the MECP district office in Ottawa and a record of the report is kept on site. A monthly summary of material tonnage received in 2020 is provided as Schedule 'B' in Appendix '4'. The location of materials stockpiled on site is shown on Figure 4.1.


NAVAN ROAD (R.R.28)
GATE
WEIGHT STATION
CARDBOARD CONTAINER
OFFICE / MAINTENANCE FACILITY
WHEEL WASH STATION
ACTIVE WORKING FACE AREA
PHASE 4
PHASE 2
PHASE 6
LIMIT OF WASTE
CONTAMINATED SOIL STOCKPILE
PHASE 5
ROCK STOCKPILE
LIMIT OF WASTE
PHASE 7
PHASE 3
CONTAMINATED SOIL STOCKPILE
PHASE 8
SAND STOCKPILE
BRUSH AND STUMPS
CLEAN SHINGLES
METAL
DRAINAGE CHUTE
WOODCHIPS
ASPHALT
CONTAMINATED SOIL TREATMENT
AGGREGATE
PHASE 1
LEACHATE PUMPING STATION
ACCESS ROAD ALONG SOUTH DITCH

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5. SITE CAPACITY AND LIFE EXPECTANCY

The capacity of the site is a measure of the amount of compacted waste that can be incorporated into the site in a series of lifts in accordance with the approved top of waste elevation contours as shown on Figure 3.1. The total site capacity includes the total volume of daily cover material used for lift and cell construction. The estimate of air space remaining does not include the final cover materials that WCC will place once the waste pile has reached the approved fill height.

Some of the factors that continue to influence the estimated life remaining at the Navan Waste Recycling and Disposal facility are as follows:

- Volume of waste permitted by the approved top of waste elevation contours;
- Annual and daily material tonnage received at the facility for landfilling;
- Characteristics (bulk density) of the waste materials being landfilled;
- Compaction energy provided during the placing of the waste;
- Volumetric cover to waste ratio;
- The degree of cell development optimisation;
- Operational factors such as recycled waste removed from the site and the exclusion of bulky, non-compactable materials that cannot be readily incorporated into the working face;
- The re-use of waste materials received as an alternative construction material for roads and unloading pads;
- The treatment of contaminated soils;
- The removal and re-use of rock and concrete from waste;
- The volume of loose non-compactable asbestos waste received at the site and cover material required to properly dispose of asbestos waste;
- Water infiltration and rate of biodegradation of the waste; and
- Settlement/consolidation of the waste pile and underlying soft clay soils.

Factors affecting the remaining life of a site are many and varied and in fact, some will change daily. Therefore, such calculations will only provide a theoretical approximation of the expected life remaining. A factor which appears to be changing year over year is the bulk density of waste landfilled. Increased recycling efforts at the source with the diversion of heavy materials such as concrete, rock, brick and rubble along with increased efforts to recycle and divert materials from landfill impact on the bulk density of the waste placed within the air space used. Other factors that affect the in-place density is the volume of impacted soils landfilled, the volume of daily cover used and the volume of impacted soils treated rather than landfilled as a waste material and the volume of bulky asbestos waste that cannot be effectively compacted following burial of this waste.

Information related to site life expectancy is important for the proper management of landfill operations. Daily records of waste landfilled or stored at the site are therefore necessary.

5.1 *Estimate of Air Space Used (ASU) - 2020*

A simplistic approach to the calculation of air space used (ASU) is based on assigning assumed in-place compacted densities to the various types of waste materials landfilled as described below:

- 2.0 tonnes/m^3 for cover soil material;
- 0.9 tonnes/m^3 for IC&I, C&D, and general waste materials;
- 0.9 tonnes/m^3 for excavated waste materials;
- 1.2 tonnes/m^3 for roofing materials
- 1.5 tonnes/m^3 for Special Waste Materials (Industrial Waste, Screenings, etc.)
- 0.4 tonnes/m^3 for asbestos waste
- 0.4 tonnes/m^3 for wood waste; and
- 2.0 tonnes/m^3 for materials that are re-usable such as soil, concrete, brick and masonry.

Based on the assumed waste density distribution indicated above, the air space used by waste received, cover material and re-used materials placed within the air space during 2020 as presented in Table 5.1 is estimated at approximately 267,759 m^3 and excludes materials diverted off site for recycling and some materials re-used outside the air space. Based on this approach, the weighted average of the in-place density for all of the materials used in the air space calculation for 2020 is estimated to be 1.20 tonnes/m^3.

Table 5.1: ESTIMATED AIR SPACE USED (ASU), Jan.1 – Dec. 31, 2020

Material	Tonnage	Average Assumed Density, (tonnes/m^3)	Estimated Volume (m^3)
Waste Materials Landfilled	158,809	0.9	176,454.4
Special Waste Material	21,692	1.5	14,461.3
Asbestos Waste	2,587	0.4	6,466.5
Daily Cover Soils	113,065	2.0	56,532.3
Re-use materials (aggregates, asphalt)	20,737	2.0	10,368.5
Shingles used for sub base on road/turn areas	4,171	1.2	3,476
Estimated Air Space Used	321,061	1.20	267,759

Golder Associates Ltd. estimated the air space used by measuring the volumetric changes from topographic mapping generated from aerial photography obtained on April 28th 2020 and the previous year on April 30th 2019. The net estimated air space used (ASU) between the last two aerial survey dates was reported to be 308,130 m^3 resulting in air space remaining of 1,816,529 m^3. Records indicate that the ASU during that period of time was consumed by approximately 338,399 tonnes of waste, daily cover material and other materials resulting in a density calculation of 1.10 tonnes/m^3 for a 5 year average of 1.43 tonnes/m^3. The variance between the assumed density calculations could be attributed to many factors including optimization of cell excavation, settlement of the underlying soft clay soils and surcharge loading of the waste pile which influence the year over year volume calculations.

Active landfilling of waste materials and daily cover throughout 2020 was carried out in the east cell or area outlined as Phase 6 (refer to Figure 2.4). Of the 188,436 tonnes of impacted soils received in 2020, a total 35,881 tonnes were treated and re-used in the east buffer or re-used on site. A total of 113,065 tonnes of impacted soils were re-used as daily and interim cover and as cover over asbestos waste in accordance with O. Reg. 347 (17). A balance of 23,045 tonnes received in 2020 was added to the soil stockpiled on site for re-use as cover material and located in the southeast corner of Phase 3 as shown on Figure 4.1.

The remaining air space volume of the landfill (as of the latest Aerial Survey dated April 28th, 2020) was estimated by Golder Associates Limited to be 1,816,529 m^3. Golder Associates Limited estimated the remaining life of the landfill as of December 31st, 2020 to be 6.6 years based on the remaining air space calculated, a projected airspace of 222,846 m^3 to be consumed between the last survey date and December 31st, 2020, remaining air space of 1,593,683 m^3 as of December 31st, 2020, a 5 year average density of 1.43 tonnes/m^3 and projected future annual waste receipts and daily cover soils of 344,750 tonnes/yr.

The actual tonnage landfilled and re-used within the air space between May 1st and December 31st, 2020 was 228,251 tonnes as shown in Table 5.2 consuming an estimated volume of 191,776 m^3 based on assumed waste type densities shown yielding an estimated overall density of 1.19 tonnes/m^3 and remaining air space of 1,624,753 m^3 as of December 31st, 2020. Allowing for future waste receipts and

cover soils of 344,750 tonnes/year consuming 289,706 m^3/year at a density of 1.19 tonnes/m^3, the estimated life remaining would be 5.6 years.

Table 5.2: **ESTIMATED AIR SPACE USED (ASU)**, May 1 – Dec. 31, 2020

Material	Tonnage	Average Assumed Density, (tonnes/m^3)	Estimated Volume (m^3)
Waste Materials Landfilled	114,544	0.9	127,271.1
Special Waste Material	16,540	1.5	11,026.4
Asbestos Waste	1773	0.4	4,433.6
Daily Cover Soils	74,127	2.0	37,063.3
Re-use materials (aggregates, asphalt)	17,220	2.0	8609.8
Shingles used for sub base on road/turn areas	4,047	1.2	3,372.1
Estimated Air Space Used	228,251	1.19	191,776.3

As of January 1st, 2021 the life expectancy remaining for the Navan Waste Recycling and Disposal Facility under the present Environmental Compliance Approval is estimated to be 5.6 years (2026) to 6.6 years (2027) based on future projected annual waste receipts and cover soils of 344,750 tonnes/yr and a waste density varying from 1.19 to 1.43 tonnes/m^3 as discussed above. As indicated, the actual life of the landfill will vary significantly based on in-place waste densities and waste mix, but also on annual waste tonnage receipts, the amount of waste diversion and recycling initiatives at the landfill and settlement of the underlying soft clays.

5.2 *Financial Assurance*

In compliance with Condition 15 of the Environmental Compliance Approval #A460702, Financial Assurance for the site is currently in place with the MECP in the form of a Surety Bond in the amount of $13,566,246.00. Amendment Notice 11 to the ECA A460702 dated June 19th, 2018 requires that Financial Assurance be reviewed at intervals of three (3) years commencing on March 31, 2021 (Condition 15(b)); that commencing on March 31st, 2019 the owner shall prepare and maintain at the Site an updated re-evaluation of the amount of Financial Assurance required to implement the actions required under Condition 15(a) for each of the intervening years in which a re-evaluation is not required to be submitted to the Director under Condition 15(b). A Financial Assurance re-evaluation will be required this year for submission to the MECP by March 31st, 2021.

6. ENVIRONMENTAL CONTROLS

6.1 *Overview*

The key components of the environmental controls at the site are as follows:

a) Surface Water Controls:

- Ditches have been constructed to divert external flows around the landfill. These consist of north, west, and east diversion ditches, including a 237 m large diameter drainage culvert at the northwest corner of the site;
- Drainage water generated within the landfill that does not come into contact with waste is diverted to the perimeter ditches. Surface runoff water is directed from the top of the landfill down drainage chutes lined with erosion protection;
- The east diversion ditch was constructed as a fish habitat and was commissioned in late 2009 following the South Nation Conservation Authority approval;
- A pond exists in the southeast corner of the site which serves as a storm water retention pond. The north and east parts of the site drain to this pond prior to discharge to the east diversion ditch;
- A pond exists in the northwest corner of the site which serves as a storm water retention pond. The northwest and west parts of the site drain to this pond prior to discharge to the north diversion ditch.

b) Leachate Controls:

- The landfill is underlain with native low permeability clay soil (i.e. a natural liner);
- A perimeter leachate collection system has been constructed along the west and south perimeter of the waste pile;
- A leachate underdrain and collection system has been constructed below the waste in the north 1/3 of Phase 3; below the waste in the east part of Phase 8; below the waste in Phase 4; below the waste in the east half of Phase 5; below the waste in Phase 1; and below the waste in Phase 6;
- The landfill will be covered with low permeability final cover material to reduce water infiltration. Final cover has been completed in parts of the landfill as shown on Figure 3.2.

c) Landfill Gas Controls:

- Riser pipes for the leachate collection system along the north, east and west perimeters of the waste pile have been capped and the interim landfill gas odour control system consisting of a landfill gas collection and flaring system was approved by the TSSA and commissioned in April of 2012. This system has since been in operation on a continuous basis;

- The landfill gas collection system was extended to the top of Phase 3 below the final clay cover in late 2014 as well as a connection to the central MH to control odours generated from these areas. Additional horizontal gas collectors were added to this system in 2016 and 2017 and 2020. In 2017, 5 vertical wells were added in the Phase 3 area and 2 vertical wells were added in the south east corner of the Phase 1 area. In 2019, 4 vertical wells were added in the Phase 4 area of the waste footprint.

- The leachate collection system and maintenance holes along the west and south waste boundaries serve as a passive venting system.

- In 2017, a misting system comprising of a 300 m perforated HDPE line and blower powered by a diesel generator was constructed on the west side of the main access road that runs along Grid Line 14 as an added odour control system.

Environmental control systems for surface water, groundwater, leachate control, and erosion control systems are discussed in greater detail in the Design & Operations Report (Golder 2008). For the purpose of this report, a summary of the systems presently in use and/or proposed is provided in the following sub-sections. Surface water, groundwater, leachate and landfill gas monitoring undertaken by Golder Associates Ltd. are discussed in Sections 7 and 8 of this report.

6.2 *Surface Water Management*

The overall objectives for surface water management at the site are as follows:

- Divert surface run-off and shallow ground water flows originating upstream of the site around the outside perimeter of the waste footprint;

- Maintain the pre-development drainage conditions and water balance to each watershed;

- Minimize the amount of surface water that comes into contact with waste (which must then be managed as leachate); and

- Maximize the removal of suspended sediment from surface water generated on site prior to its release to the downstream drainage systems.

The regional surface water setting of the landfill is discussed in Section 2.7 and existing surface water control features are shown on Figure 6.1. Existing controls can be summarized as follows:

a) Upstream flows originate from the north and northwest of the site. These flows are diverted around the landfill via ditches located along the perimeters of the site buffer zones.

b) A diversion ditch has been constructed in the north buffer of the landfill flowing east from the office/maintenance facility. A large diameter culvert was added in 2019 at the northwest corner of the waste footprint. This northern diversion ditch and culvert discharges into the east perimeter ditch. The east perimeter ditch conveys water southward into a storm water retention pond located at the southeast corner of the site. This pond discharges into an existing ditch along the landfill's south property line. The southern ditch drains under the VIA ROW near Grid Lines R-16 and flows onto WCC property and to the Mer Bleue drainage basin.

c) A diversion ditch has been constructed in the north buffer area flowing west from the office/maintenance facility. This ditch discharges into a natural drainage channel, referred to as the west perimeter ditch, flowing southward along the west perimeter of the property east of Grid Line -2. This ditch discharges at a location near the intersection of Grid Lines R and -2 and conveys flows westward to the Mud Creek drainage basin. Land through which this ditch flows is subject to a proposed residential development.

d) Clay cover has been placed on the north, west and south facing slopes of the waste pile as well as the top of Phase 3, the north edge of Phase 4 and the south half of Phase 1 where final waste grades have been reached as shown on Figure 3.2. Finished slopes are covered with clay soil, a thin layer of topsoil, graded and seeded. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control.

e) Landfill operations are carried out such that surface water is directed away from the waste to minimize water infiltration.

Surface water monitoring is discussed in Section 7.

6.3 *Leachate Management*

Leachate is generated from a combination of infiltration of precipitation into the waste pile as well as surface water and groundwater discharge into the landfill despite efforts to divert water around the waste footprint. Generation of leachate is minimized by grading the waste surface and placing low permeability cover materials over areas of the landfill that have been filled with waste in efforts to reduce infiltration from precipitation and to promote surface runoff.

Leachate generated by the landfill is collected by a collection system consisting of four separate components that all drain to a leachate pumping station in the southeast corner of the site. Figure 6.2 presents the leachate collection system in plan view.

1. A perimeter leachate collection system has been constructed along the southern limit of the waste footprint extending from Grid line 15 to Grid Line 1 and then approximately 330 m north along the west perimeter of the waste footprint along Grid Line 1 to just north of Grid

Line K. The perimeter leachate collection system was designed with a slope varying between 0.4% and 0.6% to provide gravity drainage to a collection point at the southeast corner of the site. The waste in the north 1/3 area of Phase 3 (Northwest Cell) was placed on a drainage blanket that connects to the west perimeter leachate collection system. This system consists of a granular trench with a 250 mm diameter perforated HDPE (Boss 2000) drainage pipe. Along the southern perimeter, the leachate collection system has been constructed with lateral granular filled hydraulic connector trenches into the waste pile. Access to the western and southern leachate collection system is provided by a series of manholes spaced at approximately 100 m intervals for monitoring and maintenance purposes.

2. The north area of the site below Phase 4 was constructed with a grid-type drainage network within a stone drainage layer underlying the waste. The leachate collection system in this excavated cell consists of 200 mm diameter perforated HDPE (Boss 2000) drainage pipe surrounded by 50 mm clear stone and non-woven geotextile laid out in a grid pattern spaced no more than 45 m apart. A network of French drains, consisting of clear stone wrapped in non-woven geotextile, placed between the drainage pipes reduces the drainage path along the floor of the cell to approximately 15 m.

3. An underdrain leachate collection system has been constructed beneath the waste located between Grid Lines 14 and 16 and south of Grid Line N and just north of the pump station consisting of a stone drainage layer and perforated drainage piping similar to the system constructed in the Phase 4 area to the north. A clay berm was constructed along Grid Line N to separate the two leachate collection systems located on each side of Grid Line N.

4. A fourth component to the leachate collection system consists of the east lateral expansion cell (Phases 1 and 6) designed by Golder Associates Ltd. and approved by the MECP as an amendment to the ECA No. A460702 Notice 1 dated October 9th 2009. This system in Phase 1 was completed in 2015 with Phase 6 completed in 2019. QA/QC was carried out by Golder Associates Ltd. and as-built reports were prepared by Golder Associates for each of the completed cells and submitted to the MECP. A leachate sump and pump is located at the northwest corner of Phase 1 to drain leachate from both the Phase 1 and Phase 6 areas.

Presently, the disposal method of choice for leachate generated by the WCC Facility is pre-treatment using air stripping followed by direct discharge to the City sewer system via a WCC forcemain. The leachate pumping station located at the southeast corner of the landfill site and leachate forcemain connection to the municipal sewer system on Renaud Road were completed in 2007 and commissioned in early 2008. Pre-treatment of leachate to reduce the concentration of H_2S and Volatile Organic Carbons (VOCs) using an air stripping system is carried out prior to pumping leachate to the municipal system. In 2008, cleanouts were added along the leachate forcemain to provide easier access for cleaning and maintenance. In 2011, the leachate pre-treatment and pumping station was expanded with the addition of higher capacity treatment chambers and higher capacity pumps to maintain discharge flows at the approved 17L/sec. The forcemain discharging to the City of Ottawa sewer system was pressure washed on two separate occasions in 2020 to clean the line and maintain unobstructed flows.

In 2020, a total of 132,775 m^3 of pre-treated leachate was discharged to the City of Ottawa wastewater system, a 10.8 % reduction over 2019. The decrease is attributed to efforts to decrease surface water runoff into the waste. The monthly leachate volumes discharged are summarized in Table 6.1. The monthly and cumulative volumes of leachate pumped are shown graphically on Figures 6.3, 6.4 and 6.5. The peak month was April with a volume of 19,216 m^3. The daily average for the period of operation was 363.8 m^3/day.

Table 6.1: Summary of Leachate Volumes Discharged Off-Site in 2020

Month	Leachate Volumes (m^3) Discharged to City Sewer	Cumulative Leachate Volumes (m^3)
January	11,199	11,199
February	7,317	18,516
March	18,882	37,398
April	19,216	56,614
May	15,206	71,820
June	11,879	83,699
July	9,525	93,224
August	3,490	96,714
September	12,105	108,819
October	9,943	118,762
November	6,243	125,005
December	7,770	132,775
Total:	132,775	

Leachate monitoring is discussed in Section 7.

6.4 *Landfill Gas Management*

Landfill gas generation at the site is limited although its presence can be identified in the waste pile area by signs of dying vegetation and/or localized snow melt during the winter. Landfill gas is produced when organic waste decomposes. It consists primarily of methane (50%) and carbon dioxide (50%) as well as water vapour, nitrogen, and trace amounts of other non-methane organic compounds (NMOC). Non-putrescible waste received at the landfill does not generate landfill gas and methane at the same rate as municipal solid waste (MSW). Methane, which is explosive at concentrations greater than 5%, presents a health and safety risk both on-site and off-site. As a result, monitoring of landfill gas is carried out at the property boundary and within facilities located on site. In addition, passive gas ventilation systems and an active gas collection system at the site prevent the off-site migration of landfill gas.

The perimeter leachate collection system extends below the water table and prevents off-site migration of gas. Figure 6.2 provides details of the perimeter leachate collection system along the southern limit of the landfill.

As part of a commitment to control potential odorous emissions from the site, WCC has installed an interim landfill gas odour control system which will operate until the full-scale landfill gas collection system is installed at the site, which is expected in 2021. This interim odour control system, constructed within the existing landfill footprint, includes connections to leachate collection cleanouts, existing vertical landfill gas extraction wells, and to horizontal wells. This system also includes the installation of lateral and header piping, condensate management facilities, an outdoor skid-mounted abstraction plant, and a candlestick flare. During construction, leachate collection system cleanouts were excavated and the perforated pipe replaced with solid pipe and air tight connections. Tees were installed in the header pipe to allow for expansion of the system as required.

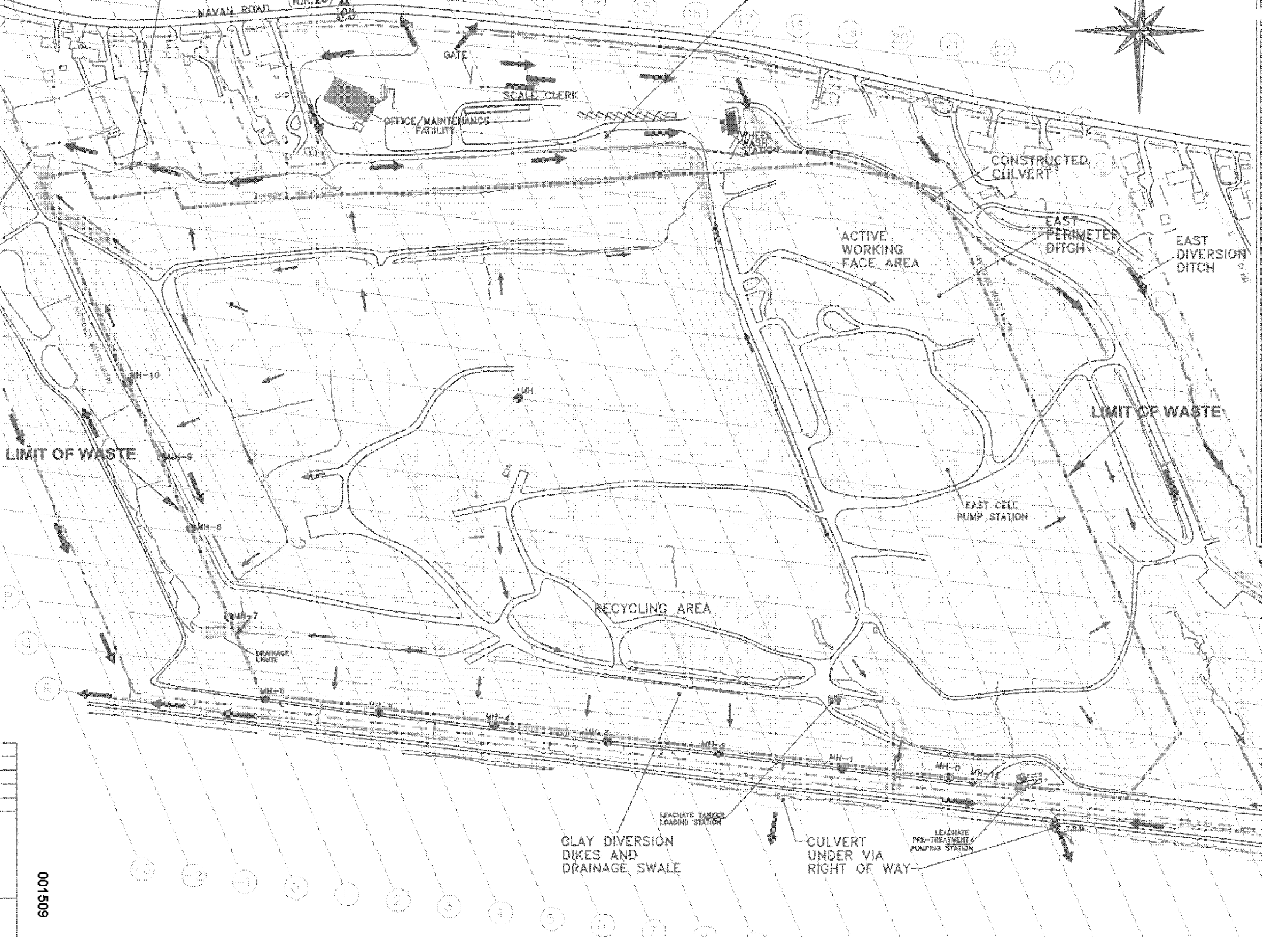
The interim landfill gas odour control system was installed in 2011 and commissioned in April of 2012. Additions to the LFG collection system which included horizontal and vertical wells were constructed in the fall of 2016, in late 2017, in 2019 and in 2020. In 2020 the LFG system operated for 8387 hrs at an average of 433.1scfm with a methane (CH4) concentration of approximately 45.7%, yielding a total of 2,820,777 m^3 of methane which was flared using the landfill gas flaring system. A 6.3% increase in methane recovery was recorded from 2019 to 2020.

A monitoring program associated with the odour control system has also been implemented. Design of the full-scale landfill gas collection and flaring system has been completed by Golder Associates Ltd. with a construction start in 2021.

Landfill Gas monitoring is discussed in Section 8.

6.5 *Buffer Zone*

The perimeter of the site is surrounded by a buffer zone which occupies an area of about 6.2 ha. In accordance with the ECA, a minimum buffer width of 30 m is maintained between the northern, eastern and western limits of the landfill area and the property boundary. A minimum buffer width of 10 m is maintained between the southern limit of the landfill area and a VIA Right-of-Way. WCC owns additional lands to the north, west and east of the landfill site as well as a 100m wide track of land south of the VIA ROW providing additional buffer space. No waste is deposited within the designated buffer zone. The limits of waste are illustrated on Figure 2.4.


NAVAN ROAD
GATE
SCALE CLERK
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
CONSTRUCTED CULVERT
ACTIVE WORKING FACE AREA
EAST PERIMETER DITCH
EAST DIVERSION DITCH
LIMIT OF WASTE
LIMIT OF WASTE
MH-10
MH-9
MH-8
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-1E
MH
MH
DRAINAGE CHUTE
RECYCLING AREA
EAST CELL PUMP STATION
LEACHATE TANKER LOADING STATION
CLAY DIVERSION DIKES AND DRAINAGE SWALE
CULVERT UNDER VIA RIGHT OF WAY
LEACHATE PRE-TREATMENT/ PUMPING STATION
T.B.M.

001509

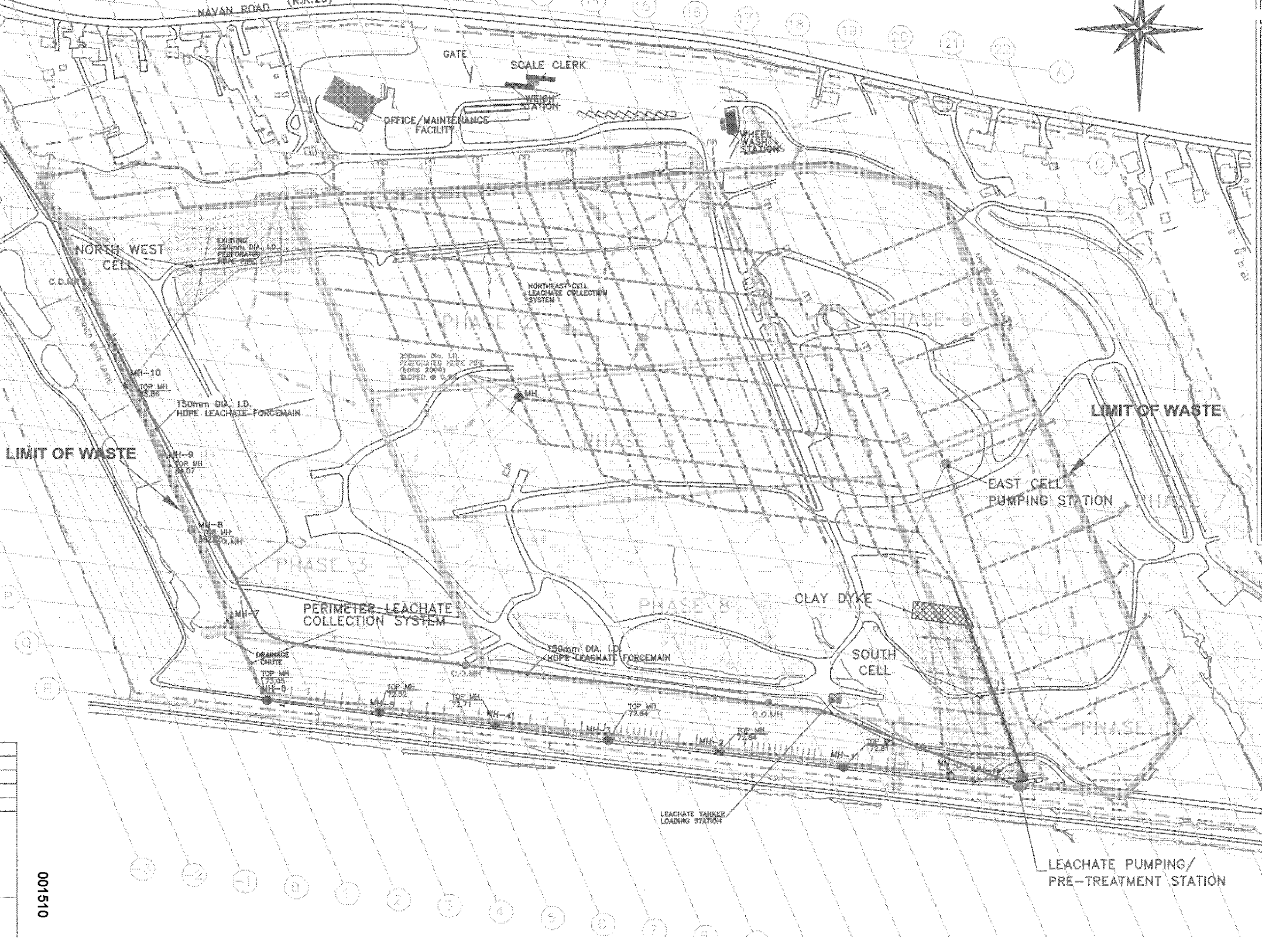

NAVAN ROAD (R.R.125)
GATE
SCALE CLERK
WEIGH STATION
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
NORTH WEST CELL
EXISTING 250mm DIA. I.D. PERFORATED HDPE PIPE
NORTHEAST CELL LEACHATE COLLECTION SYSTEM
MH-10
TOP MH 80.86
150mm DIA. I.D. HDPE LEACHATE FORCEMAIN
LIMIT OF WASTE
MH-9
TOP MH 80.67
MH-8
TOP MH 80.52
MH-7
PERIMETER LEACHATE COLLECTION SYSTEM
DRAINAGE CHUTE
TOP MH 75.05
MH-6
TOP MH 72.82
MH-5
TOP MH 72.71
MH-4
TOP MH 72.64
MH-3
TOP MH 72.54
MH-2
TOP MH 72.81
MH-1
LEACHATE TANKER LOADING STATION
CLAY DYKE
SOUTH CELL
EAST CELL PUMPING STATION
LIMIT OF WASTE
LEACHATE PUMPING/ PRE-TREATMENT STATION
PHASE 3
PHASE 2
PHASE 1
001510

Figure 6.3: Total Monthly Volume of Pre-treated Leachate Discharged to City of Ottawa Sewer

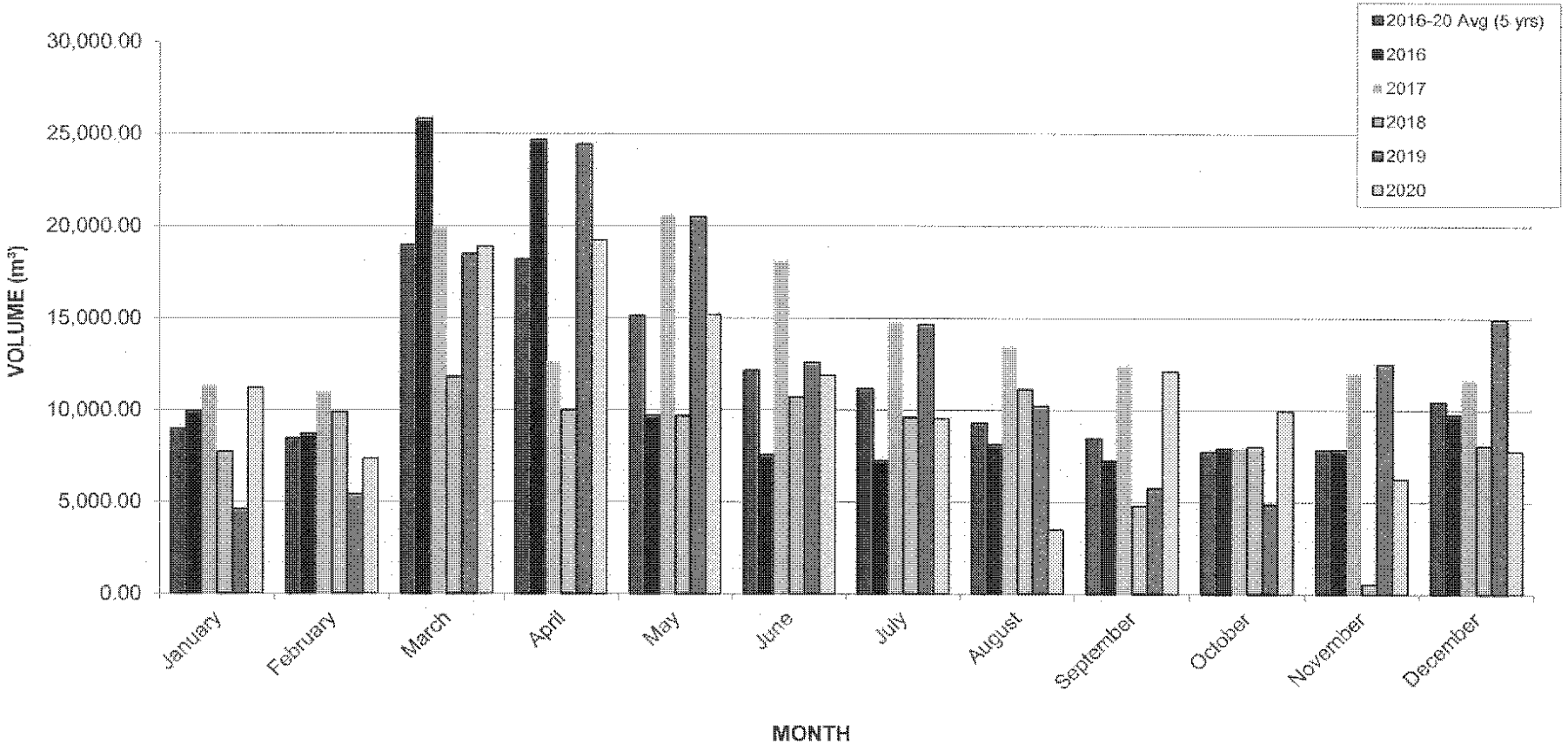


Figure 6.4: Cumulative Monthly Volume of Pre-treated Leachate Discharged to City of Ottawa Sewer

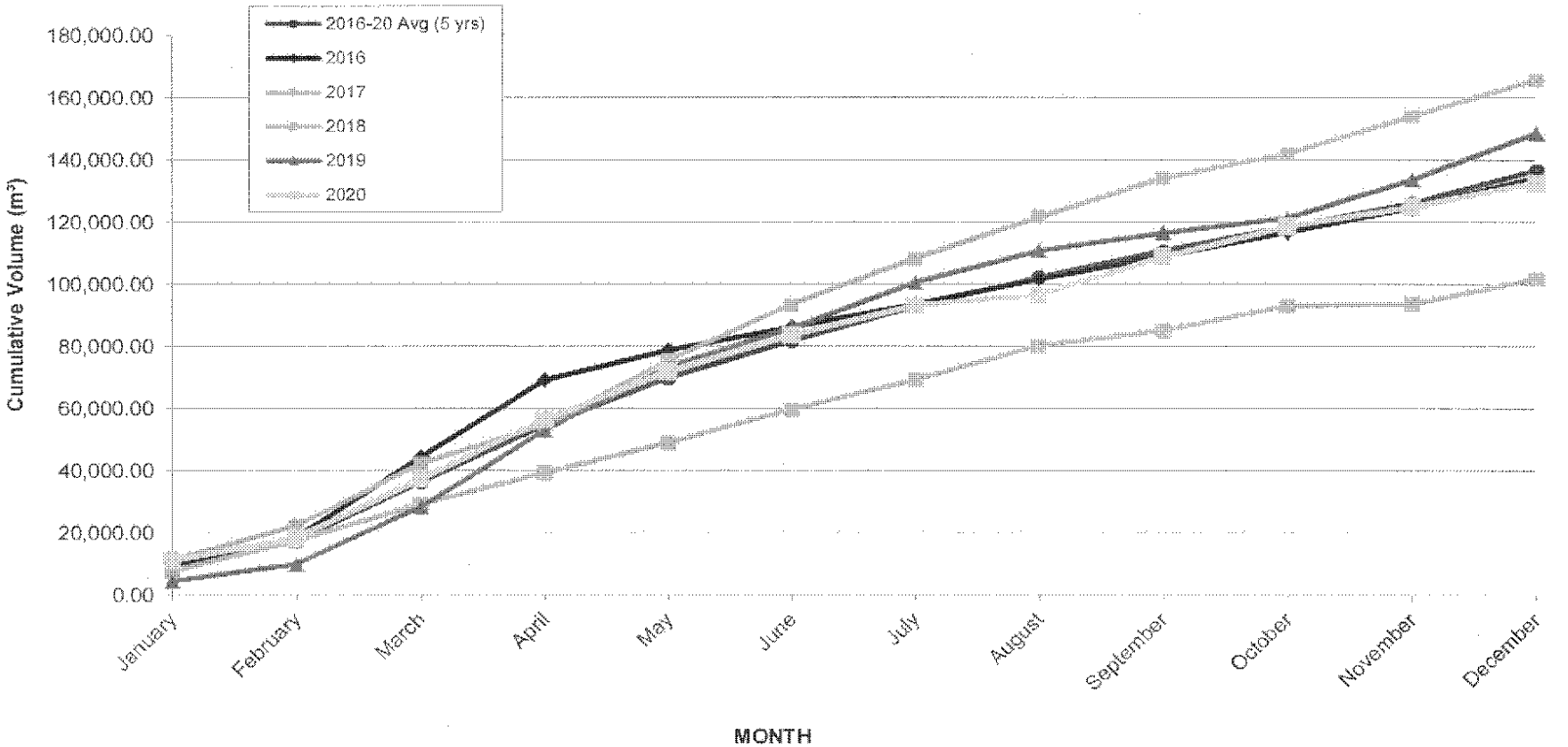
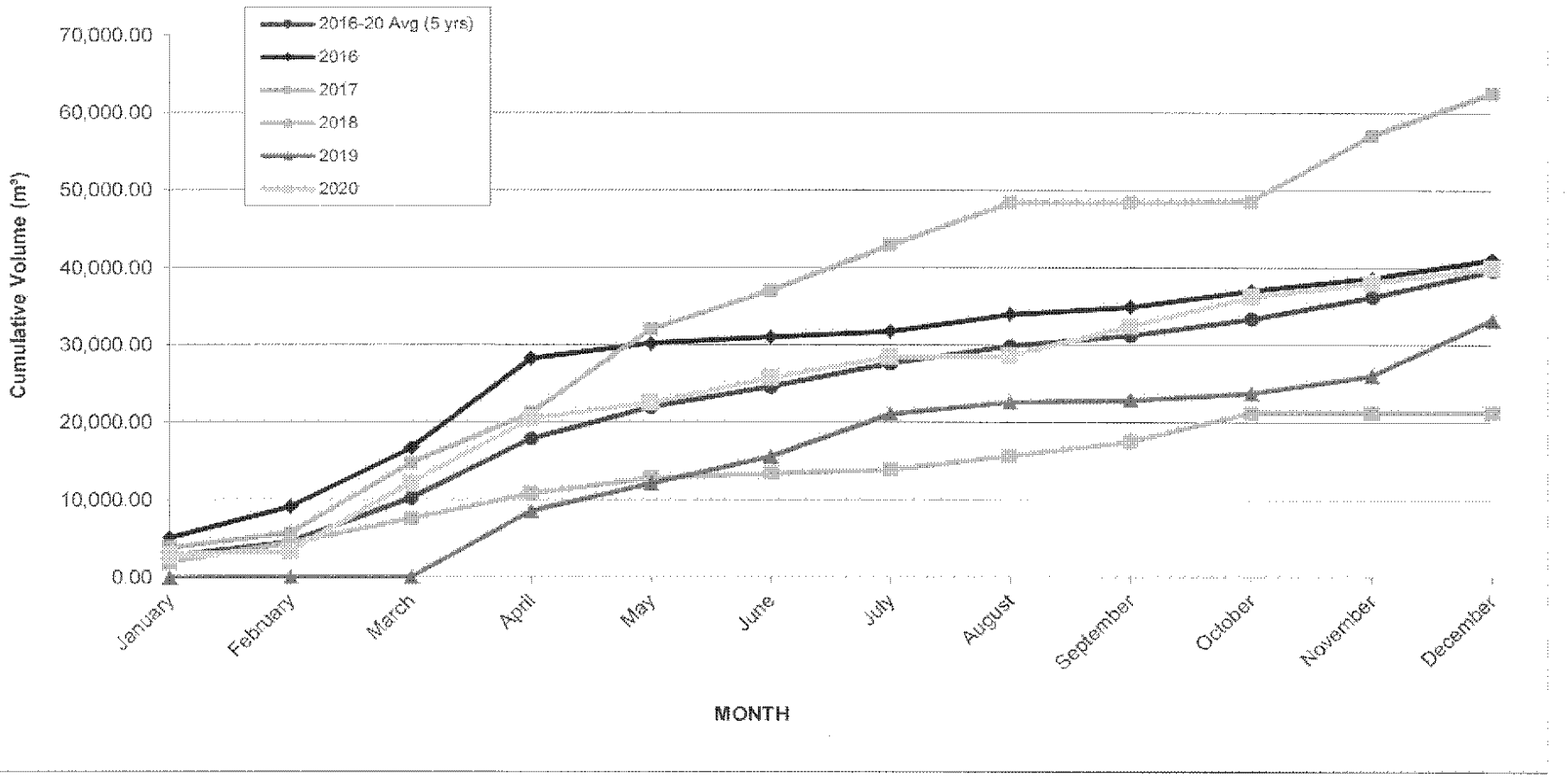


Figure 6.5: Cumulative Monthly Volume of Pre-treated Leachate From East Cell



7. WATER QUALITY MONITORING

Water quality monitoring undertaken to date at the Navan Waste Recycling and Disposal Facility consists of water quality analysis of surface water, groundwater, leachate and sediment. The location of water monitoring stations is shown on Figure 7.1. In 2020, Golder Associates Ltd. (GAL) was retained to carry out the annual water quality monitoring program and reporting requirements for the Navan Waste Recycling and Disposal Facility and prepare a report to fulfill the reporting requirements outlined in Conditions 135 and 136 of the Environmental Compliance Approval (ECA) No. A460702. The 2020 GAL report is attached in Appendix 1 and summarized below.

The following summary highlights key points only; for complete information and findings it is necessary for the reader to examine the GAL report provided in Appendix 1.

The monitoring program undertaken in 2020 was a continuation of the monitoring program carried out in 2019 and followed the program outlined in Conditions 109 and 112 of the ECA and Condition 10.1 of the Conditions of Environmental Assessment Approval. As per Condition 109, the monitoring program includes sampling of the monitoring wells located in BH09-1 in order to assess the groundwater quality in the Mer Bleue Bog. The original monitoring program indicated the wells would be sampled during the winter, when the Mer Bleue Bog is frozen and the wells are accessible. However, the groundwater in the monitoring wells has frequently been frozen during these events. In the 2013 monitoring report (Golder, 2014), it was proposed to sample them during the summer, rather than the winter, and this recommendation has carried forward to the present (monitoring is now completed either in summer or in fall, depending on site conditions). Due to dry conditions in the vicinity of the Mer Bleue Bog in the summer of 2020, groundwater samples were instead successfully collected at monitoring wells BH09-1B, BH09-C and BH09-D during the fall session on November 26, 2020 (no sample was collected from monitoring well BH09-1A in November due to frozen conditions).

Groundwater monitoring sessions in 2020 were carried out by GAL on May 21 and November 26, and surface water monitoring sessions were carried out by GAL on May14, August 26 and November 25. Leachate quality analysis was undertaken on samples obtained by GAL from the pump station (L5) on May 14, August 27 and November 25. The following is a summary of the results of the monitoring sessions undertaken in 2020 presented in the GAL report provided in Appendix '1'. Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected in May 2020. The monitoring wells screened in the intact clay deposit and in the glacial till/upper bedrock zone will be sampled again in the fall of 2021.

During the spring monitoring session, the condition of each well within the monitoring well network at the site was assessed. A summary of the findings of the 2020 monitoring well network condition survey (properly cased, capped and locked) are provided in Table 3 of the GAL report attached in Appendix 1. At the time of the condition survey it was observed that all monitoring wells were in good condition noting that monitoring well MW09-1A requires a new cap.

In addition, sediment quality is also monitored at three locations within the Mer Bleue Bog. The sampling locations are the same as the surface water sampling stations located within the bog, i.e., SED-W was obtained at SW-W, SED-C at SW-C and SED-E at SW-E (refer to Figure 7.1). This program was initiated in 2000 at the request of the National Capital Commission (NCC). In 2020, sediment samples were obtained by GAL on May 14 and November 25.

A Monitoring and Screening Checklist prepared and signed by a Competent Environmental Practitioner (CEP) is included with the Golder 2020 Landfill Monitoring Report attached as Appendix '1'.

The objectives of the 2020 environmental monitoring program were:

- To comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of Environmental Compliance Approval No. A460702;
- To assess any potential impacts on water quality at the site resulting from landfill operations;
- To continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill;
- To document the chemical composition of groundwater and surface water in the vicinity of the landfill;
- To assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate; and
- To document the chemical composition of sediment at three locations in the Mer Bleue Bog.

7.1 *Groundwater Quality Assessment*

Groundwater has been monitored at observation wells since 1981. However, since 1985, landfilling operations expanded over the original down-gradient observation wells which have since been replaced with the existing wells. Existing observation wells were installed in 1992, 1994, 1995, 1998, 2005, 2007, 2009, 2010 and 2011.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as follows:

- a shallow surface sand layer at depths ranging from 1.5 to 2.5 m below original grade
- the weathered clay zone of a thick clay deposit at depths ranging from 3.5 to 4.5 m below original grade
- the intact clay deposit at depths ranging from 7 to 8 m below original grade
- glacial till/bedrock contact zone at depths ranging from 22.3 to 37.1 m below original grade

Monitoring wells are present up-gradient, at the down-gradient edge (used to assess compliance) and further down-gradient of the landfill in each of these units. The two upper stratigraphic units, the sand and weathered clay units, were sampled for both the May and November monitoring events. The two lower stratigraphic units, the intact clay and near bedrock units, are sampled every 18 months. Groundwater samples from these units were collected in May 2020 and the next sampling session for the monitoring wells screened in these units will be in the fall of 2021.

Based on the groundwater levels obtained during the 2020 monitoring program, no significant change in groundwater flow patterns was observed.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

Traditional methods of site compliance provide very limited useful and/or reliable parameters for assessment of the WCC Navan Facility; therefore, an alternate method must be used. The difference in hydrogeology across the site coupled with the very saline environment of the clay deposit that underlies the Mer Bleue clay have resulted in the MECP accepting that Guideline B-7 (RUPO) is not applicable at this site. The MECP's position in this regard was documented in a November 2000 memorandum issued by the MECP (MOE, 2000). Therefore, the Leachate Indicator Parameter list and the method to determine if leachate from the site is impacting local groundwater was developed in the Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The Leachate Indicator Parameter list includes alkalinity, ammonia, boron, chloride, hardness, magnesium, manganese and potassium.

After the completion of a monitoring session, the concentration of each Leachate Indicator Parameter for all groundwater locations used to assess compliance should be visually checked. If a parameter concentration appears to be elevated, a comparison to the background concentration range should be completed. The potential for an increase in concentration of a Leachate Indicator Parameter will be investigated by comparing the concentrations for each parameter to the background range for its corresponding stratigraphic unit. The background range will be derived from the maximum and minimum data obtained at the locations used to assess compliance from 1998 to present in each stratigraphic unit. In addition, data from monitoring wells MW05-3A to D located to the east of the site and not impacted by landfill leachate will be used to define the background range. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each location used to assess compliance are presented in time-concentration graphs in Appendix F of the GAL report (provided in Appendix I). The background ranges will be updated annually using the most recent data if it is not deemed impacted by landfill leachate. An exceedance of the background range is considered an exceedance of the trigger mechanism and the implementation of the trigger format outlined in the trigger mechanism report should proceed.

In 2020, no confirmed (continued increase in concentration beyond the background range) trigger exceedance of the background range was reported in any stratigraphic unit monitored. Some parameters' exceedance of background conditions will need to be confirmed during the 2021 monitoring sessions to determine if the trigger protocol needs to be implemented and/or the background range of that parameter should be considered to increase.

Following the confirmed exceedances reported in the 2018 annual monitoring report (Golder, 2019), in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. Trigger results of the spring and fall monitoring sessions were reported by Golder, on behalf of WCC, to the MECP Ottawa District Office via email on August 8, 2019 and December 24, 2019, respectively. In accordance with the proposed course of action presented to the MECP in the 2018 annual monitoring report and communications in 2019, WCC acquired a spare leachate pump to reduce down time when a pump requires servicing and WCC intends to proactively maintain the forcemain in good working condition in a continuing effort to achieve a drained state in the leachate collection system.

Leachate pumping and disposal operating issues reported in the fall 2018 had an impact to groundwater quality in the sand and weathered clay units in monitoring wells located immediately downgradient of the leachate collection system (less than 10 m south of the leachate collection system and close to the south toe collector).

Concentrations of some Leachate Indicator Parameters in the sand unit spiked in November 2018, but the efforts from WCC in 2019 were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented. Since the hydraulic conductivity of the sand is greater than the weathered clay, elevated concentrations have been taking longer to dissipate in the weathered clay unit.

Golder contacted the MECP Ottawa District Office via email on July 9, 2020 to update them on the trigger exceedances and to notify them that no trigger exceedance was reported in the spring of 2020 following two previous exceedances showing an increasing trend and that there was no need to implement a contingency plan at this time.

It is WCC's intention to continue implementing in 2021 the proposed voluntary action plan to control potential increases in concentrations.

A Phase II Environmental Site Assessment was conducted at the landfill by Intera (Intera, 2003). This assessment concluded that groundwater within the sand layer, the upper weathered clay and perhaps the deeper intact clay deposit on down-gradient lands has slightly elevated concentrations of parameters previously thought to be indicative of landfill leachate (e.g., boron, ammonia, TKN). However, there is no obvious spatial correlation of these parameters with proximity to the landfill or groundwater migration pathway. The lack of spatial correlation suggests that groundwater on down-gradient lands is representative of naturally elevated background groundwater quality associated with the Mer Bleue environment.

In addition, the groundwater and surface water trigger mechanism report prepared by Golder (Golder, 2007b) demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are not potential impacts from landfill activities. Naturally elevated parameters measured included boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

7.2 Leachate Water Quality Assessment

Prior to the construction of the leachate collection system (LCS) in 1991-1992, leachate was sampled and analysed in areas where surface breakout was observed. Breakout of leachate, when encountered, usually occurred at the down-gradient toe of the landfill.

The monitoring program for leachate quality has focused on the LCS. For the purpose of the annual monitoring report, leachate generated by the landfill is monitored at the down-gradient end of the south toe collector at L5 at the same time surface water is monitored. A more extensive leachate monitoring program is carried out throughout the year in accordance with a City of Ottawa Leachate Discharge Agreement for the discharge of treated leachate at the Robert O. Pickard Environmental Centre (ROPEC), the municipal wastewater treatment plant.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation. The landfill is underlain by a thick natural clay deposit which has a hydraulic conductivity, K, of less than 10-9 metres per second and as such performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater, but rather it is predominantly precipitation that has infiltrated through the waste pile. It should be noted that leachate at the site could also consist of porewater from the underlying clay as a result of upward gradients and/or consolidation, noting that porewater release to the leachate collection system is slowed by the low hydraulic conductivity of the clay.

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. The intrinsic biodegradability of municipal landfill leachate can be measured by a BOD:COD ratio. During the first several years of production, the BOD:COD ratio generally is in the 0.5 range. As the landfill ages, the ratio decreases to levels less than 0.1 suggesting a more or less biologically recalcitrant organic composition (Andreottola et al., 1989). Also, the concentration of ammonia tends to increase with landfill age since ammonia is a by-product of the stabilization of organic matter (Elefiniotis et al., 1989), although at a dry waste facility such as the WCC Facility, ammonia concentrations can be expected to remain relatively low.

Leachate quality monitoring results for 2020 indicate that the leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Concentrations of ammonia, boron, chloride, potassium, and TKN show a generally increasing trend over time although chloride and boron concentrations have been relatively stable in recent years. The concentrations of DIC, manganese, show a general decreasing trend over time. Previously reported decreasing trend in hardness appears to be stabilizing. The concentrations of certain parameters remain above the surface water and groundwater quality near the site.

7.3 *Surface Water Quality Assessment*

The WCC Navan Facility is located on a watershed divide resulting in drainage of surface water to both the east and west of the site. The east side of the site drains to the Bear Brook or Mer Bleue drainage basin and the west side into the Mud Creek drainage basin which drains into Green's Creek. The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog.

For the purpose of surface water quality assessment, the background surface water quality is assumed to be represented by the data available from stations located in close proximity to the landfill and up-gradient of surface water flow. For the 2020 monitoring program, the PWQO is being applied for the purpose of water quality assessment at the surface water sampling stations.

A total of eleven surface water stations continue to be monitored on an on-going basis at this site. The monitoring stations have been located to obtain representative information on water quality up-gradient from the landfill at stations S1, S3, S15, S16 and S17 (background), on water quality at compliance sites down-gradient from the landfill at stations S5, S8 and S9 and on water quality in the Mer Bleue Bog at S10 (SW-W), S11 (SW-C) and S12 (SW-E). Monitoring locations SW-W, SW-C and SW-E are location references used by the NCC.

The up-gradient surface water quality is characterized by concentrations of the following parameters which exceed or are outside the PWQO: cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorus. Occasional PWQO exceedances of cadmium, chromium, boron, and zinc have been observed in the past as well.

Surface water quality is generally consistent over time (with seasonal variability). An increasing trend in concentrations of alkalinity, chloride, and conductivity, can be observed at surface water station S1 over time. Previously observed overall increasing trends for concentrations of DIC, sodium, TDS, and hardness at surface water station S1, concentrations of alkalinity, ammonia, DIC and iron at surface water station S3, and concentrations of manganese, sodium and TDS at surface water station S15 appear to have stabilized, with seasonal variability remaining. Similarly, the previously observed decreasing trend in dissolved oxygen concentrations at surface water stations S3 appears to have stabilized with seasonal variability remaining. Previously observed increasing trend in iron concentrations at surface water station S15 has stabilized during the 2020 monitoring session.

The current or historical increases in concentrations of parameters at these locations are not related to leachate impact as these stations are up gradient of the site.

The down-gradient surface water quality is characterized by dissolved oxygen, iron, and total phosphorus concentrations which exceed or are outside the PWQO. Occasional PWQO exceedances of boron, cadmium, cobalt, copper, chromium, phenols and zinc have been observed.

The concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the May, August and November 2020 monitoring sessions were generally similar to or lower than the surface water quality at the up-gradient station S16 during the same session.

Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed.

Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. It becomes increasingly difficult to assess surface water site compliance with scattered data. The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater-based trigger mechanism is the appropriate approach for the WCC Navan Facility. Surface water quality monitoring will continue at the site, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the WCC Navan Facility.

7.4 Sediment Quality Assessment

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Analytical results on the sediment samples indicate that no parameters exceed the CCME Guidelines for freshwater sediment. Copper, chromium and nickel concentrations exceed the MECP Table 1 sediment criteria. The analytical results observed at the sampling locations are consistent with historical results observed at the respective locations.

Analytical results on the sediment samples indicate that boron exceeds MECP Table 2 and Table 4 soil criteria during the spring and fall monitoring sessions at each sampling location, except at sediment monitoring location SED-E in the spring 2020 monitoring session. Selenium exceeded the CCME soil criteria during the fall monitoring session at SED-W. In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

In 2002/2003, an assessment of the WCC Navan Facility operations was undertaken in support of a WCC-NCC (WSI-NCC) exchange of land parcels located south of the WCC Navan Facility along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

7.5 Proposed 2021 Monitoring Program

The proposed 2021 Environmental Monitoring Program is the same as was conducted in 2020, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (these proposed changes were also listed in the 2019 Annual Monitoring Report).

In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in downgradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations of one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in downgradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As explained in Section 7.3, the MECP agreed that an excursion of landfill leachate would be apparent in the underlying stratigraphic units prior to a surface water impact and a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. Therefore, it is proposed to discontinue sediment monitoring and rely on the groundwater and surface water monitoring programs to assess off-site leachate impacts. With MECP concurrence, sediment monitoring could resume temporarily if leachate impacts and trigger exceedances are reported at the site.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during May 2020 monitoring session and will be monitored again in the fall of 2021.

HAVAN Rd.
OW-92-12/15
S17
S1
S2
MW-05-1
(MW-5D)
LIMIT OF WASTE
EAST CELL
PUMP STATION
DRAINAGE
CHUTE
S-8
OW-94-1/3
MW-05-R3
OW-95-1/3
(MW-W)
100 METRES
MW-C
MW-05-8
OW-92-1/8
S-5
MW-E
OW-92-9/11
MW-05-11
S-9
OW-95-9
OW-95-5/7
S10

001522

8. LANDFILL GAS (LFG)

Golder Associates Ltd. (GAL) was retained to carry out the landfill gas monitoring program in 2020. The monitoring program undertaken was a continuation of the monitoring program already in place for this site and the results of the monitoring events undertaken are summarized below and presented in more details in the GAL report provided in Appendix '2'.

8.1 *LFG Monitoring Results*

The report has been prepared to fulfill the reporting requirements outlined in Condition 110 of Environmental Compliance Approval No. A460702 dated April 16th, 2009.

LFG monitoring was undertaken on May 15th 2020, on August 27th 2020 and on December 10th 2020. At most locations monitored, methane gas was less than 5 percent (%) of the Lower Explosive Limit (LEL). Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system that also serves as a passive ventilation system, with methane concentrations measured in excess of 25% LEL (or 1.25% by volume) at the following locations (refer to Fig 2, Appendix "2"):

- MH-9 (G-3a), MH-5 (G-11a), MH-4 (G12-a), and MH-2 (G-18-a) in May 2020
- MH-8 (G4-a), monitoring well OW-92-8 (G15), and pipeline clean out (G82-a) in August 2020
- Monitoring well OW-92-8 (G15) in December 2020

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5 percent by volume; and,
- The concentration of methane gas must be less than 1.0 percent by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the Navan Facility based on the 2020 monitoring results.

The Navan Facility is designed with a buffer area and natural barriers. The site has a favourable hydrogeological setting whereby the site is underlain and surrounded by a thick clay deposit of low permeability. The depth below grade to the water table at the perimeter of the site is shallow. The depth of the landfill between the ground surface and the water table is less than 2.5 metres. It is generally considered that methane gas migration of any significance may extend for a distance of ten times the

depth of the landfill between the ground surface and the water table. Based on site conditions, this 10:1 general rule would suggest that methane migration could extend for a distance of 25 metres. The north, west, south and east sides of the landfill footprint are surrounded by buffer zones of 30 to 70 metres, 100 metres, 10 metres and 140 metres, respectively. Note that on the south side of the landfill a 10-metre buffer zone exists between the south limits of the waste mound and the VIA Rail right-of-way (ROW) and an additional buffer strip with a width of 100 metres exists to the south of the VIA Rail ROW. These buffers would therefore, under present groundwater conditions, provide adequate natural venting. The natural barriers and the provision of adequate buffer area present at the Navan Facility are the preferred method of dealing with potential LFG migration. Although no monitoring locations are available below surface at the property boundary, based on the presence of a buffer area and natural barrier system, it is anticipated that the Navan Facility met the property boundary requirements in 2020.

Hydrogen sulfide was not detected at any location during the 2020 monitoring events with the exception of the following locations, which reported relatively low detections:

- Collector MH (G-26i) in May 2020

In the past, venting of LFG could be observed at ground surface along the west side of the landfill between MHs. The LFG venting was only noticeable once the ground surface was covered with snow. In 2020, venting of LFG at ground surface was not noticeable.

During the 2020 winter monitoring session, no odours were noted at the site, strong odours were noted in August, and faint odours were noted in May by the Golder field technician. Gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2020, WCC personnel responded to three odour related complaints. One horizontal well was installed on site in 2020 as part of the permanent LFG collection system which will help mitigate some of the odour present once connected to the current system.

It is noted that an interim LFG odour control system (refer to Section 6.4) was installed in 2011 and commissioned in April 2012. An extension to the LFG odour control system was installed in the fall of 2016, 2017 and 2019. In 2020, one horizontal well was added at the north-west corner of Phase 1. The purpose of this system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells (refer to Fig. 8.1). The additional vertical wells installed in 2017 and 2019 are intended to be part of the permanent LFG collection system.

8.2 *2019 Regulatory Reporting (NPRI, O.Reg. 127/01, O.Reg. 347, O.Reg 452/09 and Federal GHG)*

In 2020, Dillon Consulting Limited (Dillon) was retained by Waste Connections of Canada Inc. (WCC) to complete the following for the WCC Navan Facility:

- An assessment to determine the reporting requirements under the *National Pollutant Release Inventory* (NPRI) for the 2019 calendar year;
- Greenhouse Gas Reduction Reporting as required under *Ontario Regulation 347*;
- An assessment to determine the reporting requirements under *Ontario Regulation 390/18 – Greenhouse Gas Emissions: Quantification, Reporting and Verification (O.Reg. 390/18) and the Federal Government Greenhouse Gas Reporting for the 2019 calendar year;*
- An assessment to determine the reporting requirements under the Federal Government Greenhouse Gas Reporting Program (GHGRP) for the 2019 calendar year; and
- Assist with data input and submission for Environment Canada's online Single Window Information Manager (SWIM) module, if required.

The Navan Landfill has reported in past years to the NPRI program under ID 10967 and the GHGRP program under ID G10975. Site operations are identified by NAICS code number 562210 - Waste Treatment and Disposal.

Dillon conducted an assessment of facility operations and material usage in order to determine which substances must be reported to each of the programs mentioned above for the year 2019.

The reporting of releases to the NPRI is separated into on-site releases to air, land, and water, and off-site transfers for disposal and recycle for Part 1, 2 and 3 substances. Only air releases for Part 4 and 5 substances are reported to NPRI. Based on Dillon's assessment, the Navan Landfill was required to report in 2020 under the NPRI program for the year 2019. The total annual on-site releases and off-site transfers of the reportable NPRI Part 1, Part 2, and Part 3 substances are summarized in Table 8.1. Annual air releases for the NPRI Part 4 and Part 5 substances are also provided in Table 8.1.

The reports were made based on estimates and not measured values. Many of the parameters that are reportable are the result of handling high volumes of materials on site which are above the manufactured, processed or otherwise used reporting threshold, e.g. leachate and asbestos, but do not result in airborne emissions from the facility. The reporting of the emissions of particulate matter (PM10) was triggered by fugitive dust emissions from roads and is generally also reported by all industrial operations in Ontario due to very low thresholds.

It is noted that an interim landfill gas odour control system (refer to Section 6.4) was installed in 2011 and commissioned in April 2012. The purpose of this system is to control potential odorous emissions from the site until the full-scale landfill gas collection system is installed. The interim landfill gas odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical landfill gas extraction wells as shown on Figure 8.1.

Table 8.1: 2019 NPRI Reporting

NPRI Substance	On-site Releases (tonnes)			Off-site Transfers (tonnes)	
	Air	Land	Water	Disposal	Recycle
Part 1 Substances					
Asbestos	-	-	-	369.4 (on-site)	-
Part 2 Substances					
None	-	-	-	-	-
Part 3 Substances					
None	-	-	-	-	-
Part 4 Substances					
CO	75.54				
PM10	5.122	-	-	-	-
PM2.5	2.056	-	-	-	-
Part 5 Substances					
None	-	-	-	-	-

The reporting threshold for the federal Greenhouse Gas Emissions Reporting Program through Environment Canada is 10,000 tonnes of CO2 equivalent units.

Based on the assessment by Dillon, the Navan Landfill meets the GHG reporting requirements for the Federal reporting program and is therefore required to report for the 2019 calendar year. Table 8.2 provides the annual CO_2e release for comparison with the government reporting threshold. Only direct emissions are included in the annual totals shown. CO_2 emissions from biomass decomposition and emissions from indirect electricity consumption are not included in the federal threshold calculation for comparison purposes.

Table 8.2: 2019 GHG Reporting

Reporting Program	Annual CO_2e Release (tonnes)	Reporting Threshold (tonnes)	Required to Report (Y/N)
Environment Canada – Federal Greenhouse Gas Reporting	33,594	10,000	Y

The reporting threshold for O.Reg. 390/18 is 10,000 tonnes of CO_2 equivalent units. Table 8.3 provides the annual CO_2e release for comparison with the provincial government reporting threshold. Only direct emissions from stationary combustion are included in the annual totals shown.

The Navan Landfill is not required to report GHG emissions to the Province of Ontario as annual emissions are below the provincial CO_2e reporting threshold.

Table 8.3: 2019 Provincial GHG Reporting Requirements

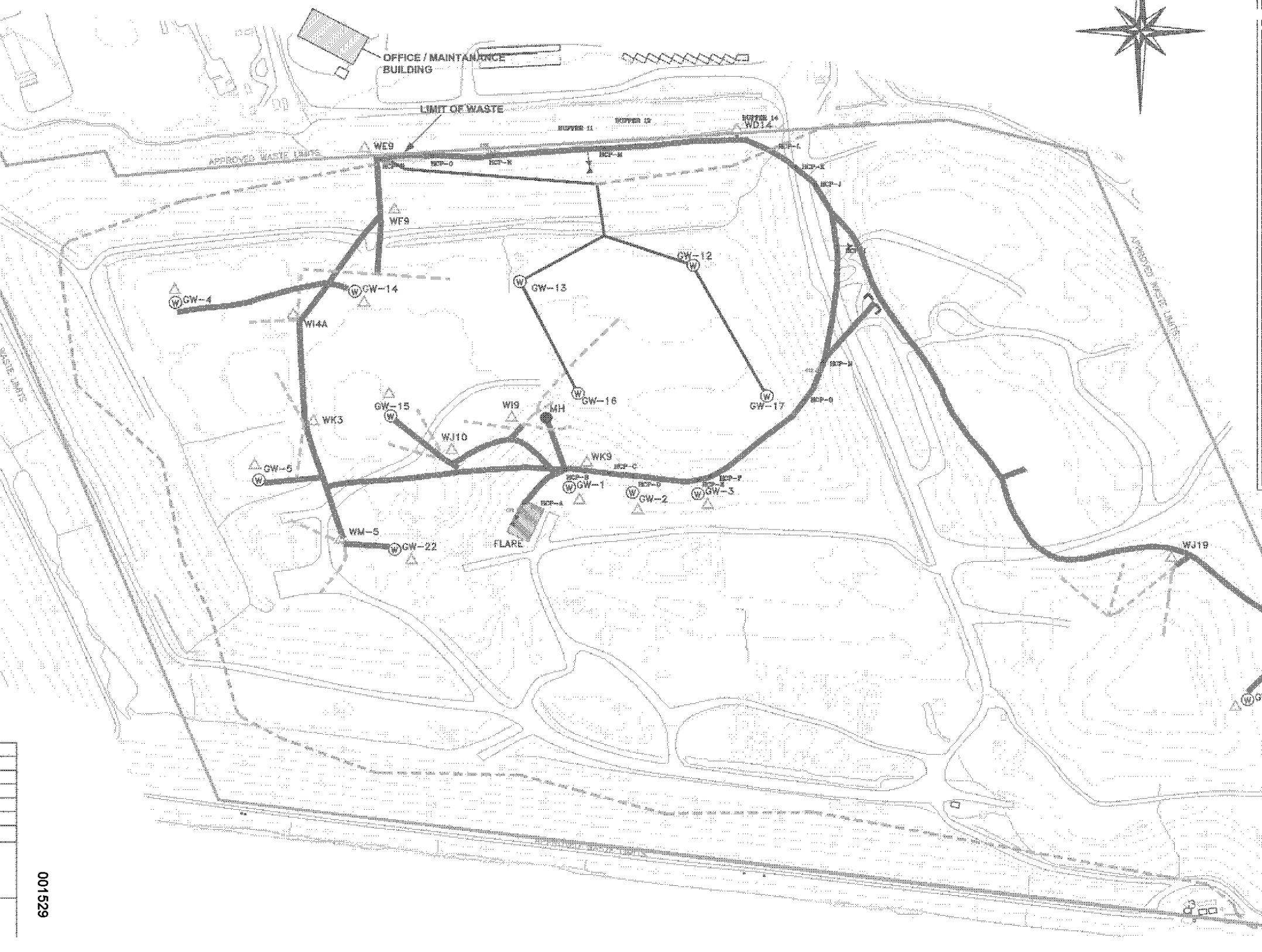
Reporting Program	Annual CO_2e Release (tonnes)	Reporting Threshold (tonnes)	Required to Report (Y/N)
O.Reg. 390/18 (with CO_2 from biomass)	12,876	-	-
O.Reg. 390/18 (without CO_2 from biomass)	937.7	10,000	N

Release Estimate Comparison: 2018 vs. 2019

Table 8.4 provides a comparison between 2018 and 2019 releases for reportable substances. Reasons for changes in release quantities for the two reporting years are provided for those substances/contaminants shown with a ±10% change in release quantity.

Table 8.4 – 2018 vs. 2019 Release Values

Substance	2018 Reported Value	2019 Reported Value	% Change	Reason/ Comments
Asbestos	Air = 0 tonnes Disposal = 211.8 tonnes Recycle = 0 tonnes	Air = 0 tonnes Disposal = 369.4 tonnes Recycle = 0 tonnes	(+) 74%	Increase in asbestos waste received at the site
Mercury	Air = 0 tonnes Disposal = 25,01 kg Recycle = 0 tonnes	Did not trigger reporting	N/A	Shipments of contaminated soils received at the site did not contained elevated levels of mercury
CO	Air = 74.19 tonnes	Air = 75.54 tonnes	(+) 2%	No significant change in air releases
PM_{10}	Air = 3.487 tonnes	Air = 5.122 tonnes	(+) 47%	Increase distance traveled on unpaved roads
$PM_{2.5}$	Air = 1.867 tonnes	Air = 2.056 tonnes	(+) 10%	No significant change in air releases
CO_2e(Federal)	Air = 27,005 tonnes	Air = 33,594 tonnes	(+)24%	Decrease capture efficiency of LFG to the flare system


OFFICE / MAINTANANCE BUILDING
LIMIT OF WASTE
APPROVED WASTE LIMITS
WE9
WD14
WF9
GW-4
GW-14
GW-13
GW-12
WI4A
GW-15
WI9
MH
GW-16
GW-17
WK3
WJ10
WK9
GW-5
GW-1
GW-2
GW-3
WM-5
GW-22
FLARE
WJ19

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9. PROCESSING/RECYCLING

9.1 *Diversion of Waste and Other Materials from Disposal*

Diversion through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the WCC Navan Waste Recycling and Disposal Facility. For example, all daily and intermediate cover needs are met by substitution of virgin soils with the re-use of significant quantities of impacted soils. Brick, concrete, asphalt and rubble are also recovered for re-use each year in the construction of access roads and container storage pads. Roofing shingles free of paper and other debris are also re-used on site as a sub-base for roads and pads over which is placed a layer of aggregate or recycled asphalt. In addition, steel, aluminum, wood and white goods are recovered daily from the active face of the landfill and recycled. The site also currently assists local landscape and tree removal contractors by receiving wood waste that is put through a grinding process and sent to markets off site for use as bio-mass or bulking agent for organic composting. Other waste materials removed from the site for recycling include cardboard, tires, glass, drywall, E-waste, large boulders and screened rock.

Materials received by the Navan Waste Recycling and Disposal Facility are those which IC&I generators, contractors and local residents have generally deemed to be waste and of no further value (i.e., post diversion at the source). Many of the waste generators serviced by waste collection contractors who bring waste to the site also divert materials from the landfill at their place of business prior to collection. Recycling within the IC&I sector is regulated by the Ministry of the Environment, Conservation and Parks under Regulations 101, 103 and 104. While the site receives post-diversion waste materials from the IC&I sector, WCC has procedures in place to screen the incoming waste for recyclable material in what is known as a "last chance harvest" which is a "positive" sort where the recyclable item must be removed from the mixed waste mass. In this case, the majority of the material is not recyclable (i.e., it is waste). This is very different than recycling from "source separated" material, which results in a "negative" sort, where the waste components are removed from what is predominantly recyclable material. WCC also encourages and receives "clean" recyclable materials such as wood, metals, drywall, glass and E-waste. Such materials are shipped to market in bulk in efforts to make the recycling of these materials more economically viable.

Management at the WCC Navan Waste Recycling and Disposal Facility is constantly searching for on-site and off-site diversion opportunities to ensure that approved disposal capacity is preserved and used for the disposal of waste material of least commercial value. Given the provincial policy and regulations concerning waste diversion from landfill, the WCC Facility will continue to support the City and the Province in their efforts to meet diversion targets while at the same time ensuring essential disposal capacity is available locally.

Approval for the treatment of contaminated soils was received from the MECP in June of 2015. The treatment of hydrocarbon contaminated soils was started soon after in the processing area of the site located within the waste footprint (refer to Figure 2.4). Treated soils are re-used on site as final cover material or as structural fill within the east buffer along the limit of waste. Soils which had not reached the treatment criteria by the end of 2020 remained on the treatment pad until the treatment objectives could be achieved or landfilled as waste.

The amount of waste diversion achieved from "last chance harvest" at the WCC Navan Waste Recycling and Disposal Facility over the past five years is summarized in Table 9.1.

Table 9.1: Diversion at Navan Waste Recycling and Disposal Facility (2016 - 2020)

Material	2016	2017	2018	2019	2020	5-Year Total
Off-Site recycling:						
Materials removed for off-Site recycling	13,164	10,249	14,712	11,025	6,017	55,167
On-Site reuse:						
Aggregate material re-used (rubble; brick; concrete; rock)	22,651	8,480	11,935	5,949	25,788	74,803
Asphalt, clean fill, clean shingles	13,877	7,262	5,623	11,151	7,916	45,829
Treated/re-used soils	61,048	31,096	31,726	67,249	35,249	226,368
Total Diversion (excluding daily cover soils)	**110,740**	**57,087**	**63,996**	**95,374**	**74,970**	**402,167**
Waste to Landfill	233,867	171,419	233,994	222,976	224,497	1,086,753
WCC Recycling and Disposal Facility "last chance harvest" diversion rate (excluding daily cover soils)	**32.1%**	**25.0%**	**21.5%**	**29.9%**	**25.0%**	**27.0%**

NOTE: All quantities are in tonnes

At the Navan Waste Recycling and Disposal Facility, loads of clean rubble, rock, asphalt, clean shingles or concrete that are received for disposal from a construction job site are set aside for re-use in the construction of on-site roads and pads. From 2016 to 2020, approximately 120,632 tonnes of these materials were diverted from disposal, avoiding the use of a more valuable resource such as quarried stone.

Heavy equipment equipped with a large magnet and grappling attachments are used for the recovery of metals from the waste after it is dumped at the landfill. Five people are hired full-time to focus on recycling opportunities and are assisted by landfill personnel. All refrigerant containing appliances have the refrigerant removed by a licensed technician prior to recycling. Metals collected on site are stockpiled and removed in bulk by a local contractor using tractor trailers. Smaller loads of more valued metals such as copper, aluminum and brass are shipped regularly to local scrap metal recyclers such as American Iron and Metal (AIM). In response to market interests in recycled wood products, wood is recovered from waste at the site and a wood grinder is used to reduce the wood to a chip size that is suitable to an end market and then removed in bulk using tractor trailers. Wood chips are shipped off-site to local mills where they are re-used in the production of wood pellets or used directly as an alternate fuel source. Wood chips are also used as a bulking agent at organic composting sites. Glass is also collected and removed in bulk from the site for recycling. From 2016 to 2020, over 55,167 tonnes of materials have been shipped off site for recycling and diverted from disposal at the site.

As indicated in Table 9.1, the Navan Waste Recycling and Disposal Facility diverted over 74,970 tonnes of material from disposal in 2020, and over 402,167 tonnes during the past 5 years. For 2020, this represents a "last chance harvest" diversion rate of 25. 0% and excludes the re-use of impacted soils for daily cover material. This is in addition to the diversion rate for IC&I waste that occurs at the source. WCC will continue to improve waste diversion and recycling initiatives at the Navan Facility and pursue economically viable waste diversion opportunities to help the local community and WCC clients achieve a better IC&I recycling rate.

9.2 *Recycling*

For years, an independent contractor has undertaken processing (recycling) of steel and wood at the active face of the landfill. In 2009, the use of heavy equipment and permanent staff were introduced to improve health and safety as well as productivity. Daily records of materials received for processing and materials recycled and/or reused are maintained on site. In 2020, there were no operational problems reported related to the processing (recycling) facility.

A total of 6,017 tonnes of waste materials consisting of aluminium, wood, glass, drywall, e-waste, white goods, tires and ferrous metals were recycled and removed from the site in 2020. At the end of the year some materials remained stockpiled for removal in bulk at a later date such as white goods and metals. Wood waste also remained stockpiled in the material recycling area for further size reduction with the use of a wood grinder prior to shipment to off-site markets.

Brick, aggregate, rock and rubble received at the site and re-used in 2020 as aggregate for road construction totalled 25,788 tonnes. Clean fill, clean shingles and asphalt re-used on site as final grading, road/pad construction and engineered fill totalled 7,916 tonnes.

Drywall material received at the site free of debris was stored in a designated area for recycling and when sufficient volumes were received, drywall was processed through a grinder and re-used in powder form as a soil amendment.

Glass received at the site free of debris was stored in a designated area and when a sufficient volume was received, the glass was shipped in bulk to a recycling facility in Montreal, Quebec or Guelph, Ontario. In 2020, a total of 1,836 tonnes of glass were shipped off site for recycling.

Treatment of hydrocarbon contaminated soils was started at the site in 2015 following the receipt of MECP approval. Treated soils were re-used on site as final cover material and as structural fill along the waste limit within the east buffer. Soils which had not reached the treatment criteria by the end of 2020 remained on the treatment pad until the treatment objectives could be achieved or landfilled as waste. In 2020, 21,611 tonnes of hydrocarbon impacted soils were treated at the recycling facility for re-use in the east buffer and 14,270 tonnes of impacted soils were re-used within the landfill footprint as construction materials.

10. PROPOSED 2021 OPERATIONS

10.1 *Landfill Development*

10.1.1 Phasing of Remaining Operations

In 2021, WCC will continue to develop the landfill in a manner consistent with their past operating practices and proceed with capital projects required for the site operations as presented in the revised D&O (Golder, 2008). Over the past number of years, landfilling has progressed in a counter-clockwise pattern starting in the northwest corner of the site (area indicated as north half of Phase 3 on Figure 10.1). To date waste has been placed over the entire permitted waste footprint of the landfill as shown on Figure 10.1 with Phases 2 and 3 having been completed. In areas where significant settlement has occurred, re-grading will be carried out. In 2021, landfilling will continue in the last completed cell identified as Phase 6 with closure work to be carried out over completed north and east slopes of Phase 6 as shown on Figure 3.2.

The landfill development strategy for the 2021 operating period is presented on Figures 10.1 A & B and 10.2 and described in more detail in Section 10.1.2.

10.1.2 Development Schedule

The schedule for developing the remaining landfill capacity is driven by the on-going rate of waste receipts for disposal and readily available constructed landfill air space. Under the revised ECA (April 2009), the life expectancy remaining for the WCC Landfill as of January 1st, 2021 is estimated to be 5.6 years (2026) to 6.6 years (2027) based on future projected annual waste receipts of 344,750 tonnes/yr and a waste density varying from 1.19 to 1.43 tonnes/m^3 (refer to Chapter 5). The actual life of the landfill will vary based on the actual annual fill rate, waste densities achieved, waste diversion and recycling initiatives at the landfill and the rate of air space development.

Other site operations will evolve together with the on-going landfilling operation as follows:

a) Landscaping

- Apply topsoil and provide additional landscaping to completed final cover areas on the north surface of Phase 4 as well as planting additional trees in previously completed areas. This will include removing trees previously planted and re-planting them in other areas of the landfill that have been completed.

b) Final Cover Construction

- Complete filling to final grade in the north and east area of Phase 6 (refer to Fig. 3.2). Complete final cover construction in completed areas of fill.

c) Surface Water Management

- Re-align surface runoff away from fill areas and cell construction areas.
- Raise grades in the north and east buffer adjacent to the waste footprint and grade to direct surface runoff away from waste.
- Place cover clay in areas where final waste elevations have been reached to direct surface runoff water to collection swales and ditches.

d) Recycling Operations

- "Last Chance Harvest" of recyclable waste will continue in the active face using specialized heavy equipment as per present practice.
- Increase efforts to sort and divert waste from small vehicles at the small vehicle drop-off area and provide incentives to clients to sort materials at source prior to arrival at the site.
- Establish markets for new recyclable materials in efforts to increase the types of materials to be recycled at the site.
- Enhance treatment of contaminated soil.
- Expand the working pad in the area of Phase 8 further north for recycling activities.

e) Landfill Gas Flaring System

- Where required, add additional wells (horizontal and/or vertical) to the landfill gas collection system to control fugitive gas in fill areas and enhance the odour control system.
- Construct, install and commission the permanent abstraction and flaring plant.
- Construct the permanent perimeter landfill gas forcemain along the south, the west and north perimeter as designed by Golder Associates and connect it to the existing landfill gas system.

f) East Cell Construction (Phase 6)

- Complete landfilling on the north and northeast cell slopes in Phase 6 to above the perimeter grade to allow for improved surface runoff.
- Construct a barrier wall in the east buffer at the limit of waste.

g) Access Road Construction

- Complete construction of the perimeter access road north and northeast of Phase 6.
- Construct an access road extending from the east of Phase 6 onto the top of Phase 1.

10.1.3 Soil Management

The development of the remaining landfill capacity in the area of Phase 6 (east cell) requires filling and compacting approximately 7,200 m^3 of material including side slopes as of the last aerial photo (April 28th, 2020). Soil management practices will include the following:

- Excavation of clay from the Phase 5 and Phase 8 areas will occur in the first three quarters of 2021;

- Sediment control measures will be taken so that inactive areas such as soil stockpile side slopes are seeded; silt fences are installed as required around the perimeter of disturbed areas; and surface runoff from the stockpile areas will be channeled to the internal ditch system which will drain to the site's stormwater retention ponds.

10.2 *Proposed Surface Water Control Improvements*

The current surface water management system is described in the "Design and Operations Report - Navan Landfill Site Expansion Approvals" (Golder 2008). The surface water management system operates at the site to maintain the pre-landfill drainage conditions to each watershed; to divert surface water and shallow groundwater flows originating upstream of the site around the landfill; to minimize the amount of surface water that comes into contact with waste; and to maximize the removal of suspended sediment from surface water generated prior to it's release to the downstream watersheds. Water that comes into contact with waste is collected and managed as leachate. For the revision and updating of the D&O plan, the existing surface water system was assessed in regards to the storm flows that can be transmitted and these flows were compared to the requirements of the Landfill Standards. Improvements were proposed where the existing system was deficient relative to the Standards. Further modifications have been proposed in support of the EPA/OWRA application for the landfill expansion. As a result of these assessments, WCC has proceeded with changes to the surface water management system at the site in order to improve the overall system. The proposed changes to the drainage system are described as follows:

- The east diversion ditch has been deemed a fish habitat and its construction included various features to promote and support fish habitat. This work was completed and continues to be maintained.

- A stormwater management pond was constructed in the southeast corner of the site and a ditch discharging surface runoff water to the pond was constructed along the east access road connecting the pond to the north drainage ditch. In 2021, inspection of sediment accumulation should be carried out and if required, dredging could be planned and budgeted for 2022. In 2019, construction of a HDPE drainage culvert in the existing ditch alignment along the north and north-east edge of the waste cell was completed and the clay cut-off wall above the culvert was constructed in 2020. In 2021, the east cell wall at the waste limit will be completed.

- A stormwater management pond located in the northwest corner of the site was constructed in 2012 to manage runoff water from the west side of the site. Landscaping consisting of the

planting of shrubs and trees in this area is on-going. Drainage chutes in the northwest and southwest corners of Phase 3 were constructed in 2015 to control surface runoff water from the completed surface of Phase 3 and Phase 4. As the access roads at the top of Phase 3 and Phase 4 continue to be extended, swales to promote drainage and seeding will also be carried out;

- Efforts will be made on a continuing basis to maximize the diversion of surface runoff from the active working face in order to reduce leachate generation. This will involve the redirection of internal ditching on an as-needed basis to direct runoff water from capped and stabilized areas to the perimeter ditch system.

10.3 *Leachate Management*

All leachate collected in the existing leachate collection system is designed to drain to a collection well and pump station located at the southeast corner of the existing waste footprint near Grids Q-16. A forcemain connection allowing treated leachate to be pumped directly to the municipal sewage system for conveyance to the city waste water treatment plant has been constructed and an agreement is in place with the City of Ottawa to discharge pre-treated leachate to the City sewer system. The forcemain was commissioned in early 2008 and has since been successfully in use. The use of the forcemain to discharge leachate from the site to the City of Ottawa sewer system is anticipated to continue throughout 2021.

Approved modifications to the pre-treatment/pumping system were completed in 2011. These improvements were initiated in advance of the east expansion cell construction to improve the treatment efficiency and capacity of the system and to increase the pump station flow rates as well as reduce maintenance. The system improvements were commissioned in early 2012 and will continue operations throughout 2021. One additional 35 HP pump was purchased in 2019 as backup to the existing pumps and to minimize downtime during servicing. No other alterations or modifications are anticipated in 2021.

The "Navan Landfill Leachate Collection and Maintenance System Lateral Expansion Area – Quality Assurance/Quality Control Plan and Specifications" prepared by Golder Associates was submitted and approved by the MECP in 2009. Excavation and construction of the east expansion cell, Phase 1, was completed in 2015 with Phase 6 completed in 2019 which included the construction of the drainage layer and leachate drainage features and the east cell pumping system. This system will continue to be in full operation in 2021 discharging collected leachate from the east cells to the leachate treatment system. Completing the upper east wall at the waste limit of Phase 6 will occur in 2021.

A vertical manhole, connected to the leachate collection system in the centre of the existing waste footprint (referred to as "the central manhole"), provides an alternative point of access to evacuate leachate from this part of the leachate collection system in the event that the positive drainage to the wet well and pump station cannot be maintained due to sub-grade settlement. This manhole has been raised to an elevation of 101 metres and will require that it be raised with additional MH sections in 2021. Water levels within this manhole should be measured to assess the depth of leachate ponding on top of the leachate collection system in this area and if required, consideration be given to installing a pump at the base of this manhole.

10.4 *Surface Water, Groundwater and Leachate Monitoring*

The proposed 2021 Environmental Monitoring Program is the same as was conducted in 2020, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program and terminating the sediment sampling program. In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in downgradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations of one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in downgradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or fall) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the May 2020 monitoring session and will be monitored again in the fall 2021.

The objectives of the 2021 environmental monitoring program are:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

10.5 *Landfill Gas Management*

Construction of an approved landfill gas collection and flaring system to serve as an interim odour control system was completed in 2011. Commissioning of this system was carried out in April 2012. In 2021, the permanent landfill gas collection system will be constructed consisting of a closed flare and abstraction plant located at the south-east corner of the landfill and a gas collection forcemain extending along the south, west and north perimeter of the waste footprint. This forcemain will also be connected to the existing landfill gas collection system. The east perimeter forcemain will be completed at a later date when waste fill heights have reached final waste grades.

The landfill gas monitoring program undertaken by Golder Associates in 2020 will be continued in 2021. Monitoring of landfill gas is carried out three times per year at the property boundary and within facilities located on the site. Monitoring of the odour control and flaring system will also be part of this program.

Assessment of air emissions will again be undertaken for the landfill site in accordance with MECP Reg.127/01 and NPRI reporting requirements.

10.6 *Recycling and Small Vehicle Unloading Facility*

Recycling will continue at the WCC Landfill site in 2021. Heavy equipment equipped with a large magnet and grappler is used for the removal of metal and wood from waste received at the active face of the landfill. A small vehicle unloading pad consisting of a raised paved surface with concrete retaining walls has been constructed at the front of the site east of the new site entrance to serve as an area for small vehicles to unload and sort materials. Concrete bunkers for the receipt of small loads of recyclable materials such as clean fill, asphalt, aggregates, and roofing shingles were added just south of the scale house with access from the small vehicle pad to the east. This small vehicle unloading area improves safety at the site by eliminating the need for small vehicles to access the active face. The facility is grade separated such that bins for various types of wastes and recyclables are easily accessible (i.e., with the top of the bins at or near the ground surface in the drop off area). A utility road has been included to provide access to collect or drop off roll-off containers. Small vehicles are required to be weighed on the scales when entering and exiting the site.

Another recycling area is located within the waste footprint along the southern edge of the area identified as Phase 8. This area is used for the storage of processed materials for later removal in bulk and shipment to local markets. White goods containing refrigerants are also stored in this area for refrigerant removal by an on-site technician. Recycling activities in this area consist of tires, drywall, glass, clean shingles, metals and wood. In 2021, it is proposed to construct a recycling pad at the south end of Phase 1 and expand the east end of the existing pad north into Phase 8.

E-waste recycling services are also offered for the benefit of the local community.

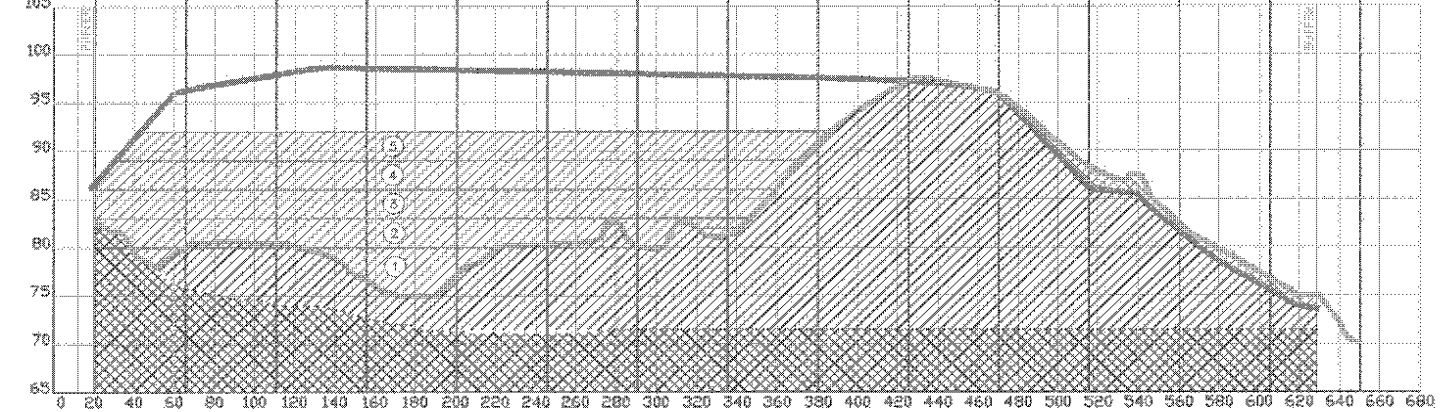
The treatment of contaminated soil as part of the recycling initiatives at the site was approved by the MECP in 2015. Contaminated soils will be treated to a level sufficient for an alternative use on-site and/or off-site. The treatment of impacted soils will continue throughout 2021.

These recycling activities will continue throughout 2021 as will efforts to expand on recycling services and finding new markets for recycled materials.

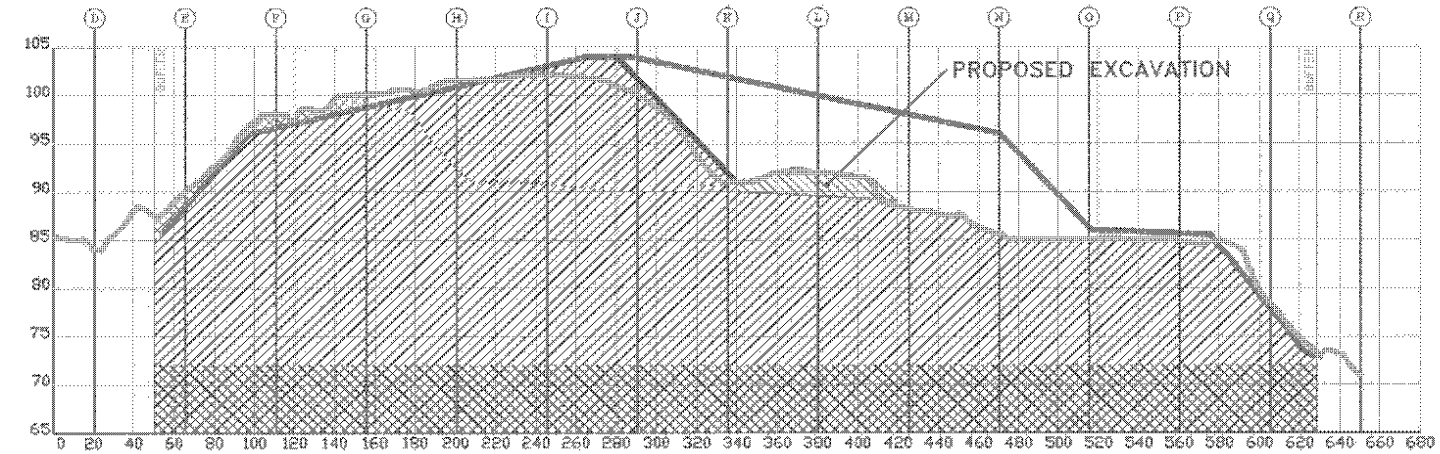
10.7 *Capital Improvements*

A major capital improvement project to take place in 2021 will be the construction of the permanent landfill gas collection and flaring system. No other capital site improvement projects other than on-going access road construction, landscaping and minor site improvements are anticipated. An access road along the north and east perimeter of Phase 6 extending onto the top of Phase 1 will be constructed. Landscaping efforts will continue on the north, west, south and southeast facing slopes where cover construction has been completed. Preserving existing vegetation by transplanting trees to the east and north sides of the landfill in addition to adding new trees and shrubs will also continue. Although a deep sanitary sewer will be constructed on Navan Road extending to the northwest corner of the landfill site, it is yet uncertain if it will be commissioned in 2021 allowing for the leachate forcemain to be connected to it.

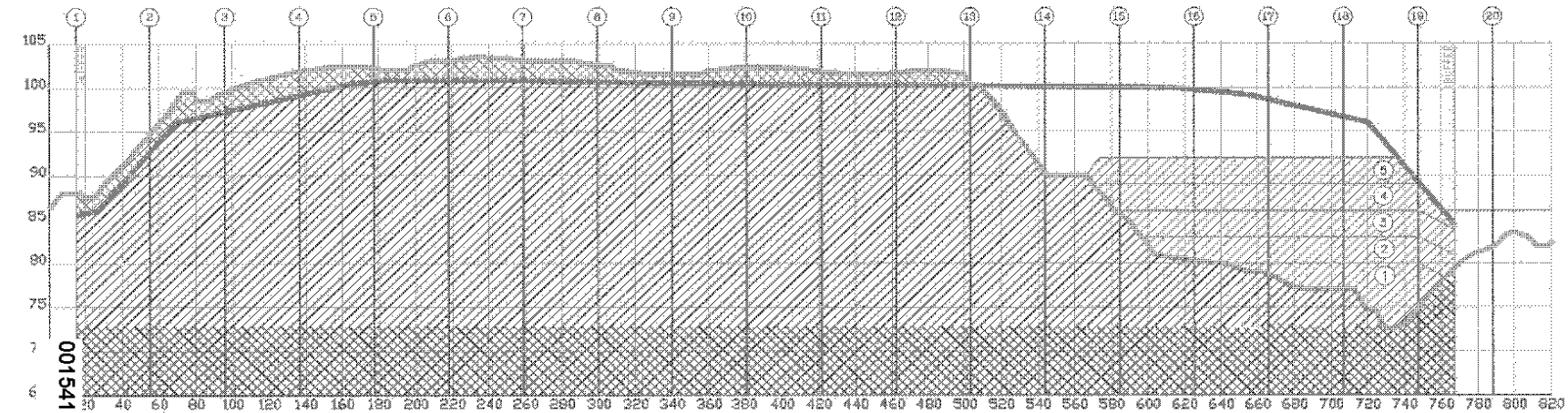
PHASE 7
PHASE 1
PHASE 2
(COMPLETED)
PHASE 4
PHASE 5
PHASE 3
A1
A2
A3
A4
A5



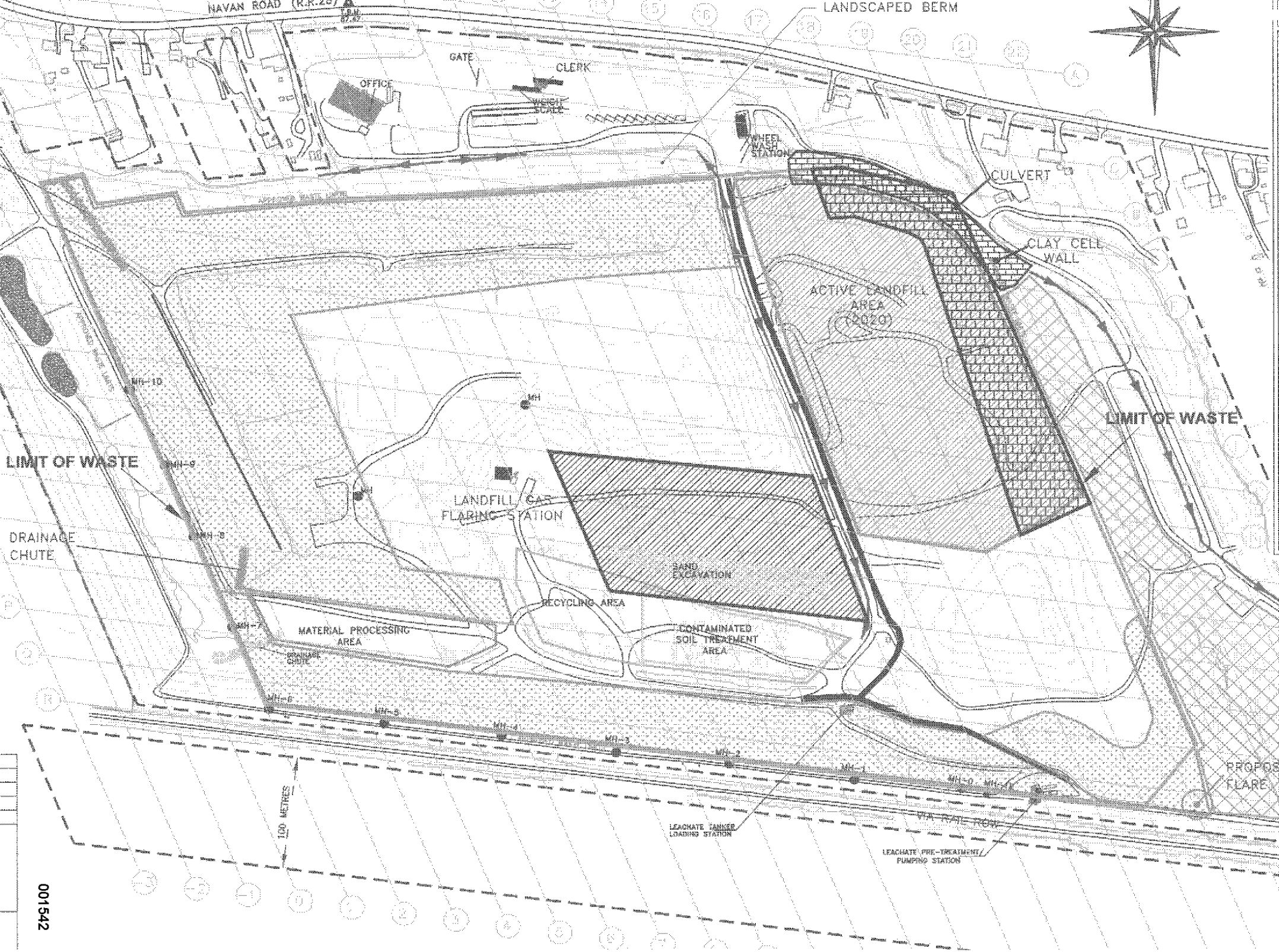
SECTION A2–A2



SECTION A3–A3



001541


HAVAN ROAD (R.R.28)
LANDSCAPED BERM
GATE
CLERK
OFFICE
WEIGHT SCALE
WHEEL WASH STATION
CULVERT
CLAY CELL WALL
ACTIVE LANDFILL AREA (2020)
LIMIT OF WASTE
LIMIT OF WASTE
MH-10
MH-9
MH-8
MH
MH
LANDFILL GAS FLARING STATION
DRAINAGE CHUTE
SAND EXCAVATION
RECYCLING AREA
MATERIAL PROCESSING AREA
DRAINAGE CHUTE
CONTAMINATED SOIL TREATMENT AREA
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-11
100 METRES
VIA RAIL TRACK
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT/ PUMPING STATION
PROPOS
FLARE
001542

Information presented in this report was provided by Waste Connections of Canada Inc. (WCC) Navan Waste Recycling and Disposal Facility personnel.

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LIST OF ABBREVIATIONS

The abbreviations commonly employed on Records of Boreholes, on figures, and in the text of the report are as follows:

I. SAMPLE TYPE

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO or DP	Seamless open-ended, driven or pushed tube samplers
DS	Denison type sample
FS	Foil sample
RC	Rock core
SC	Soil core
SS	Split spoon sampler
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample
DT	Dual tube sample
DD	Diamond drilling

II. PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg. (140 lb.) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split spoon sampler for a distance of 300 mm (12 in.).

Dynamic Cone Penetration Resistance (DCPT); N_d:

The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) to drive an uncased 50 mm (2 in.) diameter, 60^0 cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH:	Sampler advanced by hydraulic pressure
PM:	Sampler advanced by manual pressure
WH:	Sampler advanced by static weight of hammer
WR:	Sampler advanced by weight of sampler and rod

Cone Penetration Test (CPT):

An electronic cone penetrometer with a 60^0 conical tip and a projected end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and friction along a sleeve are recorded electronically at 25 mm penetration intervals.

III. SOIL DESCRIPTION

(a) Cohesionless Soils

Density Index (Relative Density)	**N** Blows/300 mm Or Blows/ft.
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very dense	over 50

(b) Cohesive Soils

C_u or S_u

Consistency	kPa	Psf
Very soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1,000
Stiff	50 to 100	1,000 to 2,000
Very stiff	100 to 200	2,000 to 4,000
Hard	Over 200	Over 4,000

IV. SOIL TESTS

w	Water content
w_p or PL	Plastic limited
w_1 or LL	Liquid limit
C	Consolidaiton (oedometer) test
CHEM	Chemical analysis (refer to text)
CID	Consolidated isotropically drained triaxial test[1]
CIU	Consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	Relative density
DS	Direct shear test
Gs	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	Organic content test
SO_4	Concentration of water-soluble sulphates
UC	Unconfined compression test
UU	Unconsolidated undrained triaxial test
V	Field vane test (LV-laboratory vane test)
γ	Unit weight

Note: [1] Tests which are anisotropically consolidated prior shear are shown as CAD, CAU.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$ x or log x	logarithm of x to base 10
g	acceleration due to gravity
t	time
FOS	factor of safety
V	volume
W	weight

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta \sigma'$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
ν	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial vertical effective overburden stress
$\sigma_1\sigma_2\sigma_3$	principal stresses (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3) / 3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) formerly (G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_1 or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity Index = $(w_1 - w_p)$
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_c	consistency index = $(w_1 - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (overconsolidated range)
C_s	swelling index
C_α	coefficient of secondary consolidation
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	overconsolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p or τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c'	effective cohesion
c_u or s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3) / 2$
p'	mean effective stress $(\sigma'_1 + \sigma'_3) / 2$
q	$(\sigma_1 - \sigma_3) / 2$ or $(\sigma'_1 - \sigma'_3) / 2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes:
[1] $\tau = c' + \sigma' \tan \phi'$
[2] shear strength = (compressive strength) / 2

PROJECT: 11-1125-0017

RECORD OF BOREHOLE: BH11-1

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 30, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl)	ADDITIONAL LAB TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE									
0	Power Auger 200 mm Diam. (Hollow Stem)	Very loose to loose grey brown silty fine sand and silty clay (FILL)		0.00	1	50 DO	1				Bentonite Seal
1					2	50 DO	WH				Native Backfill
2					3	50 DO	4				
3					4	50 DO	5				
		Grey brown silty clay, some sand (FILL)		3.51							
4		Loose brown SILTY fine SAND, trace gravel, clay and organic matter		3.66	5	50 DO	7				
5					6	50 DO	7				
		Stiff red brown SILTY CLAY, trace sand (Weathered Crust)		5.18	7	50 DO	8				Bentonite Seal
6		Very soft grey SILTY CLAY		5.94	8	50 DO	1				
7					9	50 DO	PM				
					10	50 DO	PM				Silica Sand
8					11	50 DO	PM				
9					12	50 DO	PM				50 mm Diam. PVC #10 Slot Screen
10		End of Borehole		10.67							
11											
12											
13											
14											
15											

DEPTH SCALE

1 : 75

LOGGED: DG

CHECKED: LEB

Golder Associates

001549

MIS-BHS 001 1111250017-01.GPJ GAL-MIS.GDT 12/23/11 P.G

PROJECT: 09-1125-0006

RECORD OF BOREHOLE: 09-1A

SHEET 1 OF 2

LOCATION: N ;E

BORING DATE: 02/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		68.76				SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○)	WATER CONTENT PERCENT (Wp W Wl)		
		Black SANDY SILT with organic matter		0.00							Protective casing
				68.23							
		Loose brown fine SANDY SILT		0.53	1	SS DO	6				
				67.77							Bentonite Seal
1		Stiff grey brown SILTY CLAY (Weathered Crust)		0.99	2	SS DO	4				
					3	SS DO	WH				
2				66.17							
		Grey SILTY CLAY		2.59	4	SS DO	WH				
3											
4					5	SS DO	PM				
				63.84							
5		Grey SILTY CLAY, trace of black organic matter		4.89							
6					6	SS DO	PM				
					7	SS DO	PM				
				60.84							
8		Grey SILTY CLAY, occasional rust brown layers, traces black organic matter		7.89							Native Backfill
9					8	SS DO	PM				
10				58.40							
		Grey SILTY CLAY, trace black organic matter		10.38	9	SS DO	PM				
11											
12					10	SS DO	PM				
13											
14					11	SS DO	PM				
15		CONTINUED NEXT PAGE									

Power Auger
203mm Diam. (Hollow Stem)

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.G.
CHECKED: MKF

001550

MIS-BHS 001 09112532060.GPJ GAL-MIS.GDT 3/8/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1A

SHEET 2 OF 2

LOCATION: N ;E

BORING DATE: 02/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-5} 10^{-4} 10^{-3} 10^{-2})	WATER CONTENT PERCENT Wp W Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
15	Power Auger 200mm Diam. (Hollow Stem)	— CONTINUED FROM PREVIOUS PAGE —											
15		Grey SILTY CLAY, trace black organic matter			12	50 DO	PM						
16													
17					13	50 DO	PM						Notfrey Backfill
18				50.78									
18		Grey SILTY CLAY		17.94	14	50 DO	WH						
19													Bentonite Seal
19				49.00	15	50 DO	>50						
20		Very dense grey SANDY SILT, some gravel and clay (GLACIAL TILL)		19.76									Silica Sand
20													32mm diam. PVC #10 slot screen
21				47.65									
21		End of Borehole		21.11		50 DO	>50						
22													Well Screen frozen to Elev. 68.67 m on Feb 8, 2010
23													
24													
25													
26													
27													
28													
29													
30													

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.G.

CHECKED: MKF

001551

GINT 9.0.GDT 9/8/10 09-1125-0008-2000.GPJ GAL-MIS.GDT 9/8/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1B&C

SHEET 1 OF 1

LOCATION: N ;E

BORING DATE: 04/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp ⊢—○ W —⊣ Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		68.72									
	Power Auger 200mm Diam. (Nominal 8-inch)	For subsurface stratigraphy refer to record of borehole 09-B2A		0.00									Protective Casing; Bentonite Seal; Native Backfill; Silica Sand; 32mm diam. PVC #10 slot screen C; Silica Sand; Bentonite Seal; Native Backfill and Bentonite; Bentonite Seal; Silica Sand; 32mm diam. PVC #10 slot screen B
10		End of Borehole		58.61 10.00									W.L. in Screen B at Elev. 67.43 m; W.L. in Screen C at Elev. 67.57 m on Feb. 8, 2010

DEPTH SCALE

1 : 75

LOGGED: D.G.

CHECKED: WKF

Golder Associates

001552

M:\2-10 001 GINT\1250008-2003 GPJ GAL-MIS GDT 3/9/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1D

SHEET 1 OF 1

LOCATION: N ;E

BORING DATE: 08/02/2010

DATUM: Geodetic

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		69.58									
0	Hand Auger Open Hole	PEAT		0.00	1	50 DO	WH						Bentonite Seal
1					2	50 DO	1						Silica Sand Backfill; 32mm Dia. PVC # 10 Slot Screen
2		End of Borehole		67.60 1.98	3	50 DO	WH						Well Installed Elev. 68.40 m Feb. 8, 2010
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

DEPTH SCALE

1 : 75

LOGGED: J.D.

CHECKED: MKC

Golder Associates

001553

MIS-BHS 001 09112500008-2000.GPJ GAL-MIS.GDT 3/6/10

PROJECT: 07-1122-0203-200

RECORD OF BOREHOLE: BH07-1

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: August 27, 2007

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q -, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10⁻⁶ 10⁻⁵ 10⁻⁴ 10⁻³); WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		32.34							
		TOPSOIL (FILL)		32.25							Protective Casing
		Brown SANDY SILTY some gravel trace brick (FILL)		31.95							Bentonite Seal
		Brown SILTY SAND, trace topsoil (FILL)		31.55	1	50 DO	8				Silica Sand
				30.46	2	50 DO	3				50mm Diam. PVC #10 Slot Screen D
		Dark grey brown SILTY SAND, trace topsoil (FILL)		30.31							
		Stiff grey brown SILTY CLAY (Weathered Crust)		29.84	3	50 DO	WH				
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter		29.50	4	50 DO	WH				Bentonite Seal
					5	50 DO	PH				38mm Diam. PVC #10 Slot Screen C
					6	50 DO	PH				Native Backfill
					7	50 DO	PH				Bentonite Seal
		Grey SILTY CLAY, trace black organic matter		23.61							Silica Sand
				23.51	8	50 DO	PH				38mm Diam. PVC #10 Slot Screen B
					9	50 DO	PH				
		Grey SILTY CLAY, trace to some black organic matter		20.56							
					10	50 DO	PH				
					11	50 DO	PH				Native Backfill
					12	50 DO	PH				
					13	50 DO	PH				
					14	50 DO	PH				
					15		PH				
		CONTINUED NEXT PAGE									

Bored 4 3/4" 105mm Diam. (Rotation Bored)

DEPTH SCALE

1 : 100

LOGGED: D.J.S

CHECKED: P.L.E

Golder Associates

001554

MISSING 021 07-1122-0203-200 EP1 BLOR 23-NOV-2007 R1907

PROJECT: 07-1122-0203-200

RECORD OF BOREHOLE: BH07-1

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: August 27, 2007

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10⁻⁴ 10⁻⁵ 10⁻⁶ 10⁻⁷)	WATER CONTENT PERCENT (Wp — W — Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Power Auger 200mm diam. (Hollow Stem)	— CONTINUED FROM PREVIOUS PAGE —											
		Grey SILTY CLAY, trace to some black organic matter			15	SS DO	PM						Native Backfill
		Grey SILTY CLAY, occasional clayey silt seam		20.70									
22		Compact dark grey SANDY SILT, some gravel and clay, occasional cobbles (GLACIAL TILL)		21.73	16	SS DO	HAM						Bentonite Seal
					17	SS DO	13						Silica Sand
24		End of Borehole Auger Refusal		23.90									38mm Diam. PVC #10 Slot Screen
26													
28													
30													
32													
34													
36													
38													
40													

Note: monitoring well screens A and B are each installed in their own boreholes and monitoring well screens C and D are installed in one borehole.

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: O.J.S.

CHECKED: P.L.E.

001555

GINS-S-GO1 07-1122-0203-200 GPJ GLOBAL_CAN.GDT 9/19/07

PROJECT: 05-1120-732-303

RECORD OF BOREHOLE: 05-11

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Aug. 17, 2005

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (net V. +, Q - ●; rem V. ⊕, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10⁻⁵ 10⁻⁴ 10⁻³ 10⁻²)	WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		72.81									
		Stone dust (FILL)		0.00									
				72.04									
		Grey brown silty clay, trace sand and organic matter (FILL)		0.77									Protective steel casing set in bentonite
1	Power Auger				1	SS	7						
	200mm Diam. (Hollow Stem)				2	SS	5						Native Backfill
				70.81									
		Dark grey TOPSOIL		2.00									
2		Compact brown fine SAND, trace to some silt		3.85	3	SS	10						Bentonite Seal
													Silica Sand
					4	SS	12						
3		Grey SILTY CLAY		69.01 3.80									30mm Diam. PVC #10 Slot Screen
					5	SS	WH/4						
		End of Borehole		64.03 4.98									
4													
5													
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

001556

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/2/06

PROJECT: 05-1120-732-303

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-8

BORING DATE: Aug. 17, 2005

SHEET 1 OF 1

DATUM:

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		73.15 / 0.00				SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	WATER CONTENT PERCENT Wp W Wl (10 20 30 40)		
0		Stone dust (FILL)		72.86 / 0.30							Protective steel casing set in bentonite
1		Asphalt and gravel (FILL)									
		Dark brown and grey brown silty clay and sandy silt, trace organic matter (FILL)		71.84 / 1.31	1	50 DO	7				
2	Power Auger 200mm Diam. (Hollow Stem)	Brown sand with plastic and metal (FILL)		71.00 / 2.07	2	60 DO	27				Native Backfill
		TOPSOIL		69.95 / 3.20	3	50 DO	19				Bentonite Seal
3		Compact brown fine SAND, trace to some silt		3.35							Silica Sand
4					4	50 DO	18				
		Grey SILTY CLAY		64.83 / 8.33							38mm Diam. PVC #10 Slot Screen
5					5	50 DO	1				
		End of Borehole		65.13 / 8.03							
6											
7											
8											
9											
10											

DEPTH SCALE

1:50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

001557

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/2/06

PROJECT: 05-1120-732-303

RECORD OF BOREHOLE: 05-R3

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Aug. 18, 2005

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7}) / WATER CONTENT PERCENT (Wp ⊢ W ⊣ Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		72.93							
		Grey stone dust (FILL)		0.00							Protective steel casing set in bentonite
		Brown sandy silt; some gravel (FILL)		72.50 / 0.43							
		Grey brown silty clay, trace sand, organic matter and gravel (FILL)		72.08 / 0.85	1	SS DO	8				
					2	SS DO	9				Native Backfill
		Grey brown and red brown SILTY CLAY (Weathered Crust)		69.88 / 3.05	3	SS DO	6				Bentonite Seal
					4	SS DO	7				Silica Sand
		Grey SILTY CLAY		68.60 / 4.33	5	SS DO	WH				38mm Diam. PVC #10 Slot Screen
		End of Borehole		67.75 / 5.18							

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

001558

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/5/08

PROJECT: 04-1120-143-3000

RECORD OF BOREHOLE: 05-4

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 16, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		85.00							
0	Power Auger 200mm Diam. (Hollow Stem)	Brown stratified fine SAND, some silt		0.00							
				84.45							
		Grey brown SILTY CLAY (Weathered Crust)		0.55							
1				83.93	1	50 DO	WH	+			
		Soft to stiff grey SILTY CLAY		1.07							
					2	50 DO	WH	+			
2				82.87							
		End of Borehole		2.13							
3	Nilcon Vane							+			
4								+			
5								+			
6								+			
7								+			
8								+			
9								+			
10								+			
11								+			
12								+			
13								+			
14								+			
15		CONTINUED NEXT PAGE									

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 06-1122-273.GPJ GLDR_CAN.GDT 1/17/07

001559

PROJECT: 04-1120-143-3000

RECORD OF BOREHOLE: 05-4

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 16, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + Q - ● rem V. ⊕ U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-5} 10^{-6} 10^{-4} 10^{-3})	WATER CONTENT PERCENT Wp W Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
15		— CONTINUED FROM PREVIOUS PAGE —											
16									+				
17									+				
18	Nilson Vane								+				
19									+				
20									+				
21									+				
22									+				
23													
24													
25													
26													
27													
28													
29													
30													

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 06-1122-273.GPJ GLDR_CAN.GDT 1/17/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-3

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 8, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		69.85							
0	Power Auger 200mm Diam. (Hollow Stem)	Grey and grey brown silty clay (FILL)		0.00 / 69.39							Bentonite Seal
		Firm to stiff grey brown SILTY CLAY (Weathered Crust)		0.46 / 68.78	1	50 DO	2				Silica Sand
		Grey SILTY CLAY, occasional red brown layer, trace organic matter		1.07							38mm Diam. PVC #10 Slot Screen D
2					2	50 DO	WH				
					3	50 DO	PH				Bentonite Seal
					4	50 DO	WH				Silica Sand
4											38mm Diam. PVC #10 Slot Screen C
					5	50 DO	WH				
6					6	50 DO	PH				Native Backfill
					7	50 DO	PM				
8											Bentonite Seal
					8	50 DO	PM				Silica Sand
10											38mm Diam. PVC #10 Slot Screen B
					9	50 DO	PM				Silica Sand
		Grey SILTY CLAY, trace black organic matter		58.27 / 11.58							
12					10	50 DO	PH				
14					11	50 DO	PM				Native Backfill
					12	50 DO	PM				
16											
					13	50 DO	PM				
18		Grey SILTY CLAY		51.87 / 17.98							
					14	50 DO	PM				
		Grey layered SILTY CLAY and CLAYEY SILT		50.65 / 19.20							Bentonite Seal
20					15		26				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-3

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 8, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q- ●, rem V. ⊕ U- ○; 20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20		*— CONTINUED FROM PREVIOUS PAGE —*									
	Power Auger 200mm Diam. (Hollow Stem)	Very loose to compact grey to dark grey SANDY SILT, some gravel, trace clay (GLACIAL TILL)		48.78 / 20.12	15	50 DO	26				Silica Sand
22					16	50 DO	3				38mm Diam. PVC #10 Slot Screen A
		End of Borehole Auger Refusal		47.39 / 22.46							
24											
26											
28											
30											
32											
34											
36											
38											
40											

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-2

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 10, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		80.08							
		Brown fine SAND, some silt		0.00							Protective casing set in bentonite
				79.50							Bentonite Seal
		Very stiff to stiff grey brown SILTY CLAY, occasional red brown layer, fine sand and silt seam (Weathered Crust)		0.58	1	50 DO	12				
2					2	50 DO	6				Native Backfill
					3	50 DO	6				Bentonite Seal
					4	50 DO	5				Silica Sand
4					5	50 DO	5				38mm Diam. PVC #10 Slot Screen D
					6	50 DO	2				
				74.84							
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter		5.24	7	50 DO	WH				Bentonite Seal
6					8	50 DO	PH				
											Native Backfill
8					9	50 DO	WH				
											Bentonite Seal
					10	50 DO	PH				Silica Sand
10											38mm Diam. PVC #10 Slot Screen C
					11	50 DO	PM				
12					12	50 DO	PM				
14					13	50 DO	PM				Native Backfill
					14	50 DO	WR				
16					15	50 DO	WR				
											Bentonite Seal
18											Silica Sand
					16	50 DO	PH				
											38mm Diam. PVC #10 Slot Screen B
20					17		WR				

Power Auger 200mm Diam. (Hollow Stem)

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 100

LOGGED: D.J.S.

CHECKED: P.L.E.

Golder Associates

001563

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-2

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 10, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q- ● rem V. ⊕ U- ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Power Auger 200mm Diam. (Hollow Stem)	--- CONTINUED FROM PREVIOUS PAGE ---									
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter			17	50 DO	WR				
22					18	50 DO	WR				
		Grey SILTY CLAY, slight trace black organic matter		57.52 22.58	19	50 DO	WR				Native Backfill
24					20	50 DO	WR				
26					21	50 DO	WR				Bentonite Seal
		Grey layered SILTY CLAY and CLAYEY SILT		52.60 27.58	22	50 DO	WR				Silica Sand
28		Compact to dense grey to dark grey SANDY SILT, some gravel and clay with cobbles (GLACIAL TILL)		27.89							38mm Diam. PVC #10 Slot Screen A
		Probably weathered SHALE BEDROCK		50.58 29.50	23	50 DO	41				
30		End of Borehole Auger Refusal		29.72							
32											
34											
36											
38											
40											

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

001564

PROJECT: 05-1120-732-110

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-1

BORING DATE: Aug. 2, 2005

SHEET 1 OF 2

DATUM: Geodetic

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		85.53							
		Grey crushed stone (FILL)		0.12							Protective casing
		Compact brown stratified fine SAND, trace silt			1	50 DO	15				Silica Sand
				84.01							38mm Diam. PVC #10 Slot Screen D
2		Grey SILTY CLAY, occasional red brown layer with depth		1.52	2	50 DO	WH				Native Backfill
											Bentonite Seal
					3	50 DO	PM				Silica Sand
4					4	50 DO	PH				38mm Diam. PVC #10 Slot Screen C
6					5	50 DO	PM				Native Backfill
8					6	50 DO	PM				Bentonite Seal
					7	50 DO	PM				Silica Sand
10	Power Auger 200mm Diam. (Hollow Stem)				8	50 DO	PH				38mm Diam. PVC #10 Slot Screen B
				73.95							
12		Grey SILTY CLAY, occasional red brown layer, scattered trace black organic matter		11.58	9	50 DO	PM				Native Backfill
14					10	50 DO	PM				
					11	50 DO	PM				
16											Bentonite Seal
					12	50 DO	WR				
18					13	50 DO	PM				Native Backfill
20					14		WR				

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MISS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 10/19/06

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-1

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 2, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20		— CONTINUED FROM PREVIOUS PAGE —									
	Power Auger 200mm Diam. (Hollow Stem)	Grey SILTY CLAY, occasional red brown layer, scattered trace black organic matter			14	50 DO	WR				
22					15	50 DO	WR				
		Grey SILTY CLAY, occasional red brown layer, trace to some black organic matter		62.97 22.56							
					16	50 DO	WR				
24					17	50 DO	PM				
26					18	50 DO	WR				Native Backfill
					19	50 DO	WR				
28											
					20	50 DO	WR				
30											
					21	50 DO	WR				
32											
					22	50 DO	WR				
		Layered SILTY CLAY and CLAYEY SILT		52.29 33.24							Bentonite Seal
											Silica Sand
34		Grey CLAYEY SILT, some gravel		51.53	23	50 DO	WR				
		Compact to dense dark grey SANDY SILT, some gravel and clay (GLACIAL TILL)		34.14							38mm Diam. PVC #10 Slot Screen A
				50.33	24	50 DO	>100				
		End of Borehole Auger Refusal		35.20							
36											
38											
40											

DEPTH SCALE

1 : 100

Golder Associates

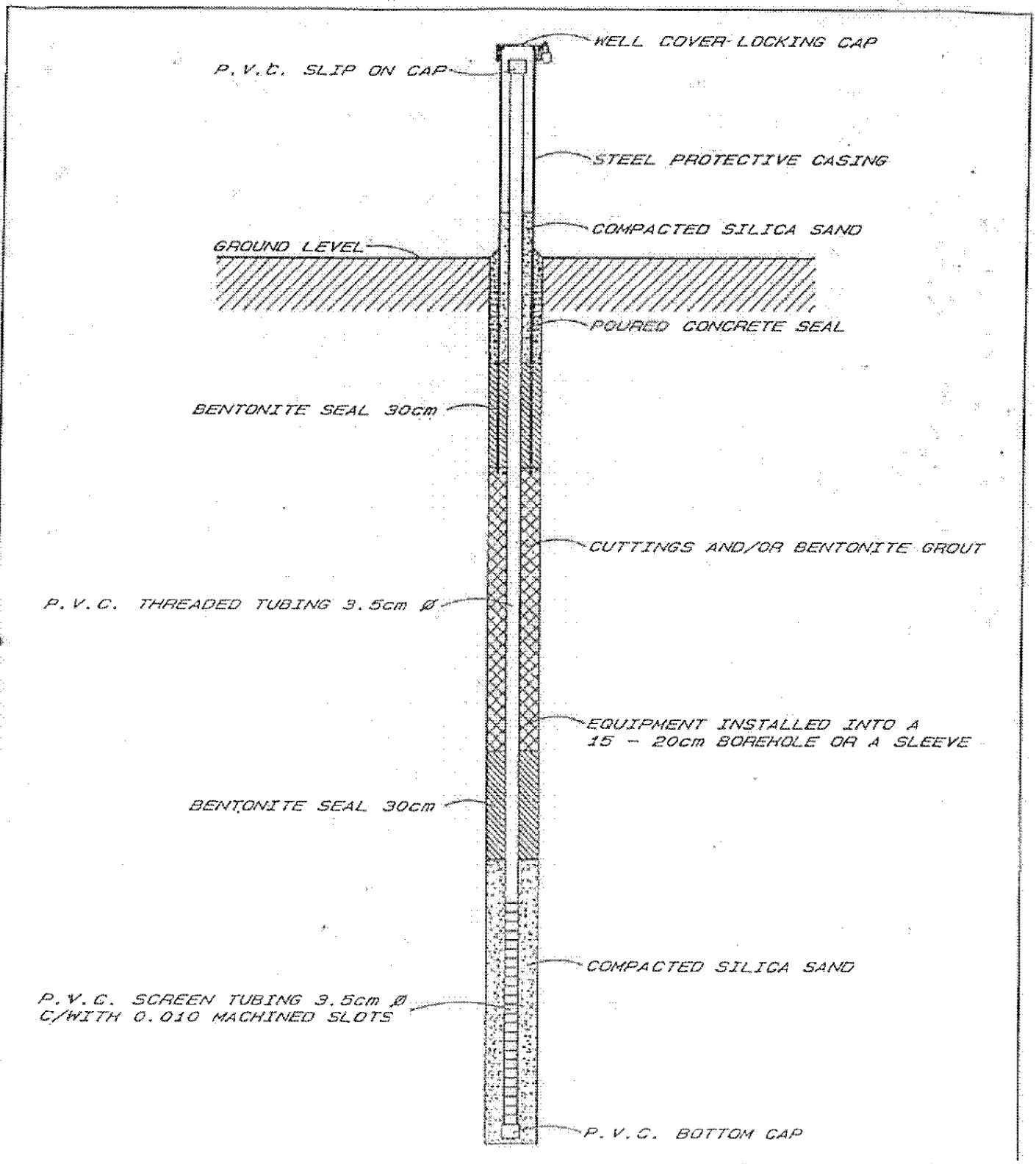
LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 10/19/06

TYPICAL MONITORING WELL INSTALLATION

INSTALLATION TYPIQUE D'UN PUIT D'OBSERVATION



001567

PROJECT NO. WSI006

BOREHOLE NO. MW-4 (MW-4)

PROJECT HUNEAULT LANDFILL

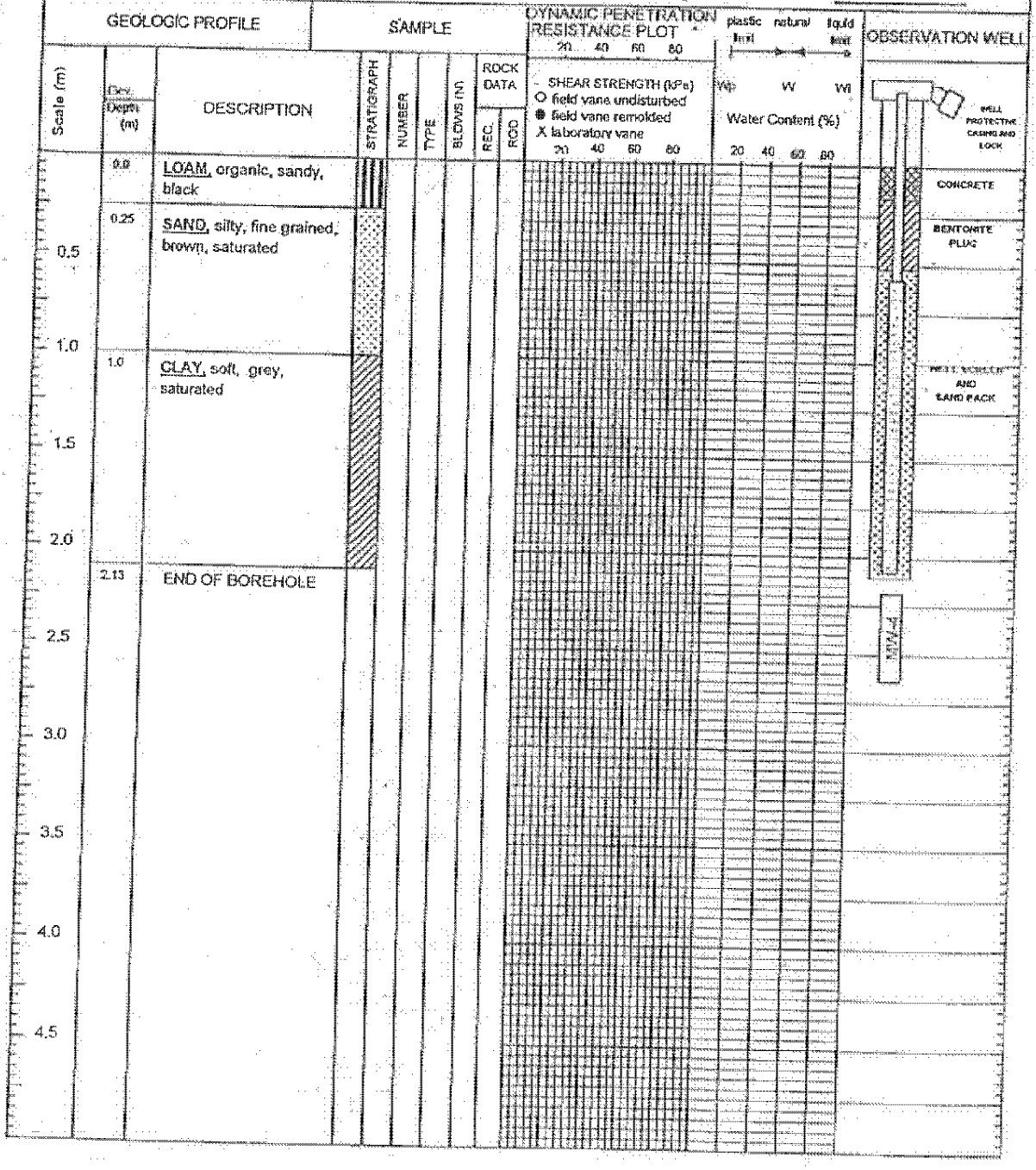
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM Arbitrary BOREHOLE TYPE HAND AUGER

DRILLING DATE 19-May-00

REPORT DATE Sep-00

COMPILED BY N.C.



PROJECT NO. WSI006

BOREHOLE NO. MW-5 (MW-E)

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM Arbitrary BOREHOLE TYPE HAND AUGER

DRILLING DATE 19-May-00

REPORT DATE Sep-00

COMPILED BY N.C.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPH	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS (N)	ROCK DATA: REC.	ROCK DATA: RQD
0	0.00	LOAM, organic, sandy, black						
0.5	0.25	SAND, silty, fine grained, brown, saturated						
1.0								
1.5	1.2	CLAY, soft, grey, saturated						
2.0								
2.5	2.13	END OF BOREHOLE						
3.0								
3.5								
4.0								
4.5								

DYNAMIC PENETRATION RESISTANCE PLOT

SHEAR STRENGTH (kPa)
O field vane undisturbed
● field vane remolded
X laboratory vane

20 40 60 80

plastic limit — natural — liquid limit

Wp W Wl

Water Content (%)

20 40 60 80

OBSERVATION WELL

WELL PROTECTIVE CASING AND LOCK

CONCRETE

BENTONITE PLUG

WELL SCREEN AND SAND PACK

MW-5

001569

PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

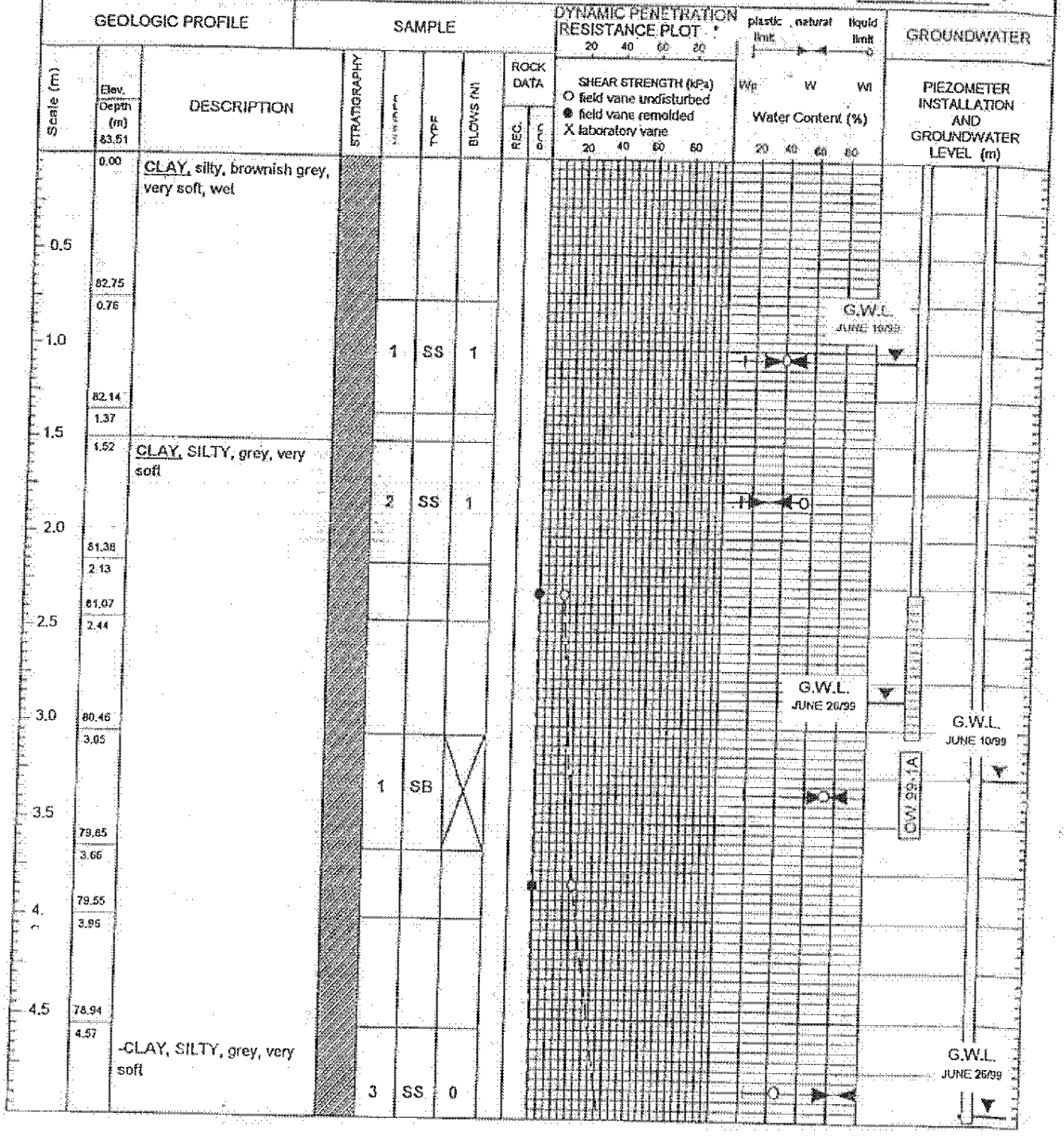
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.

Page1/4



PROJECT NO. E9701 BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL DRILLING DATE Jun-99
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Jan-00
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS COMPILED BY V.G.

GEOLOGIC PROFILE | SAMPLE | DYNAMIC PENETRATION RESISTANCE PLOT | plastic limit | natural | liquid limit | GROUNDWATER

Scale (m)	Elev. / Depth (m) 78.51	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	TYPE	BLOWS (N)	ROCK DATA REC.	ROCK DATA	SHEAR STRENGTH (kPa) O field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	5.00										
	5.18 / 78.02										
5.5	5.49 / 77.41										
6.0	6.10 / 76.8	-CLAY, SILTY, grey, very soft, wet		4	SS	0					
6.5	6.71 / 76.50										
7.0	7.01 / 75.89										
7.5	7.62 / 75.28	-CLAY, SILTY, grey, very soft, wet		5	SS	0					
8.0	8.23 / 74.98										
8.5	8.53 / 74.37										
9.0	9.14 / 73.76			2	SB	X					
9.5	9.75										

PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

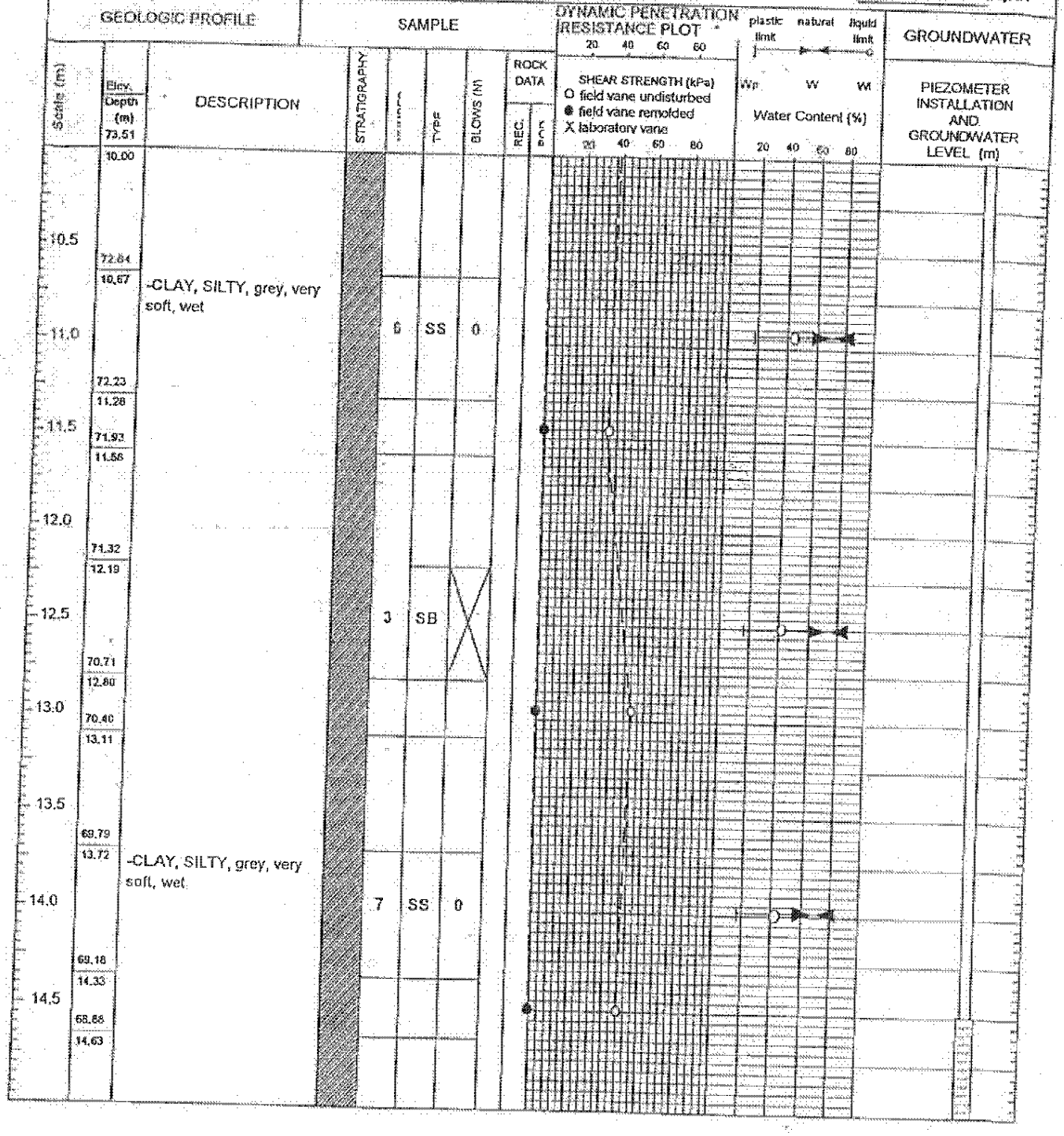
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.



PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

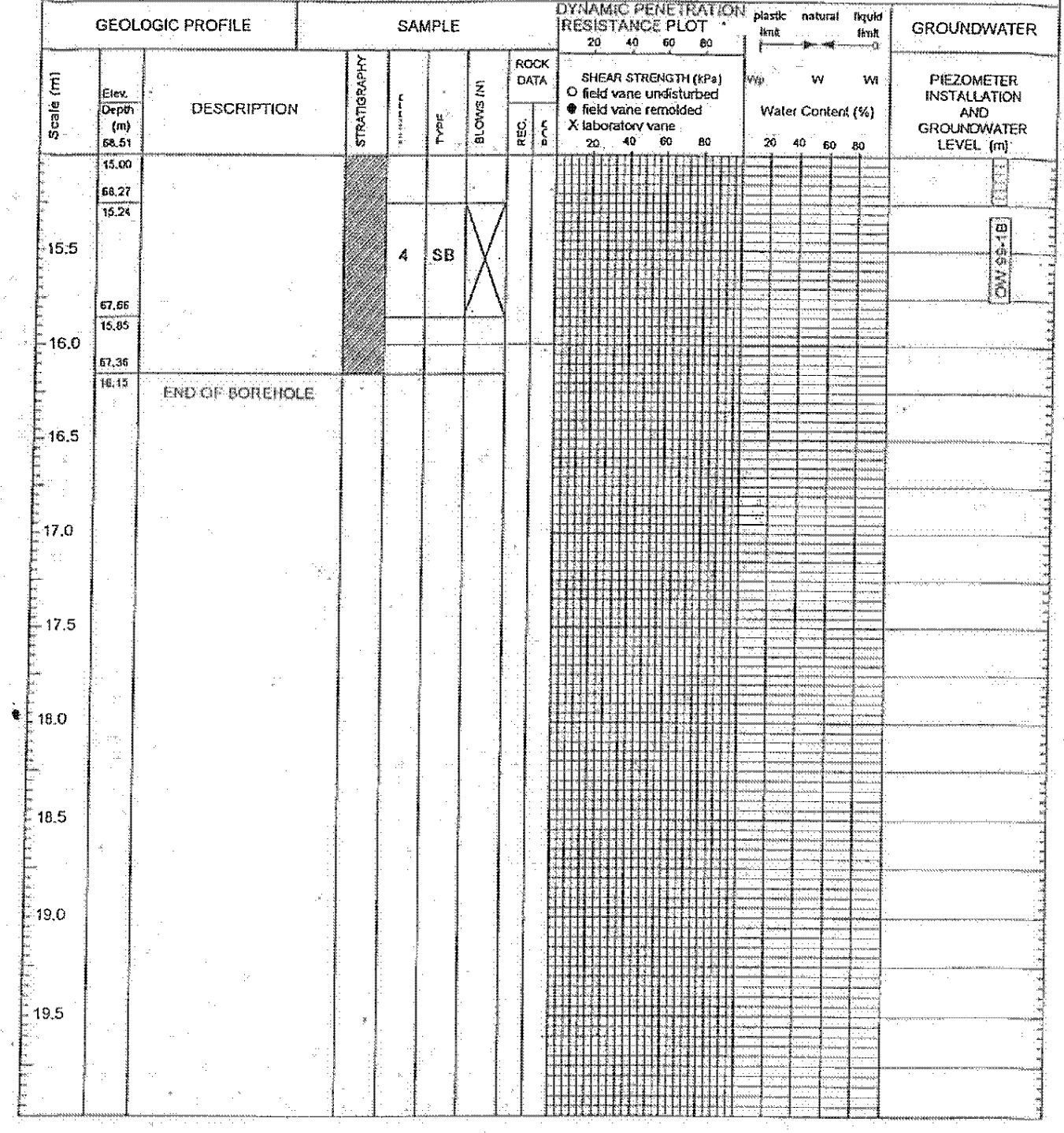
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.



PROJECT NO. E8401

BOREHOLE NO. 98-1

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

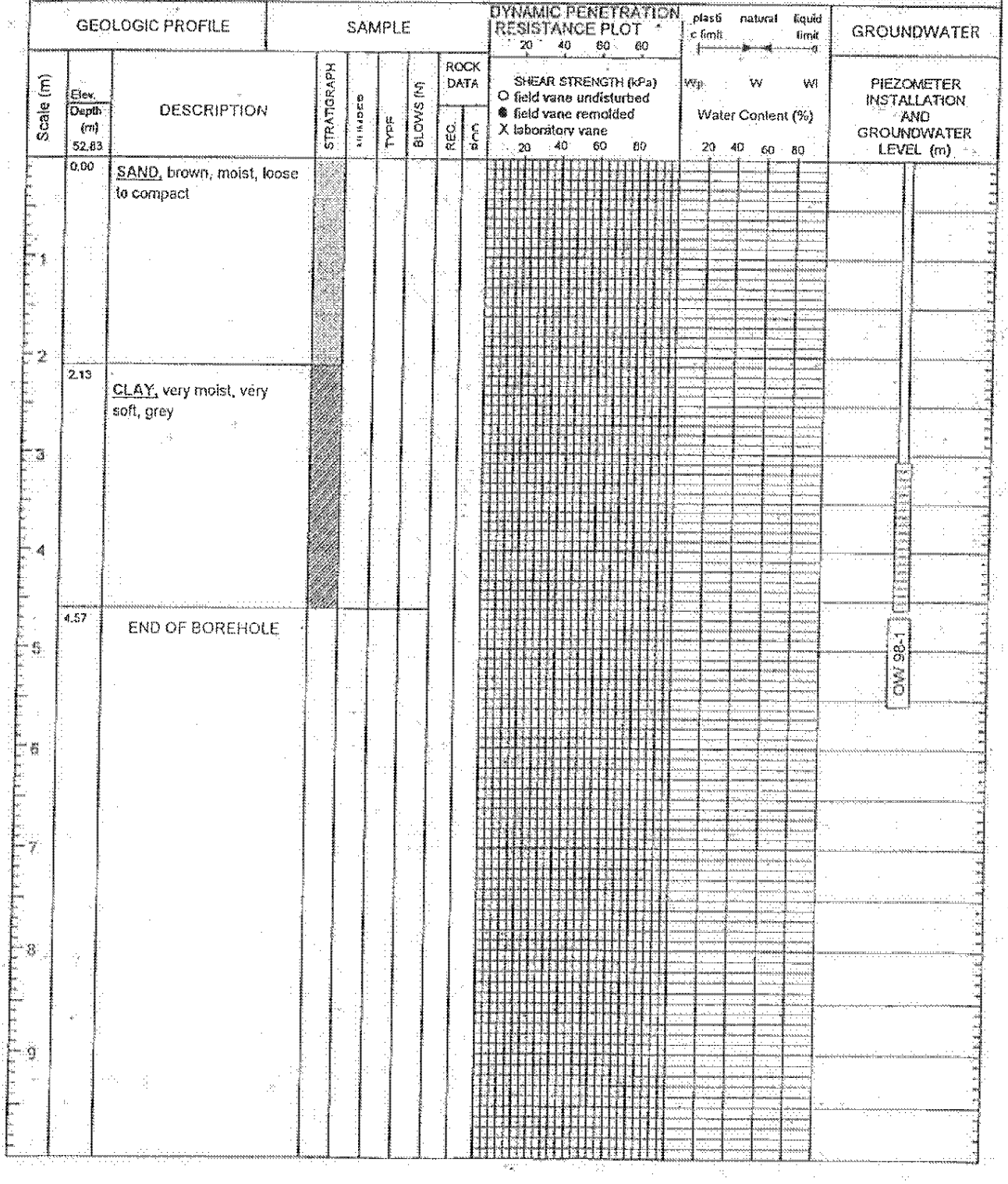
DATUM GEODETIC

BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Oct-98

REPORT DATE Oct-98

COMPILED BY V.G.



PROJECT NO. E8401

BOREHOLE NO. 98-2

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DRILLING DATE Oct-98

REPORT DATE Oct-98

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - 108MM LOW STEM AUGERS

COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE				ROCK DATA		DYNAMIC PENETRATION RESISTANCE PLOT		GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPH	Sequence	TYPE	BLOWS (N)	REC.	RQD	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	plasti c limit / natural / liquid limit; Wp W Wl; Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
1	0.00	SAND, brown, moist, loose to compact		1	S	1					
	1.37			2	S	0					
2	2.13	CLAY, very moist, very soft, grey		3	S	0					
3	2.90			4	S	0					
	3.66			5	S	0					
4	4.42										
5											
6				6	S	0					
	6.71										
7	7.62			7	S	0					
8	8.23	END OF BOREHOLE									OW 98-2
9											

PROJECT NO. E8401

BOREHOLE NO. 98-3

PROJECT HUNEAULT LANDFILL

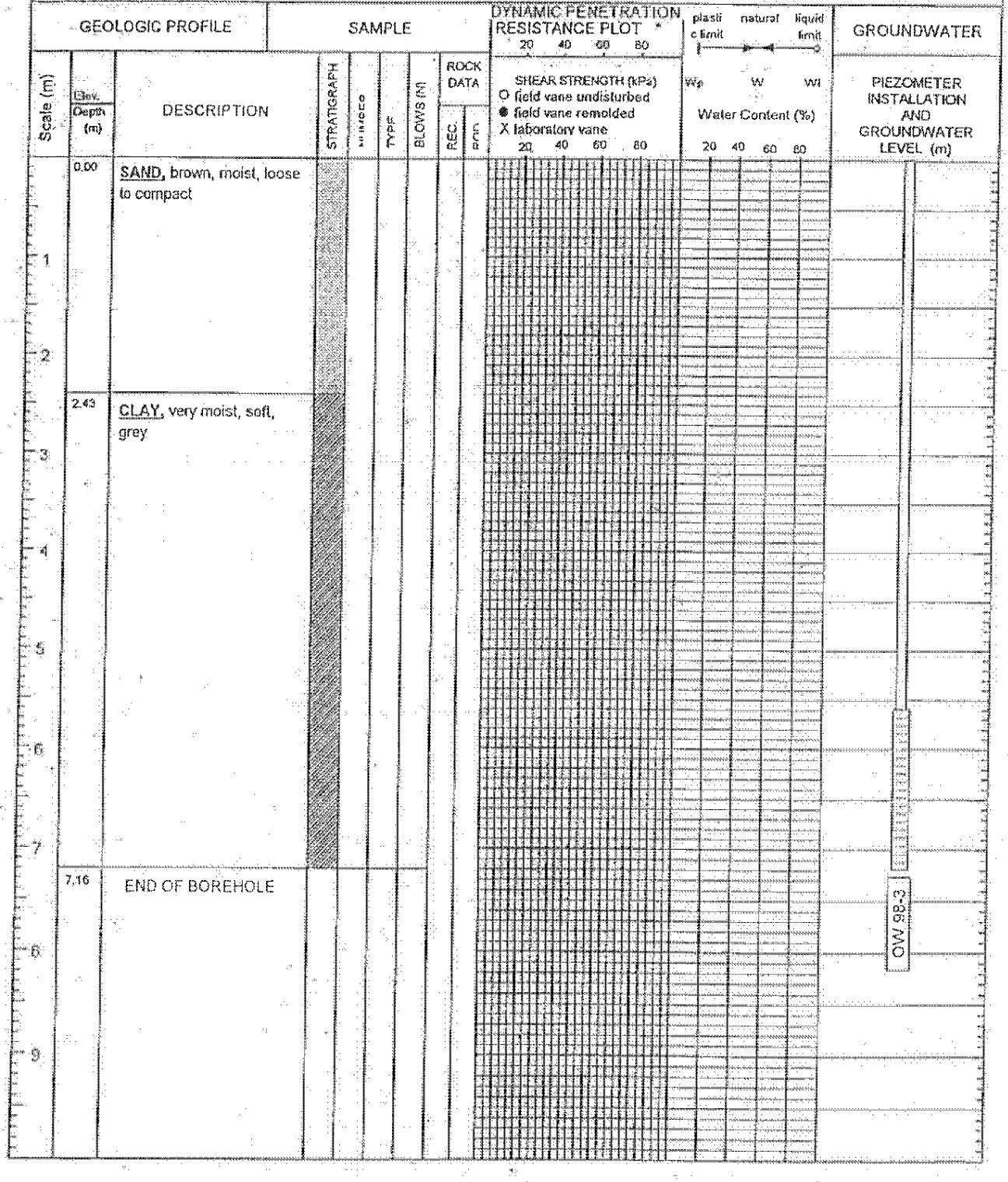
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Oct-98

REPORT DATE Oct-98

COMPILED BY V.G.



PROJECT NO. E8401

BOREHOLE NO. 98-4

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Oct-98

REPORT DATE Oct-98

COMPILED BY V.G.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPH	SAMPLE NUMBERS	TYPE	BLOWS /0.3m	ROCK DATA REC.	ROCK DATA RQD
1	0.00	SAND, brown, dry, loose to compact						
2	2.13	CLAY, very moist, soft, grey						
3	4.57	END OF BOREHOLE						
4								
5								
6								
7								
8								
9								

DYNAMIC PENETRATION RESISTANCE PLOT
20 40 60 80

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER

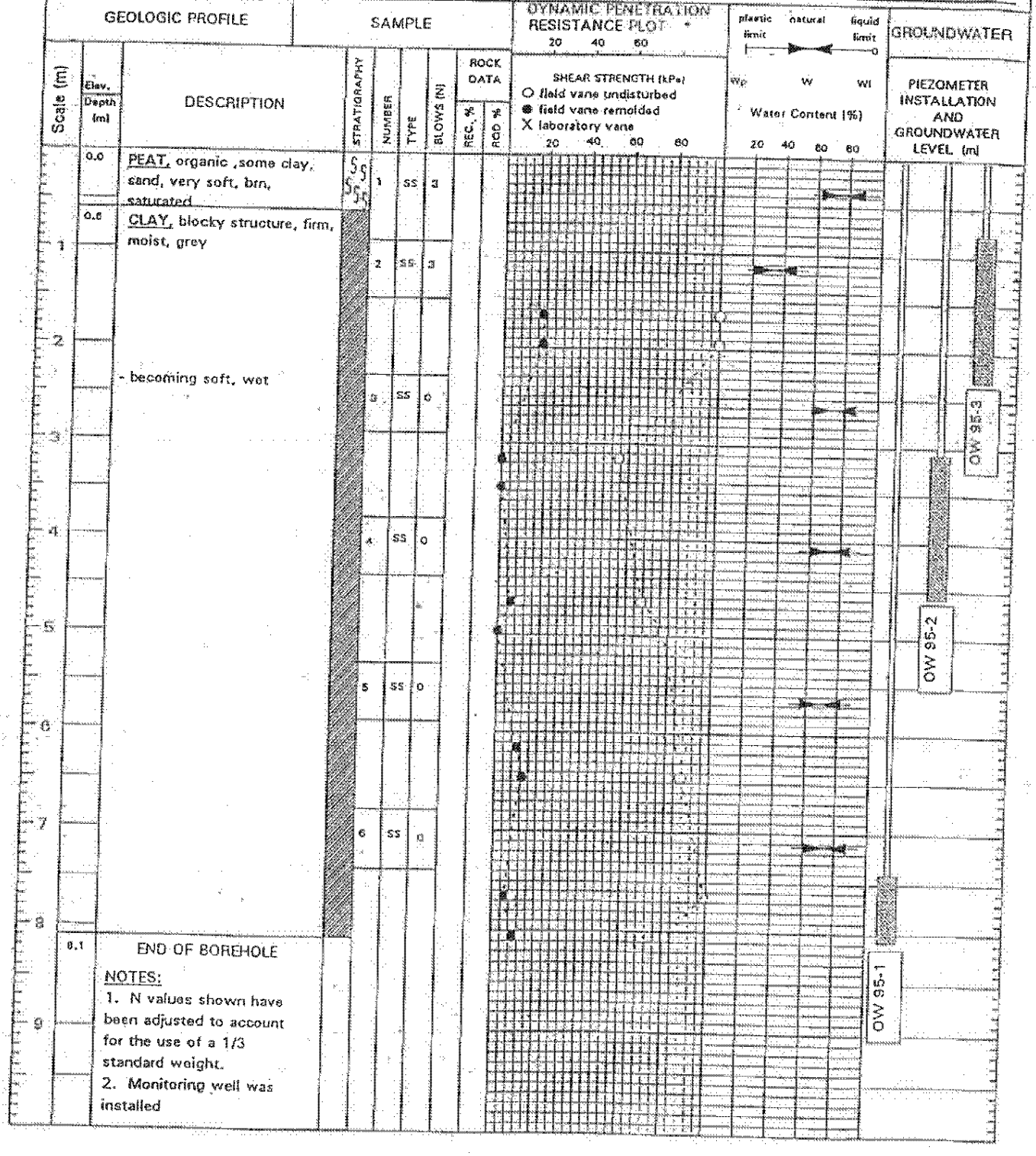
PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 98-4

001577

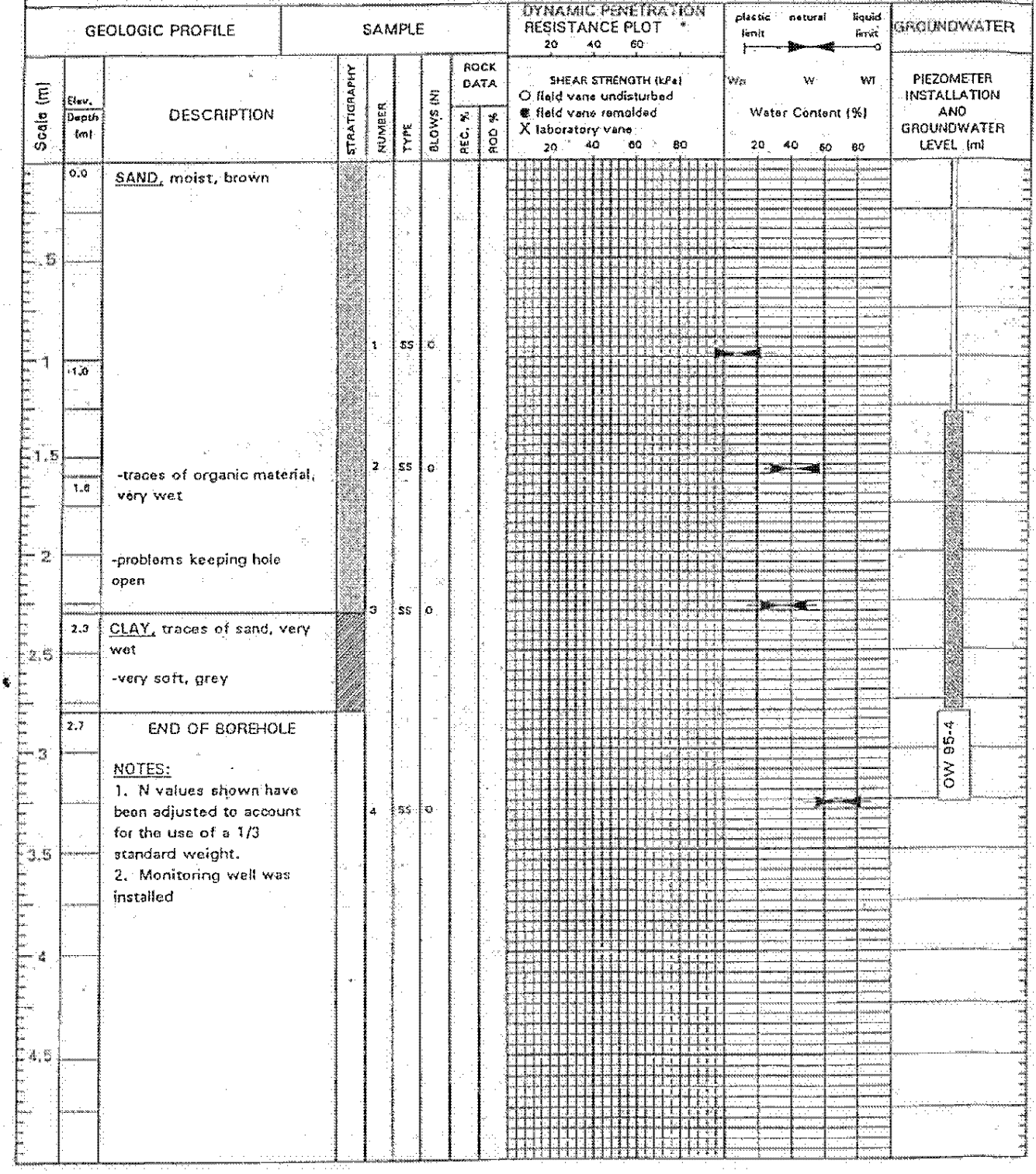
PROJECT NO. E0100 BOREHOLE NO. 95-1

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



PROJECT NO. E0100 BOREHOLE NO. 95-4

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



PROJECT NO. E0100 BOREHOLE NO. 95-5

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	ROCK DATA: REC. %	ROCK DATA: RQD %
	0.0	PEAT, organic, soft, wet, brn		1	SS	0		
	0.3			2	SS	0		
	0.6	SAND, moist, brown						
1		CLAY, moist, brown		3	SS	7		
		-grey, moist						
2				4	SS	5		
3		-soft, moist		5	SS	0		
4								
5		-becoming stiff, grey, traces of brown and black color		6	SS	0		
6				7	SS	0		
		-stiff, grey, traces of brown and black color						
7								
8				8	SS	0		
	8.25	END OF BOREHOLE						

NOTES:
1. N values shown have been adjusted to account for the use of a 1/3 standard weight.
2. Monitoring well was installed

DYNAMIC PENETRATION RESISTANCE PLOT * 20 40 60

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER
PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 95-7
OW 95-8
OW 95-9

PROJECT NO. E0100

BOREHOLE NO. 95-8

PROJECT HUNEAULT WASTE MANAGEMENT

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATU GEODETIC

BOREHOLE TYP PORTABLE DRILLING

DRILLING DATE Jun-95

REPORT DATE Aug-95

COMPILED BY V.G.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA RQD %
0	0.0	SAND, moist, brown		1	SS	0		
.5				2	SS	0		
1	1.0			3	SS	0		
1.5	1.55	- CLAY, very soft, very moist, grey		4	SS	0		
2								
2.5	2.3			5	SS	0		
3	2.7	END OF BOREHOLE						
3.5		NOTES: 1. N values shown have been adjusted to account for the use of a 1/3 standard weight. 2. Monitoring well was installed						
4								
4.5								

DYNAMIC PENETRATION RESISTANCE PLOT 20 40 60

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

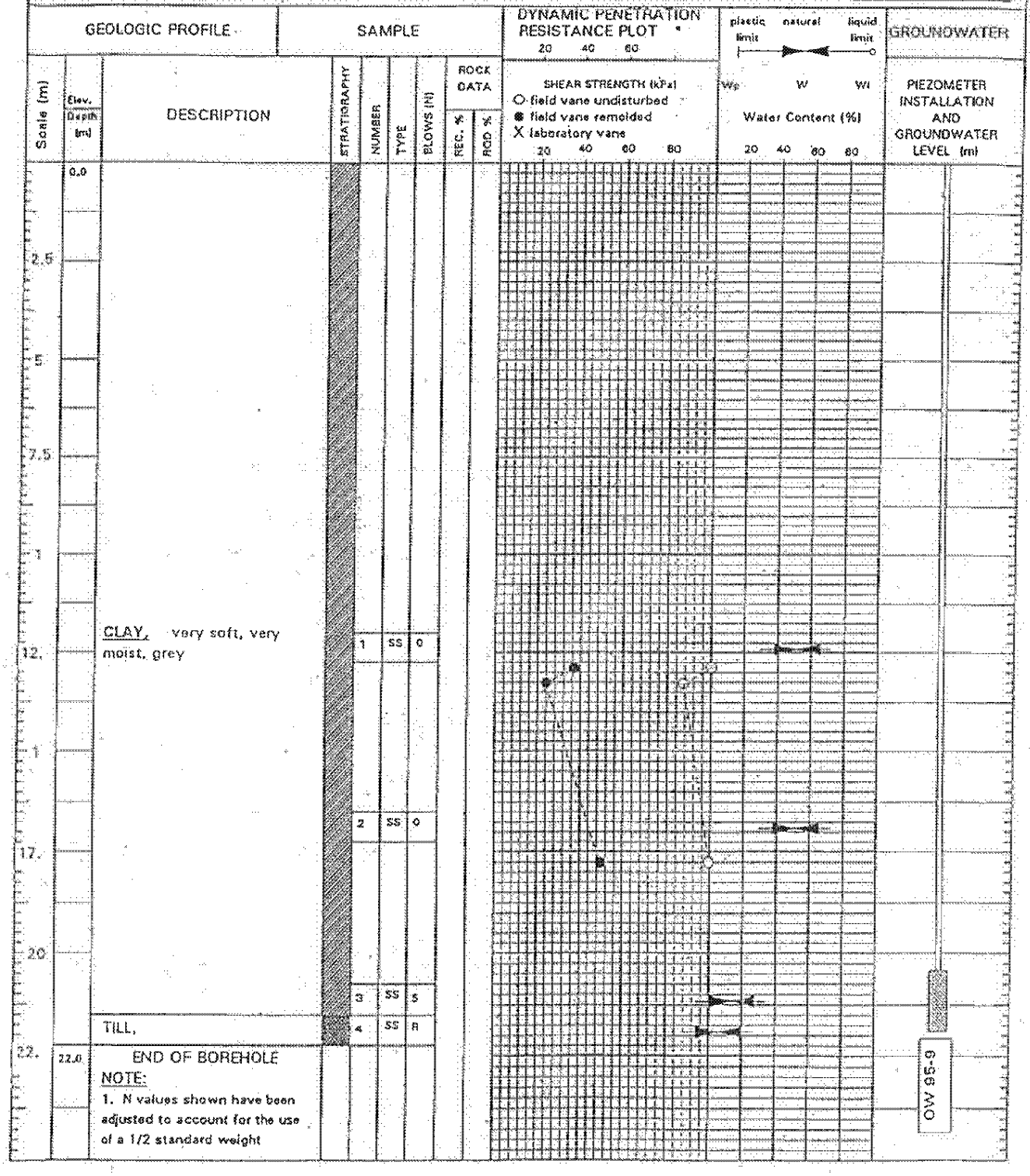
GROUNDWATER

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 95-8

PROJECT NO. E0100 BOREHOLE NO. 95-9

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



PROJECT NO. E0100 BOREHOLE NO. OW-1A-D

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jul-95

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE

DATU GEODETIC BOREHOLE TYP AUGER TYPE COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE					DYNAMIC PENETRATION RESISTANCE PLOT * 20 40 60	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	ROCK DATA REC. %	ROD %	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	0.0	PEAT, organic, very soft, brn, moist									
1.5											
1											OW 1A
											OW 1B
											OW 1C
	1.7	SAND, med. grained, brn, very moist									
2		END OF BOREHOLE									OW 1D

NOTES:
1. Monitoring well was installed

PROJECT NO. E0100 BOREHOLE NO. OW-2A-D

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jul-95

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE

DATU GEODETIC BOREHOLE TYP AUGER TYPE COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE					DYNAMIC PENETRATION RESISTANCE PLOT * 20 40 60	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS/0.3	ROCK DATA REC. %	ROD %	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
0.5	0.0	PEAT, organic, very soft, brn, moist									
1											OW 2A
1.5											OW 2B
	1.7	SAND, med. grained, brn, very moist									OW 2C
2		END OF BOREHOLE NOTES: 1. Monitoring well was installed									OW 2D

001584

CASTONGUAY Technologies Inc.
Environmental and Geotechnical Engineering

PROJECT NO. E0100 BOREHOLE NO. 94-1

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE May 19/94
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-94
DATU GEODETIC BOREHOLE TYP BOA DRILL - HOLLOW STEM COMPILED BY N.G.C.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (/f)	ROCK DATA REC. %	ROCK DATA RQD %
1	0.0	FILL, mixture: sand, gravel, silt, clay, loose to compact, moist, med. brn						
	0.8	SAND, med. grained, tr. silt, very moist, reddish brn, loose, wet @ 1.1m		1	SS	14		
2	1.5	CLAY, blocky structure, firm, moist, brown to 1.8m becoming grey		2	SS	3		
3		- becoming soft, grey, saturated		3	SS	1		
4				4	SS	1		
5								
6				5	SS	0		
7								
8				6	SS	0		
9	8.5	END OF BOREHOLE						

DYNAMIC PENETRATION RESISTANCE PLOT * (20 40 60)

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER
PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

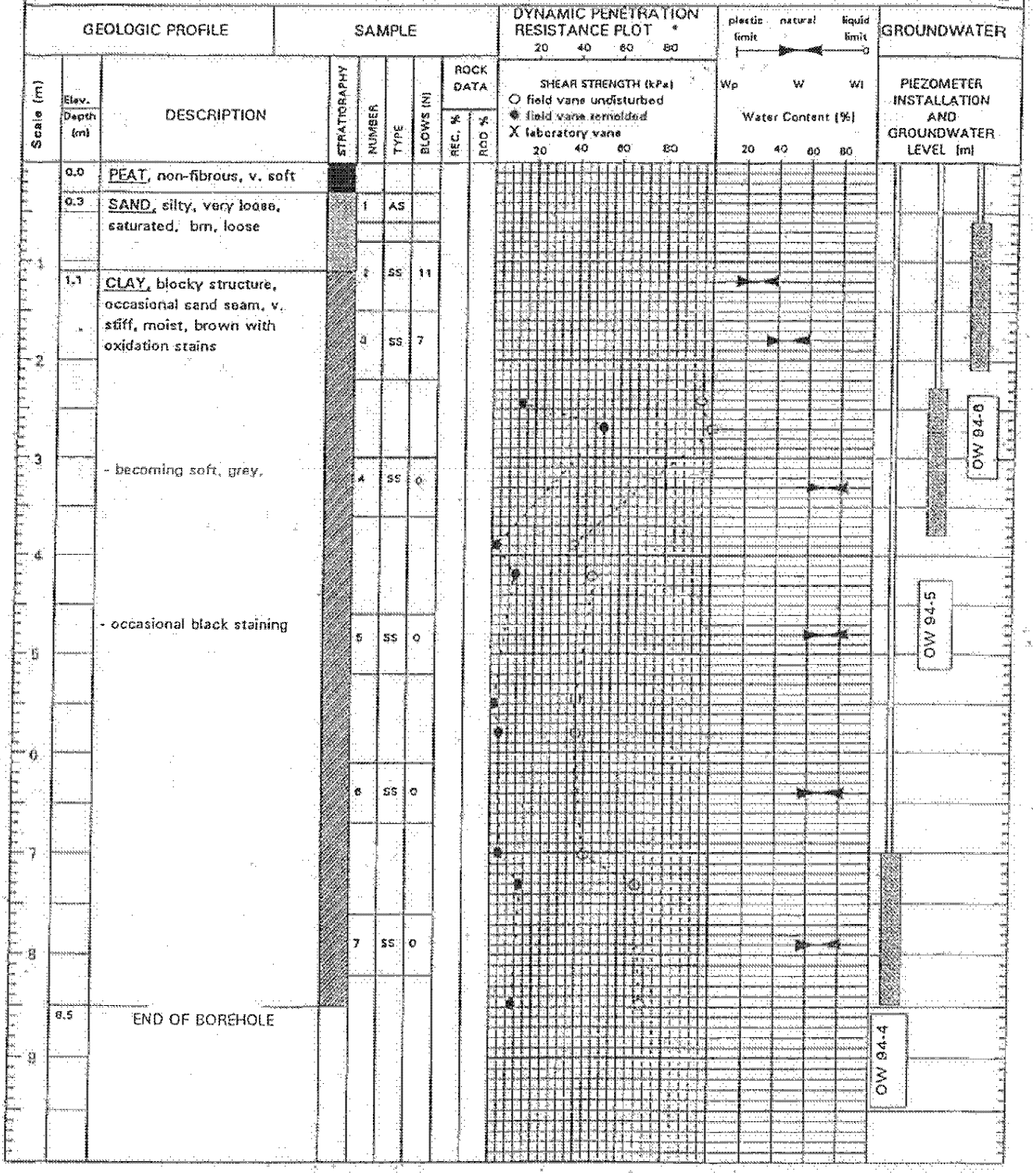
OW 94-3
OW 94-2
OW 94-1

001585

CASTONGUAY Technologies Inc.
Environmental and Geotechnical Engineering

PROJECT NO. E0100 BOREHOLE NO. 94-4

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE May 19/94
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-94
DATU GEODETIC BOREHOLE TYP BOA DRILL - HOLLOW STEM COMPILED BY N.G.C.



O-8550E

FONDEX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Dynamic Cone Penetration Resistance Plot 20 40 60 80 / Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	plastic limit / natural / liquid limit Wp W Wl / Water Content (%) 20 40 60 80	GROUNDWATER PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	71.10										
	0.00	SILTY CLAY (FILL) : SOFT, BLACK, MOIST, ORGANIC ODOUR, PIECES OF ASPHALT.									OW-92-1
1	69.70										
	1.40	SAND : LOOSE, BROWN CHANGING TO GREY AND MOIST.									
2											
	68.10										
3	3.00	CLAY : SOFT, GREY, MOIST, BLOCKY STRUCTURE.									
				1	ST						
4		- BECOMING LAYERED.									
5				2	ST						
6											
7				3	ST						
8		- WITH ALTERNATING BROWN LAYERS.									
		- SEA SHELLS VISIBLE AT A DEPTH OF 8.80m.									
		- ALTERNATING GREY AND BLACK LAYERS.									

001587

O-8550E

FOND DX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Dynamic Cone Penetration Resistance Plot 20 40 60 80 / Shear Strength (kPa) • field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	plastic limit / natural / liquid limit Wp W Wl Water Content (%) 20 40 60 80	GROUNDWATER PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	51.10										
	10.00	CLAY : SOFT, WITH ALTERNATING GREY AND BROWN LAYERS.		4	ST						OW-92-1
11											
12											
13											
14		- BECOMING WET.									
15		- BECOMING DARK GREY, VARVED STRUCTURE.									
16											
17											
18											

001588

O-8550E

FONDEX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	51.10 20.00	CLAY : DARK GREY, WET, VARVED STRUCTURE.									OW-92-1
21	49.90 21.20	- BECOMING VERY SOFT, TRACE OF SILT AND GRAVEL AT A DEPTH OF 21.80m.									
22											
23		- BECOMING TILL-LIKE ACCORDING TO SOUND AND DIFFICULTY OF DRILLING.									
	47.15										
24	23.95	SAND AND GRAVEL TILL : ACCORDING TO SOUND AND DIFFICULTY OF DRILLING.									
25	45.80	PRACTICAL AUGER REFUSAL									
	25.30	END OF BOREHOLE									

NOTE :
THE SOIL PROFILE PRESENTED IS REPRESENTATIVE OF THE PIEZOMETER NEST. CONTINUOUS SAMPLING WAS CARRIED OUT AT OW-92-01 TO A DEPTH OF APPROXIMATELY 21.0m. SHELBY TUBE SAMPLES WERE OBTAINED AT VARIOUS ELEVATIONS AT OTHER BOREHOLES WITHIN THE PIEZOMETER NEST.

O-8550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Dynamic Cone Penetration Resistance Plot 20 40 60 80 / Shear Strength (kPa) ○ field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	plastic limit / natural / liquid limit — Wp W Wl — Water Content (%) 20 40 60 80	GROUNDWATER PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	76.03										
	10.00	CLAY : TRACE OF SILT, SOFT, GREY, WET.		4	ST						OW-92-12
	75.03										
11	11.00	SILTY CLAY : SOFT, GREY, WET.									
12											
13											
14											
15											
16											
17											
18		- BECOMING SATURATED, ORGANIC ODOUR DETECTED.									

001590

O-B550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot	plastic limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	20 40 60 80	Wp W Wl	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
									Shear Strength (kPa) * field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	Water Content (%) 20 40 60 80	
	0.00	200mm OF GRAVEL OVER SAND : FINE GRAINED, LOOSE, BROWN, WET.									OW-92-12
1											
2											
3		- BECOMING GREY.									
4	81.43			1	ST						
	4.60	CLAY : TRACE OF SILT, SOFT, GREY, WET.									
5				2	ST						
6											
7				3	ST						
8											

001591

O-B530E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot	plastic limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Shear Strength (kPa) • field vane undisturbed × field vane remolded ◦ laboratory vane	Wp W Wl Water Content (%)	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	28.03								20 40 60 80	20 40 60 80	
	20.00	SILTY CLAY : SOFT, GREY, SATURATED.									OW 92-12
21											
22											
23											
24		- ASSUMED SILTY CLAY BASED ON SOUND AND EASE OF DRILLING									
25											
26											
27											
28											
9											

001592

O-B550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	56.03										
	30.00	SILTY CLAY : (ASSUMED)									OW-92-12
31											
32											
33	52.53										
	33.50	SAND AND GRAVEL TILL :									
34		- ENCOUNTERED COBBLES AND BOULDERS.									
35											
36											
37	48.83										
	37.20	PRACTICAL TRICONE REFUSAL									
		END OF BOREHOLE									

NOTE :
THE SOIL PROFILE PRESENTED IS REPRESENTATIVE OF THE PIEZOMETER NEST. CONTINUOUS SAMPLING WAS CARRIED OUT AT OW-92-12 TO A DEPTH OF APPROXIMATELY 22,0m. SHELBY TUBE SAMPLES WERE OBTAINED AT VARIOUS ELEVATIONS AT OTHER BOREHOLES WITHIN THE PIEZOMETER NEST.

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consulting engineers and hydrogeologists
4806 dixie road, R.R.4, mississauga, ontario l4w 2k4 - 625-0044

OW2-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 15, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT
TOPSOIL fine to medium grained, dark brown, wet, come organic material (FILL).	1	5				lockable steel protective casing; stick-up 0.90m; bentonite grout; 50mm Ø sch 40 threaded PVC riser pipe	
SAND fine to medium grained, reddish brown, wet, compact, some red and black staining.	2						
CLAY grey, wet, cohesive, plastic, laminated compact, weathered	3	10				bentonite seal; silica sand filter pack	
CLAY grey, wet, very cohesive, plastic, soft, laminated. Frequent black vertical staining (0.5cm thick) from 5m to depth. Red banding (1cm thick) 10-15cm apart from 3.6m to depth.	4	15				50mm Ø continuously wound PVC #8 slot well screen; end cap	
END OF HOLE 5.26m bgl.	5						
	6	20					
	7						
	8	25					
	9						

001594

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OW2-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED Noverber 15, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing. stick-up 0.91m
TOPSOIL fine to medium grained sand, dark brown, wet, some organic material (FILL).	1	5					50mm Ø sch 40 threaded PVC riser pipe.
SAND fine to medium grained, reddish brown, wet, compact, some red and black staining.	2						
CLAY grey, wet, cohesive plastic, laminated, compact, weathered.	3	10					bentonite grout.
CLAY grey, wet, very cohesive, plastic, soft, laminated. Frequent black vertical staining (0.5cm thick) from 5m to depth. Red banding (1cm thick) 10-15cm apart from 3.6m to depth.	4	15					
	5						bentonite seal.
	6	20					silica sand filter pack.
	7						50mm Ø continuously wound PVC #8 slot well screen.
		25					
END OF HOLE 7.92m bgl.	8						end cap.
	9	30					

001595

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OW3-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 16, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing. stick-up 1.08m
TOPSOIL fine to medium sand with some very fine gravel, brown to dark brown with some organic material wet, compact, becoming black (FILL).		1					50mmØ sch 40 threaded PVC riser pipe.
SAND fine to medium grained, orangish brown becoming dark brown, saturated, loose		2					bentonite grout.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, weathered.		3					bentonite seal.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, some black vertical staining (1cm thick) from 3.5m. Red banding (1-2cm thick) from 5.0m.		4					silica sand filter pack.
		5					50mm Ø continuously wound PVC #8 slot well screen.
END OF HOLE 5.15m bgl.		6					end cap.
		7					
		8					
		9					

WL-040181

001596

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consulting engineers and hydrogeologists

OW3-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 16, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing, stick-up 0.75m
TOPSOIL fine to medium sand with some very fine gravel, brown to dark brown with some organic material, wet, compact, becoming black (FILL).							
SAND fine to medium grained, orangish brown becoming dark brown, saturated, loose.	2	5					50mm Ø sch 40 threaded PVC riser pipe.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, weathered.	3	10					bentonite grout.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, some black vertical staining (1cm thick) from 3.5m. Red banding (1-2cm thick) from 5.0m.	4	15					
	5						bentonite seal.
	6	20					silica sand filter pack.
	7						50mm Ø continuously wound PVC #8 slot well screen.
		25					
END OF HOLE 7.92m bgl.	8						end cap.
	9						

001597

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OW4-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 17, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing.
TOPSOIL fine to medium grained sand, brown, moist, loose (FILL).							50mmØ sch40 threaded PVC riser pipe.
SAND fine to medium grained, orangish to greenish brown, wet, loose.		5					bentonite grout.
CLAY grey, moist, compact, cohesive, plastic, laminated, weathered.		10					bentonite seal.
CLAY grey, moist, very cohesive, soft (moldable) Black vertical staining (1cm thick) every 4 to 5cm from 5m. Red banding (1cm thick) every 4 to 5cm from 5m.		15					50mmØ continuously wound PVC #8 slot well screen.
		20					silica sand filter pack.
END OF HOLE 5.27m bgl.							end cap.

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OW4-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 17, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing. stick-up 0.82m.
TOPSOIL fine to medium grained sand, brown, moist, loose (FILL).			1		5		
SAND fine to medium grained, orangish to greenish brown, wet, loose.			2				50mm Ø sch 40 threaded PVC riser pipe.
CLAY grey, moist, compact, cohesive, plastic, laminated, weathered.			3		10		bentointe grout.
			4				
CLAY grey, moist, very cohesive, soft, (moldable) Black vertical staining (1cm thick) every 4 to 5 cm from 5m. Red banding (1cm thick) every 4 to 5cm from 5m.					15		
			5				bentonite seal.
			6		20		silica sand filter pack.
			7				50mm Ø continuously wound PVC #8 slot well screen.
					25		
END OF HOLE 7.92m bgl.			8				end cap.
			9		30		

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-20-00056
Project: 19130610- Navan LF
Custody: 57235

Report Date: 1-Mar-2021
Order Date: 27-Nov-2020

Revised Report

Order #: 2048556

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2048556-01	L-5

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	30-Nov-20	30-Nov-20
Ammonia, as N	EPA 351.2 - Auto Colour	1-Dec-20	1-Dec-20
Anions	EPA 300.1 - IC	30-Nov-20	30-Nov-20
Biochemical Oxygen Demand	SM 5210B - DO Probe	28-Nov-20	28-Nov-20
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	27-Nov-20	1-Dec-20
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	30-Nov-20	30-Nov-20
Hardness	Hardness as CaCO3	30-Nov-20	30-Nov-20
Metals, ICP-MS	EPA 200.8 - ICP-MS	30-Nov-20	30-Nov-20
Phenolics	EPA 420.2 - Auto Colour, 4AAP	4-Dec-20	4-Dec-20
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	30-Nov-20	3-Dec-20
Total Dissolved Carbon	MOE 3247B - Combustion IR	30-Nov-20	30-Nov-20
Total Dissolved Solids	SM 2540C - gravimetric, filtration	1-Dec-20	2-Dec-20
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	30-Nov-20	1-Dec-20
Total Suspended Solids	SM 2540D - Gravimetric	30-Nov-20	1-Dec-20
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	27-Nov-20	27-Nov-20

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

	Client ID:	L-5	-	-	-
	Sample Date:	25-Nov-20 15:49	-	-	-
	Sample ID:	2048556-01	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	2440	-	-	-
Ammonia as N	0.01 mg/L	76.9 [4]	-	-	-
BOD	2 mg/L	27	-	-	-
Chemical Oxygen Demand	10 mg/L	405	-	-	-
Dissolved Inorganic Carbon	2.00 mg/L	359	-	-	-
Dissolved Organic Carbon	0.5 mg/L	119	-	-	-
Total Dissolved Carbon	0.5 mg/L	478	-	-	-
Hardness	mg/L	1110	-	-	-
Phenolics	0.001 mg/L	0.082	-	-	-
Phosphorus, total	0.01 mg/L	0.19	-	-	-
Total Dissolved Solids	10 mg/L	2770	-	-	-
Total Suspended Solids	2 mg/L	59	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	72.6	-	-	-
Anions					
Chloride	1 mg/L	544	-	-	-
Nitrate as N	0.1 mg/L	<1.0 [2]	-	-	-
Nitrite as N	0.05 mg/L	<0.50 [3]	-	-	-
Sulphate	1 mg/L	47	-	-	-
Metals					
Arsenic	1 ug/L	4	-	-	-
Boron	10 ug/L	17300	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	162000	-	-	-
Chromium	1 ug/L	11	-	-	-
Cobalt	0.5 ug/L	4.4	-	-	-
Copper	0.5 ug/L	<0.5	-	-	-
Iron	100 ug/L	3890	-	-	-
Lead	0.1 ug/L	<0.1	-	-	-
Magnesium	200 ug/L	171000	-	-	-
Manganese	5 ug/L	296	-	-	-
Potassium	100 ug/L	106000	-	-	-
Sodium	200 ug/L	643000	-	-	-
Zinc	5 ug/L	<5	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

	Client ID:	L-5	-	-	-
	Sample Date:	25-Nov-20 15:49	-	-	-
	Sample ID:	2048556-01	-	-	-
	MDL/Units	Water	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Manganese	ND	5	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	278	5	mg/L	279			0.1	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	211	5	mg/L	215			2.1	10	
General Inorganics									
Alkalinity, total	56.7	5	mg/L	57.1			0.7	14	
Ammonia as N	0.315	0.01	mg/L	0.287			9.3	18	
BOD	ND	400	mg/L	ND			NC	20	BOD01
Chemical Oxygen Demand	154	10	mg/L	166			7.5	12	
Dissolved Organic Carbon	ND	0.5	mg/L	ND			NC	37	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.044	0.01	mg/L	0.049			9.9	15	
Total Dissolved Solids	1050	10	mg/L	1090			3.9	10	
Total Suspended Solids	4.0	2	mg/L	4.0			0.0	10	
Total Kjeldahl Nitrogen	0.33	0.1	mg/L	0.34			4.1	16	
Metals									
Arsenic	3.2	1	ug/L	3.1			2.0	20	
Boron	25	10	ug/L	25			0.7	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	1.48	0.5	ug/L	1.49			0.6	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Manganese	20.5	5	ug/L	20.0			2.8	20	
Zinc	9	5	ug/L	8			3.6	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-20-00056

Report Date: 01-Mar-2021
Order Date: 27-Nov-2020
Project Description: 19130610- Navan LF

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	195	1	mg/L	186	89.3	77-123			
Nitrate as N	1.04	0.1	mg/L	ND	104	79-120			
Nitrite as N	1.04	0.05	mg/L	ND	104	84-117			
Sulphate	143	1	mg/L	135	81.5	74-126			
General Inorganics									
Ammonia as N	0.555	0.01	mg/L	0.287	107	81-124			
BOD	163	2	mg/L	ND	81.4	71-121			
Chemical Oxygen Demand	344	10	mg/L	166	89.0	85-111			
Dissolved Organic Carbon	10.8	0.5	mg/L	ND	108	60-133			
Phenolics	0.027	0.001	mg/L	ND	110	69-132			
Phosphorus, total	0.528	0.01	mg/L	0.049	95.9	80-120			
Total Dissolved Solids	96.0	10	mg/L	ND	96.0	75-125			
Total Suspended Solids	22.0	2	mg/L	ND	110	75-125			
Total Kjeldahl Nitrogen	2.09	0.1	mg/L	0.34	87.6	81-126			
Metals									
Arsenic	53.5	1	ug/L	3.1	101	80-120			
Boron	40	10	ug/L	ND	79.6	80-120			QS-02
Cadmium	44.8	0.1	ug/L	ND	89.5	80-120			
Chromium	52.0	1	ug/L	ND	104	80-120			
Cobalt	49.5	0.5	ug/L	ND	99.0	80-120			
Copper	46.9	0.5	ug/L	1.49	90.9	80-120			
Iron	2450	100	ug/L	ND	97.3	80-120			
Lead	46.8	0.1	ug/L	ND	93.5	80-120			
Manganese	70.2	5	ug/L	20.0	100	80-120			
Zinc	51	5	ug/L	8	85.0	80-120			
Volatiles									
Benzene	36.5	0.5	ug/L	ND	91.4	60-130			
1,1-Dichloroethane	39.6	0.5	ug/L	ND	98.9	60-130			
Ethylbenzene	40.0	0.5	ug/L	ND	100	60-130			
Methylene Chloride	36.9	5.0	ug/L	ND	92.4	60-130			
Toluene	42.4	0.5	ug/L	ND	106	60-130			
Vinyl chloride	34.9	0.5	ug/L	ND	87.2	50-140			
m,p-Xylenes	82.6	0.5	ug/L	ND	103	60-130			
o-Xylene	39.5	0.5	ug/L	ND	98.8	60-130			

Qualifier Notes:

Sample Qualifiers :

2 : Elevated Reporting Limit due to matrix interference.

3 : Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

4 : Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions.

QC Qualifiers :

BOD01 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1 - This report now includes data for Na, K, and Mg for the sample L-5

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

PARACEL LABORATORIES LTD

Paracel ID: 2048556

Paracel Order Number (Lab Use Only): 2048556

Chain Of Custody (Lab Use Only): No 57235

Client Name: GOSS

Contact Name: JANNICK MARCEAU

Address: 193 Robertson Road

Telephone: 613-592-9600

Project No: 1913060 - NAIAS LF

Quote #: 19-399-Leachate

PO #: 7145-20-000056

Email: jmarceau@goss.com
dbeer@goss.com
kent.hunsuck@wastecontrol.com

Page 1 of 1

Turnaround Time: 1 day, 2 day, 3 day, Regular

Date Required:

Regulation 153/04 / Other Regulation

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis

	Sample ID/Location Name	# of Containers	Sample Taken: Date	Time	For Leachate
1	L-5	9	Nov 25/20	15:49	✓
2					
3					
4					
5					
6					
7					
8					
9					
10					

Comments: - Invoice Waste Connections of Canada (Kent Hunsuck)
- GOSS Facility 6253

Relinquished by (Sign): R Hayward

Relinquished by (Print): Rob Hayward

Date/Time: Nov 25, 2020 5:00 pm

Received by Driver/Depot: M Lemire

Date/Time: 27/11/20 10:54

Temperature: °C

Received at Lab: Summerstown RDK/mal

Date/Time: NOV 27, 2020 01:15

Temperature: 4.7 °C

Delivered to: Paracel Courier

Date/Time: 11-27-20 13:28

pH Verified: X By: MX

Chain of Custody (Blank).xlsx

Revision 3.0

001608

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-20-00056
Project: 19130610
Custody:

Report Date: 1-Mar-2021
Order Date: 22-May-2020

Revised Report

Order #: 2021337

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2021337-01	92-19
2021337-02	05-1D
2021337-03	95-8
2021337-04	92-18
2021337-05	98-1
2021337-06	05-1C
2021337-07	05-R3
2021337-08	05-8
2021337-09	05-11
2021337-10	05-3D
2021337-11	07-1D
2021337-12	MW-C
2021337-13	MW-E
2021337-14	92-7
2021337-15	92-10
2021337-16	94-2
2021337-17	94-6
2021337-18	95-3
2021337-19	95-7
2021337-20	05-3C
2021337-21	07-1C
2021337-22	94-5
2021337-23	95-2
2021337-24	95-6
2021337-25	92-16
2021337-26	05-1B
2021337-27	11-1
2021337-28	92-5
2021337-29	92-9
2021337-30	94-1

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

2021337-31	05-3B
2021337-32	07-1B
2021337-33	94-4
2021337-34	95-1
2021337-35	95-5
2021337-36	92-12
2021337-37	05-1A
2021337-38	92-1
2021337-39	05-3A
2021337-40	07-1A
2021337-41	95-9
2021337-42	Dupe-2
2021337-43	Dupe-3
2021337-44	Dupe-4
2021337-45	Dupe-5
2021337-46	Trip Blank
2021337-47	Field Blank

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, bicarbonate	calculated from EPA 310.1 - Titration to pH 4.5	22-May-20	23-May-20
Alkalinity, carbonate	calculated from EPA 310.1 - Titration to pH 4.5	25-May-20	22-May-20
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	22-May-20	22-May-20
Ammonia, as N	EPA 351.2 - Auto Colour	26-May-20	26-May-20
Anions	EPA 300.1 - IC	22-May-20	23-May-20
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	22-May-20	25-May-20
Hardness	Hardness as CaCO3	22-May-20	22-May-20
Metals, ICP-MS	EPA 200.8 - ICP-MS	22-May-20	22-May-20
Phenolics	EPA 420.2 - Auto Colour, 4AAP	28-May-20	28-May-20
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	22-May-20	26-May-20
Total Dissolved Solids	SM 2540C - gravimetric, filtration	25-May-20	27-May-20
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	26-May-20	26-May-20
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	23-May-20	23-May-20

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	92-19	05-1D	95-8	92-18
	Sample Date:	21-May-20 08:33	21-May-20 09:31	21-May-20 12:38	21-May-20 08:25
	Sample ID:	2021337-01	2021337-02	2021337-03	2021337-04
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Alkalinity, total	5 mg/L	267	269	1010	202
Alkalinity, bicarbonate	5 mg/L	266	268	1010	200
Alkalinity, carbonate	5 mg/L	<5	<5	<25 [1]	<5
Ammonia as N	0.01 mg/L	0.08	0.02	2.82	0.08
Chemical Oxygen Demand	10 mg/L	21	24	138	17
Hardness	mg/L	270	501	853	499
Phenolics	0.001 mg/L	0.004	<0.001	0.009	<0.001
Phosphorus, total	0.01 mg/L	0.08	0.04	0.03	0.30
Total Dissolved Solids	10 mg/L	464	1300	1350	1140
Total Kjeldahl Nitrogen	0.1 mg/L	0.4	0.4	3.5	0.3
Anions					
Chloride	1 mg/L	47	591	198	456
Nitrate as N	0.1 mg/L	0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	115	126	15	48
Metals					
Aluminum	1 ug/L	89	41	20	5
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	<1	<1	3
Barium	1 ug/L	84	176	266	66
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	52	20	50	24
Cadmium	0.1 ug/L	<0.1	<0.1	0.1	<0.1
Calcium	100 ug/L	86300	142000	212000	130000
Chromium	1 ug/L	<1	<1	13	<1
Cobalt	0.5 ug/L	1.4	<0.5	4.2	<0.5
Copper	0.5 ug/L	7.6	6.0	9.6	3.8
Iron	100 ug/L	199	<100	3510	<100
Lead	0.1 ug/L	0.1	<0.1	0.1	0.2
Magnesium	200 ug/L	13300	35500	78600	42400
Manganese	5 ug/L	3130	47	10900	13
Molybdenum	0.5 ug/L	1.2	<0.5	0.8	1.8
Nickel	1 ug/L	1	1	25	<1
Potassium	100 ug/L	6540	12800	19300	7020
Selenium	1 ug/L	<1	<1	1	<1

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	92-19	05-1D	95-8	92-18
	Sample Date:	21-May-20 08:33	21-May-20 09:31	21-May-20 12:38	21-May-20 08:25
	Sample ID:	2021337-01	2021337-02	2021337-03	2021337-04
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	69500	210000	132000	95600
Strontium	10 ug/L	638	533	930	638
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Tin	5 ug/L	<5	<5	<5	<5
Titanium	5 ug/L	5	<5	<5	<5
Tungsten	10 ug/L	<10	<10	<10	<10
Uranium	0.1 ug/L	3.1	3.9	10.8	0.7
Vanadium	0.5 ug/L	<0.5	0.9	13.7	0.7
Zinc	5 ug/L	<5	5	6	<5
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	92-19	05-1D	95-8	92-18
	Sample Date:	21-May-20 08:33	21-May-20 09:31	21-May-20 12:38	21-May-20 08:25
	Sample ID:	2021337-01	2021337-02	2021337-03	2021337-04
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	117%	117%	114%	118%
Dibromofluoromethane	Surrogate	92.1%	94.2%	88.5%	95.3%
Toluene-d8	Surrogate	102%	103%	102%	102%

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	98-1	05-1C	05-R3	05-8
	Sample Date:	21-May-20 13:15	21-May-20 09:22	21-May-20 12:24	21-May-20 12:11
	Sample ID:	2021337-05	2021337-06	2021337-07	2021337-08
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Alkalinity, total	5 mg/L	414	178	848	980
Alkalinity, bicarbonate	5 mg/L	409	176	845	979
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<25 [1]
Ammonia as N	0.01 mg/L	0.63	0.27	<0.01	1.03
Chemical Oxygen Demand	10 mg/L	39	18	28	89
Hardness	mg/L	312	161	719	899
Phenolics	0.001 mg/L	0.002	<0.001	0.004	0.005
Phosphorus, total	0.01 mg/L	0.18	0.45	0.04	0.16
Total Dissolved Solids	10 mg/L	1190	334	1070	1020
Total Kjeldahl Nitrogen	0.1 mg/L	1.1	0.5	0.3	2.4
Anions					
Chloride	1 mg/L	588	64	25	24
Nitrate as N	0.1 mg/L	0.2	<0.1	1.2	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	3	62	182	<1
Metals					
Aluminum	1 ug/L	4	2	1	66
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	2	<1	<1
Barium	1 ug/L	32	12	42	43
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	163	61	416	932
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	66100	38400	165000	191000
Chromium	1 ug/L	<1	<1	1	1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Copper	0.5 ug/L	3.1	3.1	4.4	3.1
Iron	100 ug/L	<100	297	<100	11700
Lead	0.1 ug/L	<0.1	0.1	0.1	0.3
Magnesium	200 ug/L	35700	15700	74300	102000
Manganese	5 ug/L	222	58	14	9570
Molybdenum	0.5 ug/L	<0.5	3.6	<0.5	<0.5
Nickel	1 ug/L	<1	<1	1	3
Potassium	100 ug/L	14400	4810	8270	5910
Selenium	1 ug/L	<1	<1	<1	<1

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	98-1	05-1C	05-R3	05-8
	Sample Date:	21-May-20 13:15	21-May-20 09:22	21-May-20 12:24	21-May-20 12:11
	Sample ID:	2021337-05	2021337-06	2021337-07	2021337-08
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	354000	51500	117000	88500
Strontium	10 ug/L	489	209	997	1120
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Tin	5 ug/L	<5	<5	<5	<5
Titanium	5 ug/L	<5	<5	<5	7
Tungsten	10 ug/L	<10	<10	<10	<10
Uranium	0.1 ug/L	<0.1	<0.1	5.6	0.1
Vanadium	0.5 ug/L	<0.5	<0.5	0.6	2.3
Zinc	5 ug/L	6	<5	<5	<5
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	98-1	05-1C	05-R3	05-8
	Sample Date:	21-May-20 13:15	21-May-20 09:22	21-May-20 12:24	21-May-20 12:11
	Sample ID:	2021337-05	2021337-06	2021337-07	2021337-08
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	112%	122%	113%	119%
Dibromofluoromethane	Surrogate	99.8%	100%	99.2%	94.3%
Toluene-d8	Surrogate	103%	105%	106%	105%

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	05-11	05-3D	07-1D	MW-C
	Sample Date:	21-May-20 11:18	21-May-20 10:35	21-May-20 11:06	21-May-20 15:32
	Sample ID:	2021337-09	2021337-10	2021337-11	2021337-12
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Alkalinity, total	5 mg/L	775	712	393	362
Alkalinity, bicarbonate	5 mg/L	773	704	391	357
Alkalinity, carbonate	5 mg/L	<5	8	<5	<5
Ammonia as N	0.01 mg/L	0.64	0.02	0.23	0.04
Chemical Oxygen Demand	10 mg/L	66	25	142	63
Hardness	mg/L	748	366	466	562
Phenolics	0.001 mg/L	0.009	0.004	<0.001	0.004
Phosphorus, total	0.01 mg/L	0.10	0.12	2.89	0.40
Total Dissolved Solids	10 mg/L	978	1040	716	1250
Total Kjeldahl Nitrogen	0.1 mg/L	1.5	0.4	4.2	1.0
Anions					
Chloride	1 mg/L	69	139	21	151
Nitrate as N	0.1 mg/L	<0.1	<0.1	1.8	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	126	126	253	146
Metals					
Aluminum	1 ug/L	33	1	3	3
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	1	<1	<1	1
Barium	1 ug/L	65	36	56	46
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	1960	411	185	403
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	171000	62700	116000	114000
Chromium	1 ug/L	1	<1	<1	<1
Cobalt	0.5 ug/L	1.2	<0.5	<0.5	<0.5
Copper	0.5 ug/L	3.4	6.1	4.7	3.1
Iron	100 ug/L	10400	<100	195	734
Lead	0.1 ug/L	0.2	<0.1	<0.1	0.1
Magnesium	200 ug/L	77700	50900	42800	67100
Manganese	5 ug/L	3240	40	392	165
Molybdenum	0.5 ug/L	0.9	1.2	1.1	1.4
Nickel	1 ug/L	3	<1	1	2
Potassium	100 ug/L	9610	13600	5540	7380
Selenium	1 ug/L	<1	<1	<1	<1

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	05-11	05-3D	07-1D	MW-C
	Sample Date:	21-May-20 11:18	21-May-20 10:35	21-May-20 11:06	21-May-20 15:32
	Sample ID:	2021337-09	2021337-10	2021337-11	2021337-12
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	89700	272000	55000	196000
Strontium	10 ug/L	1260	474	710	583
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Tin	5 ug/L	<5	<5	<5	<5
Titanium	5 ug/L	<5	<5	<5	<5
Tungsten	10 ug/L	<10	<10	<10	<10
Uranium	0.1 ug/L	1.7	0.8	3.8	5.5
Vanadium	0.5 ug/L	2.4	<0.5	0.5	1.0
Zinc	5 ug/L	7	<5	<5	<5
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	05-11	05-3D	07-1D	MW-C
	Sample Date:	21-May-20 11:18	21-May-20 10:35	21-May-20 11:06	21-May-20 15:32
	Sample ID:	2021337-09	2021337-10	2021337-11	2021337-12
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	113%	115%	119%	121%
Dibromofluoromethane	Surrogate	90.1%	100%	100%	99.8%
Toluene-d8	Surrogate	101%	101%	102%	101%

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	MW-E	92-7	92-10	94-2
	Sample Date:	21-May-20 15:50	21-May-20 12:03	21-May-20 11:35	21-May-20 14:32
	Sample ID:	2021337-13	2021337-14	2021337-15	2021337-16
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Alkalinity, total	5 mg/L	245	630	809	893
Alkalinity, bicarbonate	5 mg/L	244	617	798	871
Alkalinity, carbonate	5 mg/L	<5	13	11	22
Ammonia as N	0.01 mg/L	0.02	0.17	0.52	0.09
Chemical Oxygen Demand	10 mg/L	44	51	71	57
Hardness	mg/L	267	239	538	266
Phenolics	0.001 mg/L	<0.001	<0.001	0.010	0.004
Phosphorus, total	0.01 mg/L	0.25	0.25	0.82	0.60
Total Dissolved Solids	10 mg/L	400	1410	1220	1680
Total Kjeldahl Nitrogen	0.1 mg/L	0.8	0.7	1.4	0.9
Anions					
Chloride	1 mg/L	33	564 [4]	278	612
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.2	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	86	3	63	11
Metals					
Aluminum	1 ug/L	562	5	1700	3
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	<1	1	1
Barium	1 ug/L	43	32	69	36
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	217	410	882	491
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	73300	35600	91100	37100
Chromium	1 ug/L	1	<1	4	<1
Cobalt	0.5 ug/L	0.6	<0.5	1.7	<0.5
Copper	0.5 ug/L	7.0	3.5	6.5	5.3
Iron	100 ug/L	924	<100	5690	<100
Lead	0.1 ug/L	0.6	<0.1	1.6	0.1
Magnesium	200 ug/L	20300	36500	75500	42100
Manganese	5 ug/L	142	203	1340	26
Molybdenum	0.5 ug/L	0.7	<0.5	<0.5	1.4
Nickel	1 ug/L	2	<1	5	2
Potassium	100 ug/L	1590	16300	17700	16000
Selenium	1 ug/L	<1	<1	1	<1

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	MW-E	92-7	92-10	94-2
	Sample Date:	21-May-20 15:50	21-May-20 12:03	21-May-20 11:35	21-May-20 14:32
	Sample ID:	2021337-13	2021337-14	2021337-15	2021337-16
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	35500	459000	291000	599000
Strontium	10 ug/L	327	370	712	431
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Tin	5 ug/L	<5	<5	<5	<5
Titanium	5 ug/L	20	<5	44	<5
Tungsten	10 ug/L	<10	<10	<10	<10
Uranium	0.1 ug/L	2.2	<0.1	0.3	0.6
Vanadium	0.5 ug/L	2.4	1.3	5.3	2.3
Zinc	5 ug/L	8	5	14	<5
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	MW-E	92-7	92-10	94-2
	Sample Date:	21-May-20 15:50	21-May-20 12:03	21-May-20 11:35	21-May-20 14:32
	Sample ID:	2021337-13	2021337-14	2021337-15	2021337-16
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	119%	119%	118%	121%
Dibromofluoromethane	Surrogate	98.9%	100%	102%	97.8%
Toluene-d8	Surrogate	103%	104%	102%	107%

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	94-6	95-3	95-7	05-3C
	Sample Date:	21-May-20 17:11	21-May-20 14:45	21-May-20 16:08	21-May-20 10:21
	Sample ID:	2021337-17	2021337-18	2021337-19	2021337-20
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Alkalinity, total	5 mg/L	339	665	532	960
Alkalinity, bicarbonate	5 mg/L	338	659	527	942
Alkalinity, carbonate	5 mg/L	<5	6	5	18
Ammonia as N	0.01 mg/L	0.06	0.11	0.35	0.65
Chemical Oxygen Demand	10 mg/L	52	37	66	92
Hardness	mg/L	331	225	246	95.0
Phenolics	0.001 mg/L	0.006	0.003	0.003	0.008
Phosphorus, total	0.01 mg/L	0.39	0.66	0.30	1.04
Total Dissolved Solids	10 mg/L	1010	998	1200	1630
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	0.7	1.0	2.1
Anions					
Chloride	1 mg/L	292	184	505	392
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	0.9
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	271	89	22	25
Metals					
Aluminum	1 ug/L	431	1250	30	147
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	0.5
Arsenic	1 ug/L	<1	<1	1	4
Barium	1 ug/L	64	63	29	15
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	201	745	357	1520
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	64800	34900	38100	11200
Chromium	1 ug/L	<1	2	<1	1
Cobalt	0.5 ug/L	1.1	2.0	0.8	0.6
Copper	0.5 ug/L	4.7	2.1	6.0	4.5
Iron	100 ug/L	1010	2700	180	977
Lead	0.1 ug/L	1.5	4.0	0.1	0.2
Magnesium	200 ug/L	41000	33500	36600	16300
Manganese	5 ug/L	1080	921	2540	42
Molybdenum	0.5 ug/L	<0.5	<0.5	2.6	1.1
Nickel	1 ug/L	4	6	2	2
Potassium	100 ug/L	4600	7710	8310	16800

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	94-6	95-3	95-7	05-3C
	Sample Date:	21-May-20 17:11	21-May-20 14:45	21-May-20 16:08	21-May-20 10:21
	Sample ID:	2021337-17	2021337-18	2021337-19	2021337-20
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Selenium	1 ug/L	<1	<1	<1	<1
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	212000	377000	421000	641000
Strontium	10 ug/L	368	301	279	162
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Tin	5 ug/L	<5	<5	<5	<5
Titanium	5 ug/L	13	24	<5	8
Tungsten	10 ug/L	<10	<10	<10	<10
Uranium	0.1 ug/L	0.7	2.4	0.1	0.2
Vanadium	0.5 ug/L	3.2	7.5	2.4	5.6
Zinc	5 ug/L	8	10	<5	6
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	94-6	95-3	95-7	05-3C
	Sample Date:	21-May-20 17:11	21-May-20 14:45	21-May-20 16:08	21-May-20 10:21
	Sample ID:	2021337-17	2021337-18	2021337-19	2021337-20
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	124%	122%	124%	121%
Dibromofluoromethane	Surrogate	99.4%	100%	102%	99.2%
Toluene-d8	Surrogate	105%	105%	102%	104%

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	07-1C	94-5	95-2	95-6
	Sample Date:	21-May-20 10:57	21-May-20 17:26	21-May-20 15:03	21-May-20 16:20
	Sample ID:	2021337-21	2021337-22	2021337-23	2021337-24
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Alkalinity, total	5 mg/L	660	828	1140	894
Alkalinity, bicarbonate	5 mg/L	657	819	1110	880
Alkalinity, carbonate	5 mg/L	<5	9	26	15
Ammonia as N	0.01 mg/L	0.54	0.97	1.35	1.59
Chemical Oxygen Demand	10 mg/L	49	104	76	66
Hardness	mg/L	238	426	269	356
Phenolics	0.001 mg/L	0.004	0.005	0.007	0.004
Phosphorus, total	0.01 mg/L	1.01	3.96	0.95	0.95
Total Dissolved Solids	10 mg/L	1570	2120	2210	2190
Total Kjeldahl Nitrogen	0.1 mg/L	1.4	2.0	2.3	2.3
Anions					
Chloride	1 mg/L	566	1000	748	1020
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	113	18	8	<1
Metals					
Aluminum	1 ug/L	2	6	1370	2
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	3	1	2	2
Barium	1 ug/L	47	44	59	52
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	389	432	852	608
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	34000	57100	35500	47100
Chromium	1 ug/L	<1	<1	3	<1
Cobalt	0.5 ug/L	0.7	0.9	1.8	0.5
Copper	0.5 ug/L	3.4	3.1	0.8	3.0
Iron	100 ug/L	853	1190	3110	<100
Lead	0.1 ug/L	0.1	<0.1	1.8	<0.1
Magnesium	200 ug/L	37100	68700	43700	57900
Manganese	5 ug/L	396	1940	183	220
Molybdenum	0.5 ug/L	1.3	2.0	<0.5	1.9
Nickel	1 ug/L	4	2	5	1
Potassium	100 ug/L	14400	11900	18300	19600

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	07-1C	94-5	95-2	95-6
	Sample Date:	21-May-20 10:57	21-May-20 17:26	21-May-20 15:03	21-May-20 16:20
	Sample ID:	2021337-21	2021337-22	2021337-23	2021337-24
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Selenium	1 ug/L	<1	<1	<1	<1
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	537000	665000	748000	724000
Strontium	10 ug/L	428	433	416	472
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Tin	5 ug/L	<5	<5	<5	<5
Titanium	5 ug/L	<5	<5	39	<5
Tungsten	10 ug/L	<10	<10	<10	<10
Uranium	0.1 ug/L	0.5	0.4	0.3	0.1
Vanadium	0.5 ug/L	<0.5	1.9	5.7	1.9
Zinc	5 ug/L	<5	<5	12	<5
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	07-1C	94-5	95-2	95-6
	Sample Date:	21-May-20 10:57	21-May-20 17:26	21-May-20 15:03	21-May-20 16:20
	Sample ID:	2021337-21	2021337-22	2021337-23	2021337-24
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	115%	119%	121%	119%
Dibromofluoromethane	Surrogate	99.6%	96.5%	99.7%	98.0%
Toluene-d8	Surrogate	105%	102%	105%	105%

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	92-16	05-1B	11-1	92-5
	Sample Date:	21-May-20 08:41	21-May-20 09:14	21-May-20 12:40	21-May-20 11:50
	Sample ID:	2021337-25	2021337-26	2021337-27	2021337-28
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Alkalinity, total	5 mg/L	180	258	469	779
Alkalinity, bicarbonate	5 mg/L	177	252	461	766
Alkalinity, carbonate	5 mg/L	<5	6	8	13
Ammonia as N	0.01 mg/L	0.14	0.19	0.60	1.44
Chemical Oxygen Demand	10 mg/L	39	39	45	127
Hardness	mg/L	56.4	22.5	277	290
Phenolics	0.001 mg/L	<0.001	0.002	<0.001	0.005
Phosphorus, total	0.01 mg/L	0.49	1.54	0.25	1.50
Total Dissolved Solids	10 mg/L	276	450	1640	2680
Total Kjeldahl Nitrogen	0.1 mg/L	0.5	0.8	1.1	2.6
Anions					
Chloride	1 mg/L	33	24	912	1400
Nitrate as N	0.1 mg/L	<0.1	0.4	0.6	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	10	22	<1	<1
Metals					
Aluminum	1 ug/L	116	24	71	659
Antimony	0.5 ug/L	<0.5	0.5	<0.5	<0.5
Arsenic	1 ug/L	2	3	1	3
Barium	1 ug/L	12	8	39	56
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	112	248	236	920
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	12500	4590	52200	35500
Chromium	1 ug/L	<1	<1	<1	2
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	1.1
Copper	0.5 ug/L	3.2	6.6	4.8	3.5
Iron	100 ug/L	233	<100	189	998
Lead	0.1 ug/L	0.2	0.1	0.7	0.3
Magnesium	200 ug/L	6150	2670	35500	48800
Manganese	5 ug/L	66	9	46	122
Molybdenum	0.5 ug/L	4.8	7.7	0.7	<0.5
Nickel	1 ug/L	1	2	2	2
Potassium	100 ug/L	5350	6360	18700	28900
Selenium	1 ug/L	<1	<1	<1	<1

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	92-16	05-1B	11-1	92-5
	Sample Date:	21-May-20 08:41	21-May-20 09:14	21-May-20 12:40	21-May-20 11:50
	Sample ID:	2021337-25	2021337-26	2021337-27	2021337-28
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	65300	118000	554000	899000
Strontium	10 ug/L	107	46	517	518
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Tin	5 ug/L	<5	<5	<5	<5
Titanium	5 ug/L	<5	<5	<5	40
Tungsten	10 ug/L	<10	<10	<10	<10
Uranium	0.1 ug/L	0.1	0.4	0.2	0.1
Vanadium	0.5 ug/L	0.8	3.4	2.6	2.6
Zinc	5 ug/L	<5	<5	5	6
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

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Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	92-16	05-1B	11-1	92-5
	Sample Date:	21-May-20 08:41	21-May-20 09:14	21-May-20 12:40	21-May-20 11:50
	Sample ID:	2021337-25	2021337-26	2021337-27	2021337-28
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	121%	125%	123%	115%
Dibromofluoromethane	Surrogate	96.8%	98.1%	96.6%	90.7%
Toluene-d8	Surrogate	104%	104%	105%	109%

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	92-9	94-1	05-3B	07-1B
	Sample Date:	21-May-20 11:28	21-May-20 13:24	21-May-20 10:09	21-May-20 10:43
	Sample ID:	2021337-29	2021337-30	2021337-31	2021337-32
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Alkalinity, total	5 mg/L	751	1130	1140	936
Alkalinity, bicarbonate	5 mg/L	737	1110	1120	917
Alkalinity, carbonate	5 mg/L	14	<25 [1]	<25 [1]	19
Ammonia as N	0.01 mg/L	2.18	2.27	2.83	3.47
Chemical Oxygen Demand	10 mg/L	82	84	120	99
Hardness	mg/L	235	265	86.4	425
Phenolics	0.001 mg/L	0.007	0.011	0.005	0.007
Phosphorus, total	0.01 mg/L	0.96	1.29	5.89	0.93
Total Dissolved Solids	10 mg/L	2230	3000	2010	3190
Total Kjeldahl Nitrogen	0.1 mg/L	3.0	3.0	3.8	3.4
Anions					
Chloride	1 mg/L	1070	1360	596	1670
Nitrate as N	0.1 mg/L	0.2	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	<1	<1	4	2
Metals					
Aluminum	1 ug/L	75	2290	206	7
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	7	3	3	3
Barium	1 ug/L	37	107	11	61
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	997	1430	1780	1150
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	28600	32800	10000	47100
Chromium	1 ug/L	<1	4	2	<1
Cobalt	0.5 ug/L	0.7	2.5	0.5	0.7
Copper	0.5 ug/L	3.9	1.3	1.0	2.6
Iron	100 ug/L	421	4610	760	541
Lead	0.1 ug/L	0.2	4.8	0.2	<0.1
Magnesium	200 ug/L	39600	44400	14900	74700
Manganese	5 ug/L	81	272	29	89
Molybdenum	0.5 ug/L	1.8	<0.5	0.7	0.6
Nickel	1 ug/L	1	6	2	<1
Potassium	100 ug/L	25300	27400	20300	32700
Selenium	1 ug/L	<1	<1	<1	<1

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	92-9	94-1	05-3B	07-1B
	Sample Date:	21-May-20 11:28	21-May-20 13:24	21-May-20 10:09	21-May-20 10:43
	Sample ID:	2021337-29	2021337-30	2021337-31	2021337-32
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	728000	1020000	719000	1030000
Strontium	10 ug/L	391	535	175	659
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Tin	5 ug/L	<5	<5	<5	<5
Titanium	5 ug/L	6	44	16	<5
Tungsten	10 ug/L	<10	<10	<10	<10
Uranium	0.1 ug/L	0.5	0.2	<0.1	<0.1
Vanadium	0.5 ug/L	3.3	7.2	4.1	0.8
Zinc	5 ug/L	<5	16	<5	9
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	92-9	94-1	05-3B	07-1B
	Sample Date:	21-May-20 11:28	21-May-20 13:24	21-May-20 10:09	21-May-20 10:43
	Sample ID:	2021337-29	2021337-30	2021337-31	2021337-32
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	117%	113%	115%	115%
Dibromofluoromethane	Surrogate	89.8%	88.8%	92.5%	88.7%
Toluene-d8	Surrogate	104%	101%	103%	104%

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	94-4	95-1	95-5	92-12
	Sample Date:	21-May-20 17:18	21-May-20 15:18	21-May-20 16:32	21-May-20 08:52
	Sample ID:	2021337-33	2021337-34	2021337-35	2021337-36
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Alkalinity, total	5 mg/L	1300	1300	1280	676
Alkalinity, bicarbonate	5 mg/L	1280	1270	1250	647
Alkalinity, carbonate	5 mg/L	<25 [1]	27	<25 [1]	29
Ammonia as N	0.01 mg/L	4.15	2.46	3.97	1.10
Chemical Oxygen Demand	10 mg/L	121	94	126	60
Hardness	mg/L	537	195	410	35.5
Phenolics	0.001 mg/L	0.012	0.004	0.010	0.004
Phosphorus, total	0.01 mg/L	1.47	1.94	1.63	2.31
Total Dissolved Solids	10 mg/L	4020	2790	3700	980
Total Kjeldahl Nitrogen	0.1 mg/L	4.4	3.3	4.4	1.8
Anions					
Chloride	1 mg/L	1980	1050	1740	160
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	<1	<1	<1	<1
Metals					
Aluminum	1 ug/L	328	8	5	3
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	2	2	2	<1
Barium	1 ug/L	67	32	59	284
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	1640	1580	1590	821
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	52200	24600	42400	5040
Chromium	1 ug/L	1	<1	<1	<1
Cobalt	0.5 ug/L	0.7	<0.5	0.7	<0.5
Copper	0.5 ug/L	2.8	1.4	2.3	<0.5
Iron	100 ug/L	1210	223	263	<100
Lead	0.1 ug/L	0.2	<0.1	<0.1	<0.1
Magnesium	200 ug/L	98700	32400	73900	5570
Manganese	5 ug/L	130	63	93	<5
Molybdenum	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Nickel	1 ug/L	1	<1	1	<1
Potassium	100 ug/L	37000	24500	34200	10300
Selenium	1 ug/L	<1	<1	<1	<1

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	94-4	95-1	95-5	92-12
	Sample Date:	21-May-20 17:18	21-May-20 15:18	21-May-20 16:32	21-May-20 08:52
	Sample ID:	2021337-33	2021337-34	2021337-35	2021337-36
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	1300000	963000	1170000	365000
Strontium	10 ug/L	737	413	621	336
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Tin	5 ug/L	<5	<5	<5	<5
Titanium	5 ug/L	20	<5	<5	<5
Tungsten	10 ug/L	<10	<10	<10	<10
Uranium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Vanadium	0.5 ug/L	2.0	1.2	1.6	1.8
Zinc	5 ug/L	5	<5	9	<5
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	94-4	95-1	95-5	92-12
	Sample Date:	21-May-20 17:18	21-May-20 15:18	21-May-20 16:32	21-May-20 08:52
	Sample ID:	2021337-33	2021337-34	2021337-35	2021337-36
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	116%	115%	113%	123%
Dibromofluoromethane	Surrogate	76.8%	89.3%	89.4%	89.0%
Toluene-d8	Surrogate	107%	105%	103%	107%

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	05-1A	92-1	05-3A	07-1A
	Sample Date:	21-May-20 09:03	21-May-20 08:03	21-May-20 09:57	21-May-20 10:43
	Sample ID:	2021337-37	2021337-38	2021337-39	2021337-40
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Alkalinity, total	5 mg/L	1060	760	822	838
Alkalinity, bicarbonate	5 mg/L	1040	729	788	800
Alkalinity, carbonate	5 mg/L	27	31	33	38
Ammonia as N	0.01 mg/L	2.31	1.13	0.82	1.93
Chemical Oxygen Demand	10 mg/L	788	71	51	45
Hardness	mg/L	54.5	74.5	38.9	70.8
Phenolics	0.001 mg/L	0.010	0.007	0.006	0.003
Phosphorus, total	0.01 mg/L	9.44	1.22	0.25	0.48
Total Dissolved Solids	10 mg/L	1900	1410	1380	1840
Total Kjeldahl Nitrogen	0.1 mg/L	6.6	1.7	1.3	2.1
Anions					
Chloride	1 mg/L	243	423	365	728
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	<1	<1	<1
Metals					
Aluminum	1 ug/L	33	472	3	12
Antimony	0.5 ug/L	0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	1	<1	<1	<1
Barium	1 ug/L	541	431	533	865
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	1420	830	778	947
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	5710	14500	5910	7230
Chromium	1 ug/L	1	1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Copper	0.5 ug/L	3.3	3.2	3.1	1.6
Iron	100 ug/L	151	825	<100	<100
Lead	0.1 ug/L	0.1	0.3	<0.1	<0.1
Magnesium	200 ug/L	9770	9260	5860	12800
Manganese	5 ug/L	<5	55	5	<5
Molybdenum	0.5 ug/L	1.2	<0.5	<0.5	<0.5
Nickel	1 ug/L	1	<1	<1	<1
Potassium	100 ug/L	15300	14000	9190	17100
Selenium	1 ug/L	<1	<1	<1	<1

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	05-1A	92-1	05-3A	07-1A
	Sample Date:	21-May-20 09:03	21-May-20 08:03	21-May-20 09:57	21-May-20 10:43
	Sample ID:	2021337-37	2021337-38	2021337-39	2021337-40
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	557000	563000	555000	669000
Strontium	10 ug/L	290	530	406	545
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Tin	5 ug/L	<5	<5	<5	<5
Titanium	5 ug/L	<5	22	<5	<5
Tungsten	10 ug/L	<10	<10	<10	<10
Uranium	0.1 ug/L	<0.1	0.2	<0.1	<0.1
Vanadium	0.5 ug/L	2.2	2.2	<0.5	<0.5
Zinc	5 ug/L	9	8	<5	8
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	05-1A	92-1	05-3A	07-1A
	Sample Date:	21-May-20 09:03	21-May-20 08:03	21-May-20 09:57	21-May-20 10:43
	Sample ID:	2021337-37	2021337-38	2021337-39	2021337-40
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	120%	124%	120%	119%
Dibromofluoromethane	Surrogate	88.4%	91.9%	93.0%	93.6%
Toluene-d8	Surrogate	102%	105%	103%	103%

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	95-9	Dupe-2	Dupe-3	Dupe-4
	Sample Date:	21-May-20 16:10	21-May-20 07:30	21-May-20 07:31	21-May-20 07:32
	Sample ID:	2021337-41	2021337-42	2021337-43	2021337-44
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
General Inorganics					
Alkalinity, total	5 mg/L	755	926	680	1140
Alkalinity, bicarbonate	5 mg/L	723	923	651	1110
Alkalinity, carbonate	5 mg/L	32	<5	29	26
Ammonia as N	0.01 mg/L	1.84	2.95	1.12	2.88
Chemical Oxygen Demand	10 mg/L	35	132	51	95
Hardness	mg/L	102	846	35.3	88.0
Phenolics	0.001 mg/L	0.002	0.004	0.006	0.008
Phosphorus, total	0.01 mg/L	0.79	0.03	2.21	2.22
Total Dissolved Solids	10 mg/L	1520	1320	958	1990
Total Kjeldahl Nitrogen	0.1 mg/L	2.0	3.8	1.7	3.5
Anions					
Chloride	1 mg/L	523	209	155	572
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	0.06
Sulphate	1 mg/L	<1	14 [4]	<1	3
Metals					
Aluminum	1 ug/L	1310	21	4	208
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	<1	<1	3
Barium	1 ug/L	666	262	296	18
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	857	53	860	1890
Cadmium	0.1 ug/L	<0.1	0.2	<0.1	<0.1
Calcium	100 ug/L	18400	209000	5030	10200
Chromium	1 ug/L	<1	13	<1	2
Cobalt	0.5 ug/L	0.8	4.3	<0.5	0.5
Copper	0.5 ug/L	1.5	7.2	2.3	3.3
Iron	100 ug/L	1880	3440	<100	762
Lead	0.1 ug/L	2.3	<0.1	<0.1	0.3
Magnesium	200 ug/L	13700	78900	5520	15200
Manganese	5 ug/L	72	10700	<5	32
Molybdenum	0.5 ug/L	<0.5	0.8	<0.5	0.7
Nickel	1 ug/L	2	25	<1	2
Potassium	100 ug/L	16400	19200	11000	21100
Selenium	1 ug/L	<1	1	<1	<1
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	95-9	Dupe-2	Dupe-3	Dupe-4
	Sample Date:	21-May-20 16:10	21-May-20 07:30	21-May-20 07:31	21-May-20 07:32
	Sample ID:	2021337-41	2021337-42	2021337-43	2021337-44
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Sodium	200 ug/L	627000	137000	372000	729000
Strontium	10 ug/L	718	935	341	187
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Tin	5 ug/L	<5	<5	<5	<5
Titanium	5 ug/L	33	<5	<5	17
Tungsten	10 ug/L	<10	<10	<10	<10
Uranium	0.1 ug/L	0.3	10.3	<0.1	<0.1
Vanadium	0.5 ug/L	2.9	13.5	1.8	4.0
Zinc	5 ug/L	9	<5	<5	<5
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	95-9	Dupe-2	Dupe-3	Dupe-4
	Sample Date:	21-May-20 16:10	21-May-20 07:30	21-May-20 07:31	21-May-20 07:32
	Sample ID:	2021337-41	2021337-42	2021337-43	2021337-44
	MDL/Units	Ground Water	Ground Water	Ground Water	Ground Water
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	<10.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	118%	123%	121%	119%
Dibromofluoromethane	Surrogate	97.8%	103%	96.1%	96.4%
Toluene-d8	Surrogate	106%	101%	103%	104%

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	Dupe-5	Trip Blank	Field Blank	-
	Sample Date:	21-May-20 07:33	19-May-20 09:00	21-May-20 17:00	-
	Sample ID:	2021337-45	2021337-46	2021337-47	-
	MDL/Units	Ground Water	Ground Water	Ground Water	-
General Inorganics					
Alkalinity, total	5 mg/L	1150	-	-	-
Alkalinity, bicarbonate	5 mg/L	1130	-	-	-
Alkalinity, carbonate	5 mg/L	<25 [1]	-	-	-
Ammonia as N	0.01 mg/L	1.51	-	-	-
Chemical Oxygen Demand	10 mg/L	67	-	-	-
Hardness	mg/L	265	-	-	-
Phenolics	0.001 mg/L	0.005	-	-	-
Phosphorus, total	0.01 mg/L	0.72	-	-	-
Total Dissolved Solids	10 mg/L	2170	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	2.2	-	-	-
Anions					
Chloride	1 mg/L	758	-	-	-
Nitrate as N	0.1 mg/L	<0.1	-	-	-
Nitrite as N	0.05 mg/L	0.09	-	-	-
Sulphate	1 mg/L	7	-	-	-
Metals					
Aluminum	1 ug/L	1060	-	-	-
Antimony	0.5 ug/L	<0.5	-	-	-
Arsenic	1 ug/L	2	-	-	-
Barium	1 ug/L	52	-	-	-
Beryllium	0.5 ug/L	<0.5	-	-	-
Boron	10 ug/L	1130	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	34400	-	-	-
Chromium	1 ug/L	2	-	-	-
Cobalt	0.5 ug/L	1.5	-	-	-
Copper	0.5 ug/L	<0.5	-	-	-
Iron	100 ug/L	2430	-	-	-
Lead	0.1 ug/L	1.4	-	-	-
Magnesium	200 ug/L	43400	-	-	-
Manganese	5 ug/L	168	-	-	-
Molybdenum	0.5 ug/L	<0.5	-	-	-
Nickel	1 ug/L	4	-	-	-
Potassium	100 ug/L	18300	-	-	-
Selenium	1 ug/L	<1	-	-	-

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	Dupe-5	Trip Blank	Field Blank	-
	Sample Date:	21-May-20 07:33	19-May-20 09:00	21-May-20 17:00	-
	Sample ID:	2021337-45	2021337-46	2021337-47	-
	MDL/Units	Ground Water	Ground Water	Ground Water	-
Silver	0.1 ug/L	<0.1	-	-	-
Sodium	200 ug/L	750000	-	-	-
Strontium	10 ug/L	402	-	-	-
Thallium	0.1 ug/L	<0.1	-	-	-
Tin	5 ug/L	<5	-	-	-
Titanium	5 ug/L	36	-	-	-
Tungsten	10 ug/L	<10	-	-	-
Uranium	0.1 ug/L	0.2	-	-	-
Vanadium	0.5 ug/L	5.0	-	-	-
Zinc	5 ug/L	8	-	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	-
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	-
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	-
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	Dupe-5	Trip Blank	Field Blank	-
	Sample Date:	21-May-20 07:33	19-May-20 09:00	21-May-20 17:00	-
	Sample ID:	2021337-45	2021337-46	2021337-47	-
	MDL/Units	Ground Water	Ground Water	Ground Water	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	-
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	-
4-Bromofluorobenzene	Surrogate	125%	119%	123%	-
Dibromofluoromethane	Surrogate	102%	95.5%	97.3%	-
Toluene-d8	Surrogate	101%	102%	104%	-

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Alkalinity, bicarbonate	ND	5	mg/L						
Alkalinity, carbonate	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
Surrogate: Toluene-d8	*86.5*		*ug/L*		*108*	*50-140*			

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	394	5	mg/L	405			2.8	10	
Nitrate as N	2.37	0.1	mg/L	2.37			0.1	10	
Nitrite as N	ND	0.05	mg/L				NC	10	
Sulphate	169	1	mg/L	181			6.9	10	
General Inorganics									
Alkalinity, total	278	5	mg/L	267			4.2	14	
Alkalinity, bicarbonate	278	5	mg/L	266			4.3	14	
Alkalinity, carbonate	ND	5	mg/L	ND			NC	14	
Ammonia as N	0.063	0.01	mg/L	0.077			NC	18	
Chemical Oxygen Demand	22	10	mg/L	21			4.7	12	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.079	0.01	mg/L	0.075			5.5	15	
Total Dissolved Solids	1310	10	mg/L	1300			0.8	10	
Total Kjeldahl Nitrogen	0.34	0.1	mg/L	0.37			8.7	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	407	10	ug/L	402			1.1	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	143000	100	ug/L	142000			0.6	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	1.68	0.5	ug/L	1.63			3.3	20	
Copper	2.40	0.5	ug/L	2.37			1.5	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	0.24	0.1	ug/L	0.12			NC	20	
Magnesium	71600	200	ug/L	70200			1.9	20	
Manganese	17.7	5	ug/L	17.3			2.4	20	
Potassium	29400	100	ug/L	29300			0.2	20	
Sodium	1660000	2000	ug/L	1660000			0.5	20	
Zinc	5	5	ug/L	ND			NC	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*84.2*		*ug/L*		*105*	*50-140*			

Certificate of Analysis

Report Date: 01-Mar-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 22-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	11.0	1	mg/L	ND	110	85-115			
Nitrate as N	1.07	0.1	mg/L	ND	107	86-114			
Nitrite as N	0.984	0.05	mg/L	ND	98.4	85-115			
Sulphate	11.3	1	mg/L	ND	113	86-114			
General Inorganics									
Ammonia as N	0.311	0.01	mg/L	0.077	93.6	81-124			
Chemical Oxygen Demand	234	10	mg/L	21	106	85-111			
Phenolics	0.024	0.001	mg/L	ND	94.7	69-132			
Phosphorus, total	0.557	0.01	mg/L	0.075	96.4	80-120			
Total Dissolved Solids	112	10	mg/L	ND	112	75-125			
Total Kjeldahl Nitrogen	2.42	0.1	mg/L	0.37	102	81-126			
Metals									
Arsenic	48.4	1	ug/L	ND	95.3	80-120			
Boron	45	10	ug/L	ND	89.7	80-120			
Cadmium	39.2	0.1	ug/L	ND	78.3	80-120			QM-01
Calcium	67800	100	ug/L	57100	106	80-120			
Chromium	59.1	1	ug/L	ND	117	80-120			
Cobalt	53.1	0.5	ug/L	1.63	103	80-120			
Copper	47.3	0.5	ug/L	2.37	89.8	80-120			
Iron	2480	100	ug/L	ND	98.0	80-120			
Lead	35.2	0.1	ug/L	0.12	70.2	80-120			QM-01
Magnesium	9760	200	ug/L	ND	97.6	80-120			
Manganese	70.7	5	ug/L	17.3	107	80-120			
Potassium	22000	100	ug/L	12800	91.8	80-120			
Sodium	9630	200	ug/L	ND	96.3	80-120			
Zinc	48	5	ug/L	ND	95.5	80-120			
Volatiles									
Benzene	28.0	0.5	ug/L	ND	70.0	60-130			
1,1-Dichloroethane	30.4	0.5	ug/L	ND	76.0	60-130			
Ethylbenzene	36.8	0.5	ug/L	ND	92.0	60-130			
Methylene Chloride	27.7	5.0	ug/L	ND	69.2	60-130			
Toluene	36.6	0.5	ug/L	ND	91.5	60-130			
Vinyl chloride	41.7	0.5	ug/L	ND	104	50-140			
Surrogate: Toluene-d8	*72.8*		*ug/L*		*91.0*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

QC Qualifiers :

QM-01 : The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

Sample Data Revisions

4- REV 1 : Revision 1 - Data updated with corrected dilution factor

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

PARAC

Paracel ID: 2021337

Head Office
[illegible]

Chain of Custody
(Lab Use Only)

Page 1 of 2

Client Name: Golder Associates	Project Reference: 19135610
Contact Name: Yannick Marceau	Quote #: 19-797
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7146-20-00056
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_bacon@golder.com; benoit.hurneault@wasteconnections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day

Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC (Reg ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other CDWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2021337

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	92-19	GW		7	05/21/20	8:33	✓
2	05-1D	GW		7		9:31	✓
3	95-8	GW		7		12:38	✓
4	92-19	GW		7		8:35	✓
5	95-1	GW		7		1:15	✓
6	05-1C	GW		7		9:12	✓
7	05-R3	GW		7		12:24	✓
8	05-8	GW		7		12:11	✓
9	05-11	GW		7		11:16	✓
10	05-3D	GW		7	✓	10:35	✓

Comments: Invoice to Waste Connections of Canada with PO#7146-20-00056 to be sent along with the results

ESdat facility code 0220

Method of Delivery: DropBox

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Sagar Kantaria	Date/Time:	Date/Time: May 22 8:10	Date/Time: May 22 10:07
Date/Time: May 21/20 8:30	Temperature: °C	Temperature: 7.7 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

PARACEL LABORATORIES LTD.

Paracel ID: 2021337

Head Office
[illegible]
Ottawa, Ontario [illegible]
[illegible]

Chain of Custody
(Lab Use Only)

Page 1 of 5

Client Name:	Golder Associates	Project Reference:	19130610
Contact Name:	Yannick Marcerou	Quote #:	19-797
Address:	1931 Robertson Rd Ottawa, Ontario K2H 5E7	PO #:	7145-20-00056
Telephone:	613-592-9600	Email Address:	yannick_marcerou@golder.com, emily_bacon@golder.com henri.hursen@wasteconnections.com

TAT: ☑ Regular ☐ 1 Day ☐ 2 Day ☐ 3 Day

Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table: ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2021337

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	07-10	GW		7	05/21/20	11:30	☑
2	MW-C	GW		7	"	3:32	☑
3	MW-E	GW		7	"	3:50	☑
4	92-7	GW		7	"	12:05	☑
5	92-10	GW		7	"	11:35	☑
6	94-2	GW		7	"	2:32	☑
7	94-6	GW		7	"	5:11	☑
8	95-3	GW		7	"	2:45	☑
9	95-7	GW		7	"	4:08	☑
10	05-3C	GW		7	"	10:21	☑

Comments: Invoice to Waste Connections of Canada, with PO#7145-[illegible] ensure to be sent along with the results

EQuIS facility code 6253

Method of Delivery: [illegible]

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Sean Lombardo	Date/Time:	Date/Time: 21 May 2020 [illegible]	Date/Time: 21 May 2020 [illegible]
Date/Time: 05/21/2020 [illegible]	Temperature: °C	Temperature: 8.9	pH Verified: [illegible] By: [illegible]

Paracel ID: 2021337

PARACEL LABORATORIES LTD.

Head Office
[illegible]

Chain of Custody
(Lab Use Only)

Page 2 of 5

Client Name: Golder Associates	Project Reference: 19130519	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marcerou	Quote #: 19-797	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-20-02056	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marcerou@golder.com, emily_bacon@golder.com henri.nureault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ REC ☐ Ind. ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2021337

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	07-1C	GW		7	09/12/20	10:57	✓
2	94-5	GW		7		5:46	✓
3	95-2	GW		7		2:03	✓
4	95-5	GW		7		4:10	✓
5	92-16	GW		7		8:41	✓
6	05-1B	GW		7		9:14	✓
7	11-1	GW		7		12:40	✓
8	92-6	GW		7		11:38	✓
9	92-9	GW		7		11:28	✓
10	94-1	GW		7		2:24	✓

Comments: Invoice to Waste Connections of Canada with PO#7145-20-02056 to be sent along with the results.

ECoS facility code 6253

Method of Delivery: DropBox

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Yannick Marcerou	Date/Time:	Date/Time: Sept 13 2020 8:10	Date/Time: Sept 14 2020 10:17
Date/Time: Sept 13/2020 6:10	Temperature: °C	Temperature: 8.9°C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 8.3 Oct. 2014

PARACEL LABORATORIES LTD.

Paracel ID: 2021337

Head Office
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Ottawa, Ontario K1G 5J8
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paracel@paracellabs.com
www.paracellabs.com

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 19130610
Contact Name: Yannick Marceau	Quote #: 16-797
Address: 1931 Robertson Rd Ottawa, Ontario K2H 5B7	PO #: 7145-20-00056
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com; emily_bacon@golder.com hplte/ureault@wasteconnections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day
Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2021337

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	05-3B	GW		7	20/May/22	10:09	✓
2	07-1B	GW		7		12:43	✓
3	94-4	GW		7		5:13	✓
4	95-1	GW		7		3:18	✓
5	95-5	GW		7		4:32	✓
6	92-12	GW		7		3:52	✓
7	05-1A	GW		7		4:03	✓
8	92-1	GW		7		3:03	✓
9	05-3A	GW		7		9:57	✓
10	07-1A	GW		7	V	10:43	✓

Comments: Invoice to Waste Connections of Canada with PO#7145-20-00056 to be sent along with the results

EQuIS facility code 6253

Method of Delivery: DHL POD

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Taylor Konkoski	Date/Time:	Date/Time: 21-May-22 10:00	Date/Time: 21-May-22
Date/Time: 20/May/2022 6:10	Temperature: °C	Temperature: 8.9	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

Paracel ID: 2021337

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[illegible]
Ottawa, Ontario K1G 4J8
[illegible]
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Chain of Custody
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Page 1 of 1

Client Name: Golder Associates	Project Reference: 1913961G		
Contact Name: Yannick Marceau	Quote #: 19-297	TAT: ☑ Regular ☐ 3 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-20-00058	☐ 2 Day ☐ 1 Day	
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_bazan@golder.com henri.huneault@wasteconnections.com	Date Required:	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: COWCS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2021337

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Per quote										
1	95-9	GW		7	05/21/20	4:10	☑										
2	Dupe-2	GW		7	"	7:30	☑										
3	Dupe-3	GW		7	"	7:31	☑										
4	Dupe-4	GW		7	05/21/20	7:32	☑										
5	Dupe-5	GW		7	05/21/20	7:33	☑										
6	Trip Blank	W		1	05/21/20												
7	Field Blank	W		2	05/21/20	5:00											
8																	
9																	
10																	

Required Analyses

Comments: Invoice to Waste Connections of Canada, with PO#7145-20-00058 to be sent along with the results

EGaS facility code 6253

Method of Delivery: Drop Off

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Josie Yanitsch	Date/Time:	Date/Time:	Date/Time:
Date/Time: 05/21/2020 16:10	Temperature: °C	Temperature: °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-20-00056
Project: 19130610
Custody:

Report Date: 22-May-2020
Order Date: 14-May-2020

Order #: 2020400

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2020400-01	SW-W
2020400-02	SW-C
2020400-03	SW-E

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 22-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	20-May-20	20-May-20
Mercury by CVAA	EPA 7471B - CVAA, digestion	20-May-20	20-May-20
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	19-May-20	19-May-20
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	19-May-20	19-May-20
Solids, %	Gravimetric, calculation	16-May-20	16-May-20

Certificate of Analysis

Report Date: 22-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	SW-W	SW-C	SW-E	-
	Sample Date:	14-May-20 09:10	14-May-20 09:40	14-May-20 09:40	-
	Sample ID:	2020400-01	2020400-02	2020400-03	-
	MDL/Units	Sediment	Sediment	Sediment	-
Physical Characteristics					
% Solids	0.1 % by Wt.	12.3	43.1	57.0	-
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	3.1	1.8	1.1	-
Barium	1.0 ug/g dry	87.4	45.0	24.3	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Boron	5.0 ug/g dry	24.8	<5.0	5.0	-
Boron, available	0.5 ug/g dry	14.8	1.9	1.1	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	29.5	19.3	14.3	-
Cobalt	1.0 ug/g dry	5.1	2.6	2.0	-
Copper	5.0 ug/g dry	23.9	7.1	<5.0	-
Iron	200 ug/g dry	12300	6970	7690	-
Lead	1.0 ug/g dry	9.3	6.6	5.3	-
Manganese	5 ug/g dry	304	108	125	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	3.5	<1.0	<1.0	-
Nickel	5.0 ug/g dry	17.4	8.5	5.5	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	3.1	<1.0	<1.0	-
Vanadium	10.0 ug/g dry	30.5	17.6	20.1	-
Zinc	20.0 ug/g dry	68.0	24.2	<20.0	-

Certificate of Analysis

Report Date: 22-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Iron	ND	200	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Manganese	ND	5	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						

Certificate of Analysis

Report Date: 22-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g dry	ND			NC	30	
Arsenic	3.4	1.0	ug/g dry	3.1			7.3	30	
Barium	82.8	1.0	ug/g dry	87.4			5.5	30	
Beryllium	ND	0.5	ug/g dry	ND			NC	30	
Boron, available	ND	0.5	ug/g dry	ND			NC	35	
Boron	23.7	5.0	ug/g dry	24.8			4.3	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium	29.7	5.0	ug/g dry	29.5			0.5	30	
Cobalt	5.2	1.0	ug/g dry	5.1			2.8	30	
Copper	23.8	5.0	ug/g dry	23.9			0.6	30	
Iron	12700	200	ug/g dry	12300			3.4	30	
Lead	9.1	1.0	ug/g dry	9.3			2.0	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Manganese	302	5	ug/g dry	304			0.4	30	
Molybdenum	3.9	1.0	ug/g dry	3.5			11.8	30	
Nickel	17.3	5.0	ug/g dry	17.4			0.7	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	3.0	1.0	ug/g dry	3.1			1.1	30	
Vanadium	30.1	10.0	ug/g dry	30.5			1.3	30	
Zinc	67.3	20.0	ug/g dry	68.0			1.0	30	
Physical Characteristics									
% Solids	65.9	0.1	% by Wt.	65.0			1.4	25	

Certificate of Analysis

Report Date: 22-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	47.5	1.0	ug/g	ND	94.5	70-130			
Arsenic	51.9	1.0	ug/g	1.2	101	70-130			
Barium	84.4	1.0	ug/g	35.0	99.0	70-130			
Beryllium	48.9	0.5	ug/g	ND	97.6	70-130			
Boron, available	3.47	0.5	ug/g	ND	69.3	70-122			QM-07
Boron	53.4	5.0	ug/g	9.9	87.0	70-130			
Cadmium	48.4	0.5	ug/g	ND	96.5	70-130			
Chromium	61.3	5.0	ug/g	11.8	98.9	70-130			
Cobalt	50.9	1.0	ug/g	2.0	97.7	70-130			
Copper	58.8	5.0	ug/g	9.6	98.5	70-130			
Iron	2310	200	ug/g	ND	92.5	70-130			
Lead	50.5	1.0	ug/g	3.7	93.6	70-130			
Mercury	1.18	0.1	ug/g	ND	78.6	70-130			
Manganese	51.6	5	ug/g	ND	103	70-130			
Molybdenum	52.0	1.0	ug/g	1.4	101	70-130			
Nickel	55.1	5.0	ug/g	7.0	96.3	70-130			
Selenium	50.0	1.0	ug/g	ND	99.5	70-130			
Silver	43.9	0.3	ug/g	ND	87.7	70-130			
Thallium	47.4	1.0	ug/g	ND	94.6	70-130			
Uranium	51.1	1.0	ug/g	1.2	99.8	70-130			
Vanadium	60.9	10.0	ug/g	12.2	97.5	70-130			
Zinc	74.2	20.0	ug/g	27.2	94.0	70-130			

Qualifier Notes:

QC Qualifiers:

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Paracel ID: 2020400

PARACEL LABORATORIES LTD.

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[illegible]
Ottawa (Ontario) K2G 3J3
Tel: (613) 836-2184
paracel@paracellabs.com
www.paracellabs.com

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 19130610	TAT: ☑ Regular ☐ 1 Day	
Contact Name: Yannick Marcoux	Quote #: 19-803	☐ 2 Day ☐ 3 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-20-00056	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bacon@golder.com henri.huneault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2020400

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	~~SED-W~~ SW-1	SED		1	[illegible]	9:10 am	☑
2	SED-C SW-2	SED		1	"	9:40 am	☑
3	~~SED-E~~ SW-3	SED		1	"	10:25 am	☑
4							
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada, with PO#7145-20-00056 to be sent along with the results

CGUIS facility code 6253

Method of Delivery: Courier

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): [illegible]	Date/Time: Nov 19 2020	Date/Time: 23-11-20	Date/Time: 23-11-20
Date/Time: 23-11-20	Temperature: 5.3°C	Temperature: 10.2°C	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

001664

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: #19-798 Golder SW 19130610 2000 PWS Navan
Custody:

Report Date: 25-May-2020
Order Date: 14-May-2020

Order #: 2020386

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2020386-01	S-20
2020386-02	S-21
2020386-03	S-1
2020386-04	S-3
2020386-05	S-15
2020386-06	S-16
2020386-07	S-17
2020386-08	S-5
2020386-09	S-8
2020386-10	S-9
2020386-11	S-10
2020386-12	S-11
2020386-13	S-12
2020386-14	Dupe-1

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-798 Golder SW 19130610 2000 PWS Navan

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	20-May-20	20-May-20
Ammonia, as N	EPA 351.2 - Auto Colour	20-May-20	20-May-20
Anions	EPA 300.1 - IC	15-May-20	16-May-20
Biochemical Oxygen Demand	SM 5210B - DO Probe	15-May-20	20-May-20
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	19-May-20	19-May-20
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	20-May-20	21-May-20
Hardness	Hardness as CaCO3	19-May-20	19-May-20
Metals, ICP-MS	EPA 200.8 - ICP-MS	19-May-20	19-May-20
Phenolics	EPA 420.2 - Auto Colour, 4AAP	22-May-20	22-May-20
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	19-May-20	21-May-20
Total Dissolved Carbon	MOE 3247B - Combustion IR	20-May-20	21-May-20
Total Dissolved Solids	SM 2540C - gravimetric, filtration	20-May-20	21-May-20
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	19-May-20	21-May-20
Total Suspended Solids	SM 2540D - Gravimetric	19-May-20	19-May-20

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-798 Golder SW 19130610 2000 PWS Navan

	Client ID:	S-20	S-21	S-1	S-3
	Sample Date:	14-May-20 10:45	14-May-20 11:55	14-May-20 12:20	14-May-20 13:50
	Sample ID:	2020386-01	2020386-02	2020386-03	2020386-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	216	269	342	281
Ammonia as N	0.01 mg/L	0.05	0.02	0.08	0.24
BOD	2 mg/L	<2	<2	<2	<2
Chemical Oxygen Demand	10 mg/L	30	26	29	27
Dissolved Inorganic Carbon	0.500 mg/L	51.6	55.1	72.0	59.1
Dissolved Organic Carbon	0.5 mg/L	16.8	22.4	26.0	24.4
Total Dissolved Carbon	0.5 mg/L	68.4	77.5	98.0	83.5
Hardness	mg/L	280	369	611	361
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.06	0.01	<0.01	<0.01
Total Dissolved Solids	10 mg/L	550	714	1200	780
Total Suspended Solids	2 mg/L	6	2	4	3
Total Kjeldahl Nitrogen	0.1 mg/L	0.5	0.4	0.4	0.6
Anions					
Chloride	1 mg/L	172	201	445	303
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	0.5
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	93	173	235	103
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	54	137	112	49
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	79300	98400	183000	111000
Chromium	1 ug/L	2	<1	<1	<1
Cobalt	0.5 ug/L	0.7	<0.5	1.1	<0.5
Copper	0.5 ug/L	2.6	1.2	1.6	1.7
Iron	100 ug/L	831	<100	440	2160
Lead	0.1 ug/L	0.6	0.3	0.1	0.1
Magnesium	200 ug/L	19800	30000	37100	20000
Manganese	5 ug/L	256	58	418	647
Potassium	100 ug/L	5320	8100	12200	7520
Sodium	200 ug/L	90900	115000	194000	129000
Zinc	5 ug/L	7	<5	8	<5

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-798 Golder SW 19130610 2000 PWS Navan

	Client ID:	S-15	S-16	S-17	S-5
	Sample Date:	14-May-20 13:25	14-May-20 14:20	14-May-20 14:00	14-May-20 09:25
	Sample ID:	2020386-05	2020386-06	2020386-07	2020386-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	323	182	143	518
Ammonia as N	0.01 mg/L	0.13	0.04	0.03	0.09
BOD	2 mg/L	4	5	<2	6
Chemical Oxygen Demand	10 mg/L	45	67	33	122
Dissolved Inorganic Carbon	0.500 mg/L	65.8	39.4	33.1	98.1
Dissolved Organic Carbon	0.5 mg/L	29.9	22.3	16.8	39.7
Total Dissolved Carbon	0.5 mg/L	95.6	61.8	49.9	138
Hardness	mg/L	374	271	194	378
Phenolics	0.001 mg/L	<0.001	0.006	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.01	0.64	0.03	0.54
Total Dissolved Solids	10 mg/L	780	588	426	712
Total Suspended Solids	2 mg/L	2	171	3	15
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	2.0	0.5	4.2
Anions					
Chloride	1 mg/L	271	260	183	34
Nitrate as N	0.1 mg/L	0.4	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	84	41	48	131
Metals					
Arsenic	1 ug/L	<1	1	<1	<1
Boron	10 ug/L	45	16	17	298
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	110000	82100	59800	98700
Chromium	1 ug/L	<1	5	1	2
Cobalt	0.5 ug/L	0.5	1.5	<0.5	0.6
Copper	0.5 ug/L	1.6	5.0	1.7	2.9
Iron	100 ug/L	882	3770	515	667
Lead	0.1 ug/L	0.1	4.0	0.3	0.8
Magnesium	200 ug/L	24400	16100	10900	32000
Manganese	5 ug/L	775	418	158	92
Potassium	100 ug/L	10700	4480	3620	6990
Sodium	200 ug/L	127000	121000	88000	39200
Zinc	5 ug/L	<5	23	8	17

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-798 Golder SW 19130610 2000 PWS Navan

	Client ID:	S-8	S-9	S-10	S-11
	Sample Date:	14-May-20 08:50	14-May-20 10:00	14-May-20 09:10	14-May-20 09:40
	Sample ID:	2020386-09	2020386-10	2020386-11	2020386-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	345	225	138	96
Ammonia as N	0.01 mg/L	0.07	0.02	0.02	0.02
BOD	2 mg/L	5	<2	8	<2
Chemical Oxygen Demand	10 mg/L	154	41	89	64
Dissolved Inorganic Carbon	0.500 mg/L	74.2	47.5	31.1	19.4
Dissolved Organic Carbon	0.5 mg/L	26.3	22.1	31.5	26.6
Total Dissolved Carbon	0.5 mg/L	100	69.6	62.6	46.0
Hardness	mg/L	294	270	120	127
Phenolics	0.001 mg/L	<0.001	0.004	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.16	0.02	0.21	0.04
Total Dissolved Solids	10 mg/L	552	542	278	306
Total Suspended Solids	2 mg/L	23	<2	25	4
Total Kjeldahl Nitrogen	0.1 mg/L	1.6	0.5	1.5	0.9
Anions					
Chloride	1 mg/L	124	171	59	92
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	76	97	28	84
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	114	54	83	97
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	72200	75600	31500	31600
Chromium	1 ug/L	1	<1	<1	5
Cobalt	0.5 ug/L	1.1	<0.5	<0.5	<0.5
Copper	0.5 ug/L	4.1	2.0	0.6	1.2
Iron	100 ug/L	530	187	1080	621
Lead	0.1 ug/L	0.5	0.1	0.1	0.3
Magnesium	200 ug/L	27700	19600	9940	11700
Manganese	5 ug/L	1390	86	215	68
Potassium	100 ug/L	7270	4820	4450	3100
Sodium	200 ug/L	108000	87500	43800	64200
Zinc	5 ug/L	14	<5	9	<5

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-798 Golder SW 19130610 2000 PWS Navan

	Client ID:	S-12	Dupe-1	-	-
	Sample Date:	14-May-20 10:25	14-May-20 09:00	-	-
	Sample ID:	2020386-13	2020386-14	-	-
	MDL/Units	Water	Water	-	-
General Inorganics					
Alkalinity, total	5 mg/L	72	225	-	-
Ammonia as N	0.01 mg/L	0.03	0.02	-	-
BOD	2 mg/L	4	2	-	-
Chemical Oxygen Demand	10 mg/L	82	33	-	-
Dissolved Inorganic Carbon	0.500 mg/L	17.3	47.5	-	-
Dissolved Organic Carbon	0.5 mg/L	21.3	20.1	-	-
Total Dissolved Carbon	0.5 mg/L	38.6	67.6	-	-
Hardness	mg/L	76.0	288	-	-
Phenolics	0.001 mg/L	0.031	<0.001	-	-
Phosphorus, total	0.01 mg/L	0.19	0.02	-	-
Total Dissolved Solids	10 mg/L	154	548	-	-
Total Suspended Solids	2 mg/L	59	<2	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	1.1	0.4	-	-
Anions					
Chloride	1 mg/L	54	171	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-
Sulphate	1 mg/L	19	97	-	-
Metals					
Arsenic	1 ug/L	<1	<1	-	-
Boron	10 ug/L	48	54	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Calcium	100 ug/L	20300	81200	-	-
Chromium	1 ug/L	6	<1	-	-
Cobalt	0.5 ug/L	0.7	<0.5	-	-
Copper	0.5 ug/L	2.7	2.2	-	-
Iron	100 ug/L	2840	214	-	-
Lead	0.1 ug/L	3.1	0.3	-	-
Magnesium	200 ug/L	6170	20700	-	-
Manganese	5 ug/L	121	92	-	-
Potassium	100 ug/L	3170	5330	-	-
Sodium	200 ug/L	34100	92300	-	-
Zinc	5 ug/L	8	<5	-	-

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-798 Golder SW 19130610 2000 PWS Navan

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Total Dissolved Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-798 Golder SW 19130610 2000 PWS Navan

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	2.49	1	mg/L	2.79			NC	10	
Nitrate as N	0.86	0.1	mg/L	0.85			0.4	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	47.4	1	mg/L	47.3			0.3	10	
General Inorganics									
Alkalinity, total	216	5	mg/L	216			0.0	14	
Ammonia as N	0.038	0.01	mg/L	0.061			NC	18	
BOD	24	2	mg/L	ND			NC	20	
Chemical Oxygen Demand	28	10	mg/L	30			6.9	12	
Dissolved Organic Carbon	18.5	0.5	mg/L	16.8			9.4	37	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.211	0.01	mg/L	0.225			6.3	15	
Total Dissolved Solids	704	10	mg/L	714			1.4	10	
Total Suspended Solids	2450	4	mg/L	2390			2.3	10	
Total Kjeldahl Nitrogen	40.1	2.0	mg/L	43.9			9.0	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	54	10	ug/L	54			0.5	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	81100	100	ug/L	79300			2.2	20	
Chromium	2.4	1	ug/L	2.0			15.6	20	
Cobalt	0.69	0.5	ug/L	0.66			5.0	20	
Copper	2.64	0.5	ug/L	2.55			3.3	20	
Iron	835	100	ug/L	831			0.5	20	
Lead	0.49	0.1	ug/L	0.59			17.4	20	
Magnesium	20600	200	ug/L	19800			3.8	20	
Manganese	259	5	ug/L	256			1.3	20	
Potassium	5600	100	ug/L	5320			5.3	20	
Sodium	90400	200	ug/L	90900			0.6	20	
Zinc	7	5	ug/L	7			2.8	20	

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-798 Golder SW 19130610 2000 PWS Navan

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	13.5	1	mg/L	2.79	107	77-123			
Nitrate as N	1.84	0.1	mg/L	0.85	98.4	79-120			
Nitrite as N	1.02	0.05	mg/L	ND	102	84-117			
Sulphate	57.7	1	mg/L	47.3	105	74-126			
General Inorganics									
Ammonia as N	0.309	0.01	mg/L	0.061	99.1	81-124			
BOD	120	2	mg/L	ND	59.8	71-121			QS-02
Chemical Oxygen Demand	238	10	mg/L	30	104	85-111			
Dissolved Organic Carbon	28.2	0.5	mg/L	16.8	114	60-133			
Phenolics	0.027	0.001	mg/L	ND	107	69-132			
Phosphorus, total	0.689	0.01	mg/L	0.225	92.8	80-120			
Total Dissolved Solids	100	10	mg/L	ND	100	75-125			
Total Suspended Solids	24.0	2	mg/L	ND	120	75-125			
Total Kjeldahl Nitrogen	1.90	0.1	mg/L	ND	95.2	81-126			
Metals									
Arsenic	44.4	1	ug/L	ND	87.6	80-120			
Boron	41	10	ug/L	ND	81.2	80-120			
Cadmium	42.0	0.1	ug/L	ND	84.1	80-120			
Calcium	9690	100	ug/L	ND	96.9	80-120			
Chromium	58.0	1	ug/L	2.0	112	80-120			
Cobalt	52.9	0.5	ug/L	0.66	105	80-120			
Copper	50.6	0.5	ug/L	2.55	96.1	80-120			
Iron	3140	100	ug/L	831	92.5	80-120			
Lead	42.5	0.1	ug/L	0.59	83.8	80-120			
Magnesium	28700	200	ug/L	19800	88.5	80-120			
Manganese	302	5	ug/L	256	92.7	80-120			
Potassium	14800	100	ug/L	5320	94.6	80-120			
Sodium	99300	200	ug/L	90900	83.6	80-120			
Zinc	42	5	ug/L	ND	84.3	80-120			

Qualifier Notes:

QC Qualifiers :

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

PARACEL LABORATORIES LTD.

Paracel ID: 2020386

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Chain of Custody
(Lab Use Only)

Page 1 of 2

Client Name: Golder Associates	Project Reference: 19130610	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marceau	Quote #: 19-798	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd Ottawa, Ontario K2H 5B7	PO #: 7145-20-60056	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_bacon@golder.com henri.huneault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ COME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2020386

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Per quote
1	S-20	SW		7	25/04/20	10:45am	☑
2	S-21	SW				11:50am	☑
3	S-1	SW				12:40pm	☑
4	S-3	SW				1:50pm	☑
5	S-15	SW				1:45pm	☑
6	S-16	SW				2:20pm	☑
7	S-17	SW				2pm	☑
8	S-5	SW				9:25am	☑
9	S-8	SW				8:50am	☑
10	S-9	SW		↓	↓	12pm	☑

Comments: Invoice to Waste Connections of Canada, with PO#7145-20-60056 to be sent along with the results
EQuIS facility code 6253

Method of Delivery:

Relinquished By (Sign):	Received at Lab: Date/Time: May 22 1135 Temperature: 5.4°C	Received By:	Verified By:
Relinquished By (Print):		Date/Time:	Date/Time: May 22 1135
Date/Time: May 22 10		Temperature:	pH Verified ☐ By:

5.3 4.30pm

PARACEL LABORATORIES LTD.

Paracel ID: 20020386

Head Office
[illegible]

Chain of Custody (Lab Use Only)

Page 2 of 2

Client Name: Golder Associates	Project Reference: 19136610
Contact Name: Yannick Marcerou	Quote #: 19-798
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 6B2	PO #: 7145-20-00056
Telephone: 613-592-9600	Email Address: yannick_marcerou@golder.com, emily_baron@golder.com, bem.bureau@wasteconnections.com

TAT: ☑ Regular ☐ 1 Day ☐ 2 Day ☐ 3 Day

Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table _____ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality _____ ☑ Other: OSWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 20 20386

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	S-10	SW		2	2020-04-20	9:10AM	✓
2	S-11	SW		1	1	9:40AM	✓
3	S-12	SW		1	1	10:25AM	✓
4	Dupe-1	SW		↓	↓	/	✓
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada, with PO#7145-20-00056 to be sent along with the results

EDoS facility code 6263

Method of Delivery: Hand

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): E. ARBUTHNOT	Date/Time: April 14, 2020	Date/Time: 20-04-14 17:20	Date/Time: 20-04-14 17:20
Date/Time: 04/14/20	Temperature: 5 °C	Temperature: 15.3 °C	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

001676

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: #19-799 Golder Leachate 19130610 2000 PWS Navan
Custody:

Report Date: 25-May-2020
Order Date: 14-May-2020

Order #: 2020401

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2020401-01	L-5

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-799 Golder Leachate 19130610 2000 PWS Navan

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	20-May-20	20-May-20
Ammonia, as N	EPA 351.2 - Auto Colour	20-May-20	20-May-20
Anions	EPA 300.1 - IC	15-May-20	16-May-20
Biochemical Oxygen Demand	SM 5210B - DO Probe	15-May-20	20-May-20
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	19-May-20	19-May-20
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	20-May-20	21-May-20
Hardness	Hardness as CaCO3	19-May-20	19-May-20
Metals, ICP-MS	EPA 200.8 - ICP-MS	19-May-20	19-May-20
Phenolics	EPA 420.2 - Auto Colour, 4AAP	22-May-20	22-May-20
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	19-May-20	21-May-20
Total Dissolved Carbon	MOE 3247B - Combustion IR	20-May-20	21-May-20
Total Dissolved Solids	SM 2540C - gravimetric, filtration	20-May-20	21-May-20
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	19-May-20	21-May-20
Total Suspended Solids	SM 2540D - Gravimetric	19-May-20	19-May-20
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	16-May-20	16-May-20

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-799 Golder Leachate 19130610 2000 PWS Navan

	Client ID:	L-5	-	-	-
	Sample Date:	14-May-20 11:40	-	-	-
	Sample ID:	2020401-01	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	1580	-	-	-
Ammonia as N	0.01 mg/L	45.3 [1]	-	-	-
BOD	2 mg/L	24	-	-	-
Chemical Oxygen Demand	10 mg/L	253	-	-	-
Dissolved Inorganic Carbon	0.500 mg/L	310	-	-	-
Dissolved Organic Carbon	0.5 mg/L	113	-	-	-
Total Dissolved Carbon	0.5 mg/L	423	-	-	-
Hardness	mg/L	1180	-	-	-
Phenolics	0.001 mg/L	0.006	-	-	-
Phosphorus, total	0.01 mg/L	0.22	-	-	-
Total Dissolved Solids	10 mg/L	2240	-	-	-
Total Suspended Solids	2 mg/L	87	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	43.9	-	-	-
Anions					
Chloride	1 mg/L	423	-	-	-
Nitrate as N	0.1 mg/L	0.6	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-
Sulphate	1 mg/L	123	-	-	-
Metals					
Arsenic	1 ug/L	1	-	-	-
Boron	10 ug/L	15800	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	205000	-	-	-
Chromium	1 ug/L	5	-	-	-
Cobalt	0.5 ug/L	2.0	-	-	-
Copper	0.5 ug/L	<0.5	-	-	-
Iron	100 ug/L	10800	-	-	-
Lead	0.1 ug/L	0.2	-	-	-
Magnesium	200 ug/L	163000	-	-	-
Manganese	5 ug/L	592	-	-	-
Potassium	100 ug/L	88200	-	-	-
Sodium	200 ug/L	497000	-	-	-
Zinc	5 ug/L	14	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-799 Golder Leachate 19130610 2000 PWS Navan

	Client ID:	L-5	-	-	-
	Sample Date:	14-May-20 11:40	-	-	-
	Sample ID:	2020401-01	-	-	-
	MDL/Units	Water	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-799 Golder Leachate 19130610 2000 PWS Navan

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Total Dissolved Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Manganese	ND	5	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-799 Golder Leachate 19130610 2000 PWS Navan

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	2.49	1	mg/L	2.79			NC	10	
Nitrate as N	0.86	0.1	mg/L	0.85			0.4	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	47.4	1	mg/L	47.3			0.3	10	
General Inorganics									
Alkalinity, total	216	5	mg/L	216			0.0	14	
Ammonia as N	0.038	0.01	mg/L	0.061			NC	18	
BOD	24	2	mg/L	ND			NC	20	
Chemical Oxygen Demand	28	10	mg/L	30			6.9	12	
Dissolved Organic Carbon	18.5	0.5	mg/L	16.8			9.4	37	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.211	0.01	mg/L	0.225			6.3	15	
Total Dissolved Solids	704	10	mg/L	714			1.4	10	
Total Suspended Solids	2450	4	mg/L	2390			2.3	10	
Total Kjeldahl Nitrogen	40.1	2.0	mg/L	43.9			9.0	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	90	10	ug/L	92			2.7	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	0.55	0.5	ug/L	0.53			4.7	20	
Copper	ND	0.5	ug/L	ND			NC	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Manganese	242	5	ug/L	248			2.5	20	
Zinc	ND	5	ug/L	ND			NC	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	

Certificate of Analysis

Report Date: 25-May-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 14-May-2020

Client PO:

Project Description: #19-799 Golder Leachate 19130610 2000 PWS Navan

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	13.5	1	mg/L	2.79	107	77-123			
Nitrate as N	1.84	0.1	mg/L	0.85	98.4	79-120			
Nitrite as N	1.02	0.05	mg/L	ND	102	84-117			
Sulphate	57.7	1	mg/L	47.3	105	74-126			
General Inorganics									
Ammonia as N	0.309	0.01	mg/L	0.061	99.1	81-124			
BOD	120	2	mg/L	ND	59.8	71-121			QS-02
Chemical Oxygen Demand	238	10	mg/L	30	104	85-111			
Dissolved Organic Carbon	28.2	0.5	mg/L	16.8	114	60-133			
Phenolics	0.027	0.001	mg/L	ND	107	69-132			
Phosphorus, total	0.689	0.01	mg/L	0.225	92.8	80-120			
Total Dissolved Solids	100	10	mg/L	ND	100	75-125			
Total Suspended Solids	24.0	2	mg/L	ND	120	75-125			
Total Kjeldahl Nitrogen	1.90	0.1	mg/L	ND	95.2	81-126			
Metals									
Arsenic	53.5	1	ug/L	ND	106	80-120			
Boron	44	10	ug/L	ND	87.9	80-120			
Cadmium	42.7	0.1	ug/L	ND	85.5	80-120			
Chromium	52.9	1	ug/L	ND	105	80-120			
Cobalt	49.0	0.5	ug/L	0.53	96.9	80-120			
Copper	41.1	0.5	ug/L	ND	82.2	80-120			
Iron	2410	100	ug/L	ND	93.0	80-120			
Lead	41.2	0.1	ug/L	ND	82.2	80-120			
Manganese	49.4	5	ug/L	ND	98.7	80-120			
Zinc	42	5	ug/L	ND	74.8	80-120			QM-01
Volatiles									
Benzene	39.6	0.5	ug/L	ND	99.0	60-130			
1,1-Dichloroethane	38.8	0.5	ug/L	ND	96.9	60-130			
Ethylbenzene	42.8	0.5	ug/L	ND	107	60-130			
Methylene Chloride	33.5	5.0	ug/L	ND	83.8	60-130			
Toluene	39.5	0.5	ug/L	ND	98.7	60-130			
Vinyl chloride	44.5	0.5	ug/L	ND	111	50-140			
m,p-Xylenes	89.1	0.5	ug/L	ND	111	60-130			
o-Xylene	44.8	0.5	ug/L	ND	112	60-130			

Qualifier Notes:

Sample Qualifiers :

1 : Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions.

QC Qualifiers :

QM-01 : The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 20204401

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Head Office
[illegible]

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 19139619	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Mansenou	Quote #: 19-799 Leachate	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-20-00056	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_mansenou@golder.com, emily_bacon@golder.com henri.huneault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table _ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: OSWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

	Paracel Order Number:	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote										
	Sample ID/Location Name																
1	LS	WL			05/04/20	11:40 AM	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Comments: Invoice to Waste Connections of Canada, with PO#7145-20-00056 to be sent along with the results

EQuIS facility code 6253

Method of Delivery:

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): A. Mansenou	Date/Time: May 5, 2020	Date/Time: May 5/20	Date/Time: May 5/20 13:33
Date/Time: 05/04/20	Temperature: 5.3°C	Temperature: 8.4°C	pH Verified: ☐ By:

4.3°C

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-20-00056
Project: 19130610
Custody:

Report Date: 31-Aug-2020
Order Date: 27-Aug-2020

Order #: 2035579

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2035579-01	Trip Blank
2035579-02	Field Blank

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-20-00056

Report Date: 31-Aug-2020

Order Date: 27-Aug-2020

Project Description: 19130610

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	29-Aug-20	29-Aug-20

Certificate of Analysis

Report Date: 31-Aug-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	24-Aug-20 09:00	27-Aug-20 09:00	-	-
	Sample ID:	2035579-01	2035579-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
Chloroethane	1.0 ug/L	<1.0	<1.0	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Chloromethane	3.0 ug/L	<3.0	<3.0	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Hexane	1.0 ug/L	<1.0	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 31-Aug-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	24-Aug-20 09:00	27-Aug-20 09:00	-	-
	Sample ID:	2035579-01	2035579-02	-	-
	MDL/Units	Water	Water	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
4-Bromofluorobenzene	Surrogate	114%	116%	-	-
Dibromofluoromethane	Surrogate	110%	108%	-	-
Toluene-d8	Surrogate	103%	103%	-	-

Certificate of Analysis

Report Date: 31-Aug-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroethane	ND	1.0	ug/L						
Chloroform	ND	0.5	ug/L						
Chloromethane	ND	3.0	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dibromoethane	ND	0.2	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloroethylene, total	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
1,3,5-Trimethylbenzene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*89.0*		*ug/L*		*111*	*50-140*			
Surrogate: Dibromofluoromethane	*71.0*		*ug/L*		*88.8*	*50-140*			
Surrogate: Toluene-d8	*85.5*		*ug/L*		*107*	*50-140*			

Certificate of Analysis

Report Date: 31-Aug-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroethane	ND	1.0	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Chloromethane	ND	3.0	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dibromoethane	ND	0.2	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
1,3,5-Trimethylbenzene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*90.0*		*ug/L*		*112*	*50-140*			
Surrogate: Dibromofluoromethane	*78.4*		*ug/L*		*98.0*	*50-140*			
Surrogate: Toluene-d8	*83.1*		*ug/L*		*104*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-20-00056

Report Date: 31-Aug-2020
Order Date: 27-Aug-2020
Project Description: 19130610

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	106	5.0	ug/L	ND	106	50-140			
Benzene	40.9	0.5	ug/L	ND	102	60-130			
Bromodichloromethane	31.7	0.5	ug/L	ND	79.2	60-130			
Bromoform	48.8	0.5	ug/L	ND	122	60-130			
Bromomethane	44.6	0.5	ug/L	ND	112	50-140			
Carbon Tetrachloride	33.9	0.2	ug/L	ND	84.8	60-130			
Chlorobenzene	39.1	0.5	ug/L	ND	97.6	60-130			
Chloroethane	36.4	1.0	ug/L	ND	91.0	50-140			
Chloroform	37.3	0.5	ug/L	ND	93.2	60-130			
Chloromethane	47.2	3.0	ug/L	ND	118	50-140			
Dibromochloromethane	35.3	0.5	ug/L	ND	88.3	60-130			
Dichlorodifluoromethane	50.0	1.0	ug/L	ND	125	50-140			
1,2-Dibromoethane	28.6	0.2	ug/L	ND	71.4	60-130			
1,2-Dichlorobenzene	38.2	0.5	ug/L	ND	95.4	60-130			
1,3-Dichlorobenzene	38.0	0.5	ug/L	ND	95.1	60-130			
1,4-Dichlorobenzene	39.4	0.5	ug/L	ND	98.6	60-130			
1,1-Dichloroethane	32.0	0.5	ug/L	ND	80.1	60-130			
1,2-Dichloroethane	47.8	0.5	ug/L	ND	119	60-130			
1,1-Dichloroethylene	25.0	0.5	ug/L	ND	62.5	60-130			
cis-1,2-Dichloroethylene	35.2	0.5	ug/L	ND	87.9	60-130			
trans-1,2-Dichloroethylene	29.5	0.5	ug/L	ND	73.8	60-130			
1,2-Dichloropropane	39.3	0.5	ug/L	ND	98.2	60-130			
cis-1,3-Dichloropropylene	45.5	0.5	ug/L	ND	114	60-130			
trans-1,3-Dichloropropylene	47.0	0.5	ug/L	ND	118	60-130			
Ethylbenzene	41.4	0.5	ug/L	ND	104	60-130			
Hexane	39.0	1.0	ug/L	ND	97.5	60-130			
Methyl Ethyl Ketone (2-Butanone)	90.8	5.0	ug/L	ND	90.8	50-140			
Methyl Butyl Ketone (2-Hexanone)	97.6	10.0	ug/L	ND	97.6	50-140			
Methyl Isobutyl Ketone	94.0	5.0	ug/L	ND	94.0	50-140			
Methyl tert-butyl ether	86.1	2.0	ug/L	ND	86.1	50-140			
Methylene Chloride	37.4	5.0	ug/L	ND	93.4	60-130			
Styrene	32.4	0.5	ug/L	ND	81.0	60-130			
1,1,1,2-Tetrachloroethane	37.5	0.5	ug/L	ND	93.7	60-130			
1,1,2,2-Tetrachloroethane	42.0	0.5	ug/L	ND	105	60-130			
Tetrachloroethylene	35.3	0.5	ug/L	ND	88.3	60-130			
Toluene	40.7	0.5	ug/L	ND	102	60-130			
1,1,1-Trichloroethane	30.3	0.5	ug/L	ND	75.8	60-130			
1,1,2-Trichloroethane	36.8	0.5	ug/L	ND	92.0	60-130			
Trichloroethylene	33.7	0.5	ug/L	ND	84.4	60-130			
Trichlorofluoromethane	36.4	1.0	ug/L	ND	91.1	60-130			
1,3,5-Trimethylbenzene	42.8	0.5	ug/L	ND	107	60-130			
Vinyl chloride	36.8	0.5	ug/L	ND	92.0	50-140			
m,p-Xylenes	82.5	0.5	ug/L	ND	103	60-130			
o-Xylene	41.1	0.5	ug/L	ND	103	60-130			
Surrogate: 4-Bromofluorobenzene	*90.8*		*ug/L*		*114*	*50-140*			
Surrogate: Dibromofluoromethane	*81.3*		*ug/L*		*102*	*50-140*			
Surrogate: Toluene-d8	*82.6*		*ug/L*		*103*	*50-140*			

Certificate of Analysis

Report Date: 31-Aug-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 2035579

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Head Office
Ottawa, Ontario

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 19136510	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marceau	Quote #: 19-800 DAGC	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7146-20-00056		
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_bacon@golder.com, henri.turgeon@waterconnections.com	Date Required:	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ ISC: Storm ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary/Storm/Quality) ☑ Other SDWOS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2035579

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	Trip Blank				August 29, 2020		☑
2	Field Blank				"	2:25 PM	☑
3					August 29, 2020		
4							
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada

Method of Delivery:

Relinquished By (Sign):	Received at Lab:	Verified By:	
Relinquished By (Print): for MARTIAGE	Date/Time:	Date/Time: Aug 29 2020 7:15	Date/Time: 8-29-2020
Date/Time: 8-29-20	Temperature: 17 °C	Temperature: 9.8 °C	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 5.0 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-20-00056
Project: 19130610
Custody:

Report Date: 3-Sep-2020
Order Date: 27-Aug-2020

Order #: 2035511

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2035511-01	S-20
2035511-02	S-21
2035511-03	S-1
2035511-04	S-3
2035511-05	S-15
2035511-06	S-16
2035511-07	S-17
2035511-08	S-9
2035511-09	S-12
2035511-10	Dupe-1

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-20-00056

Report Date: 03-Sep-2020

Order Date: 27-Aug-2020

Project Description: 19130610

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	28-Aug-20	28-Aug-20
Ammonia, as N	EPA 351.2 - Auto Colour	1-Sep-20	2-Sep-20
Anions	EPA 300.1 - IC	27-Aug-20	27-Aug-20
Biochemical Oxygen Demand	SM 5210B - DO Probe	27-Aug-20	27-Aug-20
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	28-Aug-20	31-Aug-20
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	31-Aug-20	1-Sep-20
Hardness	Hardness as CaCO3	28-Aug-20	28-Aug-20
Metals, ICP-MS	EPA 200.8 - ICP-MS	28-Aug-20	28-Aug-20
Phenolics	EPA 420.2 - Auto Colour, 4AAP	28-Aug-20	28-Aug-20
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	28-Aug-20	31-Aug-20
Total Dissolved Carbon	MOE 3247B - Combustion IR	31-Aug-20	1-Sep-20
Total Dissolved Solids	SM 2540C - gravimetric, filtration	28-Aug-20	31-Aug-20
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	28-Aug-20	1-Sep-20
Total Suspended Solids	SM 2540D - Gravimetric	28-Aug-20	28-Aug-20

Certificate of Analysis

Report Date: 03-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	S-20	S-21	S-1	S-3
	Sample Date:	26-Aug-20 11:30	26-Aug-20 13:10	26-Aug-20 13:35	26-Aug-20 14:20
	Sample ID:	2035511-01	2035511-02	2035511-03	2035511-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	198	208	406	385
Ammonia as N	0.01 mg/L	0.08	0.04	0.11	0.39
BOD	2 mg/L	<2	2	<2	<2
Chemical Oxygen Demand	10 mg/L	37	39	52	20
Dissolved Inorganic Carbon	0.500 mg/L	35.6	43.9	79.4	77.2
Dissolved Organic Carbon	0.5 mg/L	16.2	12.4	11.9	11.7
Total Dissolved Carbon	0.5 mg/L	51.8	56.3	91.3	88.9
Hardness	mg/L	356	294	646	493
Phenolics	0.001 mg/L	0.006	0.006	0.004	0.006
Phosphorus, total	0.01 mg/L	0.09	0.04	0.01	0.02
Total Dissolved Solids	10 mg/L	754	630	1160	972
Total Suspended Solids	2 mg/L	4	<2	4	7
Total Kjeldahl Nitrogen	0.1 mg/L	1.0	0.9	0.6	0.9
Anions					
Chloride	1 mg/L	194	207	320	336
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	0.6
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	201	106	210	114
Metals					
Arsenic	1 ug/L	1	<1	<1	<1
Boron	10 ug/L	289	216	216	79
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	89300	70700	192000	148000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	0.7	<0.5	0.9	0.8
Copper	0.5 ug/L	2.5	0.6	1.9	1.4
Iron	100 ug/L	203	<100	897	2980
Lead	0.1 ug/L	0.1	0.1	0.1	<0.1
Magnesium	200 ug/L	32300	28600	40200	29800
Manganese	5 ug/L	352	120	171	1170
Potassium	100 ug/L	9040	10200	15900	11100
Sodium	200 ug/L	141000	136000	216000	187000
Zinc	5 ug/L	8	<5	<5	5

Certificate of Analysis

Report Date: 03-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	S-15	S-16	S-17	S-9
	Sample Date:	26-Aug-20 14:00	26-Aug-20 15:15	26-Aug-20 14:50	26-Aug-20 09:50
	Sample ID:	2035511-05	2035511-06	2035511-07	2035511-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	526	350	224	250
Ammonia as N	0.01 mg/L	0.12	0.55	0.13	0.05
BOD	2 mg/L	<2	9	4	<2
Chemical Oxygen Demand	10 mg/L	57	213	39	37
Dissolved Inorganic Carbon	0.500 mg/L	102	69.3	46.4	51.8
Dissolved Organic Carbon	0.5 mg/L	21.0	10.9	10.6	12.6
Total Dissolved Carbon	0.5 mg/L	122	80.2	57.0	64.4
Hardness	mg/L	537	521	280	362
Phenolics	0.001 mg/L	0.009	0.009	0.006	0.003
Phosphorus, total	0.01 mg/L	0.02	1.62	0.30	0.05
Total Dissolved Solids	10 mg/L	948	828	866	670
Total Suspended Solids	2 mg/L	2	454	47	3
Total Kjeldahl Nitrogen	0.1 mg/L	1.1	4.2	1.3	0.7
Anions					
Chloride	1 mg/L	259	758	339	199
Nitrate as N	0.1 mg/L	0.7	0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	47	23	106	164
Metals					
Arsenic	1 ug/L	<1	2	1	<1
Boron	10 ug/L	59	31	73	220
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	145000	169000	89100	87800
Chromium	1 ug/L	1	7	2	1
Cobalt	0.5 ug/L	0.8	2.5	1.0	<0.5
Copper	0.5 ug/L	1.0	5.2	2.3	2.0
Iron	100 ug/L	373	14400	1660	305
Lead	0.1 ug/L	0.2	4.7	1.3	0.1
Magnesium	200 ug/L	42600	24000	14000	34600
Manganese	5 ug/L	1090	2430	292	73
Potassium	100 ug/L	21800	6340	9020	11100
Sodium	200 ug/L	148000	479000	201000	149000
Zinc	5 ug/L	<5	26	13	7

Certificate of Analysis

Report Date: 03-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	S-12	Dupe-1	-	-
	Sample Date:	26-Aug-20 10:25	26-Aug-20 10:25	-	-
	Sample ID:	2035511-09	2035511-10	-	-
	MDL/Units	Water	Water	-	-
General Inorganics					
Alkalinity, total	5 mg/L	83	248	-	-
Ammonia as N	0.01 mg/L	0.20	0.03	-	-
BOD	2 mg/L	16	4	-	-
Chemical Oxygen Demand	10 mg/L	697	48	-	-
Dissolved Inorganic Carbon	0.500 mg/L	<0.500	49.6	-	-
Dissolved Organic Carbon	0.5 mg/L	20.2	12.2	-	-
Total Dissolved Carbon	0.5 mg/L	1.8	61.7	-	-
Hardness	mg/L	230	338	-	-
Phenolics	0.001 mg/L	0.015	0.004	-	-
Phosphorus, total	0.01 mg/L	3.36	0.06	-	-
Total Dissolved Solids	10 mg/L	436	660	-	-
Total Suspended Solids	2 mg/L	986	<2	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	14.3	0.7	-	-
Anions					
Chloride	1 mg/L	109	199	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-
Sulphate	1 mg/L	130	164	-	-
Metals					
Arsenic	1 ug/L	5	<1	-	-
Boron	10 ug/L	145	216	-	-
Cadmium	0.1 ug/L	0.3	<0.1	-	-
Calcium	100 ug/L	58700	81900	-	-
Chromium	1 ug/L	64	1	-	-
Cobalt	0.5 ug/L	10.5	<0.5	-	-
Copper	0.5 ug/L	25.9	1.8	-	-
Iron	100 ug/L	26400	316	-	-
Lead	0.1 ug/L	15.5	0.1	-	-
Magnesium	200 ug/L	20400	32500	-	-
Manganese	5 ug/L	428	72	-	-
Potassium	100 ug/L	16000	10500	-	-
Sodium	200 ug/L	78500	144000	-	-
Zinc	5 ug/L	92	<5	-	-

Certificate of Analysis

Report Date: 03-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Total Dissolved Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						

Certificate of Analysis

Report Date: 03-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L	ND			NC	10	
Nitrate as N	4.36	0.1	mg/L	4.35			0.0	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	84.9	1	mg/L	84.9			0.0	10	
General Inorganics									
Alkalinity, total	257	5	mg/L	255			0.6	14	
Ammonia as N	85.7	4.00	mg/L	83.7			2.3	18	
BOD	ND	120	mg/L	ND			NC	20	BOD01
Chemical Oxygen Demand	44	10	mg/L	37			NC	12	
Dissolved Organic Carbon	16.2	0.5	mg/L	16.2			0.0	37	
Phenolics	0.002	0.001	mg/L	ND			NC	10	
Phosphorus, total	ND	0.01	mg/L	ND			NC	15	
Total Dissolved Solids	718	10	mg/L	754			4.9	10	
Total Suspended Solids	4.0	2	mg/L	4.0			0.0	10	
Total Kjeldahl Nitrogen	0.66	0.1	mg/L	0.98			NC	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	57	10	ug/L	51			12.4	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	137000	100	ug/L	136000			0.9	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	6.49	0.5	ug/L	6.58			1.3	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	0.56	0.1	ug/L	0.52			7.6	20	
Magnesium	36700	200	ug/L	37100			1.1	20	
Manganese	419	5	ug/L	428			2.0	20	
Potassium	5840	100	ug/L	5870			0.6	20	
Sodium	455000	200	ug/L	473000			4.0	20	
Zinc	ND	5	ug/L	ND			NC	20	

Certificate of Analysis

Report Date: 03-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	10.9	1	mg/L	ND	109	85-115			
Nitrate as N	1.02	0.1	mg/L	ND	102	86-114			
Nitrite as N	1.02	0.05	mg/L	ND	102	85-115			
Sulphate	10.5	1	mg/L	ND	105	86-114			
General Inorganics									
Ammonia as N	0.320	0.01	mg/L	0.078	97.1	81-124			
BOD	176	2	mg/L	ND	88.0	71-121			
Chemical Oxygen Demand	245	10	mg/L	37	104	85-111			
Dissolved Organic Carbon	7.6	0.5	mg/L	ND	76.4	60-133			
Phenolics	0.026	0.001	mg/L	ND	102	69-132			
Phosphorus, total	0.469	0.01	mg/L	ND	93.8	80-120			
Total Dissolved Solids	96.0	10	mg/L	ND	96.0	75-125			
Total Suspended Solids	23.0	2	mg/L	ND		75-125			
Total Kjeldahl Nitrogen	2.93	0.1	mg/L	0.98	97.5	81-126			
Metals									
Arsenic	58.4	1	ug/L	8.4	100	80-120			
Boron	94	10	ug/L	51	87.4	80-120			
Cadmium	49.2	0.1	ug/L	ND	98.3	80-120			
Calcium	9730	100	ug/L	ND	97.3	80-120			
Chromium	52.3	1	ug/L	ND	104	80-120			
Cobalt	47.5	0.5	ug/L	0.56	93.8	80-120			
Copper	63.5	0.5	ug/L	6.58	114	80-120			
Iron	3000	100	ug/L	ND	118	80-120			
Lead	50.2	0.1	ug/L	0.52	99.3	80-120			
Magnesium	47900	200	ug/L	37100	108	80-120			
Manganese	50.3	5	ug/L	ND	101	80-120			
Potassium	18600	100	ug/L	9480	91.4	80-120			
Sodium	9500	200	ug/L	ND	95.0	80-120			
Zinc	51	5	ug/L	ND	95.0	80-120			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-20-00056

Report Date: 03-Sep-2020
Order Date: 27-Aug-2020
Project Description: 19130610

Qualifier Notes:

QC Qualifiers :

BOD01 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 20355511

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Ottawa, Ontario K1K 4J6
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paracel@paracellabs.com
www.paracellabs.com

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Page 1 of 2

Client Name:	Golder Associates	Project Reference:	19130610
Contact Name:	Yannick Mansour	Quote #:	19-798
Address:	1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	7145-20-00056
Telephone:	613-592-9600	Email Address:	yannick_mansour@golder.com, emily_bezeau@golder.com karol.bureau@waste-connections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day
Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ ISC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ MISA (Sewer) ☐ S. U. (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 20355511

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	S-20	SW		7	08/26/20	11:30am	✓
2	S-21	SW				11:45 PM	✓
3	S-1	SW				1:35 PM	✓
4	S-3	SW				2:20 PM	✓
5	S-15	SW				2 PM	✓
6	S-16	SW				3:10 PM	✓
7	S-17	SW				2:50PM	✓
8	~~S-6~~	~~SW~~				/	☒
9	~~S-7~~	~~SW~~				/	☒
10	S-9	SW		√	√	9:50AM	✓

Comments: Invoice to Waste Connections of Canada, with PO#7145-20-00056 to be sent along with the results.
ESdat facility code 8253

Method of Delivery:

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print):	Date/Time:	Date/Time:	Date/Time:
Date/Time: 08/26/20	Temperature:	Temperature:	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

001704

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Paracel ID: 2035511

Chain of Custody
(Lab Use Only)

Page 2 of 2

Client Name: Golder Associates	Project Reference: 1913561-0	TAT: ☑ Regular ☐ 5 Day	
Contact Name: Yannick Marineau	Quote #: 19-798	☐ 3 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-20-00056	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marineau@golder.com, emily_lacac@golder.com henri.bureau@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ ISC (Filing) ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other CDWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2035511

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	~~S-10~~	SW		7	08/10/20		☑
2	S-11	SW		1	1		☑
3	S-12	SW		1	1	10:25	☑
4	Dupe-1	SW		↓	↓		☑
5							☐
6							☐
7							☐
8							☐
9							☐
10							☐

Comments: Invoice to Waste Connections of Canada, with PO#7145-20-00056 to be sent along with the results

EQuIS Facility code 9266

Method of Delivery: Courier

Relinquished By (Sign):	Received at Lab:	Verified By:	
Relinquished By (Print):	Date/Time:	Date/Time:	Date/Time:
Date/Time:	Temperature:	Temperature:	pH Verified: ☐ By:

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-20-00056
Project: 19130610
Custody:

Report Date: 14-Sep-2020
Order Date: 27-Aug-2020

Revised Report

Order #: 2035581

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2035581-01	L-5

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 14-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	28-Aug-20	28-Aug-20
Ammonia, as N	EPA 351.2 - Auto Colour	1-Sep-20	2-Sep-20
Anions	EPA 300.1 - IC	31-Aug-20	1-Sep-20
Biochemical Oxygen Demand	SM 5210B - DO Probe	28-Aug-20	28-Aug-20
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	31-Aug-20	1-Sep-20
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	31-Aug-20	1-Sep-20
Hardness	Hardness as CaCO3	2-Sep-20	2-Sep-20
Hardness	Hardness as CaCO3	2-Sep-20	2-Sep-20
Metals, ICP-MS	EPA 200.8 - ICP-MS	2-Sep-20	2-Sep-20
Phenolics	EPA 420.2 - Auto Colour, 4AAP	31-Aug-20	1-Sep-20
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	1-Sep-20	1-Sep-20
Total Dissolved Carbon	MOE 3247B - Combustion IR	31-Aug-20	1-Sep-20
Total Dissolved Solids	SM 2540C - gravimetric, filtration	28-Aug-20	31-Aug-20
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	1-Sep-20	1-Sep-20
Total Suspended Solids	SM 2540D - Gravimetric	28-Aug-20	28-Aug-20
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	29-Aug-20	29-Aug-20

Certificate of Analysis

Report Date: 14-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	L-5	-	-	-
	Sample Date:	27-Aug-20 14:45	-	-	-
	Sample ID:	2035581-01	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	916	-	-	-
Hardness	mg/L	1530	-	-	-
Ammonia as N	0.01 mg/L	33.6	-	-	-
BOD	2 mg/L	23	-	-	-
Chemical Oxygen Demand	10 mg/L	236	-	-	-
Dissolved Inorganic Carbon	0.500 mg/L	180	-	-	-
Dissolved Organic Carbon	0.5 mg/L	54.0	-	-	-
Total Dissolved Carbon	0.5 mg/L	234	-	-	-
Hardness	mg/L	1530	-	-	-
Phenolics	0.001 mg/L	0.018	-	-	-
Phosphorus, total	0.01 mg/L	0.38	-	-	-
Total Dissolved Solids	10 mg/L	2320	-	-	-
Total Suspended Solids	2 mg/L	185	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	38.0	-	-	-
Anions					
Chloride	1 mg/L	648	-	-	-
Nitrate as N	0.1 mg/L	1.2	-	-	-
Nitrite as N	0.05 mg/L	0.27	-	-	-
Sulphate	1 mg/L	128	-	-	-
Metals					
Arsenic	1 ug/L	1	-	-	-
Boron	10 ug/L	8420	-	-	-
Cadmium	0.1 ug/L	0.2	-	-	-
Calcium	100 ug/L	384000	-	-	-
Chromium	1 ug/L	75	-	-	-
Cobalt	0.5 ug/L	8.5	-	-	-
Copper	0.5 ug/L	12.4	-	-	-
Iron	100 ug/L	17200	-	-	-
Lead	0.1 ug/L	3.3	-	-	-
Magnesium	200 ug/L	138000	-	-	-
Manganese	5 ug/L	2270	-	-	-
Potassium	100 ug/L	81400	-	-	-
Sodium	200 ug/L	410000	-	-	-
Zinc	5 ug/L	4540	-	-	-
Volatiles					

Certificate of Analysis

Report Date: 14-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	L-5	-	-	-
	Sample Date:	27-Aug-20 14:45	-	-	-
	Sample ID:	2035581-01	-	-	-
	MDL/Units	Water	-	-	-
Benzene	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 14-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Total Dissolved Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Manganese	ND	5	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						

Certificate of Analysis

Report Date: 14-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	4.41	1	mg/L	4.56			3.2	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	4.71	1	mg/L	4.70			0.2	10	
General Inorganics									
Alkalinity, total	257	5	mg/L	255			0.6	14	
Ammonia as N	85.7	4.00	mg/L	83.7			2.3	18	
BOD	35	2	mg/L	34			2.9	20	
Chemical Oxygen Demand	248	10	mg/L	236			5.0	12	
Dissolved Organic Carbon	16.2	0.5	mg/L	16.2			0.0	37	
Phenolics	0.009	0.001	mg/L	0.009			3.3	10	
Phosphorus, total	0.150	0.01	mg/L	0.157			4.8	15	
Total Dissolved Solids	718	10	mg/L	754			4.9	10	
Total Suspended Solids	4.0	2	mg/L	4.0			0.0	10	
Total Kjeldahl Nitrogen	ND	0.1	mg/L	0.95			NC	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	13	10	ug/L	13			3.3	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	ND	0.5	ug/L	ND			NC	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	0.19			NC	20	
Manganese	ND	5	ug/L	ND			NC	20	
Zinc	ND	5	ug/L	ND			NC	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-20-00056

Report Date: 14-Sep-2020
Order Date: 27-Aug-2020
Project Description: 19130610

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	14.0	1	mg/L	4.56	94.0	77-123			
Nitrate as N	0.98	0.1	mg/L	ND	98.2	79-120			
Nitrite as N	0.946	0.05	mg/L	ND	94.6	84-117			
Sulphate	14.1	1	mg/L	4.70	93.9	74-126			
General Inorganics									
Ammonia as N	0.320	0.01	mg/L	0.078	97.1	81-124			
BOD	154	2	mg/L	ND	77.0	71-121			
Chemical Oxygen Demand	444	10	mg/L	236	104	85-111			
Dissolved Organic Carbon	7.6	0.5	mg/L	ND	76.4	60-133			
Phenolics	0.030	0.001	mg/L	0.009	85.2	69-132			
Phosphorus, total	0.679	0.01	mg/L	0.157	104	80-120			
Total Dissolved Solids	96.0	10	mg/L	ND	96.0	75-125			
Total Suspended Solids	23.0	2	mg/L	ND		75-125			
Total Kjeldahl Nitrogen	2.00	0.1	mg/L	ND	99.9	81-126			
Metals									
Arsenic	54.5	1	ug/L	ND	109	80-120			
Boron	60	10	ug/L	13	94.1	80-120			
Cadmium	53.7	0.1	ug/L	ND	107	80-120			
Chromium	53.9	1	ug/L	ND	108	80-120			
Cobalt	52.9	0.5	ug/L	ND	106	80-120			
Copper	52.5	0.5	ug/L	ND	104	80-120			
Iron	2380	100	ug/L	ND	94.3	80-120			
Lead	49.5	0.1	ug/L	0.19	98.6	80-120			
Manganese	54.2	5	ug/L	ND	107	80-120			
Zinc	51	5	ug/L	ND	102	80-120			
Volatiles									
Benzene	40.9	0.5	ug/L	ND	102	60-130			
1,1-Dichloroethane	32.0	0.5	ug/L	ND	80.1	60-130			
Ethylbenzene	41.4	0.5	ug/L	ND	104	60-130			
Methylene Chloride	37.4	5.0	ug/L	ND	93.4	60-130			
Toluene	40.7	0.5	ug/L	ND	102	60-130			
Vinyl chloride	36.8	0.5	ug/L	ND	92.0	50-140			
m,p-Xylenes	82.5	0.5	ug/L	ND	103	60-130			
o-Xylene	41.1	0.5	ug/L	ND	103	60-130			

Certificate of Analysis

Report Date: 14-Sep-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Aug-2020

Client PO: 7145-20-00056

Project Description: 19130610

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1 - this report now includes hardness, Mg, K, and Na

Revision 2 - This report now includes data for Ca

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

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Paracel ID: 2035581

Chain of Custody (Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 19120619		
Contact Name: Yannick Marcenac	Quote #: 19-799 Leachate	TAT: ☑ Regular ☐ 3 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO#: 7145-20-00056	☐ 2 Day ☐ 1 Day	
Telephone: 613-592-9600	Email Address: yannick_marcenac@golder.com, emily_bacon@golder.com, rene.bureault@wasteconnections.com	Date Required:	

Criteria: ☐ Reg 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2035581

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	L6	WL		9	08/27/20	2:25 pm	☑
2							
3							
4							
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada, with PO#7145-20-00056 to be sent along with the results

SSOS facility code 6213

Method of Delivery: DROP BOX

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print):	Date/Time:	Date/Time:	Date/Time:
Date/Time: 08/27/20	Temperature:	Temperature:	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-20-00056
Project: 19130610
Custody: 57235

Report Date: 30-Nov-2020
Order Date: 27-Nov-2020

Order #: 2048558

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2048558-01	Field Blank
2048558-02	Field Blank
2048558-03	Trip Blank

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 30-Nov-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	27-Nov-20	27-Nov-20

Certificate of Analysis

Report Date: 30-Nov-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	Field Blank	Field Blank	Trip Blank	-
	Sample Date:	25-Nov-20 09:00	26-Nov-20 09:00	24-Nov-20 09:00	-
	Sample ID:	2048558-01	2048558-02	2048558-03	-
	MDL/Units	Water	Water	Water	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	-
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Chloroethane	1.0 ug/L	<1.0	<1.0	<1.0	-
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	-
Chloromethane	3.0 ug/L	<3.0	<3.0	<3.0	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	<0.2	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	<10.0	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	-
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-

Certificate of Analysis

Report Date: 30-Nov-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610

	Client ID:	Field Blank	Field Blank	Trip Blank	-
	Sample Date:	25-Nov-20 09:00	26-Nov-20 09:00	24-Nov-20 09:00	-
	Sample ID:	2048558-01	2048558-02	2048558-03	-
	MDL/Units	Water	Water	Water	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	-
4-Bromofluorobenzene	Surrogate	113%	111%	115%	-
Dibromofluoromethane	Surrogate	97.0%	104%	93.5%	-
Toluene-d8	Surrogate	95.3%	94.6%	93.8%	-

Certificate of Analysis

Report Date: 30-Nov-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroethane	ND	1.0	ug/L						
Chloroform	ND	0.5	ug/L						
Chloromethane	ND	3.0	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dibromoethane	ND	0.2	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloroethylene, total	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
1,3,5-Trimethylbenzene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*97.7*		*ug/L*		*122*	*50-140*			
Surrogate: Dibromofluoromethane	*82.2*		*ug/L*		*103*	*50-140*			
Surrogate: Toluene-d8	*80.0*		*ug/L*		*100*	*50-140*			

Certificate of Analysis

Report Date: 30-Nov-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	3.75	0.5	ug/L	3.89			3.7	30	
Chloroethane	ND	1.0	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Chloromethane	ND	3.0	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dibromoethane	ND	0.2	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	5.26	0.5	ug/L	4.67			11.9	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
1,3,5-Trimethylbenzene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*87.1*		*ug/L*		*109*	*50-140*			
Surrogate: Dibromofluoromethane	*79.9*		*ug/L*		*99.8*	*50-140*			
Surrogate: Toluene-d8	*73.9*		*ug/L*		*92.4*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-20-00056

Report Date: 30-Nov-2020
Order Date: 27-Nov-2020
Project Description: 19130610

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	111	5.0	ug/L	ND	111	50-140			
Benzene	36.5	0.5	ug/L	ND	91.4	60-130			
Bromodichloromethane	39.6	0.5	ug/L	ND	99.0	60-130			
Bromoform	40.7	0.5	ug/L	ND	102	60-130			
Bromomethane	37.7	0.5	ug/L	ND	94.3	50-140			
Carbon Tetrachloride	37.8	0.2	ug/L	ND	94.4	60-130			
Chlorobenzene	40.8	0.5	ug/L	ND	102	60-130			
Chloroethane	43.3	1.0	ug/L	ND	108	50-140			
Chloroform	38.1	0.5	ug/L	ND	95.3	60-130			
Chloromethane	42.7	3.0	ug/L	ND	107	50-140			
Dibromochloromethane	41.4	0.5	ug/L	ND	103	60-130			
Dichlorodifluoromethane	38.7	1.0	ug/L	ND	96.8	50-140			
1,2-Dibromoethane	42.0	0.2	ug/L	ND	105	60-130			
1,2-Dichlorobenzene	39.2	0.5	ug/L	ND	98.0	60-130			
1,3-Dichlorobenzene	36.3	0.5	ug/L	ND	90.7	60-130			
1,4-Dichlorobenzene	38.1	0.5	ug/L	ND	95.2	60-130			
1,1-Dichloroethane	39.6	0.5	ug/L	ND	98.9	60-130			
1,2-Dichloroethane	39.5	0.5	ug/L	ND	98.7	60-130			
1,1-Dichloroethylene	38.4	0.5	ug/L	ND	96.0	60-130			
cis-1,2-Dichloroethylene	39.5	0.5	ug/L	ND	98.6	60-130			
trans-1,2-Dichloroethylene	40.8	0.5	ug/L	ND	102	60-130			
1,2-Dichloropropane	36.4	0.5	ug/L	ND	91.1	60-130			
cis-1,3-Dichloropropylene	35.8	0.5	ug/L	ND	89.6	60-130			
trans-1,3-Dichloropropylene	35.0	0.5	ug/L	ND	87.4	60-130			
Ethylbenzene	40.0	0.5	ug/L	ND	100	60-130			
Hexane	43.1	1.0	ug/L	ND	108	60-130			
Methyl Ethyl Ketone (2-Butanone)	104	5.0	ug/L	ND	104	50-140			
Methyl Butyl Ketone (2-Hexanone)	98.3	10.0	ug/L	ND	98.3	50-140			
Methyl Isobutyl Ketone	88.3	5.0	ug/L	ND	88.3	50-140			
Methyl tert-butyl ether	94.8	2.0	ug/L	ND	94.8	50-140			
Methylene Chloride	36.9	5.0	ug/L	ND	92.4	60-130			
Styrene	38.1	0.5	ug/L	ND	95.2	60-130			
1,1,1,2-Tetrachloroethane	39.3	0.5	ug/L	ND	98.4	60-130			
1,1,2,2-Tetrachloroethane	42.3	0.5	ug/L	ND	106	60-130			
Tetrachloroethylene	41.2	0.5	ug/L	ND	103	60-130			
Toluene	42.4	0.5	ug/L	ND	106	60-130			
1,1,1-Trichloroethane	39.9	0.5	ug/L	ND	99.8	60-130			
1,1,2-Trichloroethane	38.0	0.5	ug/L	ND	95.0	60-130			
Trichloroethylene	37.3	0.5	ug/L	ND	93.2	60-130			
Trichlorofluoromethane	40.1	1.0	ug/L	ND	100	60-130			
1,3,5-Trimethylbenzene	30.8	0.5	ug/L	ND	77.1	60-130			
Vinyl chloride	34.9	0.5	ug/L	ND	87.2	50-140			
m,p-Xylenes	82.6	0.5	ug/L	ND	103	60-130			
o-Xylene	39.5	0.5	ug/L	ND	98.8	60-130			
Surrogate: 4-Bromofluorobenzene	*78.6*		*ug/L*		*98.2*	*50-140*			
Surrogate: Dibromofluoromethane	*78.3*		*ug/L*		*97.8*	*50-140*			
Surrogate: Toluene-d8	*64.8*		*ug/L*		*81.0*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

PARAC LABORATORIES

Paracel ID: 2048558

Paracel Order Number (Lab Use Only): 2048558

Chain Of Custody (Lab Use Only): No 57235

Client Name: GOLDER

Contact Name: YANNICK MARCEAU

Address: 1931 Robertson Rd

Telephone: 613-592-9600

Project Ref: 19135020

Quote #: 19800-QA/QC

PO #: 7145-20-00058

E-mail: YMarceau@golder.com
dsloan@golder.com
hany_hungault@wasteconnections.com

Page 1 of 1

Turnaround Time: ☐ 1 day ☐ 3 day ☐ 2 day ☐ Regular

Date Required:

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ Table — For RSC: ☐ Yes ☐ No

Other Regulation: ☐ REG 558 ☐ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm ☐ Mun: ☑ Other: QHOS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: Bi-Carbide

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Time	Bi-Carbide
1	Field Blank			1	Nov-25/20		✓
2	Field Blank			1	Nov 25/20		✓
3	Trip Blank			1	Nov 24		✓
4							
5							
6							
7							
8							
9							
10							

Comments: - Invoice to Waste Connections of Canada (Hany Hungault)
- Govts Facility 6253

Method of Delivery: PARACEL COURIER

Relinquished By (Sign): K. McDonald

Relinquished By (Print): K. McDonald

Date/Time: Nov. 24, 2020 6:00 PM

Received By Driver/Depot: M. Lewis

Date/Time: 27/11/20 10:54

Temperature: °C

Received at Lab:

Date/Time: NOV 27 20 B16

Temperature: 1.9 °C

Verified By:

Date/Time: Nov 27 20 1355

Job Verified ☐ By:

Chain of Custody (Blank).xlsx

Revision 3.0

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-20-00056
Project: 19130610 - Navan LF
Custody: 128820

Report Date: 2-Dec-2020
Order Date: 27-Nov-2020

Order #: 2048543

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2048543-01	SED-W
2048543-02	SED-C
2048543-03	SED-E

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 02-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610 - Navan LF

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	2-Dec-20	2-Dec-20
Mercury by CVAA	EPA 7471B - CVAA, digestion	1-Dec-20	2-Dec-20
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	2-Dec-20	2-Dec-20
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	2-Dec-20	2-Dec-20
Solids, %	Gravimetric, calculation	30-Nov-20	30-Nov-20

Certificate of Analysis

Report Date: 02-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610 - Navan LF

	Client ID:	SED-W	SED-C	SED-E	-
	Sample Date:	25-Nov-20 09:00	25-Nov-20 09:00	25-Nov-20 09:00	-
	Sample ID:	2048543-01	2048543-02	2048543-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	11.1	26.0	14.8	-
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	3.0	2.2	3.7	-
Barium	1.0 ug/g dry	74.8	75.4	142	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Boron	5.0 ug/g dry	22.1	11.1	18.6	-
Boron, available	0.5 ug/g dry	15.7	7.1	8.5	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	21.7	28.7	52.1	-
Cobalt	1.0 ug/g dry	4.7	4.6	9.1	-
Copper	5.0 ug/g dry	21.0	13.0	24.9	-
Iron	200 ug/g dry	15400	13200	22000	-
Lead	1.0 ug/g dry	8.0	9.5	13.3	-
Manganese	5 ug/g dry	374	180	309	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	3.4	<1.0	2.0	-
Nickel	5.0 ug/g dry	14.5	13.7	31.2	-
Selenium	1.0 ug/g dry	1.2	<1.0	1.1	-
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	3.3	1.3	3.6	-
Vanadium	10.0 ug/g dry	26.5	24.8	51.5	-
Zinc	20.0 ug/g dry	64.0	50.7	92.4	-

Certificate of Analysis

Report Date: 02-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610 - Navan LF

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Iron	ND	200	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Manganese	ND	5	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						

Certificate of Analysis

Report Date: 02-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610 - Navan LF

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g dry	ND			NC	30	
Arsenic	1.9	1.0	ug/g dry	1.8			5.7	30	
Barium	34.8	1.0	ug/g dry	35.3			1.3	30	
Beryllium	ND	0.5	ug/g dry	ND			NC	30	
Boron, available	ND	0.5	ug/g dry	ND			NC	35	
Boron	ND	5.0	ug/g dry	ND			NC	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium	11.0	5.0	ug/g dry	10.6			3.5	30	
Cobalt	4.3	1.0	ug/g dry	4.2			1.5	30	
Copper	9.4	5.0	ug/g dry	8.8			6.0	30	
Iron	11400	200	ug/g dry	11200			2.0	30	
Lead	8.9	1.0	ug/g dry	4.6			NC	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Manganese	289	5	ug/g dry	285			1.6	30	
Molybdenum	ND	1.0	ug/g dry	ND			NC	30	
Nickel	8.7	5.0	ug/g dry	8.5			1.7	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	17.2	10.0	ug/g dry	16.8			2.3	30	
Zinc	22.3	20.0	ug/g dry	22.8			2.3	30	
Physical Characteristics									
% Solids	93.9	0.1	% by Wt.	94.5			0.6	25	

Certificate of Analysis

Report Date: 02-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610 - Navan LF

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	50.3	1.0	ug/g	ND	100	70-130			
Arsenic	52.6	1.0	ug/g	ND	104	70-130			
Barium	66.2	1.0	ug/g	14.1	104	70-130			
Beryllium	50.5	0.5	ug/g	ND	101	70-130			
Boron, available	5.21	0.5	ug/g	ND	104	70-122			
Boron	48.5	5.0	ug/g	ND	93.6	70-130			
Cadmium	49.8	0.5	ug/g	ND	99.5	70-130			
Chromium	55.6	5.0	ug/g	ND	103	70-130			
Cobalt	53.3	1.0	ug/g	1.7	103	70-130			
Copper	53.7	5.0	ug/g	ND	100	70-130			
Iron	7280	200	ug/g	4480	112	70-130			
Lead	49.8	1.0	ug/g	1.9	96.0	70-130			
Mercury	1.53	0.1	ug/g	ND	102	70-130			
Manganese	172	5	ug/g	114	116	70-130			
Molybdenum	50.2	1.0	ug/g	ND	100	70-130			
Nickel	54.2	5.0	ug/g	ND	102	70-130			
Selenium	49.1	1.0	ug/g	ND	98.1	70-130			
Silver	43.4	0.3	ug/g	ND	86.9	70-130			
Thallium	48.3	1.0	ug/g	ND	96.5	70-130			
Uranium	47.5	1.0	ug/g	ND	94.6	70-130			
Vanadium	59.8	10.0	ug/g	ND	106	70-130			
Zinc	57.9	20.0	ug/g	ND	97.5	70-130			

Certificate of Analysis

Report Date: 02-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610 - Navan LF

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.

Applies to samples: SED-W, SED-C, SED-E

QC Qualifiers :

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

PARAC LABORATORIE

Paracel ID: 2048543

Laurentian Blvd. Sudbury, ON P3A 4J8 (705) 560-6325 www.paracellabs.com info@paracellabs.com

Paracel Order Number (Lab Use Only): 2048543

Chain Of Custody (Lab Use Only) № 128820

Client Name: GOLDER

Contact Name: YANICK MARCEAU

Address: (93) Robinson Road

Telephone: 613-592-9600

Project Ref: 19132D - NAPANEE LF

Quote #: 19-801 - SED

PO #: 7145-20-00056

E-mail: ymarceau@golder.com
pleung@golder.com
hani_hmaidan@golder.com

Page 1 of 1

Turnaround Time
- ☐ 1 day
- ☐ 2 day
- ☐ 3 day
- ☑ Regular

Date Required:

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ Table — For RSC: ☐ Yes ☐ No

Other Regulation: ☐ MISA 556 ☑ PWQO ☐ CCME ☐ MISA ☐ SUB - Storm ☐ SUB - Sanit. Municipality: ☑ Other: CCME

Matrix Types: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1+F2+BTEX	VOCs	PAHs	Metals by ICP	HWS-B	CrVI	B (HWS)	For Guide
1	SED-W			1										✓
2	SED-C			1										✓
3	SED-E			1										✓
4														
5														
6														
7														
8														
9														
10														

Comments: Invoice waste Connections of Canada
Edwards Facility, 6253

Method of Delivery: RACHEL COUTEE

Relinquished By (Sign): R McDonald

Relinquished By (Print): Rae McDonald

Date/Time: Nov 26, 2020 / 5:00 PM

Received By Driver/Depot: A Keane

Date/Time: 27/11/20 10:54

Temperature: °C

Received at Lab: NW 07 Nov 20 15:10

Temperature: 2.8 °C

Verified: Dan

Date/Time: 27 Nov 20 15:19

Verified By:

Chain of Custody (Rev. 0.0)

Revision 3.0

001731

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-20-00056
Project: 19130610-Navan LF
Custody: 57235

Report Date: 8-Dec-2020
Order Date: 27-Nov-2020

Order #: 2048534

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2048534-01	92-18
2048534-02	92-19
2048534-03	05-1C
2048534-04	05-1D
2048534-05	05-3D
2048534-06	05-3C
2048534-07	07-1D
2048534-08	07-1C
2048534-09	05-11
2048534-10	92-10
2048534-11	05-8
2048534-12	92-7
2048534-13	05-R3
2048534-14	95-8
2048534-15	98-1
2048534-16	94-2
2048534-17	95-2
2048534-18	95-3
2048534-19	MW-C
2048534-20	MW-E
2048534-21	95-6
2048534-22	95-7
2048534-23	94-6
2048534-24	94-5
2048534-25	09-1B
2048534-26	09-1C
2048534-27	09-1D
2048534-28	DUPE-2
2048534-29	DUPE-3

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, bicarbonate	calculated from EPA 310.1 - Titration to pH 4.5	30-Nov-20	30-Nov-20
Alkalinity, carbonate	calculated from EPA 310.1 - Titration to pH 4.5	30-Nov-20	30-Nov-20
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	30-Nov-20	1-Dec-20
Ammonia, as N	EPA 351.2 - Auto Colour	1-Dec-20	1-Dec-20
Anions	EPA 300.1 - IC	30-Nov-20	1-Dec-20
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	27-Nov-20	1-Dec-20
Hardness	Hardness as CaCO3	30-Nov-20	30-Nov-20
Metals, ICP-MS	EPA 200.8 - ICP-MS	30-Nov-20	30-Nov-20
Phenolics	EPA 420.2 - Auto Colour, 4AAP	4-Dec-20	4-Dec-20
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	1-Dec-20	3-Dec-20
Total Dissolved Solids	SM 2540C - gravimetric, filtration	1-Dec-20	2-Dec-20
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	1-Dec-20	2-Dec-20
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	30-Nov-20	30-Nov-20

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	92-18	92-19	05-1C	05-1D
	Sample Date:	26-Nov-20 07:40	26-Nov-20 07:50	26-Nov-20 08:00	26-Nov-20 08:15
	Sample ID:	2048534-01	2048534-02	2048534-03	2048534-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	212	339	178	315
Alkalinity, bicarbonate	5 mg/L	210	338	176	313
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<5
Ammonia as N	0.01 mg/L	0.29	0.05	0.18	0.02
Chemical Oxygen Demand	10 mg/L	166	50	33	19
Hardness	mg/L	484	403	158	479
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.004 [1]
Phosphorus, total	0.01 mg/L	5.50	0.13	0.42	0.04
Total Dissolved Solids	10 mg/L	1090	738	302	1010
Total Kjeldahl Nitrogen	0.1 mg/L	1.8	0.4	0.4	0.3
Anions					
Chloride	1 mg/L	363	143	51	358
Nitrate as N	0.1 mg/L	<0.1	0.3	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	36	148	48	88
Metals					
Arsenic	1 ug/L	3	<1	2	<1
Boron	10 ug/L	25	60	66	20
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	126000	129000	37800	131000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	1.2	<0.5	<0.5
Copper	0.5 ug/L	1.5	2.7	1.1	4.8
Iron	100 ug/L	<100	<100	311	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	41200	19500	15600	37000
Manganese	5 ug/L	20	695	35	6
Potassium	100 ug/L	6460	14400	4870	7870
Sodium	200 ug/L	92700	86000	52000	196000
Zinc	5 ug/L	8	9	9	9
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	92-18	92-19	05-1C	05-1D
	Sample Date:	26-Nov-20 07:40	26-Nov-20 07:50	26-Nov-20 08:00	26-Nov-20 08:15
	Sample ID:	2048534-01	2048534-02	2048534-03	2048534-04
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	106%	105%	105%	104%

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	05-3D	05-3C	07-1D	07-1C
	Sample Date:	26-Nov-20 08:35	26-Nov-20 09:45	26-Nov-20 08:56	26-Nov-20 09:03
	Sample ID:	2048534-05	2048534-06	2048534-07	2048534-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	725	1010	428	679
Alkalinity, bicarbonate	5 mg/L	719	970	426	671
Alkalinity, carbonate	5 mg/L	6	37	<5	7
Ammonia as N	0.01 mg/L	0.14	1.93	0.20	0.27
Chemical Oxygen Demand	10 mg/L	33	81	93	65
Hardness	mg/L	344	99.6	513	193
Phenolics	0.001 mg/L	<0.001	<0.010 [1]	<0.001	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.16	2.30	0.91	0.72
Total Dissolved Solids	10 mg/L	1000	1630	764	1490
Total Kjeldahl Nitrogen	0.1 mg/L	0.4	3.1	1.9	0.8
Anions					
Chloride	1 mg/L	117	349	26	419
Nitrate as N	0.1 mg/L	<0.1	<0.5 [1]	0.2	<0.5 [1]
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	103	3	254	120
Metals					
Arsenic	1 ug/L	<1	3	<1	2
Boron	10 ug/L	436	1480	248	411
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	57200	11200	127000	27200
Chromium	1 ug/L	<1	1	<1	<1
Cobalt	0.5 ug/L	<0.5	0.5	<0.5	0.5
Copper	0.5 ug/L	1.8	7.5	3.1	1.3
Iron	100 ug/L	<100	304	<100	295
Lead	0.1 ug/L	<0.1	0.2	<0.1	<0.1
Magnesium	200 ug/L	48900	17400	47600	30300
Manganese	5 ug/L	401	34	70	371
Potassium	100 ug/L	13700	15400	6080	13700
Sodium	200 ug/L	268000	620000	62900	521000
Zinc	5 ug/L	10	10	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	05-3D	05-3C	07-1D	07-1C
	Sample Date:	26-Nov-20 08:35	26-Nov-20 09:45	26-Nov-20 08:56	26-Nov-20 09:03
	Sample ID:	2048534-05	2048534-06	2048534-07	2048534-08
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	105%	105%	104%	104%

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	05-11	92-10	05-8	92-7
	Sample Date:	26-Nov-20 09:15	26-Nov-20 09:23	26-Nov-20 09:34	26-Nov-20 09:41
	Sample ID:	2048534-09	2048534-10	2048534-11	2048534-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	764	809	1440	637
Alkalinity, bicarbonate	5 mg/L	762	804	1430	628
Alkalinity, carbonate	5 mg/L	<5	5	<25	9
Ammonia as N	0.01 mg/L	0.58	0.60	0.17	0.27
Chemical Oxygen Demand	10 mg/L	65	91	122	79
Hardness	mg/L	826	515	1000	241
Phenolics	0.001 mg/L	<0.004 [1]	<0.004 [1]	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.10	0.60	0.14	0.35
Total Dissolved Solids	10 mg/L	1130	1180	1420	1310
Total Kjeldahl Nitrogen	0.1 mg/L	1.4	1.3	1.9	0.9
Anions					
Chloride	1 mg/L	47	232	113	450
Nitrate as N	0.1 mg/L	<0.5 [1]	<0.5 [1]	<0.5 [1]	<0.5 [1]
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	267	45	<1	1
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	2050	834	3400	430
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	186000	85600	206000	34600
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	0.9	<0.5
Copper	0.5 ug/L	4.0	2.6	2.7	4.3
Iron	100 ug/L	<100	1440	3260	<100
Lead	0.1 ug/L	0.1	0.1	<0.1	0.1
Magnesium	200 ug/L	88200	73200	119000	37500
Manganese	5 ug/L	678	911	11400	39
Potassium	100 ug/L	9440	17100	10400	15900
Sodium	200 ug/L	98400	292000	182000	465000
Zinc	5 ug/L	5	<5	<5	7
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	05-11	92-10	05-8	92-7
	Sample Date:	26-Nov-20 09:15	26-Nov-20 09:23	26-Nov-20 09:34	26-Nov-20 09:41
	Sample ID:	2048534-09	2048534-10	2048534-11	2048534-12
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	104%	104%	104%	104%

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	05-R3	95-8	98-1	94-2
	Sample Date:	26-Nov-20 09:53	26-Nov-20 10:21	26-Nov-20 10:31	26-Nov-20 11:15
	Sample ID:	2048534-13	2048534-14	2048534-15	2048534-16
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	826	1170	435	898
Alkalinity, bicarbonate	5 mg/L	821	1160	429	878
Alkalinity, carbonate	5 mg/L	<5	<25	6	20
Ammonia as N	0.01 mg/L	0.03	1.70	1.12	0.30
Chemical Oxygen Demand	10 mg/L	24	169	37	80
Hardness	mg/L	722	925	334	269
Phenolics	0.001 mg/L	<0.001	<0.004 [1]	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.03	0.04	0.58	0.83
Total Dissolved Solids	10 mg/L	956	1270	1210	1680
Total Kjeldahl Nitrogen	0.1 mg/L	0.3	3.0	1.5	1.1
Anions					
Chloride	1 mg/L	20	166	508	495
Nitrate as N	0.1 mg/L	<0.5 [1]	<0.5 [1]	<0.1	<0.5 [1]
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	137	9	1	5
Metals					
Arsenic	1 ug/L	<1	<1	1	2
Boron	10 ug/L	478	57	156	445
Cadmium	0.1 ug/L	<0.1	0.2	<0.1	<0.1
Calcium	100 ug/L	161000	230000	69800	36600
Chromium	1 ug/L	<1	11	<1	<1
Cobalt	0.5 ug/L	<0.5	2.7	<0.5	<0.5
Copper	0.5 ug/L	4.1	92.6	0.8	1.2
Iron	100 ug/L	<100	<100	2470	536
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	78100	85400	38700	43000
Manganese	5 ug/L	546	10800	344	377
Potassium	100 ug/L	9840	18800	14900	14500
Sodium	200 ug/L	111000	125000	345000	587000
Zinc	5 ug/L	<5	14	8	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	05-R3	95-8	98-1	94-2
	Sample Date:	26-Nov-20 09:53	26-Nov-20 10:21	26-Nov-20 10:31	26-Nov-20 11:15
	Sample ID:	2048534-13	2048534-14	2048534-15	2048534-16
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	103%	104%	103%	104%

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	95-2	95-3	MW-C	MW-E
	Sample Date:	26-Nov-20 11:30	26-Nov-20 11:37	26-Nov-20 12:30	26-Nov-20 12:45
	Sample ID:	2048534-17	2048534-18	2048534-19	2048534-20
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	1140	699	603	531
Alkalinity, bicarbonate	5 mg/L	1110	691	593	521
Alkalinity, carbonate	5 mg/L	32	9	10	10
Ammonia as N	0.01 mg/L	1.34	0.04	0.52	0.03
Chemical Oxygen Demand	10 mg/L	101	89	91	56
Hardness	mg/L	266	179	259	739
Phenolics	0.001 mg/L	<0.004 [1]	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	1.17	0.67	0.79	0.19
Total Dissolved Solids	10 mg/L	2150	1000	1240	1300
Total Kjeldahl Nitrogen	0.1 mg/L	2.2	0.8	1.2	0.8
Anions					
Chloride	1 mg/L	627	163	282	135
Nitrate as N	0.1 mg/L	<0.5 [1]	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	3	90	154	451
Metals					
Arsenic	1 ug/L	2	<1	1	<1
Boron	10 ug/L	849	889	582	871
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	31300	28100	41000	168000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	0.6	<0.5
Copper	0.5 ug/L	2.1	3.4	1.6	4.5
Iron	100 ug/L	101	<100	622	<100
Lead	0.1 ug/L	0.1	0.1	<0.1	<0.1
Magnesium	200 ug/L	45600	26500	37900	77600
Manganese	5 ug/L	66	69	545	46
Potassium	100 ug/L	17100	7250	9260	12400
Sodium	200 ug/L	813000	345000	402000	191000
Zinc	5 ug/L	6	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	95-2	95-3	MW-C	MW-E
	Sample Date:	26-Nov-20 11:30	26-Nov-20 11:37	26-Nov-20 12:30	26-Nov-20 12:45
	Sample ID:	2048534-17	2048534-18	2048534-19	2048534-20
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	104%	104%	103%	106%

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	95-6	95-7	94-6	94-5
	Sample Date:	26-Nov-20 13:00	26-Nov-20 13:11	26-Nov-20 13:36	26-Nov-20 13:47
	Sample ID:	2048534-21	2048534-22	2048534-23	2048534-24
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	963	627	364	848
Alkalinity, bicarbonate	5 mg/L	941	619	364	838
Alkalinity, carbonate	5 mg/L	<25	<25	<5	<25
Ammonia as N	0.01 mg/L	1.71	0.08	0.16	0.68
Chemical Oxygen Demand	10 mg/L	90	79	58	91
Hardness	mg/L	358	255	256	416
Phenolics	0.001 mg/L	<0.002 [1]	<0.002 [1]	<0.001	<0.002 [1]
Phosphorus, total	0.01 mg/L	0.95	0.50	0.24	0.72
Total Dissolved Solids	10 mg/L	2410	1290	1070	2080
Total Kjeldahl Nitrogen	0.1 mg/L	2.3	0.9	0.7	1.4
Anions					
Chloride	1 mg/L	862	459	276	776
Nitrate as N	0.1 mg/L	<0.5 [1]	<0.5 [1]	<0.1	<0.5 [1]
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	11	231	13
Metals					
Arsenic	1 ug/L	2	1	<1	1
Boron	10 ug/L	599	427	174	463
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	45100	38400	51300	55300
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	0.6	<0.5	<0.5	0.9
Copper	0.5 ug/L	2.9	5.5	3.5	3.0
Iron	100 ug/L	<100	<100	117	292
Lead	0.1 ug/L	0.1	<0.1	0.1	<0.1
Magnesium	200 ug/L	59600	38700	31000	67500
Manganese	5 ug/L	206	1050	368	2040
Potassium	100 ug/L	18700	10000	3700	11700
Sodium	200 ug/L	747000	466000	151000	665000
Zinc	5 ug/L	<5	<5	5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	95-6	95-7	94-6	94-5
	Sample Date:	26-Nov-20 13:00	26-Nov-20 13:11	26-Nov-20 13:36	26-Nov-20 13:47
	Sample ID:	2048534-21	2048534-22	2048534-23	2048534-24
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	104%	104%	104%	105%

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	09-1B	09-1C	09-1D	DUPE-2
	Sample Date:	26-Nov-20 14:12	26-Nov-20 14:23	26-Nov-20 14:42	26-Nov-20 15:15
	Sample ID:	2048534-25	2048534-26	2048534-27	2048534-28
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	1320	913	103	978
Alkalinity, bicarbonate	5 mg/L	1300	901	103	976
Alkalinity, carbonate	5 mg/L	25	<25	<5	<25
Ammonia as N	0.01 mg/L	4.52	1.80	1.35	2.53
Chemical Oxygen Demand	10 mg/L	88	105	187	126
Hardness	mg/L	401	294	46.7	948
Phenolics	0.001 mg/L	<0.004 [1]	<0.004 [1]	<0.002 [1]	<0.002 [1]
Phosphorus, total	0.01 mg/L	3.01	1.39	0.11	0.04
Total Dissolved Solids	10 mg/L	3610	2050	328	1210
Total Kjeldahl Nitrogen	0.1 mg/L	4.9	2.8	3.3	3.5
Anions					
Chloride	1 mg/L	1470	736	107	167
Nitrate as N	0.1 mg/L	<0.5 [1]	<0.5 [1]	<0.1	<0.5 [1]
Nitrite as N	0.05 mg/L	<1.00 [2]	<0.05	<0.05	<0.05
Sulphate	1 mg/L	<1	3	<1	10
Metals					
Arsenic	1 ug/L	4	2	<1	<1
Boron	10 ug/L	1750	609	58	58
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	0.1
Calcium	100 ug/L	38100	40700	7290	242000
Chromium	1 ug/L	<1	<1	<1	12
Cobalt	0.5 ug/L	1.0	0.9	<0.5	3.6
Copper	0.5 ug/L	3.9	3.7	3.0	64.3
Iron	100 ug/L	207	<100	1320	1130
Lead	0.1 ug/L	0.1	<0.1	0.2	<0.1
Magnesium	200 ug/L	74300	46800	6910	83300
Manganese	5 ug/L	70	832	187	11400
Potassium	100 ug/L	33500	12800	2290	18700
Sodium	200 ug/L	1270000	619000	76300	122000
Zinc	5 ug/L	<5	<5	7	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	09-1B	09-1C	09-1D	DUPE-2
	Sample Date:	26-Nov-20 14:12	26-Nov-20 14:23	26-Nov-20 14:42	26-Nov-20 15:15
	Sample ID:	2048534-25	2048534-26	2048534-27	2048534-28
	MDL/Units	Water	Water	Water	Water
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	103%	103%	105%	104%

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	DUPE-3	-	-	-
	Sample Date:	26-Nov-20 00:00	-	-	-
	Sample ID:	2048534-29	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	1210	-	-	-
Alkalinity, bicarbonate	5 mg/L	1180	-	-	-
Alkalinity, carbonate	5 mg/L	28	-	-	-
Ammonia as N	0.01 mg/L	1.16	-	-	-
Chemical Oxygen Demand	10 mg/L	86	-	-	-
Hardness	mg/L	264	-	-	-
Phenolics	0.001 mg/L	<0.004 [1]	-	-	-
Phosphorus, total	0.01 mg/L	0.98	-	-	-
Total Dissolved Solids	10 mg/L	2220	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	2.0	-	-	-
Anions					
Chloride	1 mg/L	602	-	-	-
Nitrate as N	0.1 mg/L	<0.5 [1]	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-
Sulphate	1 mg/L	3	-	-	-
Metals					
Arsenic	1 ug/L	2	-	-	-
Boron	10 ug/L	868	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	31700	-	-	-
Chromium	1 ug/L	<1	-	-	-
Cobalt	0.5 ug/L	<0.5	-	-	-
Copper	0.5 ug/L	<0.5	-	-	-
Iron	100 ug/L	177	-	-	-
Lead	0.1 ug/L	<0.1	-	-	-
Magnesium	200 ug/L	44800	-	-	-
Manganese	5 ug/L	67	-	-	-
Potassium	100 ug/L	17400	-	-	-
Sodium	200 ug/L	799000	-	-	-
Zinc	5 ug/L	<5	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

	Client ID:	DUPE-3	-	-	-
	Sample Date:	26-Nov-20 00:00	-	-	-
	Sample ID:	2048534-29	-	-	-
	MDL/Units	Water	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
Toluene-d8	Surrogate	103%	-	-	-

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Alkalinity, bicarbonate	ND	5	mg/L						
Alkalinity, carbonate	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
Surrogate: Toluene-d8	*83.9*		*ug/L*		*105*	*50-140*			

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	363	5	mg/L	363			0.0	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	35.6	1	mg/L	36.0			1.4	10	
General Inorganics									
Alkalinity, total	56.7	5	mg/L	57.1			0.7	14	
Alkalinity, bicarbonate	56	5	mg/L	57			0.7	14	
Alkalinity, carbonate	ND	5	mg/L	ND			NC	14	
Ammonia as N	0.315	0.01	mg/L	0.287			9.3	18	
Chemical Oxygen Demand	154	10	mg/L	166			7.5	12	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.029	0.01	mg/L	0.035			NC	15	
Total Dissolved Solids	1050	10	mg/L	1090			3.9	10	
Total Kjeldahl Nitrogen	0.26	0.1	mg/L	0.32			NC	16	
Metals									
Arsenic	3.2	1	ug/L	3.1			2.0	20	
Boron	25	10	ug/L	25			0.7	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	125000	100	ug/L	126000			0.9	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	1.48	0.5	ug/L	1.49			0.6	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	41000	200	ug/L	41200			0.5	20	
Manganese	20.5	5	ug/L	20.0			2.8	20	
Potassium	6320	100	ug/L	6460			2.1	20	
Sodium	92900	200	ug/L	92700			0.3	20	
Zinc	9	5	ug/L	8			3.6	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*83.0*		*ug/L*		*104*	*50-140*			

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610-Navan LF

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	144	1	mg/L	135	85.9	77-123			
Nitrate as N	0.95	0.1	mg/L	ND	95.5	79-120			
Nitrite as N	0.993	0.05	mg/L	ND	99.3	84-117			
Sulphate	45.1	1	mg/L	36.0	90.2	74-126			
General Inorganics									
Ammonia as N	0.555	0.01	mg/L	0.287	107	81-124			
Chemical Oxygen Demand	344	10	mg/L	166	89.0	85-111			
Phenolics	0.027	0.001	mg/L	ND	110	69-132			
Phosphorus, total	0.507	0.01	mg/L	0.035	94.5	80-120			
Total Dissolved Solids	96.0	10	mg/L	ND	96.0	75-125			
Total Kjeldahl Nitrogen	2.24	0.1	mg/L	0.32	96.3	81-126			
Metals									
Arsenic	53.5	1	ug/L	3.1	101	80-120			
Boron	40	10	ug/L	ND	79.6	80-120			QS-02
Cadmium	44.8	0.1	ug/L	ND	89.5	80-120			
Calcium	8380	100	ug/L	ND	83.8	80-120			
Chromium	52.0	1	ug/L	ND	104	80-120			
Cobalt	49.5	0.5	ug/L	ND	99.0	80-120			
Copper	46.9	0.5	ug/L	1.49	90.9	80-120			
Iron	2450	100	ug/L	ND	97.3	80-120			
Lead	46.8	0.1	ug/L	ND	93.5	80-120			
Magnesium	50600	200	ug/L	41200	93.2	80-120			
Manganese	70.2	5	ug/L	20.0	100	80-120			
Potassium	16800	100	ug/L	6460	103	80-120			
Sodium	99900	200	ug/L	92700	72.6	80-120			QM-07
Zinc	51	5	ug/L	8	85.0	80-120			
Volatiles									
Benzene	42.0	0.5	ug/L	ND	105	60-130			
1,1-Dichloroethane	40.5	0.5	ug/L	ND	101	60-130			
Ethylbenzene	42.7	0.5	ug/L	ND	107	60-130			
Methylene Chloride	34.5	5.0	ug/L	ND	86.2	60-130			
Toluene	42.5	0.5	ug/L	ND	106	60-130			
Vinyl chloride	45.8	0.5	ug/L	ND	115	50-140			
Surrogate: Toluene-d8	*83.0*		*ug/L*		*104*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-20-00056

Report Date: 08-Dec-2020
Order Date: 27-Nov-2020
Project Description: 19130610-Navan LF

Qualifier Notes:

Login Qualifiers :

Container(s) - Labeled improperly/insufficient information - COD vial was not labelled

Applies to samples: DUPE-3

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.

Applies to samples: 92-18, 92-19, 05-1C, 05-1D, 05-3D, 05-3C, 07-1D, 07-1C, 05-11, 92-10, 05-8, 92-7, 05-R3, 95-8, 94-2, 95-2, 95-3, MW-C, MW-E, 95-6, 95-7, 94-6, 94-5, 09-1B, 09-1C, 09-1D, DUPE-2, DUPE-3

Sample Qualifiers :

1 : Elevated Reporting Limit due to matrix interference.

2 : Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 2048534

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Parcel Order Number (Lab Use Only): 2048534

Chain Of Custody (Lab Use Only): № 57235

Page 1 of 2

Client Name: GOLDER

Contact Name: YANICK MARCOUX

Address: 1931 ROBERTSON RD

Telephone: 613 592 9600

Project Ref: 19130610 - Nanu LF

Quote #: 19-797-GW

PO #: 7145-20-00356

Email: YMarcoux@golder.com
ebacon@golder.com
hari.hunsul@gatfinancialservices.com

Turnaround Time: ☐ 1 day ☐ 2 day ☐ 3 day ☑ Regular

Date Required:

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ Table ... For RSC: ☐ Yes ☐ No

Other Regulation: ☐ REG 558 ☑ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm ☑ Other: Metals

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: Metals (PWQO)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Metals (PWQO)
1	92-18			2	Nov 24/20	7:40	✓
2	92-19					7:50	✓
3	MW05-1C					8:00	✓
4	MW 05-1D					8:15	✓
5	05-3D					8:35	✓
6	05-3C					8:45	✓
7	07-1D					8:58	✓
8	07-1C					9:03	✓
9	05-11					9:15	✓
10	92-10	✓		✓		9:23	✓

Comments: - Invoice waste Corrections to Cheska (Hari Hunsul) - Filtered Metals
- GWMS Facility 6253

Method of Delivery: PARCEL COURIER

Relinquished By (Sign): R MacDonald

Relinquished By (Print): Rob MacDonald

Date/Time: Nov 26 2020 / 7:00 P.M.

Received By Driver/Depot: T. Teuse

Date/Time: 27/11/20 10:54

Temperature: °C AIR

Received at Lab: Y. Dan

Date/Time: Nov 27 2020 1431

Temperature: 2.1 °C

Verified By: Y. Dan

Date/Time: 27 Nov 2020 17

pH Verified: ☐ By:

Chain of Custody (Blank).xlsx

Revision 3.0

Paracel ID: 2048534

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Paracel Order Number (Lab Use Only): 2048534

Chain Of Custody (Lab Use Only) №: 57235

Page 2 of 3

Client Name: GLDE Canada

Contact Name: Yannick Masseau

Address: 1931 Robertson Rd

Telephone: 613-592-9600

Project Ref: 1913060 - Huron LF

Quote #: 19-797-SW

PO #: 2445-20-02056

E-mail: YMasseau@golder.com
dlaxon@golder.com
kerri.bursett@wastecorrections.com

Turnaround Time: ☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular

Date Required:

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ Table — For RSC: ☐ Yes ☐ No

Other Regulation: ☐ REG 558 ☐ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm ☑ Other ONWS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: For Climate

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	For Climate
1	05-6			7	Nov 22/20	9:34	✓
2	92-7					9:41	✓
3	05-R3					9:53	✓
4	95-8					10:21	✓
5	98-1					10:31	✓
6	94-2					11:15	✓
7	95-2					11:30	✓
8	95-3					11:37	✓
9	MW-C					12:30	✓
10	MW-E			✓	✓	12:45	✓

Comments: Invoice Waste Corrections of Canada
"Equis Facility 6053
"Filtered Metals

Method of Delivery: Paracel Courier

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Kerri McDonald	Date/Time: 27/11/20 10:54	Date/Time: Nov 27 2020 1451	Date/Time: 27 Nov 20 1524
Date/Time: Nov 26, 2020 (7:20)pm	Temperature: °C AM	Temperature: 3.1 °C	pH Verified: ☑ By:

Revision 3.0

Chain of Custody (Blank).xlsx

Paracel ID: 2048534

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Paracel Order Number (Lab Use Only): 2048534

Chain Of Custody (Lab Use Only) № 57235

Page 3 of 3

Client Name: Golder

Project Ref: 19130610 - Nixon LF

Contact Name: Yannick Marcoux

Quote #: 19-297-GW

Address: 191 Robertson Rd

PO #: 7145-20-00056

e-mail: ymarcoux@golder.com
kbeam@golder.com
hart_hansen4@waste-connections.com

Telephone: 613-592-9600

Turnaround Time
- ☐ 1 day
- ☐ 2 day
- ☐ 3 day
- ☑ Regular

Date Required:

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ Table ____ For RSC: ☐ Yes ☐ No

Other Regulation: ☐ REG 558 ☐ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm ☐ Mun: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: For Metals

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	For Metals
1	95-6			1	Nov 2/20	13:00	✓
2	95-7					13:11	✓
3	94-6					13:26	✓
4	94-5					13:42	✓
5	09-1B					14:12	✓
6	09-1C					14:23	✓
7	09-1D					14:42	✓
8	DUPE-2					15:15	✓
9	DUPE-3					/	✓
10				V	V	/	✓

Comments: - Private WCC - Filtered Metals - Eaton Facility 6253

Method of Delivery: Parcel Courier

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Kris McDonald	Date/Time: 29/11/20 10:54	Date/Time: Nov 2 20 14:31	Date/Time: Nov 2 20 15:25
Place/Time: Metcalfe, Ont. 7:00 p.m.	Temperature: °C AM.	Temperature: 2.1 °C	pH Verified: ☐ By:

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Revision 3.0

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-20-00056
Project: 19130610- Navan LF
Custody: 57695/96

Report Date: 8-Dec-2020
Order Date: 27-Nov-2020

Order #: 2048538

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2048538-01	S-1
2048538-02	S-3
2048538-03	S-15
2048538-04	S-16
2048538-05	S-17
2048538-06	S-8
2048538-07	S-9
2048538-08	S-10
2048538-09	S-11
2048538-10	S-12
2048538-11	S-20
2048538-12	S-21
2048538-13	DUPE-1

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	1-Dec-20	1-Dec-20
Ammonia, as N	EPA 351.2 - Auto Colour	1-Dec-20	1-Dec-20
Anions	EPA 300.1 - IC	30-Nov-20	30-Nov-20
Biochemical Oxygen Demand	SM 5210B - DO Probe	28-Nov-20	28-Nov-20
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	27-Nov-20	1-Dec-20
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	30-Nov-20	30-Nov-20
Hardness	Hardness as CaCO3	30-Nov-20	30-Nov-20
Metals, ICP-MS	EPA 200.8 - ICP-MS	30-Nov-20	30-Nov-20
Phenolics	EPA 420.2 - Auto Colour, 4AAP	4-Dec-20	4-Dec-20
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	30-Nov-20	3-Dec-20
Total Dissolved Carbon	MOE 3247B - Combustion IR	30-Nov-20	30-Nov-20
Total Dissolved Solids	SM 2540C - gravimetric, filtration	30-Nov-20	1-Dec-20
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	30-Nov-20	1-Dec-20
Total Suspended Solids	SM 2540D - Gravimetric	30-Nov-20	1-Dec-20

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

	Client ID:	S-1	S-3	S-15	S-16
	Sample Date:	25-Nov-20 13:27	25-Nov-20 14:15	25-Nov-20 14:00	25-Nov-20 15:11
	Sample ID:	2048538-01	2048538-02	2048538-03	2048538-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	404	321	387	354
Ammonia as N	0.01 mg/L	0.12	0.24	0.26	0.13
BOD	2 mg/L	<2	<2	<2	<40 [1]
Chemical Oxygen Demand	10 mg/L	30	33	30	44
Dissolved Inorganic Carbon	0.500 mg/L	-	67.4	80.6	73.6
Dissolved Inorganic Carbon	1.00 mg/L	83.7	-	-	-
Dissolved Organic Carbon	0.5 mg/L	10.4	8.6	11.8	10.1
Total Dissolved Carbon	0.5 mg/L	94.1	76.0	92.4	83.7
Hardness	mg/L	586	468	454	556
Phenolics	0.001 mg/L	<0.004 [2]	<0.004 [2]	<0.004 [2]	<0.010 [2]
Phosphorus, total	0.01 mg/L	0.01	0.07	0.02	0.44
Total Dissolved Solids	10 mg/L	1190	1020	942	2380
Total Suspended Solids	2 mg/L	4	34	5	292
Total Kjeldahl Nitrogen	0.1 mg/L	0.5	0.6	0.7	1.2
Anions					
Chloride	1 mg/L	279	340	246	1070
Nitrate as N	0.1 mg/L	<0.1	0.6	0.3	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.25 [3]
Sulphate	1 mg/L	215	108	91	116
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	117	51	62	18
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	175000	141000	125000	167000
Chromium	1 ug/L	<1	1	<1	2
Cobalt	0.5 ug/L	<0.5	0.8	<0.5	1.1
Copper	0.5 ug/L	1.2	1.8	0.8	2.8
Iron	100 ug/L	845	3820	502	3190
Lead	0.1 ug/L	<0.1	0.5	<0.1	2.6
Magnesium	200 ug/L	36300	28400	34500	33500
Manganese	5 ug/L	300	964	895	1440
Potassium	100 ug/L	11400	9700	12600	5980
Sodium	200 ug/L	172000	168000	144000	601000
Zinc	5 ug/L	<5	<5	<5	15

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

	Client ID:	S-17	S-8	S-9	S-10
	Sample Date:	25-Nov-20 14:45	25-Nov-20 09:09	25-Nov-20 10:25	25-Nov-20 11:00
	Sample ID:	2048538-05	2048538-06	2048538-07	2048538-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	246	295	283	191
Ammonia as N	0.01 mg/L	0.07	0.03	0.03	0.04
BOD	2 mg/L	<2	<2	<2	<60 [1]
Chemical Oxygen Demand	10 mg/L	38	34	31	361
Dissolved Inorganic Carbon	0.500 mg/L	56.3	62.5	-	-
Dissolved Inorganic Carbon	1.00 mg/L	-	-	65.3	45.9
Dissolved Organic Carbon	0.5 mg/L	12.5	10.0	11.7	27.6
Total Dissolved Carbon	0.5 mg/L	68.8	72.5	77.0	73.5
Hardness	mg/L	293	305	355	201
Phenolics	0.001 mg/L	<0.004 [2]	<0.001	<0.001	0.010
Phosphorus, total	0.01 mg/L	0.07	0.04	0.04	1.47
Total Dissolved Solids	10 mg/L	688	646	732	442
Total Suspended Solids	2 mg/L	11	15	6	428
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	0.5	0.5	6.6
Anions					
Chloride	1 mg/L	208	154	192	91
Nitrate as N	0.1 mg/L	0.6	<0.1	0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	69	92	134	40
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	24	74	88	99
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	88600	75900	97800	53000
Chromium	1 ug/L	1	<1	1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Copper	0.5 ug/L	2.0	2.1	1.9	1.0
Iron	100 ug/L	575	<100	315	1050
Lead	0.1 ug/L	0.7	<0.1	0.2	<0.1
Magnesium	200 ug/L	17400	28100	26900	16600
Manganese	5 ug/L	88	88	44	324
Potassium	100 ug/L	6720	7110	8050	10800
Sodium	200 ug/L	119000	116000	122000	67700
Zinc	5 ug/L	7	<5	<5	<5

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

	Client ID:	S-11	S-12	S-20	S-21
	Sample Date:	25-Nov-20 10:05	25-Nov-20 10:53	25-Nov-20 11:11	25-Nov-20 13:06
	Sample ID:	2048538-09	2048538-10	2048538-11	2048538-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	80	118	278	253
Ammonia as N	0.01 mg/L	0.04	0.16	0.35	0.02
BOD	2 mg/L	2	<400 [1]	<400 [1]	<2
Chemical Oxygen Demand	10 mg/L	76	1400	2090	28
Dissolved Inorganic Carbon	1.00 mg/L	20.0	27.2	63.1	60.1
Dissolved Organic Carbon	0.5 mg/L	20.7	19.5	13.9	11.4
Total Dissolved Carbon	0.5 mg/L	40.7	46.7	77.0	71.6
Hardness	mg/L	194	298	645	343
Phenolics	0.001 mg/L	0.009	0.025	0.013	<0.001
Phosphorus, total	0.01 mg/L	0.21	19.1	13.1	0.02
Total Dissolved Solids	10 mg/L	514	330	786	708
Total Suspended Solids	2 mg/L	16	7970	9340	8
Total Kjeldahl Nitrogen	0.1 mg/L	1.5	61.7	43.0	0.6
Anions					
Chloride	1 mg/L	113	69	215	150
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	162	44	113	153
Metals					
Arsenic	1 ug/L	<1	5	8	<1
Boron	10 ug/L	137	115	122	146
Cadmium	0.1 ug/L	<0.1	0.6	1.9	<0.1
Calcium	100 ug/L	50200	89800	174000	92900
Chromium	1 ug/L	1	18	83	<1
Cobalt	0.5 ug/L	1.4	39.8	56.3	<0.5
Copper	0.5 ug/L	1.2	31.9	55.6	0.9
Iron	100 ug/L	1660	83300	79600	<100
Lead	0.1 ug/L	0.6	14.3	63.4	0.1
Magnesium	200 ug/L	16600	17800	51200	27100
Manganese	5 ug/L	594	11200	4510	35
Potassium	100 ug/L	6860	8500	16800	8880
Sodium	200 ug/L	75700	52300	122000	104000
Zinc	5 ug/L	6	145	693	<5

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

	Client ID:	DUPE-1	-	-	-
	Sample Date:	25-Nov-20 09:00	-	-	-
	Sample ID:	2048538-13	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	298	-	-	-
Ammonia as N	0.01 mg/L	0.04	-	-	-
BOD	2 mg/L	<2	-	-	-
Chemical Oxygen Demand	10 mg/L	33	-	-	-
Dissolved Inorganic Carbon	1.00 mg/L	68.0	-	-	-
Dissolved Organic Carbon	0.5 mg/L	12.3	-	-	-
Total Dissolved Carbon	0.5 mg/L	80.3	-	-	-
Hardness	mg/L	364	-	-	-
Phenolics	0.001 mg/L	<0.002 [2]	-	-	-
Phosphorus, total	0.01 mg/L	0.08	-	-	-
Total Dissolved Solids	10 mg/L	782	-	-	-
Total Suspended Solids	2 mg/L	38	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.5	-	-	-
Anions					
Chloride	1 mg/L	186	-	-	-
Nitrate as N	0.1 mg/L	0.1	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-
Sulphate	1 mg/L	135	-	-	-
Metals					
Arsenic	1 ug/L	<1	-	-	-
Boron	10 ug/L	91	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	101000	-	-	-
Chromium	1 ug/L	3	-	-	-
Cobalt	0.5 ug/L	0.8	-	-	-
Copper	0.5 ug/L	3.0	-	-	-
Iron	100 ug/L	1020	-	-	-
Lead	0.1 ug/L	0.9	-	-	-
Magnesium	200 ug/L	27300	-	-	-
Manganese	5 ug/L	91	-	-	-
Potassium	100 ug/L	8420	-	-	-
Sodium	200 ug/L	122000	-	-	-
Zinc	5 ug/L	8	-	-	-

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	278	5	mg/L	279			0.1	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	211	5	mg/L	215			2.1	10	
General Inorganics									
Alkalinity, total	396	5	mg/L	404			1.9	14	
Ammonia as N	0.315	0.01	mg/L	0.287			9.3	18	
BOD	ND	400	mg/L	ND			NC	20	BOD01
Chemical Oxygen Demand	154	10	mg/L	166			7.5	12	
Dissolved Organic Carbon	ND	0.5	mg/L	ND			NC	37	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.044	0.01	mg/L	0.049			9.9	15	
Total Dissolved Solids	1150	10	mg/L	1190			3.1	10	
Total Suspended Solids	4.0	2	mg/L	4.0			0.0	10	
Total Kjeldahl Nitrogen	0.33	0.1	mg/L	0.34			4.1	16	
Metals									
Arsenic	3.2	1	ug/L	3.1			2.0	20	
Boron	25	10	ug/L	25			0.7	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	125000	100	ug/L	126000			0.9	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	1.48	0.5	ug/L	1.49			0.6	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	41000	200	ug/L	41200			0.5	20	
Manganese	20.5	5	ug/L	20.0			2.8	20	
Potassium	6320	100	ug/L	6460			2.1	20	
Sodium	92900	200	ug/L	92700			0.3	20	
Zinc	9	5	ug/L	8			3.6	20	

Certificate of Analysis

Report Date: 08-Dec-2020

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-Nov-2020

Client PO: 7145-20-00056

Project Description: 19130610- Navan LF

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	195	1	mg/L	186	89.3	77-123			
Nitrate as N	1.04	0.1	mg/L	ND	104	79-120			
Nitrite as N	1.04	0.05	mg/L	ND	104	84-117			
Sulphate	143	1	mg/L	135	81.5	74-126			
General Inorganics									
Ammonia as N	0.555	0.01	mg/L	0.287	107	81-124			
BOD	163	2	mg/L	ND	81.4	71-121			
Chemical Oxygen Demand	344	10	mg/L	166	89.0	85-111			
Dissolved Organic Carbon	10.8	0.5	mg/L	ND	108	60-133			
Phenolics	0.027	0.001	mg/L	ND	110	69-132			
Phosphorus, total	0.528	0.01	mg/L	0.049	95.9	80-120			
Total Dissolved Solids	102	10	mg/L	ND	102	75-125			
Total Suspended Solids	22.0	2	mg/L	ND	110	75-125			
Total Kjeldahl Nitrogen	2.09	0.1	mg/L	0.34	87.6	81-126			
Metals									
Arsenic	53.5	1	ug/L	3.1	101	80-120			
Boron	40	10	ug/L	ND	79.6	80-120			QS-02
Cadmium	44.8	0.1	ug/L	ND	89.5	80-120			
Calcium	8380	100	ug/L	ND	83.8	80-120			
Chromium	52.0	1	ug/L	ND	104	80-120			
Cobalt	49.5	0.5	ug/L	ND	99.0	80-120			
Copper	46.9	0.5	ug/L	1.49	90.9	80-120			
Iron	2450	100	ug/L	ND	97.3	80-120			
Lead	46.8	0.1	ug/L	ND	93.5	80-120			
Magnesium	50600	200	ug/L	41200	93.2	80-120			
Manganese	70.2	5	ug/L	20.0	100	80-120			
Potassium	16800	100	ug/L	6460	103	80-120			
Sodium	99900	200	ug/L	92700	72.6	80-120			QM-07
Zinc	51	5	ug/L	8	85.0	80-120			

Qualifier Notes:

Sample Qualifiers :

1 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

2 : Elevated Reporting Limit due to matrix interference.

3 : Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

QC Qualifiers :

BOD01 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

PARACEL LABORATORIES

Paracel ID: 2048538

Paracel Order Number (Lab Use Only): 2048538

Chain Of Custody (Lab Use Only): № 57695

Client Name: GOLDER

Contact Name: YANICK MARCOUX

Address: 102 Peelar Rd

Telephone: 613-592-9600

Project Ref: 19301210 - NUMAN LF

Quote #: 19-708-SW

PO #: 7145-20-00056

Email: ymarcoux@golder.com, dbain@golder.com, brent.bureault@waterconnections.com

Page 1 of 2

Turnaround Time: ☐ 1 day ☐ 3 day ☑ Regular ☐ 2 day

Date Required:

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ Table

For RSC: ☐ Yes ☐ No

Other Regulation: ☐ Reg 558 ☑ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm ☐ Mun: ☑ Other: COA

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PP, Cl, Oil & Gr
1	S-1			7	Nov 25/20	13:27	✓
2	S-3					14:15	✓
3	S-15					14:20	✓
4	S-16					15:11	✓
5	S-17					14:45	✓
6	BH5B S-8					9:09	✓
7	S-9					10:25	✓
8	S-10					12:11	✓
9	S-11					10:05	✓
10	S-12					10:53	✓

Comments: Invoice WCC (Water Connections of Canada) (Non-Hazardous) - GOLDER Facility 6253

Method of Delivery: Paracel Courier

Relinquished By (Sign): R. MacDonald

Relinquished By (Print): Rob MacDonald

Date/Time: Nov. 26, 2020 / 7:00 PM

Received By Driver/Depot: M Sousa

Date/Time: 27/11/20 10:54

Temperature: °C

Received At: Date/Time: 11-27-20 14:54

Temperature: 5.7 °C

Verified By: A pH Verified: ☐ By: IA

Date/Time: 11-27-20 14:54

Chain of Custody (Blank).xlsx

Revision 5.0

PARAC LABORATORIES

Paracel ID: 2048538

Laurentian Blvd.
ario K1G 4J8
947
@paracellabs.com
.paracellabs.com

Paracel Order Number (Lab Use Only): 2048538

Chain Of Custody (Lab Use Only) № 57696

Page 2 of 2

Client Name: GOLDER

Contact Name: JENNIFER MACKENZIE

Address: 1931 Robertson Rd

Telephone: 613-592-9600

Project No: 19136A0 - WMM LF

Quote #: 19-798 - SW

P.O. #: 7145-20-300556

Email: JMackenz@golder.com
dlucas@golder.com
hani.hunaiti@wsp-wsp.com

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☑ Regular

Date Required:

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ Table ___ For RSC: ☐ Yes ☐ No

Other Regulation: ☐ REG 558 ☑ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm ☐ Other: ORWDS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	For Cl/Cr/Br
1	S-20			7	Nov 25/20	11:11	✓
2	S-21			7	" "	13:06	✓
3	DUPE-1			7	" "		✓
4							
5							
6							
7							
8							
9							
10							

Comments: - Invoice Waste Connections of Canada (Hani.Hunaiti@)
- Golders Facility: 6253

Method of Delivery: FRIEND COURIER

Relinquished By (Print): R. MacDonald
Relinquished By (Sign): R MacDonald
Date/Time: Nov 26, 2020 / 7:00 PM

Received By Driver/Depot: M. Jesus
Received at Lab: [signature]
Date/Time: 27/11/20 10:54
Temperature: °C
Date/Time: 11-27-20 14:15
Temperature: 5.7 °C

Verified By: [signature]
Date/Time: 11-27-20 14:54
pH Verified: X By: MG

Chain of Custody (Blank).xlsx

Revision 3.0

Report of Monitoring Results - Groundwater Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1A 06-Sep-2005	05-1A 16-Nov-2005	05-1A 25-May-2006	05-1A 31-May-2012	05-1A 28-Nov-2012	05-1A 29-May-2014 [3]
							05-1A	05-1A	05-1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1180	228	1020	950	980	950
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	24	20	35
Alkalinity (Total as CaCO3)	mg/l	--	--	969	935	1020	970	1000	990
Ammonia Nitrogen	mg/l	--	--	1.68	1.94	1.76	1.8	2.0	2.5
Chemical Oxygen Demand	mg/l	--	--	263	117	134	110	120	400
Chloride	mg/l	--	250	174	180	198	180	180	200
Conductivity (Field)	uS/cm	--	--	1950	2100	1300	2042	2125	2135
Hardness, Calcium Carbonate	mg/l	--	--	49	54	44	46	50	49
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.1	<0.1	<0.10	<0.10	<0.50
Nitrite as N	mg/l	1.0	--	--	--	--	0.037	<0.010	<0.050
Nitrogen, Total Kjeldahl	mg/l	--	--	6.64	4.38	4.84	3.9	4.9	28
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	<0.10	<0.50
Nitrogen, Organic	mg/l	--	--	4.96	2.44	3.08	2.1	2.9	25.5
pH	-	--	--	--	--	--	8.44	--	8.59
pH (Field)	-	--	--	8.3	--	8.5	8.44	8.53	7.63
Phosphorus	mg/l	--	--	6.87	2.93	--	2.6	3.5	11
Sulphate	mg/l	--	500 [4]	17	18	16	<1	<1	<1
Temperature (Field)	deg c	--	15	16.3	--	6	9.9	7.1	9.3
Total Dissolved Solids	mg/l	--	500	1380	1420	1410	1480	1590	1820
Total Organic Carbon	mg/l	--	--	199	47.7	--	--	--	--
Total Suspended Solids	mg/l	--	--	2720	58	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	<0.001	0.001	0.0011	0.003	0.0031
Boron, dissolved	mg/l	5	--	1.43	1.54	1.33	1.5	1.7	1.7
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	6.22	5.92	4.05	4.3	4.9	4.3
Chromium, dissolved	mg/l	0.05	--	<0.002	0.002	<0.002	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.0019	<0.001	<0.0010
Iron, dissolved	mg/l	--	0.3	0.111	0.241	0.071	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0008	0.001	0.0002	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	8.05	9.48	8.19	8.6	9.1	9.2
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.005	0.0080	0.006	0.0039
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.2	17.7	14.8	14	16	16
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	587	638	573	550	580	580
Zinc, dissolved	mg/l	--	5	0.006	0.008	0.007	0.0070	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	0.0014
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00050	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00050	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00050	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00050	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.0025	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00050	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.0010	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.0010	<0.00020

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1A 26-Nov-2015	05-1A 24-May-2017	05-1A 29-Nov-2018	05-1A 21-May-2020
				05-1A	05-1A	05-1A	05-1A
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	954	1050	1040	1040
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [6]	23	<25 [8]	27
Alkalinity (Total as CaCO3)	mg/l	--	--	975	1080	1070	1060
Ammonia Nitrogen	mg/l	--	--	2.03	1.92	1.65	2.31
Chemical Oxygen Demand	mg/l	--	--	177	183	181	788
Chloride	mg/l	--	250	219	189	214	243
Conductivity (Field)	uS/cm	--	--	2315	2265	2042	2128
Hardness, Calcium Carbonate	mg/l	--	--	39.3	46	64	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	54.5
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.0	4.0	3.5	6.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.97	2.08	1.85	4.29
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.49	8.38	8.31	8.46
Phosphorus	mg/l	--	--	3.04	3.49	3.24	9.44
Sulphate	mg/l	--	500 [4]	1	2	2	2
Temperature (Field)	deg c	--	15	8.9	10.4	7.1	10.0
Total Dissolved Solids	mg/l	--	500	1840	1840	1720	1900
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.002	0.004	0.002	0.001
Boron, dissolved	mg/l	5	--	1.64	1.57	1.65	1.42
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	4.16	4.03	9.36	5.71
Chromium, dissolved	mg/l	0.05	--	0.001	0.009	0.001	0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0007	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0011	0.0026	0.0033
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.119	0.151
Lead, dissolved	mg/l	0.01	--	0.0001	0.0001	0.0002	0.0001
Magnesium, dissolved	mg/l	--	--	7.03	8.68	9.83	9.77
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.7	14.7	16.4	15.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	612	580	566	557
Zinc, dissolved	mg/l	--	5	0.009	<0.005	<0.005	0.009
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [7]	<0.002 [7]	<0.001	0.010
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1B 06-Sep-2005	05-1B 16-Nov-2005	05-1B 25-May-2006	05-1B 31-May-2012 05-1B	05-1B 28-Nov-2012 05-1B	05-1B 29-May-2014 05-1B
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	163	262	250	260	240
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	3.6	4.0	5.3
Alkalinity (Total as CaCO3)	mg/l	--	--	254	268	262	250	270	250
Ammonia Nitrogen	mg/l	--	--	0.8	0.98	0.69	0.36	0.94	0.28
Chemical Oxygen Demand	mg/l	--	--	40	44	31	36	73	20
Chloride	mg/l	--	250	24	21.6	20.8	19	21	29
Conductivity (Field)	uS/cm	--	--	460	480	490	555	557	568
Hardness, Calcium Carbonate	mg/l	--	--	28	32	26	27	26	24
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	1.5	0.2	<0.10	0.13	0.22
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	0.019	0.026
Nitrogen, Total Kjeldahl	mg/l	--	--	10.1	5.89	2.28	1.5	<1.0 [9]	<2.0 [9]
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	0.15	0.25
Nitrogen, Organic	mg/l	--	--	9.3	4.91	1.59	1.14	<0.06	<1.72
pH	-	--	--	--	--	--	8.19	--	8.36
pH (Field)	-	--	--	7.5	--	8.1	8.55	8.26	7.95
Phosphorus	mg/l	--	--	2.07	0.59	--	1.8	6.1	1.5
Sulphate	mg/l	--	500 [4]	47	36	32	27	23	24
Temperature (Field)	deg c	--	15	11.7	--	8	9.6	7.4	8.9
Total Dissolved Solids	mg/l	--	500	380	390	350	344	516	468
Total Organic Carbon	mg/l	--	--	89.2	17.7	--	--	--	--
Total Suspended Solids	mg/l	--	--	1810	120	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.003	<0.001	<0.001	0.0051	0.004	0.0045
Boron, dissolved	mg/l	5	--	0.263	0.267	0.228	0.24	0.28	0.27
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.0003	<0.005	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	6.27	6.91	5.46	5.3	5.5	4.9
Chromium, dissolved	mg/l	0.05	--	<0.002	0.003	<0.002	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.004	0.004	0.003	0.0078	0.007	0.0032
Iron, dissolved	mg/l	--	0.3	0.086	0.261	0.104	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	0.0003	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	3.02	3.51	3.11	3.3	3	2.8
Manganese, dissolved	mg/l	--	0.05	0.052	0.054	0.026	0.0051	0.012	0.018
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.01	0.02	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	8	8.8	6.8	6.1	6.4	6.7
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	145	153	130	120	130	130
Zinc, dissolved	mg/l	--	5	0.006	0.009	0.01	<0.0050	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1B 26-Nov-2015 05-1B	05-1B 24-May-2017 05-1B	05-1B 29-Nov-2018 05-1B	05-1B 21-May-2020 05-1B
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	262	268	283	252
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	<5	6	6
Alkalinity (Total as CaCO3)	mg/l	--	--	268	273	288	258
Ammonia Nitrogen	mg/l	--	--	0.33	0.02	0.15	0.19
Chemical Oxygen Demand	mg/l	--	--	45	23	29	39
Chloride	mg/l	--	250	20	17	19	24
Conductivity (Field)	uS/cm	--	--	598	560	553	558
Hardness, Calcium Carbonate	mg/l	--	--	21.9	27	34	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	22.5
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.2	0.4
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	0.6	0.5	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.57	0.58	0.35	0.61
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.40	8.36	8.47	8.89
Phosphorus	mg/l	--	--	1.72	0.85	0.69	1.54
Sulphate	mg/l	--	500 [4]	18	20	18	22
Temperature (Field)	deg c	--	15	9.4	9.7	7.5	9.4
Total Dissolved Solids	mg/l	--	500	446	372	396	450
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004	0.004	0.003
Boron, dissolved	mg/l	5	--	0.244	0.278	0.263	0.248
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	4.7	5.27	8.1	4.59
Chromium, dissolved	mg/l	0.05	--	<0.001	0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	0.0046	0.0092	0.0066
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0002	0.0001
Magnesium, dissolved	mg/l	--	--	2.46	3.3	3.35	2.67
Manganese, dissolved	mg/l	--	0.05	0.013	<0.005	0.008	0.009
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.17	6.37	6.74	6.36
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	140	122	122	118
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	0.002
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1C 06-Sep-2005	05-1C 16-Nov-2005	05-1C 25-May-2006	05-1C 31-May-2012 05-1C	05-1C 28-Nov-2012 05-1C	05-1C 29-May-2013 05-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	190	201	136	170	180	170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	1.6	1.9	1.8
Alkalinity (Total as CaCO3)	mg/l	--	--	156	165	136	170	180	170
Ammonia Nitrogen	mg/l	--	--	1.73	0.9	0.06	<0.050	0.11	0.090
Chemical Oxygen Demand	mg/l	--	--	36	11	21	36	14	17
Chloride	mg/l	--	250	59.5	52.2	25.4	41	42	44
Conductivity (Field)	uS/cm	--	--	480	510	350	548	541	528
Hardness, Calcium Carbonate	mg/l	--	--	216	229	156	170	160	180
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.7	0.32	0.44	0.29
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	18.9	5.2	0.73	1.2	0.64	0.46
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	0.32	0.44	0.29
Nitrogen, Organic	mg/l	--	--	17.17	4.3	0.67	<1.2	0.53	0.37
pH	-	--	--	--	--	--	8.00	--	8.05
pH (Field)	-	--	--	7.1	--	7.8	7.74	7.85	7.51
Phosphorus	mg/l	--	--	2.23	0.65	--	1.1	0.85	0.41
Sulphate	mg/l	--	500 [4]	113	86	46	53	48	57
Temperature (Field)	deg c	--	15	11.5	10.4	7	9.1	7.8	8.3
Total Dissolved Solids	mg/l	--	500	405	373	234	326	364	366
Total Organic Carbon	mg/l	--	--	65.1	8.3	--	--	--	--
Total Suspended Solids	mg/l	--	--	2670	520	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.003	0.0032	0.003	0.0019
Boron, dissolved	mg/l	5	--	0.08	0.074	0.028	0.078	0.083	0.077
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	52.7	55.9	42.7	40	40	44
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.003	<0.002	0.0018	0.002	0.0018
Iron, dissolved	mg/l	--	0.3	0.167	0.025	0.009	0.38	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0002	<0.0002	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	20.5	21.7	11.8	16	15	17
Manganese, dissolved	mg/l	--	0.05	0.232	0.112	0.044	0.032	0.002	0.045
Molybdenum, dissolved	mg/l	--	--	0.02	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.9	7.7	6.9	5.2	5.5	5.6
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	61.9	56.1	23.3	50	49	53
Zinc, dissolved	mg/l	--	5	0.007	0.008	0.011	<0.0050	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1C 26-Nov-2013 GW-6	05-1C 29-May-2014 05-1C	05-1C 19-Nov-2014 05-1C	05-1C 02-Jun-2015 05-1C	05-1C 26-Nov-2015 05-1C	05-1C 26-May-2016 05-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	170	170	170	170	175	178
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.4	2.1	1.8	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	170	170	170	171	176	179
Ammonia Nitrogen	mg/l	--	--	0.081	0.29	0.096	0.30	0.09	0.30
Chemical Oxygen Demand	mg/l	--	--	10	10	5.1	15	17	<10
Chloride	mg/l	--	250	42	45	45	51	50	55
Conductivity (Field)	uS/cm	--	--	518	531	592	576	565	578
Hardness, Calcium Carbonate	mg/l	--	--	160	180	170	115	138	168
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.013	0.024	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.66	0.88	0.39	0.4	0.4	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.10	<0.10	--	--	--
Nitrogen, Organic	mg/l	--	--	0.58	0.59	0.29	0.1	0.31	0.2
pH	-	--	--	7.94	8.12	8.06	--	--	--
pH (Field)	-	--	--	7.69	6.71	8.01	7.75	7.99	7.59
Phosphorus	mg/l	--	--	0.36	0.42	0.40	0.29	0.26	0.30
Sulphate	mg/l	--	500 [4]	54	50	50	53	52	56
Temperature (Field)	deg c	--	15	8.6	8.7	5.6	8.4	9.7	9.2
Total Dissolved Solids	mg/l	--	500	310	318	296	324	336	368
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0025	0.0023	0.0027	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.082	0.072	0.075	0.066	0.071	0.072
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	39	42	42	21.2	31.4	40.3
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0012	0.0025	0.0014	<0.0005	<0.0005	0.0009
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	15	17	17	15	14.1	16.2
Manganese, dissolved	mg/l	--	0.05	0.023	0.062	0.021	0.069	0.019	0.038
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.2	5	5.4	4.17	4.45	5.45
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	50	54	55	53.2	62	48.4
Zinc, dissolved	mg/l	--	5	0.012	<0.0050	0.0074	<0.005	0.009	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	0.00079	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1C 17-Nov-2016 05-1C	05-1C 24-May-2017 05-1C	05-1C 29-Nov-2017 05-1C	05-1C 24-May-2018 05-1C	05-1C 29-Nov-2018 05-1C	05-1C 19-Jun-2019 05-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	179	187	185	190	198	181
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	180	188	186	191	199	183
Ammonia Nitrogen	mg/l	--	--	0.27	0.02	0.16	0.29	0.08	0.29
Chemical Oxygen Demand	mg/l	--	--	11	44	51	15	11	19
Chloride	mg/l	--	250	49	53	58	55	56	55
Conductivity (Field)	uS/cm	--	--	619	579	553	584	518	540
Hardness, Calcium Carbonate	mg/l	--	--	164	165	158	173	171	172
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	0.2
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.4	0.4	0.5	0.3	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.23	0.38	0.24	0.21	0.22	0.21
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.22	7.94	6.95	7.77	7.79	6.89
Phosphorus	mg/l	--	--	0.32	0.32	0.35	0.39	0.34	0.91
Sulphate	mg/l	--	500 [4]	52	53	55	51	51	52
Temperature (Field)	deg c	--	15	10.0	9.5	8.4	8.7	7.4	10.2
Total Dissolved Solids	mg/l	--	500	314	354	314	344	270	330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.003	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.081	0.074	0.095	0.07	0.113	0.071
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	40.5	38.4	38.1	45	41.3	41.6
Chromium, dissolved	mg/l	0.05	--	0.003	0.002	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0031	0.0024	0.0022	0.0010	0.0027	0.0025
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.109	0.231	0.129	0.188
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0001	<0.0001	<0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	15.4	16.8	15.3	14.8	16.5	16.6
Manganese, dissolved	mg/l	--	0.05	<0.005	0.005	0.026	0.056	0.016	0.046
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.26	5.14	5.34	4.66	5.32	5.53
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	52.5	53.2	52.2	51.5	54.1	53
Zinc, dissolved	mg/l	--	5	0.02	0.005	<0.005	<0.005	<0.005	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1C 20-Nov-2019 05-1C	05-1C 21-May-2020 05-1C	05-1C 26-Nov-2020 05-1C
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	166	176	176
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	167	178	178
Ammonia Nitrogen	mg/l	--	--	0.17	0.27	0.18
Chemical Oxygen Demand	mg/l	--	--	21	18	33
Chloride	mg/l	--	250	53	64	51
Conductivity (Field)	uS/cm	--	--	567	547	541
Hardness, Calcium Carbonate	mg/l	--	--	192	--	158
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	161	--
Nitrate as N	mg/l	10.0	--	0.2	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.5	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.23	0.23	0.22
pH	-	--	--	--	--	--
pH (Field)	-	--	--	7.98	9.04	8.02
Phosphorus	mg/l	--	--	0.33	0.45	0.42
Sulphate	mg/l	--	500 [4]	50	62	48
Temperature (Field)	deg c	--	15	8.0	8.1	8.3
Total Dissolved Solids	mg/l	--	500	356	334	302
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.077	0.061	0.066
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	46.2	38.4	37.8
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0016	0.0031	0.0011
Iron, dissolved	mg/l	--	0.3	0.311	0.297	0.311
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	18.6	15.7	15.6
Manganese, dissolved	mg/l	--	0.05	0.074	0.058	0.035
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.8	4.81	4.87
Selenium, dissolved	mg/l	0.05	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	57.3	51.5	52
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.009
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1D 06-Sep-2005	05-1D 16-Nov-2005	05-1D 25-May-2006	05-1D 31-May-2012	05-1D 28-Nov-2012 [10]	05-1D 29-May-2013
							05-1D	05-1D	05-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	218	218	169	240	--	220
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	2.0	--	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	179	179	169	240	--	220
Ammonia Nitrogen	mg/l	--	--	4.94	0.26	0.56	<0.050	--	0.082
Chemical Oxygen Demand	mg/l	--	--	37	12	20	13	--	78
Chloride	mg/l	--	250	46.9	27.2	53	30	--	170
Conductivity (Field)	uS/cm	--	--	550	440	470	601	--	922
Hardness, Calcium Carbonate	mg/l	--	--	303	204	191	250	--	470
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.4	1.4	0.7	<0.10	--	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	--	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	30.3	1.45	2.1	0.93	--	0.99
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	--	<0.10
Nitrogen, Organic	mg/l	--	--	25.36	1.19	1.54	<0.93	--	0.91
pH	-	--	--	--	--	--	7.96	--	7.86
pH (Field)	-	--	--	6.9	--	7.8	7.59	--	7.36
Phosphorus	mg/l	--	--	1.45	0.66	--	0.30	--	0.38
Sulphate	mg/l	--	500 [4]	163	53	82	49	--	56
Temperature (Field)	deg c	--	15	17.5	9.9	6	11.0	--	10.0
Total Dissolved Solids	mg/l	--	500	476	301	351	342	--	796
Total Organic Carbon	mg/l	--	--	78.8	5.5	--	--	--	--
Total Suspended Solids	mg/l	--	--	1380	420	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.0010	--	<0.0010
Boron, dissolved	mg/l	5	--	0.053	0.039	0.057	0.039	--	0.042
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	--	<0.00010
Calcium, dissolved	mg/l	--	--	87.1	56.9	45.9	69	--	140
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.0050	--	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	--	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.004	<0.002	0.0037	--	0.0035
Iron, dissolved	mg/l	--	0.3	0.077	0.005	0.123	<0.1	--	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0002	0.0003	<0.00050	--	<0.00050
Magnesium, dissolved	mg/l	--	--	20.8	15	18.5	18	--	32
Manganese, dissolved	mg/l	--	0.05	0.422	0.081	0.1	0.03	--	0.016
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.9	9.8	5.7	7	--	9.5
Selenium, dissolved	mg/l	0.05	--	<0.001	0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	42.6	34.5	46.4	30	--	51
Zinc, dissolved	mg/l	--	5	0.007	0.01	0.019	<0.0050	--	0.0097
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	--	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	--	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	--	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	--	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	--	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	--	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	--	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	--	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	--	<0.00020

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1D 26-Nov-2013 GW-1	05-1D 29-May-2014 95-1D	05-1D 19-Nov-2014 05-1D	05-1D 02-Jun-2015 05-1D	05-1D 26-Nov-2015 05-1D	05-1D 26-May-2016 05-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	200	240	240	242	234	259
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.4	1.4	<1.0	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	200	240	240	243	234	259
Ammonia Nitrogen	mg/l	--	--	<0.050	0.063	<0.050	0.06	0.03	0.03
Chemical Oxygen Demand	mg/l	--	--	11	16	8.1	17	42	31
Chloride	mg/l	--	250	200	480	510	469	418	475
Conductivity (Field)	uS/cm	--	--	952	1734	2164	1924	1782	1940
Hardness, Calcium Carbonate	mg/l	--	--	460	860	890	628	674	644
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.13	<0.10	<0.10	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.28	0.68	0.37	0.3	0.4	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.13	<0.10	<0.10	--	--	--
Nitrogen, Organic	mg/l	--	--	<0.28	0.62	<0.37	0.24	0.37	0.37
pH	-	--	--	7.87	7.79	7.63	--	--	--
pH (Field)	-	--	--	7.25	6.26	7.16	7.24	7.44	7.41
Phosphorus	mg/l	--	--	0.16	0.22	0.33	0.20	0.12	0.20
Sulphate	mg/l	--	500 [4]	58	110	120	121	122	127
Temperature (Field)	deg c	--	15	8.4	9.5	5.8	9.1	8.9	10.5
Total Dissolved Solids	mg/l	--	500	780	1690	1530	1400	1250	1550
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.033	0.038	0.034	0.031	0.033	0.031
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	0.0002
Calcium, dissolved	mg/l	--	--	130	250	250	169	180	181
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0040	0.0064	0.0022	0.0009	0.0011	0.0033
Iron, dissolved	mg/l	--	0.3	<0.1	0.5	0.12	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	34	56	63	50.1	54.4	46.4
Manganese, dissolved	mg/l	--	0.05	0.023	0.0095	0.14	0.042	0.059	0.06
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.2	12	13	10.7	9.88	12.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	46	69	110	121	122	138
Zinc, dissolved	mg/l	--	5	0.022	0.052	0.0063	<0.005	0.008	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	0.002
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	0.00037	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1D 17-Nov-2016	05-1D 24-May-2017	05-1D 29-Nov-2017	05-1D 24-May-2018	05-1D 29-Nov-2018	05-1D 19-Jun-2019
				05-1D	05-1D	05-1D	05-1D	05-1D	05-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	248	244	251	269	246	247
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	249	245	251	270	246	248
Ammonia Nitrogen	mg/l	--	--	0.03	0.03	0.05	0.02	0.06	0.09
Chemical Oxygen Demand	mg/l	--	--	15	25	14	37	19	<10
Chloride	mg/l	--	250	285	374	271	524	277	528
Conductivity (Field)	uS/cm	--	--	1444	1600	961	2163	1089	1920
Hardness, Calcium Carbonate	mg/l	--	--	486	502	358	589	428	617
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.2	0.5	0.5	0.4	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.27	0.17	0.45	0.48	0.34	0.31
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.03	7.40	7.05	7.30	7.45	7.04
Phosphorus	mg/l	--	--	0.17	0.08	0.05	0.13	0.04	0.08
Sulphate	mg/l	--	500 [4]	86	103	76	109	57	99
Temperature (Field)	deg c	--	15	9.2	9.9	7.6	8.2	6.7	11
Total Dissolved Solids	mg/l	--	500	832	1170	718	1630	720	1400
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.04	0.024	0.061	0.029	0.039	0.04
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	139	153	102	180	119	175
Chromium, dissolved	mg/l	0.05	--	0.006	0.005	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0051	0.0046	0.0032	0.0034	0.0053	0.0069
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	34	29.3	24.7	34	31.5	43.4
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	0.109	0.043	0.01	<0.005
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.6	10.1	8.35	10.2	10	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	121	136	136	227	152	240
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	05-1D 20-Nov-2019	05-1D 21-May-2020	05-1D 26-Nov-2020
				05-1D	05-1D	05-1D
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	269	268	313
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	270	269	315
Ammonia Nitrogen	mg/l	--	--	0.02	0.02	0.02
Chemical Oxygen Demand	mg/l	--	--	11	24	19
Chloride	mg/l	--	250	323	591	358
Conductivity (Field)	uS/cm	--	--	1721	1889	1601
Hardness, Calcium Carbonate	mg/l	--	--	474	--	479
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	501	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.2	0.4	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.18	0.38	0.28
pH	-	--	--	--	--	--
pH (Field)	-	--	--	7.23	8.01	7.63
Phosphorus	mg/l	--	--	0.10	0.04	0.04
Sulphate	mg/l	--	500 [4]	85	126	88
Temperature (Field)	deg c	--	15	7.6	8.8	6.1
Total Dissolved Solids	mg/l	--	500	970	1300	1010
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.028	0.02	0.02
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	128	142	131
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0054	0.0060	0.0048
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	37.3	35.5	37
Manganese, dissolved	mg/l	--	0.05	0.005	0.047	0.006
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11.1	12.8	7.87
Selenium, dissolved	mg/l	0.05	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	173	210	196
Zinc, dissolved	mg/l	--	5	<0.005	0.005	0.009
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.004 [11]
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	11-1 29-Nov-2011 [12] 11-1	11-1 28-Nov-2012 11-1	11-1 29-May-2014 MW11-1	11-1 26-Nov-2015 11-1	11-1 24-May-2017 11-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	480	460	470	477	527
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	4.5	10	9	9
Alkalinity (Total as CaCO3)	mg/l	--	--	490	460	480	486	536
Ammonia Nitrogen	mg/l	--	--	1.20	1.2	1.3	1.05	0.03
Chemical Oxygen Demand	mg/l	--	--	50	28	27	46	32
Chloride	mg/l	--	250	657	700	780	770	630
Conductivity	uS/cm	--	--	3000	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2787	2473	2552	2975	3214
Hardness, Calcium Carbonate	mg/l	--	--	292	270	270	219	243
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.31	<0.1	0.6
Nitrite as N	mg/l	1.0	--	<0.10	0.015	0.226	<0.05	<0.25 [6]
Nitrogen, Total Kjeldahl	mg/l	--	--	1.48	1.7	1.8	1.7	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	0.53	--	--
Nitrogen, Organic	mg/l			0.28	0.5	0.5	0.65	0.47
pH	-	--	--	8.33	--	8.36	--	--
pH (Field)	-	--	--	7.93	8.15	7.26	8.29	8.04
Phosphorus	mg/l	--	--	0.65	0.53	0.62	0.24	0.14
Sulphate	mg/l	--	500 [4]	8	<1	<1	<1	3
Temperature (Field)	deg c	--	15	7.0	6.3	9.7	8.0	11.7
Total Dissolved Solids	mg/l	--	500	1950	1650	1650	1630	1550
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.002	0.0022	0.001	0.005
Boron, dissolved	mg/l	5	--	0.30	0.36	0.37	0.328	0.281
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	61	49	49	35.7	46.2
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.0050	<0.001	0.013
Cobalt, dissolved	mg/l	--	--	0.0015	<0.0005	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0034	<0.0005	0.0029
Iron, dissolved	mg/l	--	0.3	<0.03	0.5	0.16	0.158	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	34	36	36	31.5	30.9
Manganese, dissolved	mg/l	--	0.05	0.39	0.11	0.11	0.081	<0.005
Potassium, dissolved	mg/l	--	--	16	19	19	15.6	16.8
Sodium, dissolved	mg/l	--	200 [5]	490	590	520	646	523
Zinc, dissolved	mg/l	--	5	0.01	<0.005	0.0063	0.016	0.006
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.001	<0.002 [7]
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	11-1 22-Nov-2018 11-1	11-1 21-May-2020 11-1
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	570	461
Alkalinity, Carbonate as CaCO3	mg/l	--	--	8	8
Alkalinity (Total as CaCO3)	mg/l	--	--	578	469
Ammonia Nitrogen	mg/l	--	--	0.68	0.60
Chemical Oxygen Demand	mg/l	--	--	48	45
Chloride	mg/l	--	250	742	912
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2823	2664
Hardness, Calcium Carbonate	mg/l	--	--	314	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	277
Nitrate as N	mg/l	10.0	--	0.1	0.6
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.5	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l			0.82	0.5
pH	-	--	--	--	--
pH (Field)	-	--	--	7.92	7.58
Phosphorus	mg/l	--	--	0.49	0.25
Sulphate	mg/l	--	500 [4]	2	<1
Temperature (Field)	deg c	--	15	7.8	11.4
Total Dissolved Solids	mg/l	--	500	1660	1640
Metals					
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001
Boron, dissolved	mg/l	5	--	0.442	0.236
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	61.9	52.2
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0046	0.0048
Iron, dissolved	mg/l	--	0.3	<0.1	0.189
Lead, dissolved	mg/l	0.01	--	0.0001	0.0007
Magnesium, dissolved	mg/l	--	--	38.7	35.5
Manganese, dissolved	mg/l	--	0.05	0.027	0.046
Potassium, dissolved	mg/l	--	--	20.4	18.7
Sodium, dissolved	mg/l	--	200 [5]	611	554
Zinc, dissolved	mg/l	--	5	0.006	0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-12 09-Jun-1992	92-12 01-Nov-1992	92-12 15-Jun-1994	92-12 02-Nov-1994	92-12 22-Nov-1995	92-12 12-Oct-1996
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	756	822	--	771	787	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	13	--
Alkalinity (Total as CaCO3)	mg/l	--	--	684	674	680	642	672	676
Ammonia Nitrogen	mg/l	--	--	--	--	--	0.72	0.69	0.97
Chemical Oxygen Demand	mg/l	--	--	--	--	386	113	50	38
Chloride	mg/l	--	250	121	122.8	170	125	109	133
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1528	1516	1620	1564	1610	1570
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	6.42	--	--
Hardness, Calcium Carbonate	mg/l	--	--	37.65	34	78	34	36	32.9
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	0.01	0.34	0.4	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	5.75	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	5.06	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.47	8.21	8.57	8.8	8.72	8.39
Phosphate	mg/l	--	--	--	--	--	--	2.6	--
Phosphorus	mg/l	--	--	--	--	3.2	2.288	--	--
Sulphate	mg/l	--	500 [4]	4.1	1	6.7	2.5	2	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	820	785	800	790
Total Organic Carbon	mg/l	--	--	--	--	19	19.6	15.4	14.5
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	480
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.202	--	--
Boron, dissolved	mg/l	5	--	--	--	1.04	0.89	0.87	0.84
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	--
Calcium, dissolved	mg/l	--	--	3.7	5.42	10.3	2.698	3.97	3.62
Chromium, dissolved	mg/l	0.05	--	--	--	0.037	0.01	0.02	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0215	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	11.42	0.1	1.39	0.39
Lead, dissolved	mg/l	0.01	--	--	--	0.0032	0.1	0.0021	0.0002
Magnesium, dissolved	mg/l	--	--	6.9	5.04	12.7	1.778	6.2	5.27
Manganese, dissolved	mg/l	--	0.05	--	--	0.179	0.012	0.03	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.039	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.2	12.2	25.3	7.441	13.4	11.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	358.9	387	313	333.9	373	314
Zinc, dissolved	mg/l	--	5	--	--	0.034	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.074	0.001	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-12 06-Nov-1997	92-12 05-Jun-1998	92-12 06-May-1999	92-12 24-Oct-2000	92-12 14-Jun-2001	92-12 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	821	887	765	794
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	7	1
Alkalinity (Total as CaCO3)	mg/l	--	--	332	654	673	727	639	651
Ammonia Nitrogen	mg/l	--	--	0.62	0.6	0.94	0.47	0.88	0.99
Chemical Oxygen Demand	mg/l	--	--	36	46	45	--	35	54
Chloride	mg/l	--	250	300	118	117	133	132	128
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1460	1566	1500	1570	1300	1410
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	29	32	28	27	28	28
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	1.1	--	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	2.18	1.62	2.75	1.83
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	1.24	1.15	1.87	0.84
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.21	--	8.4	8.33	8.6	8.4
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	2.25	3.37	2.43
Sulphate	mg/l	--	500 [4]	69	37	1	1	1	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	730	790	750	928	900	876
Total Organic Carbon	mg/l	--	--	15.6	16.5	18.8	--	14.8	15.9
Total Suspended Solids	mg/l	--	--	--	--	--	22	239	33
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.91	0.99	1	0.93	0.99	0.98
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	2.67	2.62	1.1	2.85	2.43	2.44
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.38	0.84	0.16	0.15	0.1	0.06
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0006	0.0022	0.0002	0.0011
Magnesium, dissolved	mg/l	--	--	5.45	6.03	6	4.92	5.27	5.29
Manganese, dissolved	mg/l	--	0.05	0.01	0.02	0.01	0.01	0.01	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	13.1	15.4	5.4	10.5	6.2	8.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	316	416	370	430	353	368
Zinc, dissolved	mg/l	--	5	0.01	0.02	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.022	0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Up-Gradient Monitoring Wells

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-12 30-May-2003	92-12 19-Nov-2004	92-12 16-Nov-2005	92-12 15-May-2007	92-12 10-Nov-2008	92-12 26-Nov-2009 M-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	811	856	171	690	699	648
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	26
Alkalinity (Total as CaCO3)	mg/l	--	--	645	702	700	690	699	674
Ammonia Nitrogen	mg/l	--	--	0.73	0.87	1.02	0.89	0.98	0.94
Chemical Oxygen Demand	mg/l	--	--	108	52	42	54	28	45
Chloride	mg/l	--	250	127	110	129	131	129	129
Conductivity	uS/cm	--	--	--	--	--	--	--	1610
Conductivity (Field)	uS/cm	--	--	1370	1690	1600	1100	1300	1442
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	27	26	31	27	26	28
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	<1	0.1	<0.1	<0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.61	1.73	1.78	1.8	1.72	1.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.88	0.86	0.76	0.91	0.74	0.6
pH	-	--	--	--	--	--	--	--	8.63
pH (Field)	-	--	--	7.4	8.4	--	8.8	8.5	8.48
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.42	2.3	2.12	--	--	2.32
Sulphate	mg/l	--	500 [4]	1	10	<1	6	<1	2
Temperature (Field)	deg c	--	15	--	--	10.9	8.3	7	9.3
Total Dissolved Solids	mg/l	--	500	685	845	981	941	945	1050
Total Organic Carbon	mg/l	--	--	17.8	15.9	19.5	--	--	--
Total Suspended Solids	mg/l	--	--	12	6	13	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	0.0008	0.0006	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.94	0.992	1	0.919	0.919	1.0
Cadmium, dissolved	mg/l	0.005	--	--	--	0.0005	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	2.76	2.19	3.08	2.39	2.14	3
Chromium, dissolved	mg/l	0.05	--	0.01	0.002	<0.002	<0.002	<0.002	0.006
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	0.006	<0.005	<0.0002
Copper, dissolved	mg/l	--	1	0.01	0.002	<0.002	<0.002	<0.002	0.001
Iron, dissolved	mg/l	--	0.3	0.19	0.093	0.09	0.06	0.054	0.07
Lead, dissolved	mg/l	0.01	--	0.0004	0.0004	0.0004	0.00007	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	3	5.03	5.57	5.06	4.95	5
Manganese, dissolved	mg/l	--	0.05	0.01	0.003	0.002	0.013	0.002	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	10.8	11.1	13	11.7	11.5	11
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	363	374	420	370	377	397
Zinc, dissolved	mg/l	--	5	0.01	0.005	0.006	0.008	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	<0.001	<0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	--	--	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	--	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	<0.0005	0.0006	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-12 24-May-2011	92-12 28-Nov-2012	92-12 29-May-2014 [3]	92-12 26-Nov-2015	92-12 24-May-2017
				G-10	92-12	92-12	92-12	92-12
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	637	630	630	661	680
Alkalinity, Carbonate as CaCO3	mg/l	--	--	33	22	28	19	17
Alkalinity (Total as CaCO3)	mg/l	--	--	670	650	660	680	697
Ammonia Nitrogen	mg/l	--	--	0.94	1.1	1.1	1.04	1.04
Chemical Oxygen Demand	mg/l	--	--	45	49	49	54	38
Chloride	mg/l	--	250	128	130	140	138	108
Conductivity	uS/cm	--	--	1640	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1472	1484	1383	1512	1595
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	28	28	30	24.6	29
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.50	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.050	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.60	2.9	1.9	1.7	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.50	--	--
Nitrogen, Organic	mg/l	--	--	0.66	1.8	0.8	0.66	0.96
pH	-	--	--	8.74	--	8.67	--	--
pH (Field)	-	--	--	8.79	8.72	8.14	8.86	8.30
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.39	2.5	2.2	2.11	2.06
Sulphate	mg/l	--	500 [4]	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	12.8	6.9	11.2	9.3	10.5
Total Dissolved Solids	mg/l	--	500	1070	946	916	936	956
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0010	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.96	1.1	1.1	0.106	1.07
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3	2.5	2.9	2.57	2.7
Chromium, dissolved	mg/l	0.05	--	0.005	<0.005	<0.0050	0.001	0.008
Cobalt, dissolved	mg/l	--	--	0.0003	<0.0005	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0012	<0.0005	0.0011
Iron, dissolved	mg/l	--	0.3	0.07	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	5	5.2	5.5	4.41	5.32
Manganese, dissolved	mg/l	--	0.05	<0.01	0.002	0.0028	<0.005	5.32
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	11	11	9.57	10.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	344	370	390	393	383
Zinc, dissolved	mg/l	--	5	0.02	<0.005	0.0051	0.01	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.002 [7]	<0.002 [7]
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00050	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.00050	0.00016	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0025	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0010	0.00031	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0010	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-12 29-Nov-2018 92-12	92-12 21-May-2020 92-12
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	729	647
Alkalinity, Carbonate as CaCO3	mg/l	--	--	18	29
Alkalinity (Total as CaCO3)	mg/l	--	--	747	676
Ammonia Nitrogen	mg/l	--	--	0.93	1.10
Chemical Oxygen Demand	mg/l	--	--	46	60
Chloride	mg/l	--	250	139	160
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1393	1530
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	43	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	35.5
Nitrate as N	mg/l	10.0	--	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.0	1.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.07	0.7
pH	-	--	--	--	--
pH (Field)	-	--	--	8.36	7.20
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	2.09	2.31
Sulphate	mg/l	--	500 [4]	<1	<1
Temperature (Field)	deg c	--	15	7.3	11.2
Total Dissolved Solids	mg/l	--	500	974	980
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--
Boron, dissolved	mg/l	5	--	1.06	0.821
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	7.63	5.04
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	0.106	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	5.86	5.57
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.2	10.3
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	408	365
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	0.003	0.004
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-16 09-Jun-1992	92-16 01-Nov-1992	92-16 08-Jun-1993	92-16 04-Nov-1993	92-16 15-Jun-1994	92-16 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	224	226	201	195	--	190
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	184	185	165	160	164	156
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	0.95
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	42	194
Chloride	mg/l	--	250	31	12	4	6	4	2
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	556	398	358	446	400	391
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	7
Hardness, Calcium Carbonate	mg/l	--	--	95.53	68	58	76	63	70
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	0.42	0.48	0.24	0.54
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.87	7.52	7.74	8.33	8.14	8.95
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	1.86	0.282
Sulphate	mg/l	--	500 [4]	43	21.2	19.2	28.3	27.7	24.8
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	280	212	200	197
Total Organic Carbon	mg/l	--	--	--	--	--	--	8.3	4.8
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	1.827	0.42	--	1.039
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.1
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.022
Boron, dissolved	mg/l	5	--	--	--	--	--	0.12	0.129
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.01
Calcium, dissolved	mg/l	--	--	20.1	14	12.4	14.9	12.4	13.67
Chromium, dissolved	mg/l	0.05	--	--	--	0.014	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.1	0.01	0.007	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.109	0.1	1.25	1.293
Lead, dissolved	mg/l	0.01	--	--	--	0.1	0.0033	0.0004	0.1
Magnesium, dissolved	mg/l	--	--	11	7.99	6.6	9.3	7.8	2.614
Manganese, dissolved	mg/l	--	0.05	--	--	0.04	0.022	0.046	0.058
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.7	6.81	7.4	7.7	7.8	6.645
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	88.5	73.5	57.9	119	55	56.14
Zinc, dissolved	mg/l	--	5	--	--	0.048	0.01	0.01	0.03
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.002	0.053	0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-16 28-Jun-1995	92-16 22-Nov-1995	92-16 12-Oct-1996	92-16 06-Nov-1997	92-16 05-Jun-1998	92-16 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	205	218	--	--	--	217
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	168	179	174	186	190	178
Ammonia Nitrogen	mg/l	--	--	0.62	0.27	0.74	0.27	0.2	0.04
Chemical Oxygen Demand	mg/l	--	--	350	23	5	3	22	3
Chloride	mg/l	--	250	7.7	2.5	2.4	3	2.8	2.3
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	460	380	370	380	370	350
Dissolved Oxygen (Field)	mg/l	--	--	9.65	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	59	56	50	59	68	56
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.1	0.2	1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	11.5	3.1	--	--	--	1.39
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	10.88	2.83	--	--	--	1.35
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.35	8.38	7.93	7.4	--	7.9
Phosphate	mg/l	--	--	--	0.8	--	--	--	--
Phosphorus	mg/l	--	--	14.5	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	22	22	19	18	49	15
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	190	180	180	190	184	180
Total Organic Carbon	mg/l	--	--	5.5	3.9	4.1	4.5	5	4.6
Total Suspended Solids	mg/l	--	--	--	--	1900	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.11	0.07	0.12	0.11	0.21	0.13
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	13.5	11.4	10	12.9	12.7	11.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.02	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.03	0.76	0.61	1.17	6.26	0.02
Lead, dissolved	mg/l	0.01	--	0.0001	0.0009	0.0002	0.0002	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	5.95	6.7	5.87	6.5	8.72	6.36
Manganese, dissolved	mg/l	--	0.05	0.02	0.04	0.03	0.06	0.12	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	11.9	4.3	8.6	9.4	1.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	58.1	65.2	57.3	56.7	77.6	66.3
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.07	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-16 24-Oct-2000	92-16 14-Jun-2001	92-16 16-Dec-2002	92-16 30-May-2003	92-16 19-Nov-2004	92-16 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	226	210	187	205	220	233
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	185	172	153	168	180	191
Ammonia Nitrogen	mg/l	--	--	0.03	0.48	0.38	0.13	0.07	0.23
Chemical Oxygen Demand	mg/l	--	--	--	18	23	9	14	21
Chloride	mg/l	--	250	2.8	2.8	16.4	4.2	4.3	5.4
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	346	340	374	300	440	350
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	46	52	47	47	44	48
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.2	1.4	0.3	0.2	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.46	1.88	0.08	0.64	0.61	0.79
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.43	1.4	0	0.51	0.54	0.56
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.79	8.2	8.2	7.2	8.2	8.93
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.67	6.07	3	1.49	0.68	1.41
Sulphate	mg/l	--	500 [4]	15	15	30	13	19	16
Temperature (Field)	deg c	--	15	--	--	--	--	--	11.6
Total Dissolved Solids	mg/l	--	500	214	250	236	150	220	229
Total Organic Carbon	mg/l	--	--	--	4.2	4	4.1	4.1	5.5
Total Suspended Solids	mg/l	--	--	256	2760	2120	516	910	1800
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.003	0.003	0.003	0.002	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.12	0.14	0.12	0.12	0.118	0.12
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	10.5	12	9.48	10.5	9.89	10.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	0.004
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.02	0.04	0.01	0.012
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0006	0.0002	0.0002	<0.0002
Magnesium, dissolved	mg/l	--	--	4.81	5.45	5.58	5.07	4.8	5.17
Manganese, dissolved	mg/l	--	0.05	0.02	0.03	0.01	0.02	0.017	0.018
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	5.9	2.3	1.5	5.2	5.1	6.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [5]	61.5	63	72.9	64.9	68.4	75.5
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.024	0.001	0.001	0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-16 15-May-2007	92-16 10-Nov-2008	92-16 26-Nov-2009	92-16 24-May-2011 [12]	92-16 28-Nov-2012	92-16 29-May-2014
						M-7	G-2	92-16	92-16
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	186	183	179	178	180	180
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [13]	4	2.7	2.6
Alkalinity (Total as CaCO3)	mg/l	--	--	186	180	179	182	180	180
Ammonia Nitrogen	mg/l	--	--	0.1	0.2	0.14	0.10	0.33	0.16
Chemical Oxygen Demand	mg/l	--	--	86	<5	15	25	14	7.3
Chloride	mg/l	--	250	7.1	6.4	11	13	21	25
Conductivity	uS/cm	--	--	--	--	390	404	--	--
Conductivity (Field)	uS/cm	--	--	280	390	360	379	391	366
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	43	47	41	48	48	52
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	0.1	<0.10	0.17	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.39	0.23	0.12	0.15	0.78	0.95
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	0.29	0.03	0	0.05	0.45	0.79
pH	-	--	--	--	--	8.16	8.38	--	8.19
pH (Field)	-	--	--	8.4	8	7.8	8.02	8.16	8.07
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.61	0.87	0.60	0.59
Sulphate	mg/l	--	500 [4]	12	11	11	10	10	10
Temperature (Field)	deg c	--	15	8.7	7	8.5	10.6	7.5	10.7
Total Dissolved Solids	mg/l	--	500	224	218	254	263	340	414
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0045	0.0035	0.003	<0.01	0.002	0.0025
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.107	0.105	0.12	0.11	0.12	0.12
Cadmium, dissolved	mg/l	0.005	--	0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	9.42	10.5	10	11	11	12
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.001	<0.001	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.015	<0.005	<0.0002	0.0002	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.005	0.006	0.003	0.0045
Iron, dissolved	mg/l	--	0.3	0.261	<0.005	<0.03	<0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00034	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	4.62	5	4	5	5.2	5.6
Manganese, dissolved	mg/l	--	0.05	0.044	<0.001	<0.01	<0.01	<0.002	<0.0020
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	5.7	5	5	5.2	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	72.2	68.8	65	64	65	70
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.01	0.01	0.006	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-16 26-Nov-2015 92-16	92-16 24-May-2017 92-16	92-16 29-Nov-2018 92-16	92-16 21-May-2020 92-16
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	188	200	215	177
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	6	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	189	202	221	180
Ammonia Nitrogen	mg/l	--	--	0.24	0.03	0.51	0.14
Chemical Oxygen Demand	mg/l	--	--	32	27	122	39
Chloride	mg/l	--	250	17	19	21	33
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	417	409	394	410
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	43.4	56	74	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	56.4
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.7	2.3	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.26	0.67	1.79	0.36
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.14	7.82	8.21	8.06
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.38	6.56	0.49
Sulphate	mg/l	--	500 [4]	8	9	6	10
Temperature (Field)	deg c	--	15	9.7	9.7	7.9	8.3
Total Dissolved Solids	mg/l	--	500	256	272	270	276
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.11	0.145	0.114	0.112
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	9.82	12.1	19.3	12.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0037	0.0038	0.0032
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.233
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	4.58	6.3	6.31	6.15
Manganese, dissolved	mg/l	--	0.05	0.028	<0.005	<0.005	0.066
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.34	5.65	5.76	5.35
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	79.3	68.3	70.4	65.3
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.007	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 09-Jun-1992	92-18 01-Nov-1992	92-18 04-Nov-1993	92-18 15-Jun-1994	92-18 02-Nov-1994	92-18 28-Jun-1995
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	244	198	210	--	190	193
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	200	162	172	140	156	158
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	0.17	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	67	62	170
Chloride	mg/l	--	250	87	35.8	38	26	22	23
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	831	540	539	480	453	460
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	11.65	9.65
Hardness, Calcium Carbonate	mg/l	--	--	276.9	178	150	136	138	144
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	0.44	0.1	0.48	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.1	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	7.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	7.64
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.96	7.78	8.1	7.9	8.25	7.82
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	2.96	0.148	7.62
Sulphate	mg/l	--	500 [4]	88	68.8	40.3	44.9	36.4	36
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	248	250	228	230
Total Organic Carbon	mg/l	--	--	--	--	--	6.8	4.8	6.3
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.1	--
Barium, dissolved	mg/l	1	--	--	--	--	--	0.022	--
Boron, dissolved	mg/l	5	--	--	--	--	0.03	0.06	0.04
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	0.01	0.0001
Calcium, dissolved	mg/l	--	--	69.62	45.4	38.3	35.3	32.09	38.7
Chromium, dissolved	mg/l	0.05	--	--	--	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.01	0.003	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.124	0.336	0.103	0.02
Lead, dissolved	mg/l	0.01	--	--	--	0.0062	0.0002	0.1	0.0002
Magnesium, dissolved	mg/l	--	--	25	15.7	13.3	11.7	4.599	11.3
Manganese, dissolved	mg/l	--	0.05	--	--	0.032	0.086	0.028	0.04
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	3.9	4.54	5.3	4.9	1.864	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	77.76	53.6	72	33	37.41	40.3
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.111	0.001	0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 09-Jun-1992	92-18 01-Nov-1992	92-18 04-Nov-1993	92-18 15-Jun-1994	92-18 02-Nov-1994	92-18 28-Jun-1995
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 22-Nov-1995	92-18 12-Jun-1996	92-18 12-Oct-1996	92-18 18-Jun-1997	92-18 06-Nov-1997	92-18 05-Jun-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	195	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	168	273	273	297	842	304
Ammonia Nitrogen	mg/l	--	--	0.01	0.04	0.14	0.65	0.05	0.1
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	25	18	3	10	25	38
Chloride	mg/l	--	250	23.1	368	470	339	916	685
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	440	1790	1790	1670	2990	3060
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	3.16	--	--
Hardness, Calcium Carbonate	mg/l	--	--	137	587	590	608	829	543
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.4	0.1	0.8	1	1.5	1.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.87	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.86	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.18	7	6.63	6.85	6.29	--
Phosphate	mg/l	--	--	0.2	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	31	117	107	109	1	147
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	220	900	900	890	1500	1516
Total Organic Carbon	mg/l	--	--	3.1	7.2	7.2	7.7	8.9	11.4
Total Suspended Solids	mg/l	--	--	--	579	1030	665	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.038	0.07	0.05	0.05	0.14
Cadmium, dissolved	mg/l	0.005	--	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.6	169	176	184	249	173
Chromium, dissolved	mg/l	0.05	--	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.04	1.17	0.57	1.52	1.41	0.31
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	11.5	39.9	35.7	35.3	49.5	26.6
Manganese, dissolved	mg/l	--	0.05	0.02	0.97	0.81	1.01	1.8	1.26
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	7.7	8.88	7	7.4	7.7	9.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	42.6	286	232	253	437	343
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.23
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 22-Nov-1995	92-18 12-Jun-1996	92-18 12-Oct-1996	92-18 18-Jun-1997	92-18 06-Nov-1997	92-18 05-Jun-1998
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 29-Oct-1998	92-18 06-May-1999	92-18 19-Oct-1999	92-18 05-May-2000	92-18 24-Oct-2000	92-18 14-Jun-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	380	386	427	488	356	315
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	312	632	350	400	292	258
Ammonia Nitrogen	mg/l	--	--	0.11	0.04	0.11	0.01	0.07	0.21
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	5	15	12	45	--	13
Chloride	mg/l	--	250	580	403	627	400	614	468
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3170	1870	2413	2850	2490	1750
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	379	482	593	551	394	379
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.4	0.7	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.48	0.51	--	--	0.52	0.46
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.37	0.47	--	--	0.45	0.25
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.5	6.5	7.1	6.5	6.6	6.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.28	0.58
Sulphate	mg/l	--	500 [4]	116	111	106	80	85	72
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1590	930	1206	1425	1290	1150
Total Organic Carbon	mg/l	--	--	13.1	9.3	8.9	7.2	--	6.1
Total Suspended Solids	mg/l	--	--	--	--	506	828	348	415
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.05	0.06	0.14	0.14	0.06	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	121	172	180	160	123	124
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.02	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.44	0.02	1.78	0.61	0.59	0.03
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0022	0.0002
Magnesium, dissolved	mg/l	--	--	18.7	34.8	34.3	36.4	21	16.8
Manganese, dissolved	mg/l	--	0.05	1.82	1.14	2.51	1.61	2.38	1.68
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.04	0.02
Potassium, dissolved	mg/l	--	--	12	2.7	10.6	3.9	14.6	6.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	358	387	400	300	411	272
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.11	0.22	0.02	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.042

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 29-Oct-1998	92-18 06-May-1999	92-18 19-Oct-1999	92-18 05-May-2000	92-18 24-Oct-2000	92-18 14-Jun-2001
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 23-Nov-2001	92-18 23-May-2002	92-18 06-Nov-2002	92-18 30-May-2003	92-18 09-Oct-2003	92-18 14-May-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	304	216	198	200	--	194
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	7	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	249	189	162	164	161	159
Ammonia Nitrogen	mg/l	--	--	0.2	0.03	0.02	0.01	0.03	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	1	--
Chemical Oxygen Demand	mg/l	--	--	22	3	9	2	2	11
Chloride	mg/l	--	250	1470	89.1	103	102	100	108
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	454	640	468	540	720	710
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	37	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	866	191	186	199	197	211
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.9	0.2	0.2	0.2	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.67	0.05	0.21	0.12	0.19	0.28
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.47	0.02	0.19	0.11	0.16	0.23
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.08	7.21	8.2	7.1	7.5	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.13	0.17	0.19	0.24	0.4	1.41
Sulphate	mg/l	--	500 [4]	146	29	29	28	36	25
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2900	436	340	270	365	355
Total Organic Carbon	mg/l	--	--	11	16	2.8	3.5	5	2.4
Total Suspended Solids	mg/l	--	--	117	94	251	100	280	1180
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.003	0.002	0.002	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.07	0.05	0.06	0.04	0.043	0.038
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	282	50.8	49.2	53	51.3	56.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.05	0.02	0.02	0.11	0.792	0.005
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0009	0.0003	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	39.3	15.6	15.4	16.1	16.8	17.2
Manganese, dissolved	mg/l	--	0.05	1.5	0.01	0.01	0.01	0.012	0.003
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	22.7	5.3	5.6	4.3	4.8	4.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	730	56.7	55.8	61.5	58.2	57.4
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.01	0.005	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 23-Nov-2001	92-18 23-May-2002	92-18 06-Nov-2002	92-18 30-May-2003	92-18 09-Oct-2003	92-18 14-May-2004
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 19-Nov-2004	92-18 24-May-2005	92-18 16-Nov-2005	92-18 25-May-2006	92-18 21-Nov-2006	92-18 15-May-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	212	220	220	172	184	177
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	170	180	180	170	184	177
Ammonia Nitrogen	mg/l	--	--	0.05	<0.01	<0.01	0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	6	<5	<5	7	27
Chloride	mg/l	--	250	117	135	132	156	156	175
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	900	1200	1000	400	725	700
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	215	258	258	244	265	297
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.3	0.1	<0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.31	0.31	0.05	0.13	0.1	0.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.26	<0.31	<0.05	0.12	<0.1	<0.1
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	6	8	8.3	6.9	8.3
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.18	0.8	0.12	--	--	--
Sulphate	mg/l	--	500 [4]	25	31	29	29	27	30
Temperature (Field)	deg c	--	15	--	12.6	10.5	5.5	5	8.8
Total Dissolved Solids	mg/l	--	500	450	437	429	432	456	489
Total Organic Carbon	mg/l	--	--	2.5	1.9	3.5	--	--	--
Total Suspended Solids	mg/l	--	--	468	1560	531	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.001	0.001	0.0035	0.0041
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.049	0.026	0.049	0.034	0.041	0.037
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00002
Calcium, dissolved	mg/l	--	--	57.4	67.5	68.6	64.6	69.9	79.2
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.004	0.003	0.005	0.01	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.01	<0.005	<0.005	<0.005	<0.005	<0.005
Lead, dissolved	mg/l	0.01	--	0.0002	0.0005	<0.0002	<0.0002	<0.0001	0.00004
Magnesium, dissolved	mg/l	--	--	17.3	21.8	21	20.2	22	24.2
Manganese, dissolved	mg/l	--	0.05	0.01	<0.001	0.002	0.001	0.178	0.002
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	5.3	4.9	6.1	4.5	5.5	5.2
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	57	73	68.9	59.3	64.7	67.7
Zinc, dissolved	mg/l	--	5	0.005	0.008	0.01	<0.005	0.008	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 19-Nov-2004	92-18 24-May-2005	92-18 16-Nov-2005	92-18 25-May-2006	92-18 21-Nov-2006	92-18 15-May-2007
Semi-VOCs									
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 30-Nov-2007	92-18 22-May-2008	92-18 10-Nov-2008	92-18 19-May-2009 G-1	92-18 26-Nov-2009 M-12	92-18 25-May-2010 [12] M-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	183	150	183	174	175	168
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<2 [13]	<2 [13]	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	183	150	180	174	175	168
Ammonia Nitrogen	mg/l	--	--	<0.01	<0.01	<0.01	0.02	0.02	<0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	47	<5	<5	5	13	10
Chloride	mg/l	--	250	176	175	182	179	197	193
Conductivity	uS/cm	--	--	--	--	--	1000	1010	1060
Conductivity (Field)	uS/cm	--	--	525	850	825	800	834	1119
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	281	301	296	315	297	345
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.2	0.24	0.13	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.28	0.18	0.08	0.16	<0.10	<0.10
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	<0.28	<0.18	<0.08	0.14	<0.08	<0.1
pH	-	--	--	--	--	--	7.98	8.09	8.11
pH (Field)	-	--	--	7.5	7.4	7.8	--	7.58	6.95
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.18	0.15	0.08
Sulphate	mg/l	--	500 [4]	28	28	27	26	31	28
Temperature (Field)	deg c	--	15	6	11	9	7	9.7	14.8
Total Dissolved Solids	mg/l	--	500	481	467	491	650	657	689
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0037	0.0036	0.0032	0.003	0.002	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.042	0.037	0.036	0.05	0.05	0.04
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	74.5	81.1	79.8	85	81	92
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	0.005	0.004	0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.0002	<0.0002	<0.0002
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.003	0.003	0.003
Iron, dissolved	mg/l	--	0.3	<0.005	<0.005	<0.005	<0.03	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	23	23.9	23.4	25	23	28
Manganese, dissolved	mg/l	--	0.05	0.027	0.002	<0.001	<0.01	<0.01	<0.01
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.5	4.9	5.4	5	5	6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	63.7	63.7	62.9	63	65	66
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 30-Nov-2007	92-18 22-May-2008	92-18 10-Nov-2008	92-18 19-May-2009 G-1	92-18 26-Nov-2009 M-12	92-18 25-May-2010 [12] M-2
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 20-Oct-2010 [12]	92-18 24-May-2011 [12]	92-18 29-Nov-2011 [12]	92-18 31-May-2012	92-18 28-Nov-2012	92-18 29-May-2013
				G-2	G-5	92-18	92-18	92-18	92-18
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	172	174	177	170	190	170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	<2 [13]	<2 [13]	1.8	1.5	1.7
Alkalinity (Total as CaCO3)	mg/l	--	--	172	174	177	180	190	170
Ammonia Nitrogen	mg/l	--	--	0.03	<0.02	0.04	<0.050	0.093	0.082
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	8	25	12	22	6.8
Chloride	mg/l	--	250	215	213	226	210	220	230
Conductivity	uS/cm	--	--	1060	1090	1120	--	--	--
Conductivity (Field)	uS/cm	--	--	1020	1021	1028	1076	1084	1032
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	365	352	358	410	370	430
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	<0.10	<0.10	0.14	0.51	0.36	0.31
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	<0.07	<0.1	0.1	<0.51	0.27	0.23
pH	-	--	--	7.91	8.22	8.15	8.05	--	8.04
pH (Field)	-	--	--	7.61	7.85	7.71	6.73	7.81	6.40
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.09	0.11	0.07	0.054	0.13	0.20
Sulphate	mg/l	--	500 [4]	28	28	29	27	28	28
Temperature (Field)	deg c	--	15	10.1	13.6	9.3	10.2	7.5	9.6
Total Dissolved Solids	mg/l	--	500	689	708	728	836	636	852
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	0.0028	0.002	0.0030
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.04	0.04	0.05	0.043	0.04	0.033
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	100	93	97	110	97	120
Chromium, dissolved	mg/l	0.05	--	0.004	0.003	0.003	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0005	0.0003	<0.0002	<0.00050	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.001	0.004	<0.001	0.0036	0.001	0.0027
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.00050	<0.0005	0.00051
Magnesium, dissolved	mg/l	--	--	28	29	28	33	31	34
Manganese, dissolved	mg/l	--	0.05	0.40	<0.01	0.21	0.079	0.004	0.0048
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5	5	5	5.8	5.5	5.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	68	64	67	76	67	76
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	0.011	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 20-Oct-2010 [12] G-2	92-18 24-May-2011 [12] G-5	92-18 29-Nov-2011 [12] 92-18	92-18 31-May-2012 92-18	92-18 28-Nov-2012 92-18	92-18 29-May-2013 92-18
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 26-Nov-2013 GW-17	92-18 29-May-2014 92-18	92-18 19-Nov-2014 92-18	92-18 02-Jun-2015 92-18	92-18 26-Nov-2015 92-18	92-18 26-May-2016 92-18
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	170	180	180	181	184	195
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.7	2.0	1.5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	180	180	180	182	185	196
Ammonia Nitrogen	mg/l	--	--	<0.050	<0.050	0.051	0.08	0.07	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	23	6.3	<4.0	21	13	12
Chloride	mg/l	--	250	230	270	260	356	340	329
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1081	1105	1215	1238	1282	1362
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	310	460	410	395	358	469
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.30	0.43	0.22	0.2	0.2	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	--	--	--
Nitrogen, Organic	mg/l	--	--	<0.3	<0.43	0.17	0.12	0.13	0.17
pH	-	--	--	8.02	8.09	7.97	--	--	--
pH (Field)	-	--	--	6.42	7.57	7.95	7.40	8.11	7.42
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.11	0.089	0.26	0.15	0.11	0.15
Sulphate	mg/l	--	500 [4]	26	31	30	31	30	35
Temperature (Field)	deg c	--	15	7.7	11.8	5.4	9.1	9.5	10.1
Total Dissolved Solids	mg/l	--	500	836	912	778	884	836	1080
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0023	0.0032	0.0028	0.003	0.003	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.042	0.04	0.034	0.024	0.033	0.025
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	83	120	110	92.8	98.2	123
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0012	0.0031	0.0020	<0.0005	<0.0005	0.0013
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	25	37	34	39.7	27.2	39
Manganese, dissolved	mg/l	--	0.05	0.0080	<0.0020	<0.0020	<0.005	<0.005	<0.005
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	6.1	5.7	5.15	4.89	7.06
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	57	85	76	86.4	85.3	83.8
Zinc, dissolved	mg/l	--	5	0.0056	0.0051	<0.0050	0.007	0.007	0.006
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 26-Nov-2013 GW-17	92-18 29-May-2014 92-18	92-18 19-Nov-2014 92-18	92-18 02-Jun-2015 92-18	92-18 26-Nov-2015 92-18	92-18 26-May-2016 92-18
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 17-Nov-2016	92-18 24-May-2017	92-18 29-Nov-2017	92-18 24-May-2018	92-18 29-Nov-2018	92-18 19-Jun-2019
				92-18	92-18	92-18	92-18	92-18	92-18
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	193	204	202	213	213	197
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	193	205	203	214	214	198
Ammonia Nitrogen	mg/l	--	--	0.12	0.03	0.11	0.03	0.03	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	12	39	22	53	30	72
Chloride	mg/l	--	250	307	325	361	348	333	356
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1439	1373	1318	1463	1331	1395
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	462	495	442	499	455	511
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.2	0.3	0.3	0.3	0.3	0.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.08	0.27	0.19	0.27	0.27	0.07
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.61	7.44	6.53	7.34	6.5	6.24
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.18	0.19	0.49	0.27	0.44	0.09
Sulphate	mg/l	--	500 [4]	33	33	36	36	36	38
Temperature (Field)	deg c	--	15	10.9	9.3	8.9	8.8	8.2	12.1
Total Dissolved Solids	mg/l	--	500	886	1080	882	1280	882	1040
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004	0.004	0.003	0.003	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.03	0.029	0.06	0.028	0.048	0.026
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	126	140	117	134	119	132
Chromium, dissolved	mg/l	0.05	--	0.004	0.005	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0030	0.0019	0.0013	0.0013	0.0023	0.0022
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	35.9	35.4	36.4	40	38.2	43.8
Manganese, dissolved	mg/l	--	0.05	<0.005	0.018	<0.005	0.008	<0.005	<0.005
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.1	5.87	6.15	6.17	6.83	7.89
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	82.6	84.6	79.4	89.6	81.5	96
Zinc, dissolved	mg/l	--	5	0.014	<0.005	0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	0.004	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 17-Nov-2016	92-18 24-May-2017	92-18 29-Nov-2017	92-18 24-May-2018	92-18 29-Nov-2018	92-18 19-Jun-2019
				92-18	92-18	92-18	92-18	92-18	92-18
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 20-Nov-2019	92-18 21-May-2020	92-18 26-Nov-2020
				92-18	92-18	92-18
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	187	200	210
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	189	202	212
Ammonia Nitrogen	mg/l	--	--	0.03	0.08	0.29
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	14	17	166
Chloride	mg/l	--	250	393	456	363
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1505	1434	1387
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	539	--	484
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	499	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	<0.1	0.3	1.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	<0.07	0.22	1.51
pH	-	--	--	--	--	--
pH (Field)	-	--	--	7.65	7.76	7.43
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.10	0.30	5.50
Sulphate	mg/l	--	500 [4]	<1	48	36
Temperature (Field)	deg c	--	15	7.6	9.7	7.4
Total Dissolved Solids	mg/l	--	500	976	1140	1090
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.031	0.024	0.025
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	140	130	126
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0028	0.0038	0.0015
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	46.4	42.4	41.2
Manganese, dissolved	mg/l	--	0.05	0.182	0.013	0.02
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.73	7.02	6.46
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	97.6	95.6	92.7
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.008
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-18 20-Nov-2019	92-18 21-May-2020	92-18 26-Nov-2020
				92-18	92-18	92-18
Semi-VOCs						
Naphthalene	mg/l	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 09-Jun-1992	92-19 01-Nov-1992	92-19 08-Jun-1993	92-19 15-Jun-1994	92-19 02-Nov-1994	92-19 28-Jun-1995
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	390	283	381	--	326	336
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	320	232	312	320	267	276
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	0.1	0.06
Chemical Oxygen Demand	mg/l	--	--	--	--	--	34	77	35
Chloride	mg/l	--	250	254	97.8	315	860	400	250
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1688	934	1750	2490	1950	2120
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	9.69	8.52
Hardness, Calcium Carbonate	mg/l	--	--	687.61	459	719	637	561	605
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	0.6	0.1	0.42	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.1	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	2.24
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.69	7.09	6.35	6.5	6.73	6.64
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.3	0.203	0.62
Sulphate	mg/l	--	500 [4]	165	146.5	154	147	116	107
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	--
Total Organic Carbon	mg/l	--	--	--	--	--	9	9.4	8.8
Total Suspended Solids	mg/l	--	--	--	--	1140	1260	980	1060
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	0.168	--	0.093	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	**0.1**	--
Barium, dissolved	mg/l	1	--	--	--	--	--	0.164	--
Boron, dissolved	mg/l	5	--	--	--	--	0.07	0.078	0.01
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	**0.01**	0.0001
Calcium, dissolved	mg/l	--	--	189.1	138	210	167	154.8	176
Chromium, dissolved	mg/l	0.05	--	--	--	0.015	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.012	0.0113	0.01	0.02
Iron, dissolved	mg/l	--	0.3	--	--	0.47	0.621	0.412	0.02
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	0.0008	**0.1**	0.0002
Magnesium, dissolved	mg/l	--	--	52.18	27.8	47.3	53.4	23.506	39.6
Manganese, dissolved	mg/l	--	0.05	--	--	2.722	1.449	1.056	1.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.03
Potassium, dissolved	mg/l	--	--	5.39	5.33	6.9	11.6	3.634	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	89.81	33.5	112	185	164.6	180
Zinc, dissolved	mg/l	--	5	--	--	0.037	0.01	0.018	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.047	0.001	0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 09-Jun-1992	92-19 01-Nov-1992	92-19 08-Jun-1993	92-19 15-Jun-1994	92-19 02-Nov-1994	92-19 28-Jun-1995
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 22-Nov-1995	92-19 12-Jun-1996	92-19 12-Oct-1996	92-19 18-Jun-1997	92-19 06-Nov-1997	92-19 05-Jun-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	327	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	268	242	183	158	188	174
Ammonia Nitrogen	mg/l	--	--	0.01	0.02	0.36	0.41	0.14	0.11
Chemical Oxygen Demand	mg/l	--	--	33	11	15	6	5	20
Chloride	mg/l	--	250	156	25	26.3	28	29	40.5
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1180	470	450	480	450	521
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	3.75	--	--
Hardness, Calcium Carbonate	mg/l	--	--	525	137	134	160	152	153
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.7	0.6	0.4	0.1	0.1	1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	29	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	28.99	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	7.88	7.62	7.64	6.05	--
Phosphate	mg/l	--	--	0.4	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	118	35	32	33	21	61
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	4900	2580	2740	--	--
Total Organic Carbon	mg/l	--	--	55	4.1	3.6	3.2	3.9	3.1
Total Suspended Solids	mg/l	--	--	590	240	230	240	220	260
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.04	0.05	0.04	0.04	0.21
Cadmium, dissolved	mg/l	0.005	--	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	157	34.9	35.6	43.4	41.1	38.8
Chromium, dissolved	mg/l	0.05	--	0.03	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.02
Iron, dissolved	mg/l	--	0.3	0.36	0.492	0.07	0.56	0.53	2.24
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	31.7	11.9	10.8	12.4	11.9	13.4
Manganese, dissolved	mg/l	--	0.05	0.52	0.054	0.05	0.04	0.05	0.07
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	8.9	4.03	3.8	0.9	6.8	8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	130	45.7	40.7	40.1	39.7	67.8
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.12
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 22-Nov-1995	92-19 12-Jun-1996	92-19 12-Oct-1996	92-19 18-Jun-1997	92-19 06-Nov-1997	92-19 05-Jun-1998
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 29-Oct-1998	92-19 06-May-1999	92-19 19-Oct-1999	92-19 05-May-2000	92-19 24-Oct-2000	92-19 14-Jun-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	205	222	244	227	228	216
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	7
Alkalinity (Total as CaCO3)	mg/l	--	--	168	182	200	186	187	189
Ammonia Nitrogen	mg/l	--	--	0.07	0.01	0.11	0.03	0.01	0.08
Chemical Oxygen Demand	mg/l	--	--	3	3	3	3	--	6
Chloride	mg/l	--	250	41.9	46.1	46.8	51.8	63.5	75.9
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	493	540	521	575	564	500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	129	163	168	174	144	181
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	0.3	0.2	0.2	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.51	0.4	--	--	0.37	0.37
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.44	0.39	--	--	0.36	0.29
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.4	7.8	7.9	7.62	8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.9	1.49
Sulphate	mg/l	--	500 [4]	28	30	24	25	28	29
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	3100	5840	870	3910
Total Organic Carbon	mg/l	--	--	4.8	3.2	3.2	3.4	--	2.6
Total Suspended Solids	mg/l	--	--	245	270	260	288	310	366
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.22	0.05	0.15	0.13	0.05	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.5	40	44.6	46.4	37.5	49.5
Chromium, dissolved	mg/l	0.05	--	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.03	0.02	1.94	2.87	0.05	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	9.83	13.8	13.6	14	12.3	13.9
Manganese, dissolved	mg/l	--	0.05	0.08	0.01	0.09	0.06	0.02	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	4.5	4.2	4.4	2.7	3.4	0.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	50	55.6	60	62.1	52.4	55.2
Zinc, dissolved	mg/l	--	5	0.08	0.02	0.03	0.03	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.002	0.048

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 29-Oct-1998	92-19 06-May-1999	92-19 19-Oct-1999	92-19 05-May-2000	92-19 24-Oct-2000	92-19 14-Jun-2001
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 23-Nov-2001	92-19 23-May-2002	92-19 06-Nov-2002	92-19 30-May-2003	92-19 09-Oct-2003	92-19 14-May-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	201	395	326	355	--	381
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	165	324	267	291	273	312
Ammonia Nitrogen	mg/l	--	--	0.11	0.24	0.31	0.1	0.23	0.06
Chemical Oxygen Demand	mg/l	--	--	4	10	28	14	21	26
Chloride	mg/l	--	250	76.7	502	617	168	582	293
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	508	1890	2630	1440	3020	2230
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	62	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	189	554	503	441	418	469
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.5	0.4	0.6	0.3	1.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.22	0.36	0.73	0.45	0.6	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.11	0.12	0.42	0.35	0.37	0.76
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.49	6.68	8.66	6.4	7	6.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.14	0.2	0.21	0.22	0.35	0.66
Sulphate	mg/l	--	500 [4]	28	103	117	166	109	146
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	136	168	308	246	294	796
Total Organic Carbon	mg/l	--	--	4	6	9	8.7	10	9.1
Total Suspended Solids	mg/l	--	--	320	1370	1510	720	1307	1115
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.07	0.07	0.06	0.06	0.06	0.057
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	49.7	183	165	150	140	159
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.005	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.008	0.004
Iron, dissolved	mg/l	--	0.3	0.13	0.02	0.11	0.51	2.3	0.019
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0016	0.0002	0.0007	0.0002
Magnesium, dissolved	mg/l	--	--	15.7	23.6	22	16.2	16.6	17.5
Manganese, dissolved	mg/l	--	0.05	0.02	1.8	1.35	0.74	1.77	0.847
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.03	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	1.9	16.7	16.9	11.3	14.7	13.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	60.6	284	320	151	367	202
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.03	0.01	0.01	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 23-Nov-2001	92-19 23-May-2002	92-19 06-Nov-2002	92-19 30-May-2003	92-19 09-Oct-2003	92-19 14-May-2004
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 19-Nov-2004	92-19 24-May-2005	92-19 16-Nov-2005	92-19 25-May-2006	92-19 21-Nov-2006	92-19 15-May-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	370	332	227	286	284	364
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	303	272	186	286	284	364
Ammonia Nitrogen	mg/l	--	--	0.19	0.06	0.1	0.27	0.06	0.14
Chemical Oxygen Demand	mg/l	--	--	23	21	22	9	9	97
Chloride	mg/l	--	250	736	199	271	298	463	571
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3060	1400	1400	1425	2100	1400
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	436	179	146	371	484	367
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1	0.2	0.1	0.2	0.9	1.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.73	0.6	0.45	0.54	0.5	0.91
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.54	0.54	0.35	0.27	0.44	0.77
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	5.8	8.57	7.5	6.5	7.7
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.73	0.51	0.55	--	--	--
Sulphate	mg/l	--	500 [4]	110	87	60	119	82	121
Temperature (Field)	deg c	--	15	--	10.8	9.2	7	7	8.9
Total Dissolved Solids	mg/l	--	500	296	695	715	855	1150	1420
Total Organic Carbon	mg/l	--	--	8.7	9.5	10.7	--	--	--
Total Suspended Solids	mg/l	--	--	1530	250	118	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.001	0.0013	0.0011
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.064	0.04	0.067	0.037	0.045	0.078
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.0005	<0.005	0.0002	0.00014
Calcium, dissolved	mg/l	--	--	147	55.8	46.8	127	164	125
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.008
Copper, dissolved	mg/l	--	1	0.006	0.007	0.008	0.003	0.003	0.006
Iron, dissolved	mg/l	--	0.3	0.128	0.015	0.062	0.071	0.032	0.1
Lead, dissolved	mg/l	0.01	--	0.0006	0.0004	<0.0002	<0.0002	<0.0001	0.00006
Magnesium, dissolved	mg/l	--	--	16.5	9.61	6.94	13.2	18.1	13.6
Manganese, dissolved	mg/l	--	0.05	1.74	0.118	0.399	0.598	1.56	1.19
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	13.7	6.3	5.9	7.9	11.5	10.1
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	413	179	219	125	237	357
Zinc, dissolved	mg/l	--	5	0.005	0.006	0.009	0.006	0.009	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 19-Nov-2004	92-19 24-May-2005	92-19 16-Nov-2005	92-19 25-May-2006	92-19 21-Nov-2006	92-19 15-May-2007
Semi-VOCs									
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 30-Nov-2007	92-19 22-May-2008	92-19 10-Nov-2008	92-19 19-May-2009 G-2	92-19 26-Nov-2009 J-16	92-19 25-May-2010 M-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	332	237	264	290	361	235
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<2 [13]	<2 [13]	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	332	240	260	290	361	235
Ammonia Nitrogen	mg/l	--	--	0.31	<0.01	0.17	0.09	0.25	0.07
Chemical Oxygen Demand	mg/l	--	--	61	14	22	13	33	28
Chloride	mg/l	--	250	957	318	459	432	594	325
Conductivity	uS/cm	--	--	--	--	--	2120	2700	1740
Conductivity (Field)	uS/cm	--	--	2700	1800	3100	1900	2300	926
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	421	354	351	411	391	283
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.7	1.1	0.8	0.59	0.16	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.87	0.8	0.6	0.33	0.48	0.20
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.56	<0.8	0.43	0.24	0.23	0.13
pH	-	--	--	--	--	--	7.17	7.50	7.67
pH (Field)	-	--	--	6.5	6.7	6.7	--	6.63	6.70
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	1.13	0.20	0.99
Sulphate	mg/l	--	500 [4]	111	105	72	86	90	56
Temperature (Field)	deg c	--	15	5	10	11	7	9.6	13.6
Total Dissolved Solids	mg/l	--	500	1920	887	1060	1380	1760	1130
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0018	0.0014	0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.071	0.063	0.044	0.05	0.08	0.05
Cadmium, dissolved	mg/l	0.005	--	0.00012	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	145	121	120	140	130	92
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	0.009	<0.005	0.003
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.0005	0.0009	0.0019
Copper, dissolved	mg/l	--	1	0.004	0.002	0.002	0.004	0.007	0.005
Iron, dissolved	mg/l	--	0.3	0.06	0.006	0.305	<0.03	<0.03	0.08
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	14.4	12.4	12.2	15	16	13
Manganese, dissolved	mg/l	--	0.05	1.65	0.774	0.29	0.22	0.60	1.09
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.7	7.7	8.7	8	8	7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	478	175	227	246	466	221
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 30-Nov-2007	92-19 22-May-2008	92-19 10-Nov-2008	92-19 19-May-2009 G-2	92-19 26-Nov-2009 J-16	92-19 25-May-2010 M-1
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 20-Oct-2010 G-1	92-19 24-May-2011 G-1	92-19 29-Nov-2011 92-19	92-19 31-May-2012 92-19	92-19 28-Nov-2012 92-19	92-19 29-May-2013 92-19
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	344	336	362	320	360	360
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	<2 [13]	<2 [13]	<1.0	1.6	1.1
Alkalinity (Total as CaCO3)	mg/l	--	--	344	336	362	320	360	360
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	<0.02	<0.050	0.082	0.080
Chemical Oxygen Demand	mg/l	--	--	30	25	28	24	23	31
Chloride	mg/l	--	250	738	434	67	110	110	84
Conductivity	uS/cm	--	--	3100	2220	1020	--	--	--
Conductivity (Field)	uS/cm	--	--	2994	1943	1044	1192	1256	1200
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	725	440	419	340	570	440
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.28	0.81	1.07	4.1	2.1	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.48	0.35	0.18	0.88	0.60	0.72
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	4.2	2.1	<0.10
Nitrogen, Organic	mg/l	--	--	<0.48	<0.35	<0.18	<0.88	0.52	0.64
pH	-	--	--	7.04	7.76	7.61	7.51	--	7.50
pH (Field)	-	--	--	6.46	6.52	6.64	6.69	6.64	6.13
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.29	0.76	0.30	0.22	0.26	0.48
Sulphate	mg/l	--	500 [4]	118	109	85	140	180	210
Temperature (Field)	deg c	--	15	11.3	11.4	10.0	9.5	7.3	8.7
Total Dissolved Solids	mg/l	--	500	2010	1440	663	774	1080	840
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.07	0.07	0.06	0.052	0.046	0.071
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	244	148	143	120	200	150
Chromium, dissolved	mg/l	0.05	--	0.009	0.007	0.004	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0021	0.0016	0.0008	<0.00050	0.0005	0.0010
Copper, dissolved	mg/l	--	1	0.008	0.010	0.003	0.0035	0.003	0.0062
Iron, dissolved	mg/l	--	0.3	0.09	0.12	0.10	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	28	17	15	11	19	17
Manganese, dissolved	mg/l	--	0.05	1.51	0.74	0.37	0.13	0.27	0.62
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	8	6	5.2	7.9	7.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	290	266	49	100	89	230
Zinc, dissolved	mg/l	--	5	0.01	0.02	<0.01	<0.0050	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 20-Oct-2010 G-1	92-19 24-May-2011 G-1	92-19 29-Nov-2011 92-19	92-19 31-May-2012 92-19	92-19 28-Nov-2012 92-19	92-19 29-May-2013 92-19
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.00025	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0005	<0.00025	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0013	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.00050	<0.00020	<0.00020

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 26-Nov-2013 GW-18	92-19 29-May-2014 92-19	92-19 19-Nov-2014 92-19	92-19 02-Jun-2015 92-19	92-19 26-Nov-2015 92-19	92-19 26-May-2016 92-19
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	360	260	300	391	328
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<1.0	<1.0	<1.0	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	310	360	260	300	391	328
Ammonia Nitrogen	mg/l	--	--	<0.050	0.14	<0.050	0.06	0.04	0.05
Chemical Oxygen Demand	mg/l	--	--	20	34	9.3	30	53	30
Chloride	mg/l	--	250	220	170	100	118	163	84
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1449	1579	1081	1493	1583	1308
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	430	420	270	294	470	353
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.39	0.3	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.68	0.95	0.32	0.4	0.5	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	0.39	--	--	--
Nitrogen, Organic	mg/l	--	--	<0.68	0.81	<0.32	0.34	0.46	0.45
pH	-	--	--	7.50	7.45	7.39	--	--	--
pH (Field)	-	--	--	6.53	6.80	6.83	6.66	6.84	6.92
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.20	0.14	0.19	0.11	0.10	0.11
Sulphate	mg/l	--	500 [4]	190	300	98	231	268	255
Temperature (Field)	deg c	--	15	9.5	10.4	8.5	8.5	10.1	8.6
Total Dissolved Solids	mg/l	--	500	952	1100	458	836	990	866
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.06	0.074	0.08	0.057	0.074	0.067
Cadmium, dissolved	mg/l	0.005	--	<0.00010	0.00011	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	140	140	92	92.8	154	108
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0048	0.0081	0.0045	<0.0005	0.0024	0.0038
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	17	18	10	15	20.5	20
Manganese, dissolved	mg/l	--	0.05	0.18	0.49	0.079	0.012	0.141	0.114
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.5	7.1	5	4.28	6.65	6.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	110	210	65	70.3	173	121
Zinc, dissolved	mg/l	--	5	0.032	0.011	0.0059	0.007	0.008	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 26-Nov-2013 GW-18	92-19 29-May-2014 92-19	92-19 19-Nov-2014 92-19	92-19 02-Jun-2015 92-19	92-19 26-Nov-2015 92-19	92-19 26-May-2016 92-19
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 17-Nov-2016 92-19	92-19 24-May-2017 92-19	92-19 29-Nov-2017 92-19	92-19 24-May-2018 92-19	92-19 29-Nov-2018 92-19	92-19 19-Jun-2019 92-19
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	381	354	309	290	400	191
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	381	354	309	291	400	191
Ammonia Nitrogen	mg/l	--	--	0.04	0.10	0.07	0.07	0.17	0.10
Chemical Oxygen Demand	mg/l	--	--	36	36	45	92	45	14
Chloride	mg/l	--	250	85	115	119	60	420	76
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1414	1291	1081	949	1625	719
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	408	457	392	303	393	213
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	<0.1	4.7	0.2	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.6	0.5	0.5	0.8	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.36	0.5	0.43	0.43	0.63	0.1
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.67	6.94	6.41	6.86	6.54	6.48
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.14	0.16	0.11	0.14	0.19	0.17
Sulphate	mg/l	--	500 [4]	250	171	199	96	158	39
Temperature (Field)	deg c	--	15	11.2	9.5	7.9	8.0	8.5	10.5
Total Dissolved Solids	mg/l	--	500	750	782	756	520	1280	406
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.077	0.067	0.106	0.054	0.111	0.047
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	130	150	127	97.6	127	67.7
Chromium, dissolved	mg/l	0.05	--	0.007	0.004	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0064	0.0064	0.0051	0.0033	0.0035	0.0027
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	20	20.2	18.2	14.5	18.6	10.7
Manganese, dissolved	mg/l	--	0.05	0.096	0.12	0.05	0.612	0.436	0.023
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.15	5.7	5.31	4.22	7.3	3.12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	137	124	86.4	48.1	38	42.3
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.006	<0.005	0.009	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 17-Nov-2016 92-19	92-19 24-May-2017 92-19	92-19 29-Nov-2017 92-19	92-19 24-May-2018 92-19	92-19 29-Nov-2018 92-19	92-19 19-Jun-2019 92-19
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 20-Nov-2019 92-19	92-19 21-May-2020 92-19	92-19 26-Nov-2020 92-19
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	332	266	338
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	332	267	339
Ammonia Nitrogen	mg/l	--	--	0.04	0.08	0.05
Chemical Oxygen Demand	mg/l	--	--	30	21	50
Chloride	mg/l	--	250	93	47	143
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1113	767	1342
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	428	--	403
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	270	--
Nitrate as N	mg/l	10.0	--	0.3	0.1	0.3
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.2	0.4	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.16	0.32	0.35
pH	-	--	--	--	--	--
pH (Field)	-	--	--	6.72	7.68	6.84
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.16	0.08	0.13
Sulphate	mg/l	--	500 [4]	123	115	148
Temperature (Field)	deg c	--	15	9.4	8.1	9.1
Total Dissolved Solids	mg/l	--	500	662	464	738
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Aluminum, dissolved	mg/l	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.078	0.052	0.06
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	137	86.3	129
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0019	0.0014	0.0012
Copper, dissolved	mg/l	--	1	0.0021	0.0076	0.0027
Iron, dissolved	mg/l	--	0.3	<0.1	0.199	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	21.1	13.3	19.5
Manganese, dissolved	mg/l	--	0.05	1.04	3.13	0.695
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.8	6.54	14.4
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	69.8	69.5	86
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.009
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	92-19 20-Nov-2019 92-19	92-19 21-May-2020 92-19	92-19 26-Nov-2020 92-19
Semi-VOCs						
Naphthalene	mg/l	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-4 28-Jun-1995	95-4 22-Nov-1995	95-4 12-Jun-1996	95-4 12-Oct-1996	95-4 18-Jun-1997	95-4 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	158	142	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	130	116	143	179	123	170
Ammonia Nitrogen	mg/l	--	--	0.04	0.01	0.01	0.05	0.17	0.01
Chemical Oxygen Demand	mg/l	--	--	40	25	11	8	3	5
Chloride	mg/l	--	250	42	18.8	22	15.7	12.2	14.3
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	610	430	--	--	410	500
Dissolved Oxygen (Field)	mg/l	--	--	7.45	--	--	--	5.96	--
Hardness, Calcium Carbonate	mg/l	--	--	265	180	242	223	212	273
Nitrate as N	mg/l	10.0	--	11.6	5.8	9.1	7.7	5.6	6.8
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.5	0.48	--	--	--	--
Nitrogen, Organic	mg/l	--	--	3.46	0.47	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.99	7.35	--	--	7.31	6.15
Phosphate	mg/l	--	--	--	0.2	--	--	--	--
Phosphorus	mg/l	--	--	1.44	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	59	42	50	40	37	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	310	220	--	--	210	250
Total Organic Carbon	mg/l	--	--	2	1.7	2.3	2.8	2.2	3.1
Total Suspended Solids	mg/l	--	--	--	--	201	640	873	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.01	0.018	0.04	0.02	0.04
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	78.6	52.7	70	64.1	62.8	81.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.11	0.03	0.07	0.15	0.1
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	16.5	11.7	16.3	15.1	13.1	16.5
Manganese, dissolved	mg/l	--	0.05	0.06	0.02	0.01	0.01	0.01	0.01
Nickel, dissolved	mg/l	--	--	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	9.5	4.6	4.6	0.6	6.5
Sodium, dissolved	mg/l	--	200 [5]	10.6	6.2	11.6	8.8	8.6	7.9
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-4 05-Jun-1998	95-4 29-Oct-1998	95-4 06-May-1999	95-4 19-Oct-1999	95-4 05-May-2000	95-4 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	239	176	268	382	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	156	196	144	220	313	227
Ammonia Nitrogen	mg/l	--	--	0.03	0.04	0.01	0.04	0.01	0.01
Chemical Oxygen Demand	mg/l	--	--	3	3	4	6	3	--
Chloride	mg/l	--	250	11.9	14.1	7.1	10.2	37.7	16.9
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	497	520	370	460	850	630
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	212	239	185	233	479	216
Nitrate as N	mg/l	10.0	--	6.7	--	--	2.4	12.8	4.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	0.47	0.36	--	--	0.46
Nitrogen, Organic	mg/l	--	--	--	0.43	0.35	--	--	0.45
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7	6.9	7.7	6.9	7.06
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.08
Sulphate	mg/l	--	500 [4]	71	47	34	39	97	63
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	250	260	190	230	425	354
Total Organic Carbon	mg/l	--	--	1.7	4.2	3.6	2.4	6.5	--
Total Suspended Solids	mg/l	--	--	--	--	--	182	154	108
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Boron, dissolved	mg/l	5	--	0.07	0.06	0.03	0.19	0.12	0.04
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	59.1	73.3	54.2	66.8	135	54.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.06	0.17	0.02	0.13	0.05	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	15.5	13.6	13.3	15.8	33.4	19.7
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.01	0.01	0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5	5.3	0.4	5.1	2.2	5.4
Sodium, dissolved	mg/l	--	200 [5]	14.5	10.4	9.5	22.1	16.7	30
Zinc, dissolved	mg/l	--	5	0.019	0.01	0.01	0.1	0.14	0.03
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-4 14-Jun-2001	95-4 23-Nov-2001	95-4 23-May-2002 [10]	95-4 06-Nov-2002 [10]	95-4 30-May-2003 [10]	95-4 09-Oct-2003 [10]
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	251	306	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	206	251	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	0.01	0.01	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	5	3	--	--	--	--
Chloride	mg/l	--	250	11	10.3	--	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	500	522	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	268	302	--	--	--	--
Nitrate as N	mg/l	10.0	--	2.9	0.6	--	--	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.33	0.29	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.32	0.28	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	--	--	--	--	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.1	0.06	--	--	--	--
Sulphate	mg/l	--	500 [4]	47	30	--	--	--	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	320	468	--	--	--	--
Total Organic Carbon	mg/l	--	--	3.6	5	--	--	--	--
Total Suspended Solids	mg/l	--	--	259	74	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	--	--	--	--
Boron, dissolved	mg/l	5	--	0.02	0.04	--	--	--	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	75.4	81	--	--	--	--
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	--	--	--	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	--	--	--	--
Iron, dissolved	mg/l	--	0.3	0.02	0.02	--	--	--	--
Lead, dissolved	mg/l	0.01	--	0.0002	0.0007	--	--	--	--
Magnesium, dissolved	mg/l	--	--	19.4	21	--	--	--	--
Manganese, dissolved	mg/l	--	0.05	0.01	0.02	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	--	--	--
Potassium, dissolved	mg/l	--	--	2	0.4	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	14.5	15.6	--	--	--	--
Zinc, dissolved	mg/l	--	5	0.01	0.01	--	--	--	--
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.007	0.001	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-4 14-May-2004 [10]	95-4 19-Nov-2004 [10]	95-4 24-May-2005 [10]	95-4 16-Nov-2005 [10]	95-4 25-May-2006	95-4 16-Nov-2006 [10]
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	222	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	--	--	222	--
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	<0.01	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	36	--
Chloride	mg/l	--	250	--	--	--	--	5	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	--	--	460	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	--	--	323	--
Nitrate as N	mg/l	10.0	--	--	--	--	--	1.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	0.64	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	<0.64	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	--	--	7.8	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	--	--	--	--	124	--
Temperature (Field)	deg c	--	15	--	--	--	--	9.5	--
Total Dissolved Solids	mg/l	--	500	--	--	--	--	393	--
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	--
Boron, dissolved	mg/l	5	--	--	--	--	--	0.021	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.005	--
Calcium, dissolved	mg/l	--	--	--	--	--	--	84	--
Chromium, dissolved	mg/l	0.05	--	--	--	--	--	<0.002	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	--
Copper, dissolved	mg/l	--	1	--	--	--	--	0.003	--
Iron, dissolved	mg/l	--	0.3	--	--	--	--	<0.005	--
Lead, dissolved	mg/l	0.01	--	--	--	--	--	<0.0002	--
Magnesium, dissolved	mg/l	--	--	--	--	--	--	27.5	--
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	0.187	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	--	--	--	5.6	--
Sodium, dissolved	mg/l	--	200 [5]	--	--	--	--	14.2	--
Zinc, dissolved	mg/l	--	5	--	--	--	--	0.013	--
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	<0.001	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-4 15-May-2007 [10]	95-4 30-Nov-2007 [14]	95-4 22-May-2008 [10]	95-4 10-Nov-2008 [10]	95-4 19-May-2009 [10]	95-4 27-Nov-2009
								95-4	J-52
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	112
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	--	--	--	112
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	<0.02
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	33
Chloride	mg/l	--	250	--	--	--	--	--	10
Conductivity	uS/cm	--	--	--	--	--	--	--	341
Conductivity (Field)	uS/cm	--	--	--	--	--	--	--	309
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	--	--	--	76
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	0.20
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	<0.1
pH	-	--	--	--	--	--	--	--	8.17
pH (Field)	-	--	--	--	--	--	--	--	8.97
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.21
Sulphate	mg/l	--	500 [4]	--	--	--	--	--	42
Temperature (Field)	deg c	--	15	--	--	--	--	--	8.4
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	222
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.004
Boron, dissolved	mg/l	5	--	--	--	--	--	--	0.07
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	--	--	--	--	--	19
Chromium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.0002
Copper, dissolved	mg/l	--	1	--	--	--	--	--	0.001
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	<0.03
Lead, dissolved	mg/l	0.01	--	--	--	--	--	--	<0.001
Magnesium, dissolved	mg/l	--	--	--	--	--	--	--	7
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	--	--	--	--	4
Sodium, dissolved	mg/l	--	200 [5]	--	--	--	--	--	40
Zinc, dissolved	mg/l	--	5	--	--	--	--	--	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0004
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0040
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-4 20-Oct-2010 G-13	95-4 24-May-2011 G-44	95-4 22-Nov-2011 [10] 95-4	95-4 31-May-2012 [15] 95-4
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	244	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	6	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	310	250	--	--
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	--	--
Chemical Oxygen Demand	mg/l	--	--	25	10	--	--
Chloride	mg/l	--	250	10	8	--	--
Conductivity	uS/cm	--	--	701	550	--	--
Conductivity (Field)	uS/cm	--	--	701	552	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	342	267	--	--
Nitrate as N	mg/l	10.0	--	<0.10	0.15	--	--
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.34	0.10	--	--
Nitrogen, Organic	mg/l	--	--	<0.34	<0.1	--	--
pH	-	--	--	8.16	8.40	--	--
pH (Field)	-	--	--	7.46	7.49	--	--
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.09	0.07	--	--
Sulphate	mg/l	--	500 [4]	63	42	--	--
Temperature (Field)	deg c	--	15	13.8	16.9	--	--
Total Dissolved Solids	mg/l	--	500	456	358	--	--
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--
Boron, dissolved	mg/l	5	--	0.05	0.03	--	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	--	--
Calcium, dissolved	mg/l	--	--	86	69	--	--
Chromium, dissolved	mg/l	0.05	--	0.003	<0.001	--	--
Cobalt, dissolved	mg/l	--	--	0.0005	0.0003	--	--
Copper, dissolved	mg/l	--	1	0.003	0.006	--	--
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	--	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--
Magnesium, dissolved	mg/l	--	--	31	23	--	--
Manganese, dissolved	mg/l	--	0.05	0.25	0.03	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6	4	--	--
Sodium, dissolved	mg/l	--	200 [5]	18	15	--	--
Zinc, dissolved	mg/l	--	5	<0.01	0.02	--	--
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	--	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	--	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	--	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 28-Jun-1995	95-8 22-Nov-1995	95-8 12-Jun-1996	95-8 12-Oct-1996	95-8 18-Jun-1997	95-8 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	173	174	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	142	143	151	143	123	150
Ammonia Nitrogen	mg/l	--	--	0.18	0.15	0.12	0.11	0.01	0.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	33	13	15	3	3
Chloride	mg/l	--	250	122	121	115	130	136	146
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	840	860	810	850	840	770
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	8.18	--	--	--	2.84	--
Hardness, Calcium Carbonate	mg/l	--	--	251	265	259	234	288	288
Nitrate as N	mg/l	10.0	--	0.1	0.3	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	4.5	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.32	4.35	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.23	6.87	7.26	7	6.18
Phosphate	mg/l	--	--	--	1.4	--	--	--	--
Phosphorus	mg/l	--	--	1.66	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	74	84	76	79	72	64
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	420	440	410	430	420	360
Total Organic Carbon	mg/l	--	--	7.3	3.6	5.9	4.8	3.8	5.3
Total Suspended Solids	mg/l	--	--	--	--	1480	1780	1230	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.01	0.021	0.05	0.03	0.04
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	56.3	56	57.7	50.7	69.5	65
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.75	3.79	0.56	2.22	0.4
Lead, dissolved	mg/l	0.01	--	0.0002	0.0004	0.0002	0.0002	0.0002	0.0015
Magnesium, dissolved	mg/l	--	--	26.7	30	27.4	25.7	27.3	30.1
Manganese, dissolved	mg/l	--	0.05	0.24	0.27	0.383	0.25	0.39	0.27
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	7.6	6.98	3.8	7.7	7.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	63	67.7	78.5	71.1	71.8	61.4
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 28-Jun-1995	95-8 22-Nov-1995	95-8 12-Jun-1996	95-8 12-Oct-1996	95-8 18-Jun-1997	95-8 06-Nov-1997
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 05-Jun-1998	95-8 29-Oct-1998	95-8 06-May-1999	95-8 19-Oct-1999	95-8 05-May-2000	95-8 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	161	178	220	177	187
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	150	132	146	180	145	153
Ammonia Nitrogen	mg/l	--	--	0.22	0.13	0.03	0.08	0.01	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	19	3	3	3	13	--
Chloride	mg/l	--	250	140	142	135	151	138	152
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	836	888	840	908	700	780
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	242	227	266	269	259	208
Nitrate as N	mg/l	10.0	--	1	--	--	0.1	0.2	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	0.49	0.84	--	--	0.52
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	0.36	0.81	--	--	0.48
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	6.7	6.4	7.4	7.2	7.14
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	1.28
Sulphate	mg/l	--	500 [4]	92	75	68	71	67	75
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	416	445	430	450	350	486
Total Organic Carbon	mg/l	--	--	5.2	6.2	4.8	3.8	6	--
Total Suspended Solids	mg/l	--	--	--	--	--	712	598	1010
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Boron, dissolved	mg/l	5	--	0.14	0.07	0.04	0.16	0.12	0.04
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	52.3	50.2	61.4	61.4	58.2	41.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.58	2.72	2.17	1.47	1.73	0.03
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0012
Magnesium, dissolved	mg/l	--	--	26.6	24.8	27.1	27.6	27.2	25.2
Manganese, dissolved	mg/l	--	0.05	0.3	0.37	0.37	0.28	0.32	0.26
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.5	9.8	5	7	2	4.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	93.9	69.1	81.3	90.5	71.7	90
Zinc, dissolved	mg/l	--	5	0.35	0.01	0.01	0.16	0.12	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 05-Jun-1998	95-8 29-Oct-1998	95-8 06-May-1999	95-8 19-Oct-1999	95-8 05-May-2000	95-8 24-Oct-2000
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 14-Jun-2001	95-8 23-Nov-2001	95-8 23-May-2002	95-8 06-Nov-2002	95-8 30-May-2003	95-8 09-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	160	150	173	194	154	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	131	123	142	159	126	184
Ammonia Nitrogen	mg/l	--	--	0.31	0.03	0.22	0.05	0.16	0.1
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	1
Chemical Oxygen Demand	mg/l	--	--	11	4	3	12	7	12
Chloride	mg/l	--	250	139	136	144	158	145	142
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	850	750	770	652	780	940
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	44
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	238	250	247	231	265
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.1	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.86	0.66	1.4	0.33	0.38	0.36
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.55	0.63	1.18	0.28	0.22	0.26
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.1	6.23	6.74	7.2	6.4	7
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.22	1.01	0.6	0.48	0.25	0.19
Sulphate	mg/l	--	500 [4]	76	79	77	64	65	73
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	496	448	564	576	390	512
Total Organic Carbon	mg/l	--	--	5	6	5	5.2	5.2	10
Total Suspended Solids	mg/l	--	--	2150	682	436	554	128	132
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.04	0.05	0.04	0.05	0.03	0.039
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	54.3	51	53.1	53	48.9	56.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.005
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.007
Iron, dissolved	mg/l	--	0.3	0.08	0.04	1.8	0.75	1.13	2.73
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0008	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	22.9	26.8	28.4	27.9	26.4	30.2
Manganese, dissolved	mg/l	--	0.05	0.23	0.28	0.23	0.23	0.18	0.203
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	2.4	2.6	6.5	7.6	5.5	6.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	70.1	71.1	64.6	76.7	68.4	90.3
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.02	0.01	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.05	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 14-Jun-2001	95-8 23-Nov-2001	95-8 23-May-2002	95-8 06-Nov-2002	95-8 30-May-2003	95-8 09-Oct-2003
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 14-May-2004	95-8 19-Nov-2004	95-8 24-May-2005	95-8 16-Nov-2005	95-8 25-May-2006	95-8 21-Nov-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	162	275	310	222	358	492
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	133	230	254	364	358	492
Ammonia Nitrogen	mg/l	--	--	0.16	0.09	0.05	0.11	0.13	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	13	24	13	31	16	28
Chloride	mg/l	--	250	153	166	193	181	193	167
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	840	1110	1400	1300	1000	1300
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	233	310	366	579	408	552
Nitrate as N	mg/l	10.0	--	0.2	0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.498	0.57	0.44	0.56	0.51	0.92
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.34	0.48	0.39	0.45	0.38	0.76
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	6.7	5.9	--	6.9	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.608	1.06	0.33	0.29	--	--
Sulphate	mg/l	--	500 [4]	71	77	79	107	90	103
Temperature (Field)	deg c	--	15	--	--	6.6	10.7	4	7.5
Total Dissolved Solids	mg/l	--	500	420	550	631	800	734	866
Total Organic Carbon	mg/l	--	--	3.6	5	5.2	10.2	--	--
Total Suspended Solids	mg/l	--	--	424	528	149	165	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	0.0007
Boron, dissolved	mg/l	5	--	0.027	0.038	0.025	0.044	0.038	0.043
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.005	0.0001
Calcium, dissolved	mg/l	--	--	48.9	66.9	75.8	124	86.3	119
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	0.003	<0.002	0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.003	0.002	<0.002	0.007	0.004	0.011
Iron, dissolved	mg/l	--	0.3	0.497	0.205	2.02	0.674	2.16	1.17
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0006	<0.0002	<0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	27	34.8	42.9	65.7	46.7	62
Manganese, dissolved	mg/l	--	0.05	0.17	0.242	0.344	0.312	0.328	0.443
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	5.7	6.7	6.2	9.3	6.3	8.1
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [5]	70.9	89.2	85.1	103	100	110
Zinc, dissolved	mg/l	--	5	0.005	0.005	0.008	0.008	0.008	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.002	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 14-May-2004	95-8 19-Nov-2004	95-8 24-May-2005	95-8 16-Nov-2005	95-8 25-May-2006	95-8 21-Nov-2006
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 15-May-2007	95-8 30-Nov-2007	95-8 22-May-2008	95-8 10-Nov-2008	95-8 19-May-2009 G-12	95-8 27-Nov-2009 J-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	507	531	501	519	417	417
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [13]	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	507	531	501	519	417	417
Ammonia Nitrogen	mg/l	--	--	0.52	1.45	0.85	1.14	0.68	1.68
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	92	48	36	27	23	35
Chloride	mg/l	--	250	172	161	171	151	152	157
Conductivity	uS/cm	--	--	--	--	--	--	1350	1350
Conductivity (Field)	uS/cm	--	--	1100	1200	1300	1250	1000	1209
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	537	517	518	521	432	423
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.49	2.49	2	1.95	1.00	1.90
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.97	1.04	1.15	0.81	0.32	0.22
pH	-	--	--	--	--	--	--	7.25	7.32
pH (Field)	-	--	--	7	6.7	6.5	6.5	--	6.64
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.40	0.09
Sulphate	mg/l	--	500 [4]	101	89	88	80	59	51
Temperature (Field)	deg c	--	15	6.3	5	8.5	7	5	4.7
Total Dissolved Solids	mg/l	--	500	881	879	871	857	878	878
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0011	0.0011	0.0013	0.001	<0.001	0.001
Boron, dissolved	mg/l	5	--	0.038	0.044	0.036	0.042	0.07	0.05
Cadmium, dissolved	mg/l	0.005	--	0.00007	<0.00002	<0.00002	0.00025	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	115	117	117	122	97	97
Chromium, dissolved	mg/l	0.05	--	0.003	<0.002	0.002	0.002	0.007	0.008
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0014	0.0017
Copper, dissolved	mg/l	--	1	0.003	0.005	<0.002	0.045	0.010	0.005
Iron, dissolved	mg/l	--	0.3	3.16	1.55	3.35	0.038	0.03	3.11
Lead, dissolved	mg/l	0.01	--	0.00011	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	60.7	54.6	54.7	52.5	46	44
Manganese, dissolved	mg/l	--	0.05	0.508	0.551	0.593	1.36	1.12	1.57
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.5	10.7	9.4	12.4	8	10
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	114	127	125	124	111	116
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.005	<0.005	<0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 15-May-2007	95-8 30-Nov-2007	95-8 22-May-2008	95-8 10-Nov-2008	95-8 19-May-2009 G-12	95-8 27-Nov-2009 J-1
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 25-May-2010 [12]	95-8 20-Oct-2010	95-8 24-May-2011 [16]	95-8 29-Nov-2011	95-8 31-May-2012	95-8 28-Nov-2012
				M-4	G-11	G-6	95-8	95-8	95-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	475	452	486	521	540	690
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	<2 [13]	<2 [13]	<2 [13]	1.2	1.6
Alkalinity (Total as CaCO3)	mg/l	--	--	475	452	486	521	540	690
Ammonia Nitrogen	mg/l	--	--	1.60	1.77	2.03	2.08	2.3	2.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	40	38	45	53	90
Chloride	mg/l	--	250	126	145	142	137	130	120
Conductivity	uS/cm	--	--	1410	1360	1410	1450	--	--
Conductivity (Field)	uS/cm	--	--	1511	1395	1342	--	1416	1467
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	445	478	569	516	510	700
Nitrate as N	mg/l	10.0	--	<0.10	0.13	<0.10	<0.10	0.30	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.00	2.31	2.64	2.27	3.3	3.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	0.30	<0.10
Nitrogen, Organic	mg/l	--	--	0.4	0.54	0.61	0.19	1	1
pH	-	--	--	7.31	7.21	7.78	7.40	7.36	--
pH (Field)	-	--	--	6.48	6.63	6.57	--	6.51	6.51
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.11	0.06	0.02	0.08	0.058	0.052
Sulphate	mg/l	--	500 [4]	58	56	56	70	69	69
Temperature (Field)	deg c	--	15	9.4	8.8	13.2	--	11.0	7.4
Total Dissolved Solids	mg/l	--	500	917	884	916	942	872	990
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.001	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	0.05	0.05	0.05	0.04	0.056	0.052
Cadmium, dissolved	mg/l	0.005	--	0.0003	0.0001	0.0002	0.0002	0.00027	0.0004
Calcium, dissolved	mg/l	--	--	104	114	139	129	130	170
Chromium, dissolved	mg/l	0.05	--	0.008	0.007	0.006	0.006	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0029	0.0017	0.0030	0.0020	0.0013	0.0029
Copper, dissolved	mg/l	--	1	0.046	0.005	0.037	0.046	0.054	0.05
Iron, dissolved	mg/l	--	0.3	0.54	2.83	0.10	<0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	45	47	54	47	49	64
Manganese, dissolved	mg/l	--	0.05	2.30	1.54	3.44	2.61	2.6	6.7
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	11	16	13	13	19
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	102	116	94	100	100	100
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	<0.01	0.0064	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 25-May-2010 [12] M-4	95-8 20-Oct-2010 G-11	95-8 24-May-2011 [16] G-6	95-8 29-Nov-2011 95-8	95-8 31-May-2012 95-8	95-8 28-Nov-2012 95-8
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.004	<0.0004	<0.00010	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.005	<0.0005	<0.00010	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.005	<0.0005	<0.00010	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.01	<0.0005	<0.00010	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.04	<0.0040	<0.00050	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.005	<0.0005	<0.00010	<0.00025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.005	<0.0005	<0.00020	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.002	<0.0002	<0.00020	<0.00050

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 29-May-2013 [17]	95-8 26-Nov-2013	95-8 29-May-2014	95-8 19-Nov-2014	95-8 02-Jun-2015	95-8 26-Nov-2015
				95-8	GW-13	95-8	95-8	95-8	95-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	700	670	710	670	712	779
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.5	1.2	1.9	1.0	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	700	670	720	680	713	779
Ammonia Nitrogen	mg/l	--	--	3.6	2.5	2.7	2.8	2.57	2.60
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	75	59	70	65	81	94
Chloride	mg/l	--	250	130	140	160	170	185	177
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1448	1415	1576	1781	1782	1822
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	730	680	760	700	650	826
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.010	<0.010	0.068	0.013	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.4	3.1	3.3	3.7	3.7	3.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	0.8	0.6	0.6	0.9	1.13	1.1
pH	-	--	--	7.36	7.27	7.45	7.22	--	--
pH (Field)	-	--	--	6.61	6.73	6.57	6.62	6.57	6.74
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.19	0.11	0.070	0.063	0.05	0.05
Sulphate	mg/l	--	500 [4]	67	55	42	45	37	32
Temperature (Field)	deg c	--	15	12	8.7	9.2	6.0	10.7	8.4
Total Dissolved Solids	mg/l	--	500	1050	1010	1050	1010	1080	1110
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.054	0.057	0.065	0.063	0.059	0.068
Cadmium, dissolved	mg/l	0.005	--	0.00025	0.00023	0.00048	0.00050	0.0003	0.0003
Calcium, dissolved	mg/l	--	--	180	170	190	180	148	197
Chromium, dissolved	mg/l	0.05	--	<0.0050	0.0059	0.0054	<0.0050	0.004	0.006
Cobalt, dissolved	mg/l	--	--	0.0035	0.0032	0.0034	0.0027	0.0031	0.0034
Copper, dissolved	mg/l	--	1	0.011	0.031	0.015	0.0040	0.0196	0.0571
Iron, dissolved	mg/l	--	0.3	1.8	<0.1	1.6	3.1	<0.1	0.226
Lead, dissolved	mg/l	0.01	--	0.00060	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	64	62	69	64	68	81.1
Manganese, dissolved	mg/l	--	0.05	7.4	6.9	8.2	6.7	10.2	8.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18	16	17	16	15.7	16.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	100	100	120	120	116	139
Zinc, dissolved	mg/l	--	5	0.0093	0.0087	0.0082	<0.0050	<0.005	0.016
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [7]	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 29-May-2013 [17] 95-8	95-8 26-Nov-2013 GW-13	95-8 29-May-2014 95-8	95-8 19-Nov-2014 95-8	95-8 02-Jun-2015 95-8	95-8 26-Nov-2015 95-8
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 26-May-2016	95-8 17-Nov-2016	95-8 24-May-2017	95-8 29-Nov-2017	95-8 24-May-2018	95-8 22-Nov-2018
				95-8	95-8	95-8	95-8	95-8	95-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	768	773	856	836	941	953
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	768	773	856	836	942	953
Ammonia Nitrogen	mg/l	--	--	2.83	2.25	1.80	2.17	2.42	1.92
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	91	88	286	94	129	117
Chloride	mg/l	--	250	188	181	172	226	200	199
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1817	1894	1915	1818	2068	1819
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	776	712	769	771	962	1120
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.5	3.2	3.0	3.3	4.0	3.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.67	0.95	1.2	1.13	1.58	1.28
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.77	7.05	6.62	6.67	6.48	6.68
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.07	0.06	0.02	0.06	0.04	0.08
Sulphate	mg/l	--	500 [4]	39	33	26	25	17	16
Temperature (Field)	deg c	--	15	13.5	10.4	12.0	8.3	11.9	6.8
Total Dissolved Solids	mg/l	--	500	1180	1030	1130	1140	1410	1210
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.001	0.002	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.084	0.058	0.051	0.083	0.065	0.091
Cadmium, dissolved	mg/l	0.005	--	0.0003	0.0003	0.0002	0.0004	0.0005	0.0003
Calcium, dissolved	mg/l	--	--	197	185	209	200	263	313
Chromium, dissolved	mg/l	0.05	--	0.006	0.014	0.014	0.007	0.008	0.007
Cobalt, dissolved	mg/l	--	--	0.0035	0.0012	0.0026	0.0031	0.0033	0.0035
Copper, dissolved	mg/l	--	1	0.0351	0.0547	0.0371	0.0087	0.112	0.107
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	1.33	<0.1	0.124
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	68.7	60.6	59.8	65.9	73.8	82.8
Manganese, dissolved	mg/l	--	0.05	9.2	5.7	8.23	8.27	11.8	5.83
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	21.5	16.5	16.5	17.8	17.9	20.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	120	129	128	125	117	145
Zinc, dissolved	mg/l	--	5	0.006	0.008	0.008	<0.005	0.007	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.006	<0.002 [7]	<0.002 [7]	<0.001	<0.002 [7]	0.004

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 26-May-2016	95-8 17-Nov-2016	95-8 24-May-2017	95-8 29-Nov-2017	95-8 24-May-2018	95-8 22-Nov-2018
				95-8	95-8	95-8	95-8	95-8	95-8
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 19-Jun-2019	95-8 20-Nov-2019	95-8 21-May-2020	95-8 26-Nov-2020
				95-8	95-8	95-8	95-8
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	943	916	1010	1160
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<25 [18]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	944	916	1010	1170
Ammonia Nitrogen	mg/l	--	--	2.25	2.66	2.82	1.70
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	124	121	138	169
Chloride	mg/l	--	250	161	165	198	166
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1848	2070	1876	1855
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	864	911	853	925
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1	<0.5 [11]
Nitrite as N	mg/l	1.0	--	0.07	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.4	3.3	3.5	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.15	0.64	0.68	1.3
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	6.5	7.14	6.8
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.02	0.02	0.03	0.04
Sulphate	mg/l	--	500 [4]	14	14	15	9
Temperature (Field)	deg c	--	15	12.5	7.1	16.7	6.8
Total Dissolved Solids	mg/l	--	500	1260	1250	1350	1270
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.073	0.067	0.05	0.057
Cadmium, dissolved	mg/l	0.005	--	0.0003	0.0004	0.0001	0.0002
Calcium, dissolved	mg/l	--	--	213	225	212	230
Chromium, dissolved	mg/l	0.05	--	0.009	0.013	0.013	0.011
Cobalt, dissolved	mg/l	--	--	0.0027	0.0043	0.0042	0.0027
Copper, dissolved	mg/l	--	1	0.0948	0.0094	0.0096	0.0926
Iron, dissolved	mg/l	--	0.3	<0.1	4.02	3.51	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	0.0002	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	80.6	84.9	78.6	85.4
Manganese, dissolved	mg/l	--	0.05	11.3	10.6	10.9	10.8
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	x	--	--
Potassium, dissolved	mg/l	--	--	22.6	24.2	19.3	18.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	124	131	132	125
Zinc, dissolved	mg/l	--	5	<0.005	0.008	0.006	0.014
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.010 [7]	0.009	<0.004 [11]

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	95-8 19-Jun-2019	95-8 20-Nov-2019	95-8 21-May-2020	95-8 26-Nov-2020
				95-8	95-8	95-8	95-8
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 29-Oct-1998	98-1 06-May-1999	98-1 05-May-2000	98-1 24-Oct-2000	98-1 14-Jun-2001	98-1 23-Nov-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	293	342	357	323	272	267
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	240	280	293	265	223	219
Ammonia Nitrogen	mg/l	--	--	0.34	0.63	0.01	0.01	0.34	0.33
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	7	6	--	12	5
Chloride	mg/l	--	250	210	290	197	209	184	181
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1066	1420	1200	1260	1050	1140
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	256	214	218	233	273	278
Nitrate as N	mg/l	10.0	--	--	--	0.3	0.5	0.4	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.87	0.99	--	0.5	0.57	0.62
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.53	0.36	--	0.49	0.23	0.29
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.1	7.7	7.7	7.7	6.87
Phosphorus	mg/l	--	--	--	--	--	0.13	0.12	0.07
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	116	33	47	55	63	77
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	536	710	600	612	584	556
Total Organic Carbon	mg/l	--	--	13.8	8.4	4.6	--	3.8	6
Total Suspended Solids	mg/l	--	--	--	--	284	98	74	91
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.12	0.13	0.19	0.08	0.06	0.09
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	64.6	45.2	48.5	49.4	65.9	63.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.13	2.41	0.42	0.03	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	22.9	24.3	23.1	26.7	26.3	29.1
Manganese, dissolved	mg/l	--	0.05	0.53	0.27	0.18	0.19	0.26	0.33
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.5	6.7	8.2	12.4	3.4	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	150	238	200	148	114	131
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.08	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.055	0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 29-Oct-1998	98-1 06-May-1999	98-1 05-May-2000	98-1 24-Oct-2000	98-1 14-Jun-2001	98-1 23-Nov-2001
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 23-May-2002	98-1 06-Nov-2002	98-1 30-May-2003	98-1 09-Oct-2003	98-1 14-May-2004	98-1 19-Nov-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	266	271	271	--	282	329
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4	1	1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	224	222	222	227	231	270
Ammonia Nitrogen	mg/l	--	--	0.26	0.16	0.3	0.22	0.27	0.48
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	2	--	--
Chemical Oxygen Demand	mg/l	--	--	3	13	10	7	16	248
Chloride	mg/l	--	250	189	182	192	196	183	199
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1210	1190	1060	1280	1200	1170
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	53	--	--
Hardness, Calcium Carbonate	mg/l	--	--	266	253	268	242	263	284
Nitrate as N	mg/l	10.0	--	0.3	0.5	0.3	0.3	0.4	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.43	0.99	0.62	0.659	2.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.24	0.27	0.69	0.4	0.39	2.34
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.06	7.6	6.8	7.4	7.5	7.3
Phosphorus	mg/l	--	--	0.09	0.06	0.55	0.36	0.136	3.09
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	63	61	57	51	57	63
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	20800	588	530	626	600	585
Total Organic Carbon	mg/l	--	--	4	4.6	4.6	8	4	6.2
Total Suspended Solids	mg/l	--	--	80	74	627	340	66	740
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.0001
Boron, dissolved	mg/l	5	--	0.07	0.08	0.05	0.072	0.065	0.062
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	61.2	58.3	62.4	54.4	60.3	66.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.004	0.001	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	0.003	0.006
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.19	1.02	0.01	0.007
Lead, dissolved	mg/l	0.01	--	0.0002	0.0004	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	27.6	26	27.2	25.7	27.4	28.5
Manganese, dissolved	mg/l	--	0.05	0.33	0.28	0.38	0.274	0.408	0.454
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	0.01	0.01
Potassium, dissolved	mg/l	--	--	9.3	8.8	7.5	8.8	8.6	8.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	120	120	114	153	148	119
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.005	0.005	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 23-May-2002	98-1 06-Nov-2002	98-1 30-May-2003	98-1 09-Oct-2003	98-1 14-May-2004	98-1 19-Nov-2004
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2005	98-1 16-Nov-2005	98-1 25-May-2006	98-1 21-Nov-2006	98-1 15-May-2007	98-1 30-Nov-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	178	310	300	328	336
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	254	292	310	300	328	336
Ammonia Nitrogen	mg/l	--	--	0.23	<0.01	0.16	0.04	0.21	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	9	9	6	6	39	47
Chloride	mg/l	--	250	191	246	205	224	275	214
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1800	930	1075	1100	1100	1100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	222	258	263	260	246	291
Nitrate as N	mg/l	10.0	--	0.2	0.5	0.4	0.3	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.54	0.2	0.37	0.33	0.78	0.25
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.31	<0.2	0.21	0.29	0.57	<0.25
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.1	--	7.7	8.2	8.2	7.6
Phosphorus	mg/l	--	--	0.11	0.09	--	--	--	--
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	55	35	52	42	37	48
Temperature (Field)	deg c	--	15	6.9	11.2	5	7	6.9	6
Total Dissolved Solids	mg/l	--	500	681	725	701	723	824	788
Total Organic Carbon	mg/l	--	--	4	5.4	--	--	--	--
Total Suspended Solids	mg/l	--	--	38	22	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	0.002	0.0029	0.0028
Boron, dissolved	mg/l	5	--	0.095	0.089	0.074	0.084	0.109	0.095
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.0001	0.00003	<0.00002
Calcium, dissolved	mg/l	--	--	47.7	59.3	59	58.6	54.6	67
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.007	<0.005
Copper, dissolved	mg/l	--	1	<0.002	0.004	0.009	0.003	<0.002	0.003
Iron, dissolved	mg/l	--	0.3	0.013	0.007	0.014	0.008	0.235	0.056
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	0.0002	<0.0001	0.00007	<0.00002
Magnesium, dissolved	mg/l	--	--	25.1	26.6	28	27.7	26.7	30.2
Manganese, dissolved	mg/l	--	0.05	0.215	0.192	0.32	0.022	0.19	0.319
Mercury, dissolved	mg/l	0.001	--	<0.00006	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.1	10.3	8.3	9.4	10	10.2
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	208	180	169	180	222	215
Zinc, dissolved	mg/l	--	5	<0.005	0.009	<0.005	0.009	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2005	98-1 16-Nov-2005	98-1 25-May-2006	98-1 21-Nov-2006	98-1 15-May-2007	98-1 30-Nov-2007
Semi-VOCs									
Naphthalene	mg/l	--	--	<0.0007	--	--	--	--	--
Styrene	mg/l	--	--	<0.0006	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	<0.0001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	<0.0001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	<0.0004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	<0.0001	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	<0.0001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	<0.0002	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	<0.0001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	<0.0001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	<0.0001	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	<0.0001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	<0.0001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	<0.0002	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	<0.0001	--	--	--	--	--
Bromoform	mg/l	--	--	<0.0001	--	--	--	--	--
Bromomethane	mg/l	--	--	<0.002	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	<0.0002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	<0.0002	--	--	--	--	--
Chloroform	mg/l	--	--	<0.0003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	<0.0001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	<0.0002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	<0.0001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 22-May-2008	98-1 10-Nov-2008	98-1 19-May-2009	98-1 27-Nov-2009	98-1 25-May-2010 [12]	98-1 20-Oct-2010 [12]
						G-18	J-4	M-3	G-12
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	333	327	364	369	476	502
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [13]	<2 [13]	<2 [13]	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	333	327	364	369	476	502
Ammonia Nitrogen	mg/l	--	--	0.02	0.08	0.27	0.57	1.09	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	10	<5	20	25	28	35
Chloride	mg/l	--	250	247	265	341	467	714	819
Conductivity	uS/cm	--	--	--	--	1830	2120	3320	3480
Conductivity (Field)	uS/cm	--	--	1250	1300	1200	750	3200	3190
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	278	251	292	213	246	260
Nitrate as N	mg/l	10.0	--	0.3	0.3	0.15	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.69	0.4	0.46	0.66	1.16	1.61
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.67	0.32	0.19	0.09	0.07	0.33
pH	-	--	--	--	--	7.77	8.22	8.29	8.21
pH (Field)	-	--	--	--	7.4	--	7.15	7.78	7.82
Phosphorus	mg/l	--	--	--	--	--	0.32	0.54	0.53
Phosphorus, dissolved	mg/l	--	--	--	--	0.76	--	--	--
Sulphate	mg/l	--	500 [4]	43	38	24	6	8	2
Temperature (Field)	deg c	--	15	--	6	6	5.5	12.6	8.7
Total Dissolved Solids	mg/l	--	500	798	822	1190	1380	2160	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0025	0.0023	0.003	0.004	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.092	0.109	0.21	0.18	0.26	0.30
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	63.6	56.7	64	44	44	48
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	0.009	<0.005	0.007	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0003	0.0004	0.0004	0.0003
Copper, dissolved	mg/l	--	1	0.002	0.003	0.001	0.006	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.013	<0.005	0.22	<0.03	<0.03	0.08
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	28.9	26.5	32	25	33	34
Manganese, dissolved	mg/l	--	0.05	0.379	0.039	0.27	0.27	0.11	0.09
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.1	10.4	11	11	18	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	206	229	243	386	516	578
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01	0.01	<0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 22-May-2008	98-1 10-Nov-2008	98-1 19-May-2009	98-1 27-Nov-2009	98-1 25-May-2010 [12]	98-1 20-Oct-2010 [12]
						G-18	J-4	M-3	G-12
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	<0.0006	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2011 [12]	98-1 08-Dec-2011 [12]	98-1 31-May-2012	98-1 28-Nov-2012	98-1 29-May-2013	98-1 26-Nov-2013
				G-3	B-1	98-1	98-1	98-1	GW-4
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	355	343	370	390	350	400
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7	<2 [13]	3.7	3.3	3.2	3.8
Alkalinity (Total as CaCO3)	mg/l	--	--	362	343	370	390	360	410
Ammonia Nitrogen	mg/l	--	--	0.88	0.84	0.12	0.77	1.2	0.92
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	33	20	23	30	36	23
Chloride	mg/l	--	250	488	389	320	360	400	260
Conductivity	uS/cm	--	--	2260	1860	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1897	2049	1615	1676	1459	1659
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	222	245	240	280	320	340
Nitrate as N	mg/l	10.0	--	<0.10	0.37	0.80	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.075	0.10	0.22	0.018
Nitrogen, Total Kjeldahl	mg/l	--	--	1.46	1.09	0.79	1.1	1.4	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	0.88	0.19	0.26	<0.10
Nitrogen, Organic	mg/l	--	--	0.58	0.25	0.67	0.33	0.2	0.48
pH	-	--	--	8.32	8.16	8.02	--	7.98	8.00
pH (Field)	-	--	--	7.75	7.93	7.59	7.48	7.40	7.63
Phosphorus	mg/l	--	--	0.66	0.65	0.073	0.30	0.47	0.48
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	9	6	9	4	10	12
Temperature (Field)	deg c	--	15	12.6	7.1	11.0	7.2	10.1	7.3
Total Dissolved Solids	mg/l	--	500	1470	1210	974	986	1040	1100
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	0.0016	0.001	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.16	0.13	0.21	0.21	0.15	0.11
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	46	57	50	58	82	80
Chromium, dissolved	mg/l	0.05	--	0.005	0.004	<0.0050	<0.005	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0004	0.0003	<0.00050	<0.0005	0.00096	0.00053
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0017	<0.001	0.0012	0.0012
Iron, dissolved	mg/l	--	0.3	<0.03	0.58	<0.1	0.52	<0.1	0.26
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	26	25	28	34	28	35
Manganese, dissolved	mg/l	--	0.05	0.10	0.14	0.25	0.35	0.78	0.34
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	10	12	14	14	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	388	271	350	350	230	140
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.0091	<0.005	<0.0050	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2011 [12] G-3	98-1 08-Dec-2011 [12] B-1	98-1 31-May-2012 98-1	98-1 28-Nov-2012 98-1	98-1 29-May-2013 98-1	98-1 26-Nov-2013 GW-4
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00010	<0.00025	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.00050	<0.0013	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00020	<0.00050	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00020	<0.00050	<0.00020	<0.00020

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 29-May-2014	98-1 19-Nov-2014	98-1 02-Jun-2015	98-1 26-Nov-2015	98-1 26-May-2016	98-1 17-Nov-2016
				98-1	98-1	98-1	98-1	98-1	98-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	300	380	404	389	426	477
Alkalinity, Carbonate as CaCO3	mg/l	--	--	3.2	4.1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	300	380	406	392	428	479
Ammonia Nitrogen	mg/l	--	--	0.89	0.94	0.92	0.98	1.49	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	29	21	28	30	28	56
Chloride	mg/l	--	250	330	470	465	472	406	430
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1613	1934	1909	2143	2053	2259
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	250	290	293	235	399	322
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.1	<0.1	0.6	0.1
Nitrite as N	mg/l	1.0	--	0.165	0.064	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.4	1.4	1.5	1.4	1.8	1.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.19	<0.10	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.51	0.46	0.58	0.42	0.31	0.32
pH	-	--	--	8.06	8.06	--	--	--	--
pH (Field)	-	--	--	7.44	7.52	7.52	8.02	7.95	7.39
Phosphorus	mg/l	--	--	0.46	0.49	0.39	0.36	0.31	0.41
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	28	5	5	3	7	3
Temperature (Field)	deg c	--	15	9.4	7.9	10.1	8.1	13.8	9.7
Total Dissolved Solids	mg/l	--	500	1050	1090	1200	1180	1090	1130
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0015	0.0017	<0.001	0.002	0.001	0.002
Boron, dissolved	mg/l	5	--	0.16	0.17	0.112	0.175	0.17	0.31
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	65	68	56.8	51.7	63.5	70.4
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.008
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0027	<0.0020	<0.0005	<0.0005	0.0010	0.0053
Iron, dissolved	mg/l	--	0.3	0.85	1.6	<0.1	0.584	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	20	30	36.7	25.8	36.3	35.5
Manganese, dissolved	mg/l	--	0.05	0.17	0.46	0.162	0.285	0.066	0.119
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	14	11.6	10.8	15.3	14.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	250	300	164	376	283	319
Zinc, dissolved	mg/l	--	5	0.0054	<0.0050	0.067	0.012	<0.005	0.017
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	0.001	<0.001	0.003	0.003

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 29-May-2014	98-1 19-Nov-2014	98-1 02-Jun-2015	98-1 26-Nov-2015	98-1 26-May-2016	98-1 17-Nov-2016
				98-1	98-1	98-1	98-1	98-1	98-1
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2017	98-1 29-Nov-2017	98-1 24-May-2018	98-1 29-Nov-2018	98-1 19-Jun-2019
				98-1	98-1	98-1	98-1	98-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	442	547	501	548	523
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	445	549	504	550	526
Ammonia Nitrogen	mg/l	--	--	1.43	2.00	1.73	1.28	2.15
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	47	42	48	42
Chloride	mg/l	--	250	458	455	478	423	433
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2194	1982	2196	1901	2053
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	315	357	330	400	414
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.2
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	0.07	0.33
Nitrogen, Total Kjeldahl	mg/l	--	--	1.8	2.5	3.0	2.6	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.37	0.5	1.27	1.32	0.95
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.75	7.61	7.44	7.47	7.37
Phosphorus	mg/l	--	--	0.35	0.46	0.45	0.69	0.39
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	3	3	2	3	3
Temperature (Field)	deg c	--	15	11.2	7.7	10.9	7.3	13.2
Total Dissolved Solids	mg/l	--	500	1130	1170	1390	1120	1170
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.003	0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.154	0.201	0.173	0.153	0.163
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	74.9	78.8	74	82.4	93.7
Chromium, dissolved	mg/l	0.05	--	0.006	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0008	<0.0005	0.0009	0.0009
Copper, dissolved	mg/l	--	1	0.0012	0.0008	0.0008	0.0031	0.0011
Iron, dissolved	mg/l	--	0.3	0.942	4.67	0.699	0.581	6.58
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31.1	39	35.2	47.2	43.8
Manganese, dissolved	mg/l	--	0.05	0.816	0.8	0.352	0.504	1.39
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.8	15	13.5	16.5	18.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	353	317	335	332	327
Zinc, dissolved	mg/l	--	5	0.009	<0.005	0.006	<0.005	0.006
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2017	98-1 29-Nov-2017	98-1 24-May-2018	98-1 29-Nov-2018	98-1 19-Jun-2019
				98-1	98-1	98-1	98-1	98-1
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 20-Nov-2019	98-1 21-May-2020	98-1 26-Nov-2020
				98-1	98-1	98-1
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	501	409	429
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	6
Alkalinity (Total as CaCO3)	mg/l	--	--	505	414	435
Ammonia Nitrogen	mg/l	--	--	1.23	0.63	1.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	51	39	37
Chloride	mg/l	--	250	413	588	508
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2260	1960	2033
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	412	312	334
Nitrate as N	mg/l	10.0	--	0.5	0.2	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	1.1	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.47	0.47	0.38
pH	-	--	--	--	--	--
pH (Field)	-	--	--	7.7	7.57	8.07
Phosphorus	mg/l	--	--	0.40	0.18	0.58
Phosphorus, dissolved	mg/l	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	2	3	1
Temperature (Field)	deg c	--	15	5.5	13.2	7.0
Total Dissolved Solids	mg/l	--	500	1080	1190	1210
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001
Boron, dissolved	mg/l	5	--	0.157	0.163	0.156
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	87	66.1	69.8
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0016	0.0031	0.0008
Iron, dissolved	mg/l	--	0.3	0.77	<0.1	2.47
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	47.2	35.7	38.7
Manganese, dissolved	mg/l	--	0.05	0.288	0.222	0.344
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	19.2	14.4	14.9
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	322	354	345
Zinc, dissolved	mg/l	--	5	<0.005	0.006	0.008
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.002	<0.004 [11]

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-1 20-Nov-2019	98-1 21-May-2020	98-1 26-Nov-2020
				98-1	98-1	98-1
Semi-VOCs						
Naphthalene	mg/l	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-2 06-May-1999	98-2 19-Oct-1999	98-2 24-Oct-2000	98-2 14-Jun-2001	98-2 06-Nov-2002	98-2 30-May-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	610	584	382	289	296	215
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	13	1	2	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	500	500	313	241	243	176
Ammonia Nitrogen	mg/l	--	--	0.83	1.12	0.35	0.76	0.36	0.31
Chemical Oxygen Demand	mg/l	--	--	18	10	--	8	34	12
Chloride	mg/l	--	250	831	834	355	278	305	171
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	1710	1050	2100	890
Hardness, Calcium Carbonate	mg/l	--	--	263	268	189	198	207	195
Nitrate as N	mg/l	10.0	--	--	4.5	0.3	0.4	0.6	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	--	1.8	1.66	0.56	1.09
Nitrogen, Organic	mg/l			1.67	--	1.45	0.9	0.2	0.78
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.88	7.7	7.9	6.9
Phosphorus	mg/l	--	--	--	--	4.33	2.68	1.97	2.54
Sulphate	mg/l	--	500 [4]	11	13	42	46	46	54
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	836	764	738	445
Total Organic Carbon	mg/l	--	--	11.8	10	--	5.2	4.7	4.5
Total Suspended Solids	mg/l	--	--	--	1020	5450	3560	2430	2170
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	0.002	0.001	0.004	0.001
Boron, dissolved	mg/l	5	--	0.32	0.44	0.17	0.1	0.09	0.06
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	44.8	48.6	35.3	44.1	46.2	42.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	2.15	0.2	0.02	0.07	0.14
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0022	0.0002	0.0005	0.0003
Magnesium, dissolved	mg/l	--	--	31.5	35.2	24.4	21.4	22.2	21.8
Manganese, dissolved	mg/l	--	0.05	0.08	0.24	0.33	0.38	0.53	0.49
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	16.8	19.2	8.4	2.5	8.3	7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	586	718	340	200	213	112
Zinc, dissolved	mg/l	--	5	0.01	0.06	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.001	0.049	0.001	0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-2 19-Nov-2004	98-2 16-Nov-2005	98-2 15-May-2007	98-2 10-Nov-2008	98-2 27-Nov-2009 J-11
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	348	189	422	423	533
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	290	314	422	423	533
Ammonia Nitrogen	mg/l	--	--	0.36	1.1	0.43	1.14	1.40
Chemical Oxygen Demand	mg/l	--	--	13	70	77	17	55
Chloride	mg/l	--	250	255	350	594	547	913
Conductivity	uS/cm	--	--	--	--	--	--	3710
Conductivity (Field)	uS/cm	--	--	1540	1800	1900	2550	2870
Hardness, Calcium Carbonate	mg/l	--	--	211	198	236	229	247
Nitrate as N	mg/l	10.0	--	2	0.5	0.3	0.4	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.64	2.65	1.2	2.28	1.65
Nitrogen, Organic	mg/l			0.28	1.55	0.77	1.14	0.25
pH	-	--	--	--	--	--	--	8.25
pH (Field)	-	--	--	7.5	--	8.1	7.8	8.8
Phosphorus	mg/l	--	--	0.17	8.32	--	--	1.66
Sulphate	mg/l	--	500 [4]	40	39	31	32	3
Temperature (Field)	deg c	--	15	--	11.4	8.2	9	4.3
Total Dissolved Solids	mg/l	--	500	770	958	1430	1320	2410
Total Organic Carbon	mg/l	--	--	1.8	8.8	--	--	--
Total Suspended Solids	mg/l	--	--	32	404	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.0049	0.0034	0.005
Boron, dissolved	mg/l	5	--	0.097	0.252	0.243	0.197	0.37
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.00003	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	44.8	36.9	45	45.8	43
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	0.007
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	0.0006
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.105	0.051	0.339	<0.005	<0.03
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	0.0002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	24	25.7	30	27.7	34
Manganese, dissolved	mg/l	--	0.05	0.217	0.197	0.202	0.002	0.19
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	12.6	12.2	17.2	13.1	18
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	226	314	460	399	635
Zinc, dissolved	mg/l	--	5	0.005	0.007	<0.005	<0.005	<0.01
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001
VOCs								
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-3 06-May-1999	98-3 24-Oct-2000	98-3 14-Jun-2001	98-3 06-Nov-2002	98-3 30-May-2003	98-3 19-Nov-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	184	282	154	194	181	198
Alkalinity, Carbonate as CaCO3	mg/l	--	--	29	1	13	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	200	231	150	159	148	160
Ammonia Nitrogen	mg/l	--	--	2.03	1.3	1.19	0.17	0.09	0.98
Chemical Oxygen Demand	mg/l	--	--	92	--	47	11	2	257
Chloride	mg/l	--	250	3.4	4.1	2	20.8	2.6	2
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	440	375	270	320	370
Hardness, Calcium Carbonate	mg/l	--	--	15	8	13	26	29	26
Nitrate as N	mg/l	10.0	--	--	0.2	0.3	2.3	1.2	0.9
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4.24	2.52	4.05	0.05	0.29	0.98
Nitrogen, Organic	mg/l	--	--	2.21	1.22	2.86	0	0.2	0
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	8.31	9	8.8	7.5	8.2
Phosphorus	mg/l	--	--	--	4.11	5.9	1.29	0.96	7.9
Sulphate	mg/l	--	500 [4]	34	38	42	33	27	26
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	340	260	400	160	185
Total Organic Carbon	mg/l	--	--	9	--	3.8	2.7	3.4	3.2
Total Suspended Solids	mg/l	--	--	--	11600	8900	1380	1300	2310
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	0.006	0.008	0.006	0.005	0.004
Boron, dissolved	mg/l	5	--	0.16	0.14	0.15	0.15	0.14	0.144
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	2.37	2	3.29	5.72	7	6.34
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002
Iron, dissolved	mg/l	--	0.3	1.1	0.12	0.02	0.02	0.03	0.009
Lead, dissolved	mg/l	0.01	--	0.0026	0.0006	0.0003	0.0014	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	2.22	0.82	1.24	2.82	2.86	2.57
Manganese, dissolved	mg/l	--	0.05	0.03	0.01	0.01	0.03	0.01	0.015
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	2.4	3	0.4	0.4	3.2	3.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	99.3	120	83.9	78.3	72.1	67.6
Zinc, dissolved	mg/l	--	5	0.05	0.01	0.01	0.01	0.01	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.003	0.049	0.001	0.001	0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-3 16-Nov-2005	98-3 15-May-2007	98-3 10-Nov-2008	98-3 27-Nov-2009 J-50	98-3 24-May-2011 [12] G-36
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	217	165	158	153	156
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	4	4
Alkalinity (Total as CaCO3)	mg/l	--	--	178	165	160	158	160
Ammonia Nitrogen	mg/l	--	--	0.26	<0.01	0.2	0.15	<0.02
Chemical Oxygen Demand	mg/l	--	--	16	27	<100	25	10
Chloride	mg/l	--	250	2.9	2.6	2	4	3
Conductivity	uS/cm	--	--	--	--	--	342	360
Conductivity (Field)	uS/cm	--	--	376	240	335	331	338
Hardness, Calcium Carbonate	mg/l	--	--	22	28	24	30	30
Nitrate as N	mg/l	10.0	--	0.4	0.4	0.4	1.05	1.15
Nitrite as N	mg/l	1.0	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.39	0.26	0.62	0.15	0.14
Nitrogen, Organic	mg/l	--	--	0.13	<0.26	0.42	0	<0.14
pH	-	--	--	--	--	--	8.48	8.43
pH (Field)	-	--	--	--	8.8	8.2	7.74	8.36
Phosphorus	mg/l	--	--	1.31	--	--	1.34	0.67
Sulphate	mg/l	--	500 [4]	19	28	20	21	21
Temperature (Field)	deg c	--	15	--	8.7	9	8.3	20.8
Total Dissolved Solids	mg/l	--	500	218	216	202	222	234
Total Organic Carbon	mg/l	--	--	3.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	11400	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0077	0.007	0.006	<0.01
Boron, dissolved	mg/l	5	--	0.147	0.135	0.131	0.16	0.14
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.00005	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	5.57	6.56	5.74	7	7
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	0.008	<0.005	<0.0002	0.0002
Copper, dissolved	mg/l	--	1	0.004	<0.002	<0.002	0.004	0.005
Iron, dissolved	mg/l	--	0.3	0.007	0.197	<0.005	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	<0.0002	0.00079	0.00011	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	2.07	2.83	2.39	3	3
Manganese, dissolved	mg/l	--	0.05	0.015	0.015	0.013	0.01	<0.01
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.7	3.3	3.7	4	3
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	79.6	72.1	71.9	75	71
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.01	<0.01
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs								
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-4 29-Oct-1998	98-4 06-May-1999	98-4 19-Oct-1999	98-4 05-May-2000	98-4 24-Oct-2000	98-4 14-Jun-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	151	148	159	143	134	140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	2
Alkalinity (Total as CaCO3)	mg/l	--	--	124	121	130	117	110	119
Ammonia Nitrogen	mg/l	--	--	0.08	0.02	0.04	0.01	0.01	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	3	6	4	--	3
Chloride	mg/l	--	250	8.2	6.9	8	7.1	8.8	8.5
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	888	360	--	330	325	340
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	125	117	114	100	83	100
Nitrate as N	mg/l	10.0	--	--	--	0.6	0.6	0.6	0.7
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.04	1.27	--	--	0.32	0.32
Nitrogen, Organic	mg/l	--	--	0.96	1.25	--	--	0.31	0.29
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	6.9	--	7.9	7.55	7.9
Phosphorus	mg/l	--	--	--	--	--	--	0.26	0.67
Sulphate	mg/l	--	500 [4]	116	57	59	49	51	52
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	445	180	--	165	193	292
Total Organic Carbon	mg/l	--	--	12.7	5.1	3.9	2.8	--	1.9
Total Suspended Solids	mg/l	--	--	--	--	352	728	324	1060
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.002	0.002
Boron, dissolved	mg/l	5	--	0.08	0.06	0.17	0.14	0.07	0.06
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	37.8	29.3	29	25.7	21.4	26.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	0.02	1.64	1.12	0.03	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	7.34	10.6	9.97	8.51	7.14	8.42
Manganese, dissolved	mg/l	--	0.05	0.19	0.07	0.06	0.03	0.03	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5	0.8	5.9	0.4	4.3	0.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	53.3	35.7	44.8	39.9	36.5	35.1
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.07	0.02	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.047

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-4 29-Oct-1998	98-4 06-May-1999	98-4 19-Oct-1999	98-4 05-May-2000	98-4 24-Oct-2000	98-4 14-Jun-2001
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-4 23-Nov-2001	98-4 23-May-2002	98-4 06-Nov-2002	98-4 30-May-2003	98-4 09-Oct-2003	98-4 14-May-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	131	131	132	134	--	118
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	107	107	108	110	102	97
Ammonia Nitrogen	mg/l	--	--	0.01	0.21	0.01	0.03	0.02	0.06
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	1	--
Chemical Oxygen Demand	mg/l	--	--	6	3	6	9	4	2
Chloride	mg/l	--	250	9.5	8.8	8.9	8.5	8.2	9.2
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	340	320	241	290	360	320
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	25	--
Hardness, Calcium Carbonate	mg/l	--	--	95	97	87	88	87	88
Nitrate as N	mg/l	10.0	--	0.6	0.6	0.7	0.5	0.6	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.45	0.14	0.24	0.67	0.13	0.16
Nitrogen, Organic	mg/l	--	--	0.44	0	0.23	0.64	0.11	0.1
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.65	7.32	8.2	7.2	7.4	8.2
Phosphorus	mg/l	--	--	0.5	0.3	0.1	1	0.2	0.332
Sulphate	mg/l	--	500 [4]	50	50	48	49	46	49
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	212	306	222	145	185	160
Total Organic Carbon	mg/l	--	--	4	2	2.1	2.3	4	1.5
Total Suspended Solids	mg/l	--	--	1620	1220	974	1480	564	416
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	0.002	0.004	0.003	0.003	0.001
Boron, dissolved	mg/l	5	--	0.08	0.06	0.07	0.05	0.063	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	23.9	24.1	22.2	22.5	19.8	22.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.009	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.004	0.002
Iron, dissolved	mg/l	--	0.3	0.05	0.02	0.02	0.05	0.23	0.006
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	8.51	9.02	7.64	7.69	9.01	7.75
Manganese, dissolved	mg/l	--	0.05	0.03	0.03	0.02	0.01	0.057	0.001
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	0.4	5.3	1.1	3.5	5.3	3.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	40.1	36.7	36.6	37.7	35.5	37.3
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.011	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-4 23-Nov-2001	98-4 23-May-2002	98-4 06-Nov-2002	98-4 30-May-2003	98-4 09-Oct-2003	98-4 14-May-2004
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-4 19-Nov-2004	98-4 24-May-2005	98-4 16-Nov-2005	98-4 25-May-2006	98-4 21-Nov-2006	98-4 15-May-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	137	132	138	108	115	117
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	112	110	113	108	115	117
Ammonia Nitrogen	mg/l	--	--	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	5	6	<5	10	<5	8
Chloride	mg/l	--	250	8.4	8.7	8.9	9.6	8.6	9.2
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	450	360	320	280	350	220
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	87	92	91	81	88	86
Nitrate as N	mg/l	10.0	--	0.6	0.4	0.3	0.5	0.3	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.16	0.14	0.06	0.32	0.12	0.07
Nitrogen, Organic	mg/l	--	--	0.14	<0.14	<0.06	<0.32	<0.12	<0.07
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.1	6.4	--	8.1	7.8	8.8
Phosphorus	mg/l	--	--	0.17	0.21	0.21	--	--	--
Sulphate	mg/l	--	500 [4]	51	49	47	48	45	45
Temperature (Field)	deg c	--	15	--	9.7	10.9	11.5	10.5	0
Total Dissolved Solids	mg/l	--	500	225	192	196	186	199	197
Total Organic Carbon	mg/l	--	--	1.4	1.5	3.3	--	--	--
Total Suspended Solids	mg/l	--	--	113	108	96	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	<0.001	<0.001	0.0051	0.0041
Boron, dissolved	mg/l	5	--	0.067	0.042	0.071	0.05	0.059	0.052
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00003
Calcium, dissolved	mg/l	--	--	22.3	22.9	23.2	20.1	22.4	21.6
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.008
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	0.003	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.005	<0.005	0.025	<0.005	<0.005	0.048
Lead, dissolved	mg/l	0.01	--	0.0002	0.0003	<0.0002	<0.0002	<0.0001	0.00006
Magnesium, dissolved	mg/l	--	--	7.62	8.34	7.99	7.38	7.75	7.8
Manganese, dissolved	mg/l	--	0.05	0.004	<0.001	0.003	0.002	<0.001	0.011
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	4.1	3.6	4.5	3.3	4.1	3.6
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	38.4	36.2	39.9	33.7	41.1	38.1
Zinc, dissolved	mg/l	--	5	0.005	<0.005	<0.005	0.006	0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-4 19-Nov-2004	98-4 24-May-2005	98-4 16-Nov-2005	98-4 25-May-2006	98-4 21-Nov-2006	98-4 15-May-2007
Semi-VOCs									
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-4 30-Nov-2007	98-4 22-May-2008	98-4 10-Nov-2008	98-4 19-May-2009 G-3	98-4 26-Nov-2009 [10] 98-4	98-4 25-May-2010 [12] M-16
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	112	109	108	109	--	107
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<2 [13]	--	<2 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	112	109	108	109	--	107
Ammonia Nitrogen	mg/l	--	--	<0.01	<0.01	<0.01	<0.02	--	<0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	7	<5	8	--	10
Chloride	mg/l	--	250	8.2	8.8	8.8	9	--	10
Conductivity	uS/cm	--	--	--	--	--	332	--	336
Conductivity (Field)	uS/cm	--	--	380	320	340	340	--	344
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	84	83	79	76	--	83
Nitrate as N	mg/l	10.0	--	0.4	0.3	0.2	0.50	--	0.13
Nitrite as N	mg/l	1.0	--	--	--	--	<0.10	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.05	0.15	0.05	<0.10	--	0.14
Nitrogen, Organic	mg/l	--	--	<0.05	<0.15	<0.05	<0.1	--	<0.14
pH	-	--	--	--	--	--	8.03	--	8.14
pH (Field)	-	--	--	8.8	8.2	8.1	--	--	8.07
Phosphorus	mg/l	--	--	--	--	--	0.25	--	0.18
Sulphate	mg/l	--	500 [4]	45	46	44	42	--	43
Temperature (Field)	deg c	--	15	9.5	8.5	10	6	--	18.6
Total Dissolved Solids	mg/l	--	500	193	193	186	216	--	218
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0048	0.0033	0.0044	0.004	--	<0.01
Boron, dissolved	mg/l	5	--	0.061	0.049	0.056	0.05	--	0.09
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	--	--	21.6	21.2	20.4	19	--	20
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	0.001	--	0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.0002	--	<0.0002
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.002	--	0.029
Iron, dissolved	mg/l	--	0.3	<0.005	0.008	0.017	<0.03	--	<0.03
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.001	--	<0.001
Magnesium, dissolved	mg/l	--	--	7.44	7.35	6.78	7	--	8
Manganese, dissolved	mg/l	--	0.05	<0.001	<0.001	0.001	<0.01	--	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	3.6	4	3	--	4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	37.3	38.8	36.9	32	--	38
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.01	--	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	--	<0.001

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-4 30-Nov-2007	98-4 22-May-2008	98-4 10-Nov-2008	98-4 19-May-2009 G-3	98-4 26-Nov-2009 [10] 98-4	98-4 25-May-2010 [12] M-16
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0004	--	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	--	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0040	--	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0002

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-4 20-Oct-2010 [12] G-14	98-4 24-May-2011 [12] G-45	98-4 29-Nov-2011 [12] 98-4	98-4 31-May-2012 [15] 98-4
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	111	108	111	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [13]	2	<2 [13]	--
Alkalinity (Total as CaCO3)	mg/l	--	--	111	110	111	--
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	0.02	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	<5	5	--
Chloride	mg/l	--	250	10	10	10	--
Conductivity	uS/cm	--	--	336	344	340	--
Conductivity (Field)	uS/cm	--	--	339	330	374	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	89	85	88	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	--
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.25	<0.10	<0.10	--
Nitrogen, Organic	mg/l	--	--	<0.25	<0.1	<0.08	--
pH	-	--	--	8.11	8.32	8.19	--
pH (Field)	-	--	--	7.96	8.02	8.43	--
Phosphorus	mg/l	--	--	0.22	0.19	0.14	--
Sulphate	mg/l	--	500 [4]	44	43	42	--
Temperature (Field)	deg c	--	15	13.3	12.7	9.9	--
Total Dissolved Solids	mg/l	--	500	218	224	221	--
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	--
Boron, dissolved	mg/l	5	--	0.07	0.05	0.08	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	24	21	22	--
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	0.002	--
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0002	<0.0002	--
Copper, dissolved	mg/l	--	1	0.003	0.003	0.002	--
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	--
Magnesium, dissolved	mg/l	--	--	7	8	8	--
Manganese, dissolved	mg/l	--	0.05	<0.01	<0.01	0.02	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	3	4	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	41	37	38	--
Zinc, dissolved	mg/l	--	5	<0.01	0.03	<0.01	--
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	--

Parameter	Unit	ODWQS (169/03)-Health [1]	ODWQS-AO [2]	98-4 20-Oct-2010 [12] G-14	98-4 24-May-2011 [12] G-45	98-4 29-Nov-2011 [12] 98-4	98-4 31-May-2012 [15] 98-4
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	--

Footnotes:	
	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(4)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(5)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(6)	Elevated detection limit due to dilution required because of high target analyte concentration.
(7)	Elevated Reporting Limit due to matrix interference.
(8)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(9)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
(10)	Monitoring location was dry during this sampling event. No sample was collected.
(11)	GEN02 Elevated Reporting Limit due to matrix interference.
(12)	Arsenic MRL elevated due to matrix interference.
(13)	pH < 8.3. Calculations not available.
(14)	Insufficient water for sample collection or analysis at this monitoring location during sampling event.
(15)	Monitoring location has been decommissioned.
(16)	Due to matrix interference 10x dilution factor required for VOCs.
(17)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(18)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 06-Sep-2005 [3]	05-11 16-Nov-2005	05-11 25-May-2006	05-11 21-Nov-2006	05-11 15-May-2007	05-11 30-Nov-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	157	474	422	444	955
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	645	474	422	444	955
Ammonia Nitrogen	mg/l	--	--	--	2	0.93	0.91	0.52	0.96
Chemical Oxygen Demand	mg/l	--	--	--	54	26	25	53	112
Chloride	mg/l	--	250	--	38	26.5	7.9	7.9	118
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1700	1025	1400	1100	1500
Hardness, Calcium Carbonate	mg/l	--	--	--	645	427	553	539	889
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	<0.1	0.1	0.2	0.2	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.79	1.56	1.49	1.15	2.23
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	1.79	0.63	0.58	0.63	1.27
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.3	7	7.4	7.3
Phosphorus	mg/l	--	--	--	0.6	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	320	240	540	360	183
Temperature (Field)	deg c	--	15	--	--	8.5	10.5	11.8	11
Total Dissolved Solids	mg/l	--	500	--	1180	822	1140	937	1390
Total Organic Carbon	mg/l	--	--	--	16.3	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	1310	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	0.005	<0.001	0.0007	0.0006	0.0032
Boron, dissolved	mg/l	5	--	--	0.832	0.566	0.572	0.547	1.97
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00003	<0.00002
Calcium, dissolved	mg/l	--	--	--	153	98.7	136	130	206
Chromium, dissolved	mg/l	0.05	--	--	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	0.003	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	--	17.3	5	3.01	4.59	19.1
Lead, dissolved	mg/l	0.01	--	--	<0.0002	<0.0002	<0.0001	0.00003	<0.00002
Magnesium, dissolved	mg/l	--	--	--	63.9	43.9	51.9	52.3	91.1
Manganese, dissolved	mg/l	--	0.05	--	2.14	1.13	1.21	1.3	3.14
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	10.6	7.4	5.8	6.8	10.4
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	197	119	143	102	191
Zinc, dissolved	mg/l	--	5	--	0.015	0.01	0.008	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	0.0013
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	0.0014
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	0.0009
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	0.0006

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 28-Feb-2008	05-11 22-May-2008	05-11 10-Nov-2008	05-11 19-Dec-2008	05-11 19-May-2009 G-8	05-11 26-Nov-2009 J-19
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	740	1030	1830	1400	793	723
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	740	1030	1830	1400	793	723
Ammonia Nitrogen	mg/l	--	--	0.87	0.46	0.61	0.56	0.42	0.57
Chemical Oxygen Demand	mg/l	--	--	41	86	242	117	45	63
Chloride	mg/l	--	250	68.6	156	351	267	218	76
Conductivity	uS/cm	--	--	--	--	--	--	2190	1700
Conductivity (Field)	uS/cm	--	--	--	2000	3300	2100	--	2119
Hardness, Calcium Carbonate	mg/l	--	--	745	995	1600	1030	558	700
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.08	2.49	4.27	2.63	1.14	1.26
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.21	2.03	3.66	2.07	0.72	0.69
pH	-	--	--	--	--	--	--	7.56	7.47
pH (Field)	-	--	--	--	6.6	6.7	607	--	6.54
Phosphorus	mg/l	--	--	--	--	--	--	0.40	0.06
Sulphate	mg/l	--	500 [6]	230	153	69	107	97	146
Temperature (Field)	deg c	--	15	--	10	9	5	--	11.0
Total Dissolved Solids	mg/l	--	500	1150	1460	2500	1810	1420	1110
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0016	0.0027	0.0035	0.002	0.001	0.003
Boron, dissolved	mg/l	5	--	1.19	2.38	13.4	6.33	1.24	4.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	170	231	356	240	98	155
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	0.009	0.009
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0002	0.0014
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.006	<0.002	0.004	0.002
Iron, dissolved	mg/l	--	0.3	9.53	13.9	4.13	3.29	<0.03	12.0
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	77.6	102	172	104	76	76
Manganese, dissolved	mg/l	--	0.05	2.52	3.65	4.17	3.4	0.04	2.37
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.2	8.4	15	10.8	14	10
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	130	176	430	235	241	105
Zinc, dissolved	mg/l	--	5	0.01	0.006	<0.005	<0.005	<0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	0.0007	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	0.0013	0.0012	0.001	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 25-May-2010 [4]	05-11 20-Oct-2010 [4]	05-11 24-May-2011	05-11 29-Nov-2011	05-11 31-May-2012	05-11 28-Nov-2012
				M-11	G-6	G-18	05-11	05-11	05-11
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	921	696	744	678	630	580
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	3.5	1.4
Alkalinity (Total as CaCO3)	mg/l	--	--	921	696	744	678	630	580
Ammonia Nitrogen	mg/l	--	--	0.53	0.68	0.35	0.49	0.26	0.65
Chemical Oxygen Demand	mg/l	--	--	73	55	35	40	30	32
Chloride	mg/l	--	250	115	80	89	66	49	42
Conductivity	uS/cm	--	--	2120	1650	1760	1550	--	--
Conductivity (Field)	uS/cm	--	--	2095	1805	934	1151	1015	1085
Hardness, Calcium Carbonate	mg/l	--	--	947	661	634	578	610	560
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.018	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	1.30	1.57	0.85	0.77	0.75	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	0.77	0.89	0.5	0.28	0.49	0.17
pH	-	--	--	7.47	7.23	7.96	7.72	7.77	--
pH (Field)	-	--	--	6.63	7	6.86	6.74	6.85	6.73
Phosphorus	mg/l	--	--	0.05	0.08	0.03	0.03	<0.020	0.024
Sulphate	mg/l	--	500 [6]	128	135	117	131	130	160
Temperature (Field)	deg c	--	15	21.3	11.3	15.8	9.5	9.9	10.5
Total Dissolved Solids	mg/l	--	500	1380	1070	1140	1010	744	878
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	3.6	2.2	0.51	2.4	2.1	1.7
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	206	146	132	126	130	120
Chromium, dissolved	mg/l	0.05	--	0.004	0.006	0.005	0.004	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0035	0.0012	0.0016	0.0008	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.002	0.001	0.004	0.002	<0.0010	<0.001
Iron, dissolved	mg/l	--	0.3	12.5	9.65	<0.03	<0.03	3.6	2.2
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	105	72	74	64	71	63
Manganese, dissolved	mg/l	--	0.05	2.95	1.57	0.84	0.65	0.69	0.34
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11	9	10	9	10	10
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	149	111	111	106	110	83
Zinc, dissolved	mg/l	--	5	0.01	<0.01	0.01	<0.01	<0.0050	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025	<0.00050
Benzene	mg/l	0.001	--	<0.0005	0.0006	<0.0005	<0.0005	<0.00025	<0.00050
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0025
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0010
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 29-May-2013 05-11	05-11 26-Nov-2013 [5] GW-25	05-11 29-May-2014 05-11	05-11 19-Nov-2014 05-11	05-11 02-Jun-2015 05-11	05-11 26-Nov-2015 05-11
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	400	440	390	390	442	471
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.2	1.6	1.6	<1.0	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	400	440	390	390	443	472
Ammonia Nitrogen	mg/l	--	--	0.15	0.90	0.26	0.12	0.24	0.05
Chemical Oxygen Demand	mg/l	--	--	27	34	15	17	21	33
Chloride	mg/l	--	250	11	8	10	5	9	5
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	822	889	813	908	973	1097
Hardness, Calcium Carbonate	mg/l	--	--	510	510	500	480	389	585
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.11	<0.10	<0.10	<0.10	<0.1	0.1
Nitrite as N	mg/l	1.0	--	0.018	0.027	0.048	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.34	1.3	0.52	0.48	0.3	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.12	<0.10	0.13	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	0.19	0.4	0.26	0.36	0.06	0.35
pH	-	--	--	7.50	7.60	7.65	7.38	--	--
pH (Field)	-	--	--	6.82	7.09	6.88	6.88	6.91	6.82
Phosphorus	mg/l	--	--	0.035	0.048	0.045	0.056	<0.01	0.01
Sulphate	mg/l	--	500 [6]	150	160	150	110	148	183
Temperature (Field)	deg c	--	15	8.6	9.0	9.8	6.8	8.5	10.4
Total Dissolved Solids	mg/l	--	500	682	650	650	526	662	732
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.41	0.36	0.41	0.65	0.148	0.405
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	120	130	120	110	84.6	128
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0016	0.0026	0.0016	0.00057	0.0009	0.0011
Copper, dissolved	mg/l	--	1	0.0015	0.0015	0.0034	0.0018	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	50	48	50	50	43	64.4
Manganese, dissolved	mg/l	--	0.05	0.64	1.1	0.64	0.63	0.472	0.51
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.6	6.6	6.1	7.1	4.48	5.84
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	37	39	33	41	23.3	43.4
Zinc, dissolved	mg/l	--	5	<0.0050	0.0090	<0.0050	<0.0050	0.005	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 26-May-2016	05-11 17-Nov-2016	05-11 24-May-2017	05-11 29-Nov-2017	05-11 24-May-2018	05-11 29-Nov-2018
				05-11	05-11	05-11	05-11	05-11	05-11
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	432	389	672	900	1400	1800
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<25 [9]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	432	389	673	901	1400	1800
Ammonia Nitrogen	mg/l	--	--	0.28	0.27	0.16	0.50	1.72	1.99
Chemical Oxygen Demand	mg/l	--	--	24	24	24	93	138	192
Chloride	mg/l	--	250	7	6	22	120	199	250
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	979	1785	1337	1913	3123	3102
Hardness, Calcium Carbonate	mg/l	--	--	473	890	655	916	1190	2030
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.5	0.4	1.6	4.6	5.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.22	0.23	0.24	1.1	2.88	3.21
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.10	6.91	6.81	6.51	6.69	6.67
Phosphorus	mg/l	--	--	0.09	0.06	0.03	0.11	0.13	0.17
Sulphate	mg/l	--	500 [6]	136	708	130	63	64	35
Temperature (Field)	deg c	--	15	11.8	12.0	10.4	9.3	10.2	9.1
Total Dissolved Solids	mg/l	--	500	630	1320	812	1130	2060	2210
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.397	0.663	0.361	2.46	3.93	13.9
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	110	230	170	215	288	516
Chromium, dissolved	mg/l	0.05	--	<0.001	0.006	0.005	<0.001	<0.001	0.002
Cobalt, dissolved	mg/l	--	--	0.0020	0.0010	0.0024	0.0053	0.0027	0.0059
Copper, dissolved	mg/l	--	1	0.0008	0.0013	0.0057	0.0008	0.0014	0.0036
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	5.8	<0.1	1.17
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0007	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	48.4	76.4	56	92.2	113	181
Manganese, dissolved	mg/l	--	0.05	1.04	0.626	1.01	3.72	5.23	5.63
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.96	7.92	5.83	8.5	9.51	19
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	33.5	42.8	22.7	79.9	166	335
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.008	<0.005	0.007	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.001	<0.001	<0.001	0.004	0.004
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 19-Jun-2019 05-11	05-11 20-Nov-2019 05-11	05-11 21-May-2020 05-11	05-11 26-Nov-2020 05-11
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1330	1170	773	762
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1330	1170	775	764
Ammonia Nitrogen	mg/l	--	--	2.27	0.76	0.64	0.58
Chemical Oxygen Demand	mg/l	--	--	124	129	66	65
Chloride	mg/l	--	250	173	128	69	47
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2431	2670	1412	1575
Hardness, Calcium Carbonate	mg/l	--	--	1160	939	--	826
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	748	--
Nitrate as N	mg/l	10.0	--	<0.1	0.1	<0.1	<0.5 [11]
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.1	2.8	1.5	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.83	2.04	0.86	0.82
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	6.85	6.97	7.14	7.06
Phosphorus	mg/l	--	--	0.12	0.16	0.10	0.10
Sulphate	mg/l	--	500 [6]	44	77	126	267
Temperature (Field)	deg c	--	15	14.2	8.5	12.0	8.3
Total Dissolved Solids	mg/l	--	500	1660	1480	978	1130
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	0.001	<0.001
Boron, dissolved	mg/l	5	--	5.73	6.13	1.96	2.05
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	266	185	171	186
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0029	0.0026	0.0012	<0.0005
Copper, dissolved	mg/l	--	1	0.0013	0.0007	0.0034	0.0040
Iron, dissolved	mg/l	--	0.3	<0.1	10.2	10.4	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0002	0.0001
Magnesium, dissolved	mg/l	--	--	121	116	77.7	88.2
Manganese, dissolved	mg/l	--	0.05	6.68	4.34	3.24	0.678
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.5	16.3	9.61	9.44
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	189	189	89.7	98.4
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.007	0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.004 [10]	0.009	<0.004 [11]
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0050
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	05-3A 06-Sep-2005	05-3A 16-Nov-2005	05-3A 25-May-2006	05-3A 15-May-2007	05-3A 10-Nov-2008	05-3A 26-Nov-2009 M-11
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1030	200	845	885	800	829
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	29
Alkalinity (Total as CaCO3)	mg/l	--	--	845	820	845	885	800	858
Ammonia Nitrogen	mg/l	--	--	0.78	0.77	0.72	0.64	0.79	0.75
Chemical Oxygen Demand	mg/l	--	--	278	33	351	83	93	85
Chloride	mg/l	--	250	226	235	272	270	265	160
Conductivity	uS/cm	--	--	--	--	--	--	--	2330
Conductivity (Field)	uS/cm	--	--	1900	3000	1800	1700	1800	2075
Hardness, Calcium Carbonate	mg/l	--	--	42	31	25	25	25	28
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	0.1	0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	6.01	1.2	1.99	1.42	2.16	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.23	0.43	1.27	0.78	1.37	0.07
pH	-	--	--	--	--	--	--	--	8.57
pH (Field)	-	--	--	8.4	--	8.5	8.9	8.4	8.83
Phosphorus	mg/l	--	--	8.2	0.15	--	--	--	2.48
Sulphate	mg/l	--	500[6]	5	<1	1	2	2	2
Temperature (Field)	deg c	--	15	11.8	--	7	8.8	4	8.7
Total Dissolved Solids	mg/l	--	500	1380	1340	1320	1280	1300	1510
Total Organic Carbon	mg/l	--	--	53.2	10.9	--	--	--	--
Total Suspended Solids	mg/l	--	--	6760	63	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	<0.001	0.0015	0.0021	0.002
Boron, dissolved	mg/l	5	--	0.978	0.964	0.828	0.826	0.878	0.98
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	7.05	3.62	2.32	2.41	2.38	3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.009
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0002
Copper, dissolved	mg/l	--	1	<0.002	0.002	<0.002	<0.002	<0.002	0.001
Iron, dissolved	mg/l	--	0.3	0.334	0.08	0.062	0.128	<0.005	0.08
Lead, dissolved	mg/l	0.01	--	0.0008	0.0017	0.0002	0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	6.03	5.26	4.59	4.66	4.74	5
Manganese, dissolved	mg/l	--	0.05	0.017	0.003	0.002	0.005	0.008	<0.01
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.5	10.6	8.5	8.9	9.5	8
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	625	599	535	461	533	493
Zinc, dissolved	mg/l	--	5	0.007	0.007	0.01	0.02	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3A 24-May-2011 [4] G-42	05-3A 29-Nov-2012 05-3A	05-3A 29-May-2014 05-3A	05-3A 26-Nov-2015 05-3A	05-3A 24-May-2017 05-3A	05-3A 29-Nov-2018 05-3A	05-3A 21-May-2020 05-3A
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	778	790	770	823	858	889	788
Alkalinity, Carbonate as CaCO3	mg/l	–	–	42	34	30	22	16	20	33
Alkalinity (Total as CaCO3)	mg/l	–	–	820	830	800	845	874	910	822
Ammonia Nitrogen	mg/l	–	–	0.76	0.96	0.88	0.84	0.81	0.77	0.82
Chemical Oxygen Demand	mg/l	–	–	575	45	39	118	32	40	51
Chloride	mg/l	–	250	273	240	260	294	285	297	365
Conductivity	uS/cm	–	–	2410	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	2157	1898	1998	2246	2266	2042	2116
Hardness, Calcium Carbonate	mg/l	–	–	35	28	31	25.5	41	51	--
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	38.9
Nitrate as N	mg/l	10.0	–	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	–	<0.10	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	–	1.55	2.2	2.8	2.4	1.5	1.4	1.3
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	<0.10	<0.10	--	--	--	--
Nitrogen, Organic	mg/l	–	–	0.79	1.24	1.92	1.56	0.69	0.63	0.48
pH	-	–	–	8.76	8.66	8.62	--	--	--	--
pH (Field)	-	–	–	8.71	8.65	7.79	8.64	8.37	8.54	8.76
Phosphorus	mg/l	–	–	1.09	0.51	0.26	0.67	0.12	0.19	0.25
Sulphate	mg/l	–	500 [6]	<1	<1	<1	<1	3	<1	<1
Temperature (Field)	deg c	–	15	12.0	6.9	9.0	8.4	10.1	7.8	11.2
Total Dissolved Solids	mg/l	–	500	1570	1310	1320	1440	1340	1360	1380
Total Organic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	–	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	–	<0.01	<0.0010	<0.0010	<0.001	0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	–	0.87	0.97	1	0.962	1.01	0.98	0.778
Cadmium, dissolved	mg/l	0.005	–	<0.0001	0.00011	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	–	–	4	3.2	3.3	2.73	5.45	9.76	5.91
Chromium, dissolved	mg/l	0.05	–	<0.005	<0.0050	<0.0050	<0.001	0.009	<0.001	<0.001
Cobalt, dissolved	mg/l	–	–	0.0003	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	–	1	0.002	<0.0010	0.0023	<0.0005	0.0005	0.0022	0.0031
Iron, dissolved	mg/l	–	0.3	0.07	0.12	<0.1	<0.1	<0.1	0.13	<0.1
Lead, dissolved	mg/l	0.01	–	<0.001	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	–	–	6	4.9	5.6	4.54	6.67	6.45	5.86
Manganese, dissolved	mg/l	–	0.05	<0.01	0.0025	<0.0020	<0.005	0.025	0.011	0.005
Mercury, dissolved	mg/l	0.001	–	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	–	–	9	8.3	8.9	8.01	9.62	10	9.19
Selenium, dissolved	mg/l	0.05	–	--	--	--	--	--	--	--
Silver, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	–	200 [7]	476	540	560	617	572	536	555
Zinc, dissolved	mg/l	–	5	0.01	<0.0050	<0.0050	0.01	<0.005	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	<0.001	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]	0.002	0.006
Semi-VOCs										
Styrene	mg/l	–	–	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	–	–	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	–	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	–	<0.0010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	–	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	–	–	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	–	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3B 06-Sep-2005	05-3B 16-Nov-2005	05-3B 25-May-2006	05-3B 15-May-2007	05-3B 10-Nov-2008	05-3B 26-Nov-2009 J-20
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1340	256	1160	1190	1170	1130
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	27
Alkalinity (Total as CaCO3)	mg/l	--	--	1100	1050	1160	1190	1170	1160
Ammonia Nitrogen	mg/l	--	--	18	7.1	3.21	2.38	2.84	2.83
Chemical Oxygen Demand	mg/l	--	--	143	139	124	142	104	95
Chloride	mg/l	--	250	434	423	462	465	469	451
Conductivity	uS/cm	--	--	--	--	--	--	--	3410
Conductivity (Field)	uS/cm	--	--	2800	2100	2900	2400	2900	2820
Hardness, Calcium Carbonate	mg/l	--	--	60	91	77	70	65	69
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.1	0.1	0.2	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	19.7	10.9	6.3	6.12	5.29	4.12
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.7	3.8	3.09	3.74	2.45	1.29
pH	-	--	--	--	--	--	--	--	8.41
pH (Field)	-	--	--	7.7	--	8.2	8.5	8.2	8.2
Phosphorus	mg/l	--	--	1.41	3.18	--	--	--	6.94
Sulphate	mg/l	--	500 [6]	109	152	72	23	2	4
Temperature (Field)	deg c	--	15	12.5	--	9	8.6	7	8.0
Total Dissolved Solids	mg/l	--	500	2110	2100	2030	1920	1880	2220
Total Organic Carbon	mg/l	--	--	87	47.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	220	30	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.007	0.013	0.01	0.0138	0.0006	0.010
Boron, dissolved	mg/l	5	--	1.64	1.74	1.52	1.46	1.53	1.8
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00005	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	8.66	10.7	8.92	8.11	7.27	8
Chromium, dissolved	mg/l	0.05	--	0.005	0.005	0.004	0.003	<0.002	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005
Copper, dissolved	mg/l	--	1	0.009	0.003	0.009	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.766	1.15	3.05	1.68	0.374	1.19
Lead, dissolved	mg/l	0.01	--	0.0029	0.0007	0.0013	0.00041	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	9.43	15.7	13.4	12.2	11.4	12
Manganese, dissolved	mg/l	--	0.05	0.12	0.128	0.071	0.037	0.016	0.03
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.06	0.04	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.4	25.7	21.6	21	19.8	19
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	866	862	751	673	669	316
Zinc, dissolved	mg/l	--	5	<0.005	0.01	0.02	<0.005	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3B 24-May-2011 [4] G-41	05-3B 29-Nov-2012 05-3B	05-3B 29-May-2014 [12] 05-3B	05-3B 26-Nov-2015 05-3B	05-3B 24-May-2017 05-3B	05-3B 29-Nov-2018 05-3B	05-3B 21-May-2020 [13] 05-3B
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	1080	1100	1100	1090	1050	1150	1120
Alkalinity, Carbonate as CaCO3	mg/l	--	–	52	35	36	<25 [14]	<25 [9]	<25 [9]	<25 [15]
Alkalinity (Total as CaCO3)	mg/l	–	–	1135	1100	1100	1110	1070	1170	1140
Ammonia Nitrogen	mg/l	–	–	2.64	0.51	2.8	3.35	2.76	3.09	2.83
Chemical Oxygen Demand	mg/l	–	–	85	41	76	115	89	102	120
Chloride	mg/l	–	250	433	410	440	470	459	449	596
Conductivity	uS/cm	–	–	3510	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	2563	2776	2865	3230	3248	2919	--
Hardness, Calcium Carbonate	mg/l	–	–	76	70	80	249	73	105	--
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	86.4
Nitrate as N	mg/l	10.0	–	<0.10	<0.10	<0.50	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	–	<0.10	<0.010	<0.050	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	–	4.70	4.6	4.6	5.3	4.3	4.7	3.8
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	<0.10	<0.50	--	--	--	--
Nitrogen, Organic	mg/l	–	–	2.06	4.09	1.8	1.95	1.54	1.61	0.97
pH	-	–	–	8.71	8.53	8.54	--	--	--	--
pH (Field)	-	–	–	8.40	8.43	8.10	8.43	8.35	8.49	--
Phosphorus	mg/l	–	–	7.09	7.1	6.6	6.72	5.73	5.95	5.89
Sulphate	mg/l	–	500 [6]	<1	<1	<1	<1	5	9	4
Temperature (Field)	deg c	–	15	10.2	6.8	10.2	8.5	10.5	7.6	--
Total Dissolved Solids	mg/l	–	500	2280	1880	1830	2020	1990	2020	2010
Total Organic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	–	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	–	<0.01	0.0038	0.0034	0.004	0.01	0.005	0.003
Boron, dissolved	mg/l	5	–	1.5	1.8	1.8	1.97	1.62	1.97	1.78
Cadmium, dissolved	mg/l	0.005	–	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	–	–	9	8.3	9.3	8.04	8.55	16.1	10
Chromium, dissolved	mg/l	0.05	–	<0.005	<0.0050	<0.0050	0.006	0.013	0.002	0.002
Cobalt, dissolved	mg/l	–	–	0.0005	<0.00050	<0.00050	<0.0005	<0.0005	0.0008	0.0005
Copper, dissolved	mg/l	–	1	0.003	<0.0010	0.0023	<0.0005	0.0040	0.0035	0.0010
Iron, dissolved	mg/l	–	0.3	0.65	0.45	0.65	0.632	0.125	0.805	0.76
Lead, dissolved	mg/l	0.01	–	<0.001	<0.00050	<0.00050	<0.0001	0.0003	0.0004	0.0002
Magnesium, dissolved	mg/l	–	–	13	12	14	11.3	12.6	15.7	14.9
Manganese, dissolved	mg/l	–	0.05	0.02	0.02	0.024	0.022	0.019	0.027	0.029
Mercury, dissolved	mg/l	0.001	–	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	–	–	19	18	20	17.2	19.8	23.8	20.3
Selenium, dissolved	mg/l	0.05	–	--	--	--	--	--	--	--
Silver, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	–	200 [7]	784	740	720	878	817	842	719
Zinc, dissolved	mg/l	–	5	<0.01	<0.0050	0.0052	0.009	0.013	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	<0.001	<0.0010	<0.0010	<0.002 [10]	<0.004 [10]	<0.001	0.005
Semi-VOCs										
Styrene	mg/l	–	–	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	–	–	<0.0004	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	–	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	–	<0.0010	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	–	<0.0040	<0.0010	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	–	–	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.00040	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	–	<0.0002	<0.00040	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 06-Sep-2005	05-3C 16-Nov-2005	05-3C 25-May-2006	05-3C 15-May-2007	05-3C 30-Nov-2007	05-3C 22-May-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1090	227	880	995	1050	1010
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	891	930	880	995	1050	1010
Ammonia Nitrogen	mg/l	--	--	28.9	9.81	2.46	1.88	2.02	1.28
Chemical Oxygen Demand	mg/l	--	--	139	151	113	134	150	104
Chloride	mg/l	--	250	264	269	286	320	331	330
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2600	860	1950	1500	1700	2300
Hardness, Calcium Carbonate	mg/l	--	--	71	91	85	87	92	88
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	0.2	1.2	0.1	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	34.8	12.6	4.46	5.04	3.9	3.63
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.9	2.79	2	3.16	1.88	2.35
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.7	--	8.2	8.6	8.2	8.2
Phosphorus	mg/l	--	--	2	1.2	--	--	--	--
Sulphate	mg/l	--	500 [6]	200	119	80	35	19	13
Temperature (Field)	deg c	--	15	14.4	--	6.5	8.8	5.5	10.5
Total Dissolved Solids	mg/l	--	500	1770	1700	1560	1530	1770	1620
Total Organic Carbon	mg/l	--	--	72.6	41.3	--	--	--	--
Total Suspended Solids	mg/l	--	--	524	2520	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.003	0.008	0.009	**0.013**	**0.0246**	**0.0141**
Boron, dissolved	mg/l	5	--	1.32	1.47	1.28	1.06	1.41	1.35
Cadmium, dissolved	mg/l	0.005	--	0.0002	<0.0001	<0.005	0.00008	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	11.4	13.5	10.7	10.6	12.6	11.6
Chromium, dissolved	mg/l	0.05	--	0.003	0.005	0.003	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.011	0.006	0.003	0.003	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.199	1.81	1.56	2.05	2.77	2.08
Lead, dissolved	mg/l	0.01	--	0.0012	0.0003	0.0011	0.00032	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	10.4	14	14.3	14.7	14.6	14.4
Manganese, dissolved	mg/l	--	0.05	0.156	0.225	0.111	0.074	0.119	0.091
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.04	0.04	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.02	--	--	--	--
Potassium, dissolved	mg/l	--	--	23	21.4	16.6	15.9	17.8	16
Selenium, dissolved	mg/l	0.05	--	0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	711	708	635	536	736	630
Zinc, dissolved	mg/l	--	5	0.009	0.01	0.006	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	0.0013
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 10-Nov-2008
General Chemistry				
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1030
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1030
Ammonia Nitrogen	mg/l	--	--	1.53
Chemical Oxygen Demand	mg/l	--	--	91
Chloride	mg/l	--	250	335
Conductivity	uS/cm	--	--	--
Conductivity (Field)	uS/cm	--	--	2100
Hardness, Calcium Carbonate	mg/l	--	--	53
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--
Nitrate as N	mg/l	10.0	--	0.2
Nitrite as N	mg/l	1.0	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.55
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--
Nitrogen, Organic	mg/l	--	--	2.02
pH	-	--	--	--
pH (Field)	-	--	--	8.1
Phosphorus	mg/l	--	--	--
Sulphate	mg/l	--	500 [6]	15
Temperature (Field)	deg c	--	15	8
Total Dissolved Solids	mg/l	--	500	1560
Total Organic Carbon	mg/l	--	--	--
Total Suspended Solids	mg/l	--	--	--
Metals				
Arsenic, dissolved	mg/l	0.01	--	0.0008
Boron, dissolved	mg/l	5	--	1.37
Cadmium, dissolved	mg/l	0.005	--	<0.00002
Calcium, dissolved	mg/l	--	--	5.92
Chromium, dissolved	mg/l	0.05	--	0.002
Cobalt, dissolved	mg/l	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.004
Iron, dissolved	mg/l	--	0.3	0.477
Lead, dissolved	mg/l	0.01	--	<0.00002
Magnesium, dissolved	mg/l	--	--	9.37
Manganese, dissolved	mg/l	--	0.05	0.021
Mercury, dissolved	mg/l	0.001	--	--
Molybdenum, dissolved	mg/l	--	--	--
Nickel, dissolved	mg/l	--	--	--
Potassium, dissolved	mg/l	--	--	15.8
Selenium, dissolved	mg/l	0.05	--	--
Silver, dissolved	mg/l	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	560
Zinc, dissolved	mg/l	--	5	<0.005
Phenols				
Phenolics, Total Recoverable	mg/l	--	--	<0.001
Semi-VOCs				
Styrene	mg/l	--	--	<0.0006
VOCs				
1,1-Dichloroethane	mg/l	--	--	<0.0001
Benzene	mg/l	0.001	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003
o-Xylene	mg/l	--	--	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 19-May-2009 G-14	05-3C 26-Nov-2009 J-17	05-3C 25-May-2010 [4] M-21	05-3C 20-Oct-2010 [4] G-26	05-3C 24-May-2011 [4] G-43	05-3C 29-Nov-2011 05-3C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	960	946	935	932	936	976
Alkalinity, Carbonate as CaCO3	mg/l	--	--	21	21	22	22	44	33
Alkalinity (Total as CaCO3)	mg/l	--	--	981	967	957	954	980	1010
Ammonia Nitrogen	mg/l	--	--	1.67	1.52	1.27	1.14	1.44	1.20
Chemical Oxygen Demand	mg/l	--	--	70	98	70	80	70	55
Chloride	mg/l	--	250	303	302	281	308	291	304
Conductivity	uS/cm	--	--	2700	2640	2680	2610	2770	2760
Conductivity (Field)	uS/cm	--	--	1300	2287	2641	2533	1162	2144
Hardness, Calcium Carbonate	mg/l	--	--	83	92	87	88	96	93
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	0.23	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	3.35	2.46	2.27	2.52	2.97	2.08
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.68	0.94	1	1.38	1.53	0.88
pH	-	--	--	8.36	8.38	8.39	8.39	8.70	8.56
pH (Field)	-	--	--	--	8.27	8.24	8.4	8.29	8.00
Phosphorus	mg/l	--	--	2.12	2.61	2.38	2.22	2.40	1.57
Sulphate	mg/l	--	500 [6]	14	30	15	25	10	9
Temperature (Field)	deg c	--	15	11	8.1	21.4	11.9	11.0	7.3
Total Dissolved Solids	mg/l	--	500	1760	1720	1740	1700	1800	1790
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	**0.013**	**0.016**	<0.01	<0.01	<0.01	<0.01
Boron, dissolved	mg/l	5	--	1.43	1.4	1.8	1.4	1.6	1.6
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	10	12	10	12	12	11
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	0.0005	0.0005	0.0005	0.0006	0.0006	0.0006
Copper, dissolved	mg/l	--	1	0.006	0.011	0.002	0.003	0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.58	0.41	1.53	0.29	2.64	0.36
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	14	15	15	14	16	16
Manganese, dissolved	mg/l	--	0.05	0.05	0.03	0.06	0.03	0.06	0.04
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13	15	14	14	15	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	565	535	559	629	561	615
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	0.01	<0.01	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 31-May-2012	05-3C 29-Nov-2012	05-3C 29-May-2013 [5]	05-3C 26-Nov-2013 [16]	05-3C 29-May-2014 [17]	05-3C 19-Nov-2014 [18]
				05-3C	05-3C	05-3C	GW-15	05-3C	05-3C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	970	950	900	1000	910	920
Alkalinity, Carbonate as CaCO3	mg/l	--	--	21	25	17	22	25	18
Alkalinity (Total as CaCO3)	mg/l	--	--	990	970	920	1000	940	940
Ammonia Nitrogen	mg/l	--	--	0.95	0.79	0.81	1.6	1.3	1.3
Chemical Oxygen Demand	mg/l	--	--	66	54	53	72	66	74
Chloride	mg/l	--	250	280	270	270	320	270	270
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2225	1873	1478	2124	1893	2090
Hardness, Calcium Carbonate	mg/l	--	--	94	160	140	110	88	150
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	0.16	0.23	<1.0	<0.50	<0.10
Nitrite as N	mg/l	1.0	--	0.20	0.10	0.40	0.14	0.287	0.126
Nitrogen, Total Kjeldahl	mg/l	--	--	2.4	2.3	1.8	3.5	3.0	2.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.26	0.26	0.64	<1.0	<0.50	0.17
Nitrogen, Organic	mg/l	--	--	1.45	1.51	0.99	1.9	1.7	1.6
pH	-	--	--	8.37	8.44	8.29	8.38	8.46	8.31
pH (Field)	-	--	--	8.12	7.86	7.82	7.73	7.76	8.10
Phosphorus	mg/l	--	--	0.63	1.1	1.0	2.3	1.8	2.2
Sulphate	mg/l	--	500 [6]	<1	3	8	<1	<1	3
Temperature (Field)	deg c	--	15	10.7	7.4	11.4	6.7	9.2	3.2
Total Dissolved Solids	mg/l	--	500	1510	1410	1570	1530	1530	1470
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0045	0.0039	0.0039	0.0038	0.0042	0.0033
Boron, dissolved	mg/l	5	--	1.4	1.1	1.3	1.3	1.6	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	12	28	22	17	11	22
Chromium, dissolved	mg/l	0.05	--	<0.0050	0.0068	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.00055	0.00058	<0.00050	0.00076	<0.00050	0.00091
Copper, dissolved	mg/l	--	1	0.0071	0.0021	0.0018	0.0012	0.0023	0.0033
Iron, dissolved	mg/l	--	0.3	0.62	0.26	0.3	0.2	1	0.14
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	0.00059	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	16	22	20	17	15	22
Manganese, dissolved	mg/l	--	0.05	0.052	0.11	0.079	0.28	0.057	0.055
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	15	14	14	15	13
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	620	490	530	570	560	520
Zinc, dissolved	mg/l	--	5	0.017	0.0077	<0.0050	0.0099	<0.0050	0.011
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00020
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00020
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00020
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0013	<0.00050	<0.00050	<0.0010
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00020
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020	<0.00040
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020	<0.00040

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 02-Jun-2015	05-3C 26-Nov-2015	05-3C 26-May-2016	05-3C 17-Nov-2016	05-3C 24-May-2017	05-3C 29-Nov-2017
				05-3C	05-3C	05-3C	05-3D	05-3C	05-3C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	969	868	928	1000	674	880
Alkalinity, Carbonate as CaCO3	mg/l	--	--	25	14	14	13	<5	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	994	882	942	1010	678	891
Ammonia Nitrogen	mg/l	--	--	1.48	1.20	0.28	2.12	0.01	1.62
Chemical Oxygen Demand	mg/l	--	--	85	58	78	111	28	86
Chloride	mg/l	--	250	348	214	257	316	107	360
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2319	2053	2106	2751	1537	2439
Hardness, Calcium Carbonate	mg/l	--	--	127	79.1	158	280	323	83
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1	<0.1	0.3
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	0.27
Nitrogen, Total Kjeldahl	mg/l	--	--	3.3	2.6	1.5	3.3	0.3	3.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.82	1.4	1.22	1.18	0.29	1.68
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.15	7.94	7.97	7.91	7.64	7.81
Phosphorus	mg/l	--	--	1.77	1.38	0.98	2.41	0.15	2.18
Sulphate	mg/l	--	500 [6]	10	50	29	16	94	8
Temperature (Field)	deg c	--	15	8.8	7.9	9.9	8.9	8.9	7.8
Total Dissolved Solids	mg/l	--	500	1560	1270	1440	1610	928	1570
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.003	0.004	0.003	0.003	0.001	0.005
Boron, dissolved	mg/l	5	--	0.864	1.71	1.05	0.839	0.434	1.67
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	20.4	9.86	25.3	50.7	61.3	10.3
Chromium, dissolved	mg/l	0.05	--	<0.001	0.001	<0.001	0.008	0.005	0.001
Cobalt, dissolved	mg/l	--	--	0.0019	<0.0005	0.0005	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0008	0.0044	0.0046	0.0037
Iron, dissolved	mg/l	--	0.3	0.621	0.558	0.278	<0.1	<0.1	0.149
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	18.4	13.2	23	37.2	41.4	14
Manganese, dissolved	mg/l	--	0.05	0.312	0.05	0.159	0.289	<0.005	0.024
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.97	13.3	12.9	11.4	11.4	15.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	470	71.7	420	339	245	608
Zinc, dissolved	mg/l	--	5	0.012	0.01	0.006	0.016	0.008	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.002 [10]	0.006	0.007	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 24-May-2018	05-3C 29-Nov-2018	05-3C 19-Jun-2019	05-3C 20-Nov-2019	05-3C 21-May-2020	05-3C 26-Nov-2020
				05-3C	05-3C	05-3C	05-3C	05-3C	05-3C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	932	1050	957	1030	942	970
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25 [9]	25	<25	18	37
Alkalinity (Total as CaCO3)	mg/l	--	--	942	1070	982	1040	960	1010
Ammonia Nitrogen	mg/l	--	--	1.71	1.75	0.62	1.71	0.65	1.93
Chemical Oxygen Demand	mg/l	--	--	97	88	84	80	92	81
Chloride	mg/l	--	250	341	364	316	385	392	349
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2639	2434	2497	2730	2565	2368
Hardness, Calcium Carbonate	mg/l	--	--	82	121	90.4	121	--	99.6
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	95.0	--
Nitrate as N	mg/l	10.0	--	0.2	<0.1	0.9	0.2	0.9	<0.5 [11]
Nitrite as N	mg/l	1.0	--	0.05	0.08	0.10	0.40	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.5	3.6	2.1	2.9	2.1	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.79	1.85	1.48	1.19	1.45	1.17
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.11	8.39	7.77	8.27	8.46	8.41
Phosphorus	mg/l	--	--	2.05	2.21	0.83	2.31	1.04	2.30
Sulphate	mg/l	--	500 [6]	11	2	23	2	25	3
Temperature (Field)	deg c	--	15	10.6	7.7	13.3	5.8	12	8.2
Total Dissolved Solids	mg/l	--	500	1740	1680	1580	1710	1630	1630
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.005	0.005	0.004	0.005	0.004	0.003
Boron, dissolved	mg/l	5	--	1.59	1.54	1.49	1.42	1.52	1.48
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	10.7	18.8	10.7	14.4	11.2	11.2
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	0.001	0.002	0.001	0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0014	0.0006	0.0006	0.0006	0.0005
Copper, dissolved	mg/l	--	1	0.0030	0.0065	0.0106	0.0031	0.0045	0.0075
Iron, dissolved	mg/l	--	0.3	0.194	1.32	0.502	0.429	0.977	0.304
Lead, dissolved	mg/l	0.01	--	0.0002	0.0003	<0.0001	0.0004	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	13.4	17.9	15.4	20.7	16.3	17.4
Manganese, dissolved	mg/l	--	0.05	0.018	0.058	0.029	0.052	0.042	0.034
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.6	16.8	16.2	21.2	16.8	15.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	574	658	557	640	641	620
Zinc, dissolved	mg/l	--	5	0.009	0.005	<0.005	<0.005	0.006	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.005	<0.001	0.004	0.008	<0.010 [11]
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 06-Sep-2005	05-3D 16-Nov-2005	05-3D 25-May-2006	05-3D 15-May-2007	05-3D 30-Nov-2007	05-3D 22-May-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	593	271	480	478	507	484
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	486	444	480	478	507	484
Ammonia Nitrogen	mg/l	--	--	0.3	<0.01	0.21	<0.01	<0.01	<0.01
Chemical Oxygen Demand	mg/l	--	--	43	12	28	47	59	15
Chloride	mg/l	--	250	80.7	66.7	77.1	76	77.8	83.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1600	2500	950	900	750	1050
Hardness, Calcium Carbonate	mg/l	--	--	233	258	224	249	257	251
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.3	0.2	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.82	0.41	0.67	0.44	0.37	0.42
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.52	<0.41	0.46	<0.44	<0.37	<0.42
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.4	--	7.7	7.9	8.1	7.5
Phosphorus	mg/l	--	--	3.35	0.55	--	--	--	--
Sulphate	mg/l	--	500 [6]	137	101	96	94	91	89
Temperature (Field)	deg c	--	15	17.3	--	8.5	8.5	5	10.5
Total Dissolved Solids	mg/l	--	500	843	720	722	701	775	743
Total Organic Carbon	mg/l	--	--	35.2	4.1	--	--	--	--
Total Suspended Solids	mg/l	--	--	4570	659	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.005	0.001	0.001	0.0014	0.0019	0.0014
Boron, dissolved	mg/l	5	--	0.621	0.483	0.376	0.31	0.421	0.346
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00013	<0.00002	0.00015
Calcium, dissolved	mg/l	--	--	44.3	47.5	39.1	44.5	46.8	45.1
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.007	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.003	0.006	0.013	0.003	0.004	0.004
Iron, dissolved	mg/l	--	0.3	0.038	0.012	0.014	0.009	0.005	0.02
Lead, dissolved	mg/l	0.01	--	0.0005	0.0004	0.0007	0.0002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	29.8	33.8	30.8	33.5	34.1	33.6
Manganese, dissolved	mg/l	--	0.05	0.255	0.269	0.232	0.079	0.013	0.365
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.02	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.2	13.6	10.7	9.4	11.8	10
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	258	204	189	156	208	190
Zinc, dissolved	mg/l	--	5	0.014	0.017	0.017	0.015	<0.005	0.017
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	05-3D 10-Nov-2008	05-3D 19-May-2009 G-15	05-3D 26-Nov-2009 J-13	05-3D 25-May-2010[4] M-26	05-3D 20-Oct-2010[4] G-27	05-3D 24-May-2011 G-40	05-3D 29-Nov-2011[4] 05-3D
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	505	508	538	515	565	576	617
Alkalinity, Carbonate as CaCO3	mg/l	--	–	<5	<2[8]	<2[8]	<2[8]	<2[8]	14	<2[8]
Alkalinity (Total as CaCO3)	mg/l	–	–	505	508	538	515	565	590	617
Ammonia Nitrogen	mg/l	–	–	<0.01	0.05	0.02	0.06	0.05	0.06	<0.02
Chemical Oxygen Demand	mg/l	–	–	<5	10	15	10	15	10	8
Chloride	mg/l	–	250	84	79	89	76	84	82	84
Conductivity	uS/cm	–	–	--	1310	1370	1320	1400	1430	1460
Conductivity (Field)	uS/cm	–	–	1100	1050	1227	1246	1400	1122	1437
Hardness, Calcium Carbonate	mg/l	–	–	264	268	239	274	312	296	291
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	–	0.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	–	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	–	–	0.37	0.18	<0.10	0.13	0.12	0.56	0.16
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	–	<0.37	0.13	<0.08	0.07	0.07	0.5	<0.16
pH	-	–	–	--	8.04	8.05	8.14	8.00	8.42	8.16
pH (Field)	-	–	–	7.5	--	7.23	7.46	7.62	7.38	7.68
Phosphorus	mg/l	–	–	--	0.15	0.35	0.17	0.11	0.08	0.06
Sulphate	mg/l	–	500[6]	91	78	90	79	80	79	82
Temperature (Field)	deg c	–	15	8	8	7.8	20.2	12.2	15.0	6.9
Total Dissolved Solids	mg/l	–	500	771	852	890	858	910	930	949
Total Organic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	–	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	–	0.0016	0.001	0.001	<0.01	0.001	<0.001	<0.01
Boron, dissolved	mg/l	5	–	0.427	0.45	0.51	0.40	0.50	0.39	0.46
Cadmium, dissolved	mg/l	0.005	–	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	–	–	48.6	48	48	47	54	51	54
Chromium, dissolved	mg/l	0.05	–	<0.002	0.004	0.004	0.004	0.006	<0.005	0.005
Cobalt, dissolved	mg/l	–	–	<0.005	<0.0002	<0.0002	0.0011	0.0006	0.0020	<0.0002
Copper, dissolved	mg/l	–	1	0.003	0.006	0.005	0.008	0.003	0.005	0.005
Iron, dissolved	mg/l	–	0.3	<0.005	<0.03	<0.03	0.05	<0.03	<0.03	<0.03
Lead, dissolved	mg/l	0.01	–	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	–	–	34.7	36	29	38	43	41	38
Manganese, dissolved	mg/l	–	0.05	0.004	0.09	0.02	1.99	0.62	1.60	0.08
Mercury, dissolved	mg/l	0.001	–	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	–	–	12.3	9	10	12	13	11	11
Selenium, dissolved	mg/l	0.05	–	--	--	--	--	--	--	--
Silver, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	–	200[7]	197	195	207	209	235	187	216
Zinc, dissolved	mg/l	–	5	<0.005	0.01	0.01	0.02	<0.01	0.02	<0.01
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Styrene	mg/l	–	–	<0.0006	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	–	–	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	–	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	–	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	–	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	–	–	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	–	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	05-3D 31-May-2012 05-3D	05-3D 29-Nov-2012 05-3D	05-3D 29-May-2013 05-3D	05-3D 26-Nov-2013 GW-19	05-3D 29-May-2014 05-3D
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	610	640	640	670	660
Alkalinity, Carbonate as CaCO3	mg/l	--	–	6.5	8.5	6.1	6.0	6.8
Alkalinity (Total as CaCO3)	mg/l	–	–	620	650	650	680	670
Ammonia Nitrogen	mg/l	–	–	<0.050	0.080	0.11	<0.050	0.11
Chemical Oxygen Demand	mg/l	–	–	9.2	15	21	11	46
Chloride	mg/l	–	250	75	74	77	78	77
Conductivity	uS/cm	–	–	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	1313	1341	1241	1324	1324
Hardness, Calcium Carbonate	mg/l	–	–	290	330	320	330	280
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--
Nitrate as N	mg/l	10.0	–	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	–	<0.010	<0.010	0.018	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	–	–	0.64	0.63	0.57	0.54	0.55
Nitrogen, Nitrate-Nitrite	mg/l	–	–	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	–	–	<0.64	0.55	0.46	<0.54	0.44
pH	-	–	–	8.05	8.15	8.01	7.98	8.04
pH (Field)	-	–	–	7.95	7.75	7.47	7.55	7.35
Phosphorus	mg/l	–	–	0.089	0.085	0.17	0.070	0.052
Sulphate	mg/l	–	500[6]	71	71	72	77	72
Temperature (Field)	deg c	–	15	11.3	6.0	11.8	6.8	8.6
Total Dissolved Solids	mg/l	–	500	840	858	920	868	866
Total Organic Carbon	mg/l	–	–	--	--	--	--	--
Total Suspended Solids	mg/l	–	–	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	–	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	–	0.39	0.53	0.4	0.5	0.39
Cadmium, dissolved	mg/l	0.005	–	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	–	–	50	59	56	58	49
Chromium, dissolved	mg/l	0.05	–	<0.0050	0.0060	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	–	–	0.0017	0.00072	0.0012	<0.00050	<0.00050
Copper, dissolved	mg/l	–	1	0.0042	0.0033	0.0055	0.0041	0.0044
Iron, dissolved	mg/l	–	0.3	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	–	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	–	–	39	45	43	45	38
Manganese, dissolved	mg/l	–	0.05	1.7	0.84	0.95	0.18	0.23
Mercury, dissolved	mg/l	0.001	–	--	--	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	--	--	--
Nickel, dissolved	mg/l	–	–	--	--	--	--	--
Potassium, dissolved	mg/l	–	–	10	13	11	13	9.8
Selenium, dissolved	mg/l	0.05	–	--	--	--	--	--
Silver, dissolved	mg/l	–	–	--	--	--	--	--
Sodium, dissolved	mg/l	–	200[7]	210	240	220	260	220
Zinc, dissolved	mg/l	–	5	0.015	0.012	0.0070	0.036	0.0090
Phenols								
Phenolics, Total Recoverable	mg/l	–	–	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs								
Styrene	mg/l	–	–	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	–	–	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	–	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	–	–	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	–	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	–	–	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	–	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	05-3D 19-Nov-2014 05-3D	05-3D 02-Jun-2015 05-3D	05-3D 26-Nov-2015 05-3D	05-3D 26-May-2016 05-3D	05-3D 17-Nov-2016 05-3C	05-3D 24-May-2017 05-3D	05-3D 29-Nov-2017 05-3D
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	650	658	642	646	651	1070	714
Alkalinity, Carbonate as CaCO3	mg/l	--	–	4.1	<5	<5	<5	<5	17	<5
Alkalinity (Total as CaCO3)	mg/l	–	–	660	661	644	648	654	1090	718
Ammonia Nitrogen	mg/l	–	–	<0.050	0.10	0.02	0.04	0.08	1.91	0.22
Chemical Oxygen Demand	mg/l	–	–	9.6	18	18	19	40	98	33
Chloride	mg/l	–	250	88	92	98	104	106	342	126
Conductivity	uS/cm	–	–	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	1499	1419	1494	1455	1596	2590	1470
Hardness, Calcium Carbonate	mg/l	–	–	320	190	322	276	315	86	322
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	–	<0.10	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	–	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	–	0.24	0.2	0.3	0.3	0.3	3.2	0.6
Nitrogen, Nitrate-Nitrite	mg/l	–	–	<0.10	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	–	<0.24	0.1	0.28	0.26	0.22	1.29	0.38
pH	-	–	–	7.83	--	--	--	--	--	--
pH (Field)	-	–	–	7.49	7.49	7.67	7.78	7.56	8.18	7.40
Phosphorus	mg/l	–	–	0.076	<0.01	0.04	0.06	0.25	2.28	0.40
Sulphate	mg/l	–	500[6]	79	83	87	91	100	9	113
Temperature (Field)	deg c	–	15	5.9	8.7	7.1	9.4	9.7	10.2	8.8
Total Dissolved Solids	mg/l	–	500	650	918	874	896	882	1660	970
Total Organic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	–	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	–	<0.0010	<0.001	<0.001	<0.001	0.001	0.01	<0.001
Boron, dissolved	mg/l	5	–	0.46	0.193	0.424	0.343	0.578	1.32	0.523
Cadmium, dissolved	mg/l	0.005	–	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	–	–	57	29.4	45.7	49.8	57	10.9	53.5
Chromium, dissolved	mg/l	0.05	–	<0.0050	<0.001	<0.001	<0.001	0.006	0.011	<0.001
Cobalt, dissolved	mg/l	–	–	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	–	1	0.0067	0.0013	0.0006	0.0027	0.0045	0.0008	0.0070
Iron, dissolved	mg/l	–	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.635	<0.1
Lead, dissolved	mg/l	0.01	–	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	–	–	43	28.3	50.5	36.8	41.9	14.4	45.8
Manganese, dissolved	mg/l	–	0.05	0.063	0.06	<0.005	0.091	0.058	0.046	0.6
Mercury, dissolved	mg/l	0.001	–	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	–	–	12	7.92	10	10.7	11.7	14.3	13
Selenium, dissolved	mg/l	0.05	–	--	--	--	--	--	--	--
Silver, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	–	200[7]	260	222	282	188	249	697	247
Zinc, dissolved	mg/l	–	5	0.024	0.007	0.009	0.011	0.007	<0.005	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	<0.0010	<0.001	<0.001	0.002	<0.001	<0.004[10]	<0.001
Semi-VOCs										
Styrene	mg/l	–	–	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	–	–	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	–	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	–	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	–	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	–	–	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	–	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 24-May-2018 05-3D	05-3D 29-Nov-2018 05-3D	05-3D 19-Jun-2019 05-3D	05-3D 20-Nov-2019 05-3D	05-3D 21-May-2020 05-3D	05-3D 26-Nov-2020 05-3D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	714	753	694	666	704	719
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	6	5	8	6
Alkalinity (Total as CaCO3)	mg/l	--	--	718	756	701	671	712	725
Ammonia Nitrogen	mg/l	--	--	0.03	0.16	0.04	0.22	0.02	0.14
Chemical Oxygen Demand	mg/l	--	--	20	37	11	25	25	33
Chloride	mg/l	--	250	111	112	113	116	139	117
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1608	1457	1518	1646	1541	1490
Hardness, Calcium Carbonate	mg/l	--	--	334	369	380	378	--	344
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	366	--
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.4	0.2	0.4	0.4	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.37	0.24	0.16	0.18	0.38	0.26
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.49	7.78	7.53	7.4	8.24	7.64
Phosphorus	mg/l	--	--	0.10	0.20	0.16	0.16	0.12	0.16
Sulphate	mg/l	--	500 [6]	107	107	111	110	126	103
Temperature (Field)	deg c	--	15	9.0	8.2	12.7	9.3	12.4	7.4
Total Dissolved Solids	mg/l	--	500	992	646	970	1060	1040	1000
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.593	0.581	0.444	0.435	0.411	0.436
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	60.1	62.7	67.2	60	62.7	57.2
Chromium, dissolved	mg/l	0.05	--	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0006	<0.0005	0.0007	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0039	0.0109	0.0051	0.0030	0.0061	0.0018
Iron, dissolved	mg/l	--	0.3	<0.1	0.499	0.122	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0018	0.0003	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	44.7	51.6	51.5	55.4	50.9	48.9
Manganese, dissolved	mg/l	--	0.05	<0.005	0.246	0.052	0.623	0.04	0.401
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11.7	14.4	14.8	18.3	13.6	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	236	0.283	258	276	272	268
Zinc, dissolved	mg/l	--	5	0.006	0.015	0.006	0.008	<0.005	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.003	<0.001	0.003	0.004	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 06-Sep-2005 [3]	05-8 16-Nov-2005	05-8 25-May-2006	05-8 21-Nov-2006	05-8 15-May-2007	05-8 30-Nov-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	159	855	876	980	1040
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	650	855	876	980	1040
Ammonia Nitrogen	mg/l	--	--	--	3.29	2.02	0.79	2.22	0.35
Chemical Oxygen Demand	mg/l	--	--	--	61	57	39	169	108
Chloride	mg/l	--	250	--	89.9	27.9	16.8	24.3	122
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1600	1400	1425	1300	1500
Hardness, Calcium Carbonate	mg/l	--	--	--	649	794	769	794	1040
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	5.48	3.48	1.74	4.35	1.69
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	2.19	1.46	0.95	2.13	1.34
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	6.8	6.9	7.2	6.9
Phosphorus	mg/l	--	--	--	2.06	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	220	203	169	79	139
Temperature (Field)	deg c	--	15	--	--	4	11	9	11.5
Total Dissolved Solids	mg/l	--	500	--	1100	1120	1070	1080	1370
Total Organic Carbon	mg/l	--	--	--	17.5	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	4590	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	0.007	<0.001	0.0006	0.0013	0.0013
Boron, dissolved	mg/l	5	--	--	0.642	0.262	0.368	0.306	1.51
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00007	<0.00002
Calcium, dissolved	mg/l	--	--	--	136	179	165	174	222
Chromium, dissolved	mg/l	0.05	--	--	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	0.045	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	--	19.6	21	2.49	9.56	6.03
Lead, dissolved	mg/l	0.01	--	--	<0.0002	0.0008	<0.0001	0.00011	<0.00002
Magnesium, dissolved	mg/l	--	--	--	75.4	84.4	86.9	87.5	119
Manganese, dissolved	mg/l	--	0.05	--	1.63	2.36	3.23	3.02	4.47
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	14.6	5.9	5.8	6.8	6.4
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	169	86.8	91.4	109	129
Zinc, dissolved	mg/l	--	5	--	0.016	0.026	0.01	0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 28-Feb-2008	05-8 22-May-2008	05-8 10-Nov-2008	05-8 19-Dec-2008	05-8 19-May-2009 G-20	05-8 26-Nov-2009 M-15
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	940	970	1900	1850	1610	1400
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	940	970	1900	1850	1613	1400
Ammonia Nitrogen	mg/l	--	--	0.44	<0.01	0.8	0.72	0.72	0.67
Chemical Oxygen Demand	mg/l	--	--	43	67	214	272	140	130
Chloride	mg/l	--	250	81.2	103	444	409	302	243
Conductivity	uS/cm	--	--	--	--	--	--	3450	2960
Conductivity (Field)	uS/cm	--	--	--	1700	3500	3200	--	2511
Hardness, Calcium Carbonate	mg/l	--	--	925	1030	1500	1390	1220	1120
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.75	1.81	5.56	5.34	3.34	2.56
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.31	<1.81	4.76	4.62	2.62	1.89
pH	-	--	--	--	--	--	--	6.71	7.21
pH (Field)	-	--	--	--	6.5	6.6	6.6	--	6.34
Phosphorus	mg/l	--	--	--	--	--	--	0.53	0.79
Sulphate	mg/l	--	500 [6]	144	123	12	7	16	21
Temperature (Field)	deg c	--	15	--	10.5	11	5	--	11.4
Total Dissolved Solids	mg/l	--	500	1200	1260	2560	2490	2240	1920
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0015	0.0011	0.0023	0.005	0.003	0.004
Boron, dissolved	mg/l	5	--	0.966	1.01	13.1	12.6	8.71	5.9
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	200	223	341	325	262	248
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0022	0.0015
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.006	0.003	0.006	0.001
Iron, dissolved	mg/l	--	0.3	6.52	4.52	0.054	0.938	<0.03	7.09
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	103	116	158	140	138	122
Manganese, dissolved	mg/l	--	0.05	4.09	4.88	5.75	5.26	6.76	5.29
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6	4.9	12.3	12.5	8	12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	93.6	98.4	443	476	297	263
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.026	0.02	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.004	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	0.0011	0.0015	0.0020	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	0.0053	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	0.0015	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 25-May-2010 [4]	05-8 20-Oct-2010	05-8 24-May-2011	05-8 29-Nov-2011 [4]	05-8 31-May-2012	05-8 28-Nov-2012
				M-12	G-8	G-14	05-8	05-8	05-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1250	1210	1100	1170	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	2.7	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	1248	1210	1100	1170	1200	1200
Ammonia Nitrogen	mg/l	--	--	0.57	0.76	0.70	1.16	0.74	1.0
Chemical Oxygen Demand	mg/l	--	--	75	85	55	85	56	61
Chloride	mg/l	--	250	133	135	91	158	43	96
Conductivity	uS/cm	--	--	2490	2420	2110	2380	--	--
Conductivity (Field)	uS/cm	--	--	2474	2277	1688	2127	1866	1922
Hardness, Calcium Carbonate	mg/l	--	--	1040	1140	982	818	960	920
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	1.51	2.29	1.55	2.71	1.7	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	0.94	1.53	0.85	1.55	0.96	1
pH	-	--	--	7.14	7.02	7.76	7.51	7.38	--
pH (Field)	-	--	--	6.64	6.64	6.40	6.67	6.56	6.50
Phosphorus	mg/l	--	--	0.20	0.70	0.50	0.52	0.29	0.29
Sulphate	mg/l	--	500 [6]	29	36	34	5	<1	<1
Temperature (Field)	deg c	--	15	16.3	13	16.5	9.3	11.0	10.1
Total Dissolved Solids	mg/l	--	500	1620	1570	1370	1550	1240	1330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.001	<0.001	<0.01	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	4.8	3.6	0.50	3.6	1.6	2.7
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	222	255	207	166	210	190
Chromium, dissolved	mg/l	0.05	--	0.006	0.006	0.008	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0010	0.0012	0.0010	0.0004	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.006	0.003	0.004	<0.001	0.0016	0.001
Iron, dissolved	mg/l	--	0.3	0.92	2.39	0.11	13.0	1.8	3.8
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	119	122	113	98	110	110
Manganese, dissolved	mg/l	--	0.05	5.63	6.38	6.78	3.19	7	4.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	9	8	12	7.6	12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	211	194	140	225	130	190
Zinc, dissolved	mg/l	--	5	0.02	0.02	0.02	<0.01	<0.0050	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00050	<0.00050
Benzene	mg/l	0.001	--	<0.0005	0.0008	<0.0005	<0.0005	<0.00050	<0.00050
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00050	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0025	<0.0025
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	<0.0010
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 29-May-2013 [5]	05-8 26-Nov-2013 [5]	05-8 29-May-2014	05-8 19-Nov-2014 [18]	05-8 02-Jun-2015	05-8 26-Nov-2015 [3]
				05-8	GW-23	05-8	05-8	05-8	05-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1200	1200	1100	1200	983	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	2.2	2.2	1.8	1.9	<50	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1200	1100	1200	984	--
Ammonia Nitrogen	mg/l	--	--	1.8	1.7	1.5	0.95	1.04	--
Chemical Oxygen Demand	mg/l	--	--	78	57	51	61	69	--
Chloride	mg/l	--	250	70	64	30	95	67	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1733	1727	1566	2174	2045	--
Hardness, Calcium Carbonate	mg/l	--	--	1000	990	970	1100	933	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	2.5	2.4	2.0	2.0	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	1	0.8	0.9	1.05	0.96	--
pH	-	--	--	7.29	7.29	7.25	7.21	--	--
pH (Field)	-	--	--	6.52	6.40	6.65	6.86	6.58	--
Phosphorus	mg/l	--	--	0.14	0.13	0.21	0.21	0.09	--
Sulphate	mg/l	--	500 [6]	<1	<1	3	<1	<1	--
Temperature (Field)	deg c	--	15	9.7	8.6	10.6	7.0	9.2	--
Total Dissolved Solids	mg/l	--	500	1330	1280	1030	1300	1300	--
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	--
Boron, dissolved	mg/l	5	--	1.6	1.2	0.4	1.9	1.07	--
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	--
Calcium, dissolved	mg/l	--	--	220	220	220	230	169	--
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	--
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	--
Copper, dissolved	mg/l	--	1	0.0014	<0.0010	0.0023	0.0010	<0.0005	--
Iron, dissolved	mg/l	--	0.3	0.69	8.8	<0.1	0.76	<0.1	--
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	--
Magnesium, dissolved	mg/l	--	--	120	110	100	120	124	--
Manganese, dissolved	mg/l	--	0.05	6.8	8.2	7.6	7	6.82	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.3	7.1	4	8.6	6.37	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	140	110	49	150	126	--
Zinc, dissolved	mg/l	--	5	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	--
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.0056	0.0019	0.0015	0.0048	<0.002 [10]	--
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--
Benzene	mg/l	0.001	--	<0.00025	<0.00025	0.00033	<0.00020	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.0013	<0.00050	<0.0010	<0.0050	--
o-Xylene	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.00050	<0.00050	<0.00020	<0.00040	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00050	<0.00020	<0.00040	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 26-May-2016	05-8 17-Nov-2016	05-8 24-May-2017	05-8 29-Nov-2017	05-8 24-May-2018	05-8 22-Nov-2018
				05-8	05-8	05-8	05-8	05-8	05-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1080	1030	1120	1020	1310	1500
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25 [9]	<25 [9]	<25 [9]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1080	1040	1120	1020	1310	1500
Ammonia Nitrogen	mg/l	--	--	0.88	1.25	0.21	0.84	0.39	0.90
Chemical Oxygen Demand	mg/l	--	--	54	95	54	87	134	174
Chloride	mg/l	--	250	55	90	14	68	121	219
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1983	2205	1888	2003	2388	2506
Hardness, Calcium Carbonate	mg/l	--	--	987	937	1140	891	1220	1630
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.6	2.1	1.0	2.3	2.1	3.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.72	0.85	0.79	1.46	1.71	2.6
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.58	6.94	6.65	6.41	6.52	6.65
Phosphorus	mg/l	--	--	0.18	0.79	0.06	1.95	0.14	0.24
Sulphate	mg/l	--	500 [6]	2	<1	<1	1	1	3
Temperature (Field)	deg c	--	15	13.4	11.4	10.4	9.4	12.0	9.8
Total Dissolved Solids	mg/l	--	500	1330	1300	1170	1130	1570	1700
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.824	2.36	0.273	1.98	3.21	12.9
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	208	197	258	200	274	396
Chromium, dissolved	mg/l	0.05	--	<0.001	0.016	0.01	<0.001	<0.001	0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	0.0027
Copper, dissolved	mg/l	--	1	<0.0005	0.0017	0.0019	0.0008	0.0008	0.0012
Iron, dissolved	mg/l	--	0.3	<0.1	10	0.46	4.12	0.878	7.95
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	114	108	120	95.1	130	156
Manganese, dissolved	mg/l	--	0.05	8.74	5.59	12.6	9.67	12.5	12.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.06	11.7	3.69	4.93	4.96	11.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	84.9	159	55.4	90.4	124	226
Zinc, dissolved	mg/l	--	5	<0.005	0.005	0.006	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.004 [11]	0.007	<0.002 [10]	<0.001	<0.002 [11]	0.006
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 19-Jun-2019	05-8 20-Nov-2019	05-8 21-May-2020	05-8 26-Nov-2020
				05-8	05-8	05-8	05-8
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1250	1310	979	1430
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25	<25 [15]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1260	1310	980	1440
Ammonia Nitrogen	mg/l	--	--	0.79	0.42	1.03	0.17
Chemical Oxygen Demand	mg/l	--	--	110	141	89	122
Chloride	mg/l	--	250	113	94	24	113
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2173	2520	1667	1975
Hardness, Calcium Carbonate	mg/l	--	--	942	1200	--	1000
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	899	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.5 [11]
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	2.2	2.4	1.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.71	1.78	1.37	1.73
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	6.71	6.87	8.12	6.86
Phosphorus	mg/l	--	--	0.13	0.11	0.16	0.14
Sulphate	mg/l	--	500 [6]	1	9	<1	<1
Temperature (Field)	deg c	--	15	13.3	6.5	10.8	8.0
Total Dissolved Solids	mg/l	--	500	1400	1550	1020	1420
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	2.48	4.67	0.932	3.4
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	195	254	191	206
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0009	0.0027	<0.0005	0.0009
Copper, dissolved	mg/l	--	1	0.0046	0.0015	0.0031	0.0027
Iron, dissolved	mg/l	--	0.3	0.21	10.3	11.7	3.26
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0001	0.0003	<0.0001
Magnesium, dissolved	mg/l	--	--	110	137	102	119
Manganese, dissolved	mg/l	--	0.05	13.7	13.2	9.57	11.4
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.52	11.7	5.91	10.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	136	190	88.5	182
Zinc, dissolved	mg/l	--	5	0.008	<0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.003	0.006	0.005	<0.004 [11]
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	0.0006	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 06-Sep-2005 [3]	05-R3 16-Nov-2005	05-R3 25-May-2006	05-R3 21-Nov-2006	05-R3 15-May-2007	05-R3 30-Nov-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	140	720	765	768	815
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	575	720	765	768	815
Ammonia Nitrogen	mg/l	--	--	--	6.74	0.54	0.38	0.11	0.12
Chemical Oxygen Demand	mg/l	--	--	--	106	25	15	38	57
Chloride	mg/l	--	250	--	80.2	81.9	76	79.6	68.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1600	1300	1425	1300	1375
Hardness, Calcium Carbonate	mg/l	--	--	--	556	501	547	554	601
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	<0.1	0.8	0.8	0.5	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	33.1	1.16	0.84	0.67	0.49
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	26.36	0.62	0.46	0.56	0.37
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.2	7.1	7.6	7.6
Phosphorus	mg/l	--	--	--	5.05	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	300	185	196	198	211
Temperature (Field)	deg c	--	15	--	--	4.5	11.5	11.1	9
Total Dissolved Solids	mg/l	--	500	--	1160	1080	1150	1150	1230
Total Organic Carbon	mg/l	--	--	--	26.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	1200	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	0.008	<0.001	0.001	0.0008	0.001
Boron, dissolved	mg/l	5	--	--	1.27	1.06	1.28	1.1	1.18
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00006	<0.00002
Calcium, dissolved	mg/l	--	--	--	129	108	121	122	139
Chromium, dissolved	mg/l	0.05	--	--	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	0.009	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	<0.002	0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	--	15.2	0.022	<0.005	0.06	0.089
Lead, dissolved	mg/l	0.01	--	--	<0.0002	<0.0002	<0.0001	0.00005	<0.00002
Magnesium, dissolved	mg/l	--	--	--	57	56.1	59.9	60.5	62
Manganese, dissolved	mg/l	--	0.05	--	1.19	1.18	1.21	0.844	0.551
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	15.3	10.1	11.7	10.3	10.2
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	225	208	220	212	246
Zinc, dissolved	mg/l	--	5	--	0.017	0.006	0.008	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 28-Feb-2008	05-R3 22-May-2008	05-R3 10-Nov-2008	05-R3 19-Dec-2008	05-R3 19-May-2009 G-24	05-R3 26-Nov-2009 M-16
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	800	850	920	870	899	908
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	800	850	920	870	899	908
Ammonia Nitrogen	mg/l	--	--	<0.01	0.04	0.26	0.03	0.09	0.53
Chemical Oxygen Demand	mg/l	--	--	<5	17	14	15	23	27
Chloride	mg/l	--	250	72.8	71.7	74.1	65.9	60	73
Conductivity	uS/cm	--	--	--	--	--	--	1940	2000
Conductivity (Field)	uS/cm	--	--	--	--	1600	1500	1500	1776
Hardness, Calcium Carbonate	mg/l	--	--	601	639	639	666	646	580
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.4	0.3	0.2	0.5	0.18	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.34	0.5	0.65	0.37	0.36	0.60
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	<0.34	0.46	0.39	0.34	0.27	0.07
pH	-	--	--	--	--	--	--	7.06	7.45
pH (Field)	-	--	--	--	--	6.8	7.3	--	6.79
Phosphorus	mg/l	--	--	--	--	--	--	0.06	0.18
Sulphate	mg/l	--	500 [6]	202	186	158	150	173	153
Temperature (Field)	deg c	--	15	--	--	9	5	8	10.7
Total Dissolved Solids	mg/l	--	500	1180	1210	1240	1210	1260	1300
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.0008	0.0008	0.0008	<0.001	0.002
Boron, dissolved	mg/l	5	--	1.08	1.01	1.17	1.24	1.75	1.4
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	136	142	143	152	145	120
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	0.009	0.003
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0005	0.0008
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.031	0.279	0.099	0.006	<0.03	3.93
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	63.6	69.3	68.5	69.5	69	68
Manganese, dissolved	mg/l	--	0.05	0.614	1.19	0.964	1.5	0.42	1.61
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.5	10.3	11.7	12.5	9	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	213	218	230	236	204	224
Zinc, dissolved	mg/l	--	5	<0.005	0.005	<0.005	<0.005	<0.01	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 25-May-2010 M-15	05-R3 20-Oct-2010 G-10	05-R3 24-May-2011 G-16	05-R3 29-Nov-2011 05-R3	05-R3 31-May-2012 05-R3	05-R3 28-Nov-2012 05-R3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	852	896	951	968	940	940
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	4.4	5.0
Alkalinity (Total as CaCO3)	mg/l	--	--	852	896	951	968	940	940
Ammonia Nitrogen	mg/l	--	--	0.10	0.06	0.26	0.25	<0.050	0.11
Chemical Oxygen Demand	mg/l	--	--	23	30	23	25	21	25
Chloride	mg/l	--	250	58	55	51	81	46	44
Conductivity	uS/cm	--	--	1950	1970	1980	2030	--	--
Conductivity (Field)	uS/cm	--	--	1954	1905	1745	1852	1780	1792
Hardness, Calcium Carbonate	mg/l	--	--	732	784	766	660	750	780
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.14	<0.10	<0.10	0.11	0.21	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.28	0.83	0.50	0.62	0.58	0.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	0.21	<0.10
Nitrogen, Organic	mg/l	--	--	0.18	0.77	0.24	0.37	<0.58	0.06
pH	-	--	--	7.76	7.40	7.98	7.76	7.70	--
pH (Field)	-	--	--	6.88	6.98	6.86	6.83	6.99	6.79
Phosphorus	mg/l	--	--	0.07	0.04	0.05	0.05	0.059	0.028
Sulphate	mg/l	--	500 [6]	192	193	158	131	160	170
Temperature (Field)	deg c	--	15	14.5	11.9	16.7	9.5	10.6	8.6
Total Dissolved Solids	mg/l	--	500	1270	1280	1290	1320	1230	1280
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	1.4	1.1	0.97	1.4	0.97	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	163	187	173	134	170	180
Chromium, dissolved	mg/l	0.05	--	0.005	0.005	0.002	0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0007	0.0012	0.0007	0.0007	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.004	0.006	0.002	0.0024	0.002
Iron, dissolved	mg/l	--	0.3	0.24	0.31	<0.03	1.18	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	79	77	81	79	81	81
Manganese, dissolved	mg/l	--	0.05	0.81	1.10	0.52	1.91	1.1	0.39
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	10	10	12	11	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	218	197	170	222	180	190
Zinc, dissolved	mg/l	--	5	0.01	<0.01	0.01	<0.01	0.016	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	--	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	--	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	--	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	--	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	--	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 29-May-2013 05-R3	05-R3 26-Nov-2013 [5] GW-22	05-R3 29-May-2014 05-R3	05-R3 19-Nov-2014 05-R3	05-R3 02-Jun-2015 05-R3	05-R3 26-Nov-2015 05-R3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	940	970	960	940	958	978
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.2	4.1	5.2	3.2	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	950	970	960	940	959	980
Ammonia Nitrogen	mg/l	--	--	0.074	0.087	0.075	0.051	0.07	0.05
Chemical Oxygen Demand	mg/l	--	--	27	27	15	17	19	32
Chloride	mg/l	--	250	43	42	46	39	48	49
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1611	1646	1704	1878	1860	1849
Hardness, Calcium Carbonate	mg/l	--	--	820	750	790	820	702	800
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.17	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.50	0.45	0.43	0.33	0.2	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	0.17	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	0.43	0.36	0.36	0.28	0.13	0.35
pH	-	--	--	7.68	7.65	7.76	7.56	--	--
pH (Field)	-	--	--	6.95	6.93	7.27	7.08	6.99	6.98
Phosphorus	mg/l	--	--	0.046	0.053	0.049	0.060	0.04	0.04
Sulphate	mg/l	--	500 [6]	150	150	160	170	184	144
Temperature (Field)	deg c	--	15	9.9	9.0	11.4	7.2	10.2	10.4
Total Dissolved Solids	mg/l	--	500	1250	1220	1220	1180	1290	1250
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.97	0.96	0.91	0.94	0.698	0.838
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	190	170	180	190	132	153
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0019	0.0024	0.0031	0.0017	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	0.2	<0.1	0.31	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	83	81	84	85	90.3	101
Manganese, dissolved	mg/l	--	0.05	0.51	0.55	0.25	0.41	0.583	0.804
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.8	11	9.2	9.7	7.95	9.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	180	180	190	180	195	187
Zinc, dissolved	mg/l	--	5	<0.0050	0.0074	<0.0050	0.0065	0.011	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 26-May-2016	05-R3 17-Nov-2016	05-R3 24-May-2017	05-R3 29-Nov-2017	05-R3 24-May-2018	05-R3 22-Nov-2018
				05-R3	05-R3	05-R3	05-R3	05-R3	05-R3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	960	981	939	917	1030	991
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	961	983	941	919	1030	992
Ammonia Nitrogen	mg/l	--	--	0.02	0.13	0.03	0.12	0.10	0.03
Chemical Oxygen Demand	mg/l	--	--	16	28	17	30	48	21
Chloride	mg/l	--	250	42	42	20	21	20	21
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1880	2018	1874	1656	1790	1435
Hardness, Calcium Carbonate	mg/l	--	--	764	788	933	789	824	797
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.4	0.3	0.3	0.5	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.28	0.27	0.27	0.18	0.4	0.27
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.18	7.34	6.89	6.81	6.92	7.25
Phosphorus	mg/l	--	--	0.07	0.08	0.03	0.04	0.06	0.06
Sulphate	mg/l	--	500 [6]	223	168	296	282	131	127
Temperature (Field)	deg c	--	15	13.1	11.8	11.8	10.6	11.2	9.2
Total Dissolved Solids	mg/l	--	500	1320	1200	1290	1130	1150	990
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.796	1.14	0.58	0.649	0.501	0.62
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	172	174	229	186	195	185
Chromium, dissolved	mg/l	0.05	--	<0.001	0.012	0.008	0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0010	0.0026	0.0024	0.0016	0.0015	0.0037
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.4
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	81.5	85.7	87.5	78.8	81.7	81.5
Manganese, dissolved	mg/l	--	0.05	0.233	0.725	0.008	0.063	1.38	0.363
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.76	11.7	6.97	8.7	7.99	9.51
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	173	169	171	167	137	123
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.001	<0.001	<0.001	<0.001	0.003
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 19-Jun-2019	05-R3 20-Nov-2019	05-R3 21-May-2020	05-R3 26-Nov-2020
				05-R3	05-R3	05-R3	05-R3
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	899	756	845	821
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	902	760	848	826
Ammonia Nitrogen	mg/l	--	--	0.05	0.02	<0.01	0.03
Chemical Oxygen Demand	mg/l	--	--	18	23	28	24
Chloride	mg/l	--	250	21	18	25	20
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1560	1625	1516	1436
Hardness, Calcium Carbonate	mg/l	--	--	814	613	--	722
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	719	--
Nitrate as N	mg/l	10.0	--	<0.1	0.2	1.2	<0.5 [11]
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.2	0.3	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.25	0.18	<0.3	0.27
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.22	7.07	7.69	7.09
Phosphorus	mg/l	--	--	0.03	0.04	0.04	0.03
Sulphate	mg/l	--	500 [6]	123	162	182	137
Temperature (Field)	deg c	--	15	14.1	7.4	12.8	8.6
Total Dissolved Solids	mg/l	--	500	1020	1100	1070	956
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.507	0.446	0.416	0.478
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	183	118	165	161
Chromium, dissolved	mg/l	0.05	--	<0.001	0.003	0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0019	0.0025	0.0044	0.0041
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	86.4	77.1	74.3	78.1
Manganese, dissolved	mg/l	--	0.05	0.417	0.083	0.014	0.546
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.85	10.2	8.27	9.84
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	128	125	117	111
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	0.004	<0.001
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	07-1A 30-Nov-2007	07-1A 28-Feb-2008	07-1A 22-May-2008	07-1A 13-Aug-2008	07-1A 10-Nov-2008	07-1A 25-May-2010[4] M-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	860	795	820	805	800	761
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	28
Alkalinity (Total as CaCO3)	mg/l	--	--	860	795	820	805	800	789
Ammonia Nitrogen	mg/l	--	--	1.42	1.48	1.39	1.38	1.39	1.27
Chemical Oxygen Demand	mg/l	--	--	68	32	85	45	23	33
Chloride	mg/l	--	250	421	402	407	405	402	343
Conductivity	uS/cm	--	--	--	--	--	--	--	2640
Conductivity (Field)	uS/cm	--	--	2000	--	2350	2500	2250	2693
Hardness, Calcium Carbonate	mg/l	--	--	44	40	40	42	40	49
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1	<0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.19	2.65	3.92	2.93	1.99	1.66
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.77	1.17	2.53	1.55	0.6	0.39
pH	-	--	--	--	--	--	--	--	8.59
pH (Field)	-	--	--	8.6	--	8.6	9	8.5	8.72
Phosphorus	mg/l	--	--	--	--	--	--	--	1.07
Sulphate	mg/l	--	500[6]	4	1	2	<1	<1	<1
Temperature (Field)	deg c	--	15	3.5	--	11.5	11	7	11.9
Total Dissolved Solids	mg/l	--	500	1660	1440	1510	1440	1460	1720
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0044	0.0035	0.0025	0.0008	0.001	<0.01
Boron, dissolved	mg/l	5	--	1.05	0.993	1.01	1.03	1.06	1.3
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	2.8	2.4	2.4	2.9	2.27	3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.008
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0003
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.004	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.018	0.071	0.054	0.05	0.015	0.06
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	0.0002	0.00015	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	8.98	8.25	8.33	8.46	8.44	10
Manganese, dissolved	mg/l	--	0.05	0.004	0.005	0.003	0.003	0.002	<0.01
Potassium, dissolved	mg/l	--	--	17.5	14.2	14.9	15.6	15.9	16
Sodium, dissolved	mg/l	--	200[7]	587	581	578	518	550	515
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	07-1A 24-May-2011[4] G-7	07-1A 28-Nov-2012 07-1A	07-1A 29-May-2014 07-1A	07-1A 26-Nov-2015 07-1A	07-1A 24-May-2017 07-1A	07-1A 29-Nov-2018 07-1A	07-1A 21-May-2020 07-1A
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	784	780	770	815	864	898	800
Alkalinity, Carbonate as CaCO3	mg/l	–	–	37	18	30	20	18	22	38
Alkalinity (Total as CaCO3)	mg/l	–	–	821	800	800	835	882	920	838
Ammonia Nitrogen	mg/l	–	–	1.37	2.1	1.6	1.50	1.61	1.89	1.93
Chemical Oxygen Demand	mg/l	–	–	33	820	110	56	34	39	45
Chloride	mg/l	–	250	382	360	380	406	469	492	728
Conductivity	uS/cm	–	–	2730	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	2429	2381	2336	2585	2885	2620	2706
Hardness, Calcium Carbonate	mg/l	–	–	45	45	46	36.5	54	79	--
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	70.8
Nitrate as N	mg/l	10.0	–	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	–	<0.10	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	–	1.78	13	5.3	2.0	2.5	2.7	2.1
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	<0.10	<0.10	--	--	--	--
Nitrogen, Organic	mg/l	–	–	0.41	10.9	3.7	0.5	0.89	0.81	0.17
pH	-	–	–	8.70	--	8.62	--	--	--	--
pH (Field)	-	–	–	8.59	8.64	8.10	8.68	8.51	8.57	8.99
Phosphorus	mg/l	–	–	0.52	30	3.0	0.49	0.34	0.46	0.48
Sulphate	mg/l	–	500[6]	<1	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	–	15	18.0	7.5	9.9	8.7	10.4	6.8	11.2
Total Dissolved Solids	mg/l	–	500	1770	1560	1460	1600	1640	1650	1840
Metals										
Arsenic, dissolved	mg/l	0.01	–	<0.01	<0.001	<0.0010	<0.001	0.002	<0.001	<0.001
Boron, dissolved	mg/l	5	–	1.0	1.3	1.2	1.26	1.24	1.26	0.947
Cadmium, dissolved	mg/l	0.005	–	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	–	–	3	3.1	3	2.73	3.23	10.5	7.23
Chromium, dissolved	mg/l	0.05	–	<0.005	<0.005	<0.0050	<0.001	0.011	<0.001	<0.001
Cobalt, dissolved	mg/l	–	–	<0.0002	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	–	1	<0.001	<0.001	0.0017	<0.0005	0.0015	0.0024	0.0016
Iron, dissolved	mg/l	–	0.3	0.07	<0.1	<0.1	<0.1	<0.1	0.182	<0.1
Lead, dissolved	mg/l	0.01	–	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	–	–	9	9.1	9.3	7.21	11.1	12.9	12.8
Manganese, dissolved	mg/l	–	0.05	<0.01	0.003	0.0050	<0.005	<0.005	<0.005	<0.005
Potassium, dissolved	mg/l	–	–	15	15	14	12.9	16.6	18.7	17.1
Sodium, dissolved	mg/l	–	200[7]	606	630	530	677	674	706	669
Zinc, dissolved	mg/l	–	5	<0.01	<0.005	<0.0050	0.007	<0.005	<0.005	0.008
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	<0.001	<0.0010	<0.0010	<0.002[10]	<0.002[10]	<0.001	0.003
Semi-VOCs										
Styrene	mg/l	–	–	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	–	–	<0.0004	<0.00020	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	–	<0.0005	<0.00020	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00020	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	–	<0.0010	<0.00020	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	–	<0.0040	<0.0010	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	–	–	<0.0005	<0.00020	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.00040	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	–	<0.0002	<0.00040	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	07-1B 30-Nov-2007	07-1B 28-Feb-2008	07-1B 22-May-2008	07-1B 13-Aug-2008	07-1B 10-Nov-2008	07-1B 25-May-2010[4] M-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	965	925	920	945	950	902
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2[8]
Alkalinity (Total as CaCO3)	mg/l	--	--	965	925	920	945	950	902
Ammonia Nitrogen	mg/l	--	--	2.99	3.06	2.51	2.74	3.14	2.54
Chemical Oxygen Demand	mg/l	--	--	130	82	77	124	68	65
Chloride	mg/l	--	250	1470	1430	1470	1510	1520	1280
Conductivity	uS/cm	--	--	--	--	--	--	--	5690
Conductivity (Field)	uS/cm	--	--	4500	--	>5000	>5000	>5000	>3999
Hardness, Calcium Carbonate	mg/l	--	--	389	333	357	362	366	346
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	0.1	<0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	5.21	5.31	4.41	5.6	4.85	3.89
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.22	2.25	1.9	2.86	1.71	1.35
pH	-	--	--	--	--	--	--	--	8.28
pH (Field)	-	--	--	7.8	--	7.8	8.2	7.6	7.54
Phosphorus	mg/l	--	--	--	--	--	--	--	0.67
Sulphate	mg/l	--	500[6]	200	185	132	73	52	30
Temperature (Field)	deg c	--	15	3	--	11.5	12	7	11.0
Total Dissolved Solids	mg/l	--	500	3390	3430	3420	3320	3330	3700
Metals									
Arsenic, dissolved	mg/l	0.01	--	**0.0119**	**0.0216**	**0.0154**	**0.0108**	0.0049	<0.1
Boron, dissolved	mg/l	5	--	1.06	1.04	1.05	1.06	1.1	0.95
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	45.8	33.6	40.7	43.1	42.2	38
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0010
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.6	2.71	1.06	0.179	0.033	1.35
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	0.0005	<0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	66.8	60.6	62.1	61.8	63.4	61
Manganese, dissolved	mg/l	--	0.05	0.111	0.09	0.084	0.104	0.075	0.09
Potassium, dissolved	mg/l	--	--	40.7	34.4	35.8	38.1	36.1	32
Sodium, dissolved	mg/l	--	200[7]	1440	1070	1120	1030	1040	955
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	07-1B 24-May-2011[4] G-9	07-1B 28-Nov-2012 07-1B	07-1B 29-May-2014[5] 07-1B	07-1B 26-Nov-2015 07-1B	07-1B 24-May-2017 07-1B	07-1B 22-Nov-2018 07-1B	07-1B 21-May-2020 07-1B
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	942	910	900	967	1030	1040	917
Alkalinity, Carbonate as CaCO3	mg/l	--	–	20	8.5	18	19	17	8	19
Alkalinity (Total as CaCO3)	mg/l	–	–	962	920	920	987	1050	1050	936
Ammonia Nitrogen	mg/l	–	–	2.77	3.2	3.2	3.06	3.31	3.14	3.47
Chemical Oxygen Demand	mg/l	–	–	63	69	61	119	91	80	99
Chloride	mg/l	–	250	1360	1300	1400	1420	1430	1390	1670
Conductivity	uS/cm	–	–	6020	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	>3999	>3999	>3999	>3999	3999	>3999	>3999
Hardness, Calcium Carbonate	mg/l	–	–	355	380	370	376	331	562	--
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	425
Nitrate as N	mg/l	10.0	–	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	–	<0.10	0.010	<0.010	<0.05	<0.50[9]	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	–	3.95	4.3	4.0	4.1	4.1	4.8	3.4
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	<0.10	<0.10	--	--	--	--
Nitrogen, Organic	mg/l	–	–	1.18	1.1	0.8	1.04	0.79	1.66	0
pH	-	–	–	8.35	--	8.34	--	--	--	--
pH (Field)	-	–	–	7.78	7.99	7.73	8.02	7.94	8.1	8.39
Phosphorus	mg/l	–	–	0.99	0.96	1.5	0.89	1.05	0.92	0.93
Sulphate	mg/l	–	500[6]	7	<1	<1	4	3	2	2
Temperature (Field)	deg c	–	15	10.0	7.0	10.5	8.8	9.9	7.1	10.4
Total Dissolved Solids	mg/l	–	500	3910	3190	3050	3160	3340	3160	3190
Metals										
Arsenic, dissolved	mg/l	0.01	–	<0.1	0.006	0.0077[19]	0.003	0.012	0.003	0.003
Boron, dissolved	mg/l	5	–	0.9	1.3	1.2	1.31	0.914	1.47	1.15
Cadmium, dissolved	mg/l	0.005	–	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	–	–	40	42	41	29.2	40.5	60.6	47.1
Chromium, dissolved	mg/l	0.05	–	<0.005	<0.005	<0.0050	<0.001	0.04	<0.001	<0.001
Cobalt, dissolved	mg/l	–	–	0.0011	0.0007	0.00074	0.0005	0.0006	0.0012	0.0007
Copper, dissolved	mg/l	–	1	0.003	<0.001	0.0010	<0.0005	0.0034	0.0029	0.0026
Iron, dissolved	mg/l	–	0.3	1.59	1.3	0.75	0.519	0.832	1.53	0.541
Lead, dissolved	mg/l	0.01	–	<0.001	<0.0005	<0.00050	<0.0001	0.0003	<0.0001	<0.0001
Magnesium, dissolved	mg/l	–	–	62	66	65	73.4	55.9	99.7	74.7
Manganese, dissolved	mg/l	–	0.05	0.14	0.083	0.079	0.067	0.07	0.119	0.089
Potassium, dissolved	mg/l	–	–	30	32	30	27.2	31.6	47.6	32.7
Sodium, dissolved	mg/l	–	200[7]	1190	1100	1200	1260	1130	1180	1030
Zinc, dissolved	mg/l	–	5	0.01	<0.005	<0.0050	0.008	0.012	<0.005	0.009
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	<0.001	<0.0010	<0.0010	<0.002[10]	<0.010[11]	<0.001	0.007
Semi-VOCs										
Styrene	mg/l	–	–	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	–	–	<0.0004	<0.00050	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	–	<0.0005	<0.00050	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00050	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	–	<0.0010	<0.00050	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	–	<0.0040	<0.0025	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	–	–	<0.0005	<0.00050	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0010	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	–	<0.0002	<0.0010	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 30-Nov-2007	07-1C 28-Feb-2008	07-1C 22-May-2008	07-1C 13-Aug-2008	07-1C 10-Nov-2008	07-1C 19-May-2009 G-4
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	642	672	660	660	666	657
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	642	672	660	660	666	657
Ammonia Nitrogen	mg/l	--	--	1.41	0.73	0.66	0.79	0.75	0.30
Chemical Oxygen Demand	mg/l	--	--	360	13	40	102	29	18
Chloride	mg/l	--	250	562	471	507	505	605	425
Conductivity	uS/cm	--	--	--	--	--	--	--	2760
Conductivity (Field)	uS/cm	--	--	2100	--	2850	2600	2350	2300
Hardness, Calcium Carbonate	mg/l	--	--	252	245	260	245	235	243
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.1	0.2	0.2	0.42
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	5.52	2.23	1.93	1.88	1.73	0.66
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	4.11	1.5	1.27	1.09	0.98	0.36
pH	-	--	--	--	--	--	--	--	7.78
pH (Field)	-	--	--	7.6	--	7.4	7.8	7.3	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.26
Sulphate	mg/l	--	500 [6]	197	176	163	158	119	119
Temperature (Field)	deg c	--	15	3.5	--	10.5	11	8	8
Total Dissolved Solids	mg/l	--	500	1900	1670	1710	1640	1740	1790
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0048	0.0068	0.0084	0.0026	0.012	0.004
Boron, dissolved	mg/l	5	--	0.474	0.45	0.429	0.432	0.474	0.48
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	37.5	33.8	36.2	33.9	33.2	33
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0006
Copper, dissolved	mg/l	--	1	<0.002	0.003	<0.002	<0.002	0.003	0.004
Iron, dissolved	mg/l	--	0.3	0.149	0.122	1.44	0.005	0.01	<0.03
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	38.5	39	41.2	39	37.1	39
Manganese, dissolved	mg/l	--	0.05	0.479	0.403	0.469	0.461	0.466	0.40
Potassium, dissolved	mg/l	--	--	17.9	14.9	14.9	16.1	15.6	12
Sodium, dissolved	mg/l	--	200 [7]	662	535	561	495	526	471
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 26-Nov-2009 J-15	07-1C 25-May-2010 [4] M-6	07-1C 20-Oct-2010 [4] G-5	07-1C 24-May-2011 [4] G-4	07-1C 29-Nov-2011 [4] 07-1C	07-1C 31-May-2012 07-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	666	639	661	671	674	650
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	14	7.7
Alkalinity (Total as CaCO3)	mg/l	--	--	666	639	661	671	688	660
Ammonia Nitrogen	mg/l	--	--	0.53	0.49	0.28	0.59	0.40	0.56
Chemical Oxygen Demand	mg/l	--	--	30	25	40	30	30	34
Chloride	mg/l	--	250	454	422	468	452	460	420
Conductivity	uS/cm	--	--	2820	2760	2820	2840	2870	--
Conductivity (Field)	uS/cm	--	--	2420	2845	2945	2576	2534	2433
Hardness, Calcium Carbonate	mg/l	--	--	158	186	191	199	136	150
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	0.050
Nitrogen, Total Kjeldahl	mg/l	--	--	0.70	0.62	0.60	0.81	0.50	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	0.11
Nitrogen, Organic	mg/l	--	--	0.17	0.13	0.32	0.22	0.1	0.84
pH	-	--	--	8.06	8.10	7.79	8.26	8.35	8.10
pH (Field)	-	--	--	7.16	7.65	7.04	7.57	7.47	7.40
Phosphorus	mg/l	--	--	0.21	0.26	0.10	0.40	0.29	0.34
Sulphate	mg/l	--	500 [6]	115	108	98	86	84	72
Temperature (Field)	deg c	--	15	9.3	10.2	10.2	13.6	7.9	9.2
Total Dissolved Solids	mg/l	--	500	1830	1790	1830	1850	1870	1560
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.005	<0.01	<0.01	<0.01	<0.01	0.0043
Boron, dissolved	mg/l	5	--	0.52	0.43	0.44	0.44	0.50	0.5
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	22	25	27	27	18	21
Chromium, dissolved	mg/l	0.05	--	<0.005	0.004	0.009	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0007	0.0006	0.0005	0.0006	0.0003	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.001	0.002	0.002	<0.0010
Iron, dissolved	mg/l	--	0.3	0.11	0.40	0.75	0.88	<0.03	0.5
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	25	30	30	32	22	24
Manganese, dissolved	mg/l	--	0.05	0.38	0.32	0.38	0.34	0.14	0.24
Potassium, dissolved	mg/l	--	--	12	12	11	13	11	12
Sodium, dissolved	mg/l	--	200 [7]	537	531	510	502	521	560
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.01	0.01	<0.01	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 28-Nov-2012 07-1C	07-1C 29-May-2013 07-1C	07-1C 26-Nov-2013 GW-20	07-1C 29-May-2014 07-1C	07-1C 19-Nov-2014 07-1C	07-1C 02-Jun-2015 07-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	670	680	680	660	660	693
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5.5	5.8	7.6	8.6	6.2	8
Alkalinity (Total as CaCO3)	mg/l	--	--	680	690	680	670	670	701
Ammonia Nitrogen	mg/l	--	--	0.41	0.49	0.25	0.60	0.25	0.60
Chemical Oxygen Demand	mg/l	--	--	28	29	26	26	23	40
Chloride	mg/l	--	250	400	310	410	440	510	528
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2423	1976	2172	2366	2664	2555
Hardness, Calcium Carbonate	mg/l	--	--	150	230	180	200	160	161
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	0.11	0.16	0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.057	0.021	0.060	0.049	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.6	0.93	0.85	1.2	0.94	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.17	0.18	0.16	<0.10	--
Nitrogen, Organic	mg/l	--	--	1.19	0.44	0.6	0.6	0.69	0.5
pH	-	--	--	--	7.96	8.08	8.14	8.00	--
pH (Field)	-	--	--	7.62	6.99	7.23	7.65	7.69	7.46
Phosphorus	mg/l	--	--	0.36	0.21	0.25	0.49	0.33	0.38
Sulphate	mg/l	--	500 [6]	75	94	81	66	54	56
Temperature (Field)	deg c	--	15	8.5	8.7	7.7	9.8	6.0	9.5
Total Dissolved Solids	mg/l	--	500	1590	1600	1560	1490	1460	1700
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	0.0030	0.0029	0.0049	0.0038	0.003
Boron, dissolved	mg/l	5	--	0.59	0.56	0.48	0.52	0.53	0.314
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	20	31	25	27	23	22.9
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	0.0054	<0.0050	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.00050	<0.00050	0.00054	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.001	0.0014	0.0012	0.0025	<0.0020	<0.0005
Iron, dissolved	mg/l	--	0.3	0.46	<0.1	<0.1	1.4	0.87	0.563
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	0.0004
Magnesium, dissolved	mg/l	--	--	24	38	28	31	24	25.2
Manganese, dissolved	mg/l	--	0.05	0.32	0.33	0.28	0.35	0.27	0.33
Potassium, dissolved	mg/l	--	--	13	14	12	13	12	10.7
Sodium, dissolved	mg/l	--	200 [7]	570	560	510	570	550	586
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.0086	<0.0050	<0.0050	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 26-Nov-2015	07-1C 26-May-2016	07-1C 17-Nov-2016	07-1C 24-May-2017	07-1C 29-Nov-2017	07-1C 24-May-2018
				07-1C	07-1C	07-1C	07-1C	07-1C	07-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	709	712	713	735	737	742
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	5	5	<5	8	8
Alkalinity (Total as CaCO3)	mg/l	--	--	716	718	718	740	745	750
Ammonia Nitrogen	mg/l	--	--	0.32	0.71	0.54	1.14	0.40	0.68
Chemical Oxygen Demand	mg/l	--	--	32	31	49	30	39	67
Chloride	mg/l	--	250	450	509	511	434	478	465
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2678	2628	2773	2528	2303	2701
Hardness, Calcium Carbonate	mg/l	--	--	114	177	152	192	153	201
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.2	0.8	1.6	0.8	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.68	0.49	0.26	0.46	0.4	0.62
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.65	7.73	7.28	7.55	7.50	7.36
Phosphorus	mg/l	--	--	0.50	0.45	0.32	0.64	0.35	0.64
Sulphate	mg/l	--	500 [6]	73	63	65	105	108	93
Temperature (Field)	deg c	--	15	9.3	9.3	10.1	8.5	8.2	9.0
Total Dissolved Solids	mg/l	--	500	1460	1630	1570	1520	1560	1560
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.007	0.005	0.003	0.003
Boron, dissolved	mg/l	5	--	0.535	0.482	0.619	0.456	0.522	0.542
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	17	24.7	21.4	27	22.1	30.1
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.006	0.01	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0006	0.0012	0.0011	0.0005
Iron, dissolved	mg/l	--	0.3	0.724	0.351	0.273	<0.1	0.133	0.426
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	17.4	27.9	23.9	30.2	23.7	30.5
Manganese, dissolved	mg/l	--	0.05	0.34	0.279	0.429	0.341	0.3	0.312
Potassium, dissolved	mg/l	--	--	10.8	14.2	12.5	13.1	13.6	13.4
Sodium, dissolved	mg/l	--	200 [7]	587	502	587	583	553	509
Zinc, dissolved	mg/l	--	5	0.009	<0.005	<0.005	0.006	<0.005	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.003	0.004	<0.002 [11]	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 22-Nov-2018	07-1C 19-Jun-2019	07-1C 20-Nov-2019 [20]	07-1C 21-May-2020	07-1C 26-Nov-2020
				07-1C	07-1C	07-1C	07-1C	07-1C
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	781	661	682	657	671
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7	<5	9	<5	7
Alkalinity (Total as CaCO3)	mg/l	--	--	788	665	690	660	679
Ammonia Nitrogen	mg/l	--	--	0.38	0.61	0.36	0.54	0.27
Chemical Oxygen Demand	mg/l	--	--	40	28	42	49	65
Chloride	mg/l	--	250	552	418	448	566	419
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2379	2442	2600	2387	2316
Hardness, Calcium Carbonate	mg/l	--	--	192	229	276	--	193
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	238	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1	<0.5 [11]
Nitrite as N	mg/l	1.0	--	<0.05	0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.8	0.9	0.7	1.4	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.42	0.29	0.34	0.86	0.53
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.85	7.49	--	8.25	7.64
Phosphorus	mg/l	--	--	0.41	0.66	0.54	1.01	0.72
Sulphate	mg/l	--	500 [6]	81	117	115	113	120
Temperature (Field)	deg c	--	15	7.7	11.7	8.4	8.1	8.1
Total Dissolved Solids	mg/l	--	500	1730	1440	1470	1570	1490
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.003	0.003	0.004	0.003	0.002
Boron, dissolved	mg/l	5	--	0.55	0.452	0.421	0.389	0.411
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29.1	34	39.6	34	27.2
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0007	0.0006	0.0007	0.0005
Copper, dissolved	mg/l	--	1	0.0038	0.0010	0.0016	0.0034	0.0013
Iron, dissolved	mg/l	--	0.3	0.218	0.917	0.411	0.853	0.295
Lead, dissolved	mg/l	0.01	--	0.0001	0.0006	0.0002	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	28.9	35	43.1	37.1	30.3
Manganese, dissolved	mg/l	--	0.05	0.22	0.389	0.401	0.396	0.371
Potassium, dissolved	mg/l	--	--	16.2	14.1	19.5	14.4	13.7
Sodium, dissolved	mg/l	--	200 [7]	597	442	518	537	521
Zinc, dissolved	mg/l	--	5	<0.005	0.005	<0.005	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.006	<0.001	<0.001	0.004	<0.004 [11]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 30-Nov-2007	07-1D 28-Feb-2008	07-1D 22-May-2008	07-1D 13-Aug-2008	07-1D 10-Nov-2008	07-1D 19-May-2009 G-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	730	690	654	681	717	618
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	730	690	654	681	717	618
Ammonia Nitrogen	mg/l	--	--	1.31	1.26	0.8	1.18	1.21	1.75
Chemical Oxygen Demand	mg/l	--	--	307	58	54	114	43	33
Chloride	mg/l	--	250	105	90.7	77.2	96.4	104	63
Conductivity	uS/cm	--	--	--	--	--	--	--	1460
Conductivity (Field)	uS/cm	--	--	1300	--	1500	1450	1400	1100
Hardness, Calcium Carbonate	mg/l	--	--	383	401	381	357	386	319
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.2	0.2	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	7.44	3.91	3.24	3.32	3.2	2.37
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	6.13	2.65	2.44	2.14	1.99	0.62
pH	-	--	--	--	--	--	--	--	7.23
pH (Field)	-	--	--	6.8	--	6.8	7.2	6.7	--
Phosphorus	mg/l	--	--	--	--	--	--	--	1.15
Sulphate	mg/l	--	500 [6]	182	164	150	140	140	108
Temperature (Field)	deg c	--	15	5.5	--	10.5	15	8	8
Total Dissolved Solids	mg/l	--	500	1210	1050	1040	1020	1080	949
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0086	0.0048	0.0044	0.0015	0.0045	<0.001
Boron, dissolved	mg/l	5	--	0.431	0.314	0.326	0.424	0.446	0.33
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	65.1	71.9	65.1	61.3	72.6	57
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.006
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	8.46	12.8	14.1	2.95	8.04	2.19
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	53.5	53.7	53.2	49.6	49.8	43
Manganese, dissolved	mg/l	--	0.05	2.14	2.67	2.13	2.14	2.71	2.78
Potassium, dissolved	mg/l	--	--	12	8	9.5	11.2	10.3	6
Sodium, dissolved	mg/l	--	200 [7]	347	234	270	248	259	187
Zinc, dissolved	mg/l	--	5	<0.005	0.013	0.008	<0.005	<0.005	0.03
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 26-Nov-2009 J-14	07-1D 25-May-2010 [4] M-5	07-1D 20-Oct-2010 [4] G-3	07-1D 24-May-2011 [4] G-12	07-1D 29-Nov-2011 [4] 07-1D	07-1D 31-May-2012 07-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	697	635	709	642	690	620
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	2.0
Alkalinity (Total as CaCO3)	mg/l	--	--	697	635	709	642	690	630
Ammonia Nitrogen	mg/l	--	--	1.52	1.73	1.21	0.62	0.98	1.0
Chemical Oxygen Demand	mg/l	--	--	90	40	38	30	33	33
Chloride	mg/l	--	250	95	59	84	58	62	46
Conductivity	uS/cm	--	--	1660	1440	1590	1440	1450	--
Conductivity (Field)	uS/cm	--	--	1456	1423	1530	1070	1468	1201
Hardness, Calcium Carbonate	mg/l	--	--	333	369	404	397	403	380
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	0.12	0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	0.014
Nitrogen, Total Kjeldahl	mg/l	--	--	1.94	2.23	1.75	1.09	1.96	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	<0.10
Nitrogen, Organic	mg/l	--	--	0.42	0.5	0.54	0.47	0.98	0.7
pH	-	--	--	7.64	7.39	7.16	7.86	7.73	7.54
pH (Field)	-	--	--	6.51	6.99	6.73	6.89	7.07	6.95
Phosphorus	mg/l	--	--	1.12	0.92	1.39	0.55	0.34	0.32
Sulphate	mg/l	--	500 [6]	102	59	60	80	52	66
Temperature (Field)	deg c	--	15	9.1	13.2	9	14.0	7.7	9.9
Total Dissolved Solids	mg/l	--	500	1080	936	1030	936	942	824
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	<0.01	<0.01	<0.01	<0.01	<0.0010
Boron, dissolved	mg/l	5	--	0.48	0.31	0.52	0.26	0.44	0.39
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	64	67	81	78	79	74
Chromium, dissolved	mg/l	0.05	--	0.005	0.004	0.007	0.002	0.006	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0007	0.0006	0.0005	0.0009	0.0006	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.001	0.003	<0.001	0.0014
Iron, dissolved	mg/l	--	0.3	9.01	14.2	19.1	4.81	10.5	4.5
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	42	49	49	49	50	48
Manganese, dissolved	mg/l	--	0.05	2.01	2.79	3.55	1.63	3.22	1.7
Potassium, dissolved	mg/l	--	--	9	8	8	8	8	6.5
Sodium, dissolved	mg/l	--	200 [7]	237	211	207	174	209	170
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.01	0.01	<0.01	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 28-Nov-2012	07-1D 29-May-2013	07-1D 26-Nov-2013	07-1D 29-May-2014 [21]	07-1D 19-Nov-2014	07-1D 02-Jun-2015
				07-1D	7-1D	GW-12	07-1D	07-1D	07-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	700	510	630	370	610	503
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.5	1.8	1.9	1.8	1.5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	700	510	630	370	610	504
Ammonia Nitrogen	mg/l	--	--	1.4	0.82	1.6	0.90	0.61	1.23
Chemical Oxygen Demand	mg/l	--	--	41	36	34	25	25	37
Chloride	mg/l	--	250	75	30	41	19	58	42
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1447	977	1202	862	1161	1153
Hardness, Calcium Carbonate	mg/l	--	--	430	390	360	350	400	236
Nitrate as N	mg/l	10.0	--	<0.10	0.69	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	0.016	0.095	0.016	0.043	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.1	1.3	2.4	1.5	1.1	1.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.78	<0.10	<0.10	<0.10	--
Nitrogen, Organic	mg/l	--	--	0.7	0.48	0.8	0.6	0.49	0.67
pH	-	--	--	--	7.57	7.51	7.70	7.43	--
pH (Field)	-	--	--	6.76	6.62	6.76	7.07	6.83	6.85
Phosphorus	mg/l	--	--	0.51	0.35	0.58	0.41	0.38	0.37
Sulphate	mg/l	--	500 [6]	50	65	50	34	44	61
Temperature (Field)	deg c	--	15	7.8	9.0	7.7	9.5	7.6	9.3
Total Dissolved Solids	mg/l	--	500	950	746	736	418	600	684
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	0.64	0.41	0.36	0.42	0.28	0.293
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	78	75	81	65	96	48.6
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0008	<0.00050	0.00079	<0.00050	0.0011	0.0006
Copper, dissolved	mg/l	--	1	0.001	0.0015	0.0014	0.0016	0.0013	<0.0005
Iron, dissolved	mg/l	--	0.3	7	3.4	2.1	10	3.5	3.28
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	57	50	40	45	38	27.7
Manganese, dissolved	mg/l	--	0.05	4.1	2.2	1.7	2.1	3	1.57
Potassium, dissolved	mg/l	--	--	9.3	6.1	6.8	6.9	7.6	5.78
Sodium, dissolved	mg/l	--	200 [7]	230	160	130	160	100	121
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.011	<0.0050	0.0056	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 26-Nov-2015	07-1D 26-May-2016	07-1D 17-Nov-2016	07-1D 24-May-2017	07-1D 29-Nov-2017	07-1D 24-May-2018
				07-1D	07-1D	07-1D	07-1D	07-1D	07-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	471	477	516	383	455	439
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	471	477	517	384	456	440
Ammonia Nitrogen	mg/l	--	--	1.48	1.00	0.48	0.45	0.26	0.28
Chemical Oxygen Demand	mg/l	--	--	32	38	27	61	51	55
Chloride	mg/l	--	250	33	54	71	23	34	24
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1138	1261	1571	1046	1175	1099
Hardness, Calcium Carbonate	mg/l	--	--	365	441	561	438	527	503
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	<0.1	0.5	1.4
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.9	1.3	1.0	1.8	1.7	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.42	0.3	0.52	1.35	1.44	1.82
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.95	7.19	7.25	7.09	7.04	6.92
Phosphorus	mg/l	--	--	0.58	0.40	0.34	0.60	1.07	1.08
Sulphate	mg/l	--	500 [6]	58	153	313	220	270	196
Temperature (Field)	deg c	--	15	9.0	9.3	10.3	9.3	7.1	9.5
Total Dissolved Solids	mg/l	--	500	596	760	986	698	796	748
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.33	0.359	0.386	0.172	0.267	0.245
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	68.9	84.8	142	127	143	136
Chromium, dissolved	mg/l	0.05	--	0.001	<0.001	0.006	0.003	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0009	0.0019	0.0030	0.0025	0.0022
Iron, dissolved	mg/l	--	0.3	4.66	4.71	2.05	0.497	1.1	0.57
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	46.7	55.7	50.1	29.2	41.3	39.7
Manganese, dissolved	mg/l	--	0.05	1.31	2.03	0.824	0.27	0.487	0.334
Potassium, dissolved	mg/l	--	--	6.12	7.68	7.53	7.08	7.51	5.38
Sodium, dissolved	mg/l	--	200 [7]	137	152	105	42.3	62.9	48.6
Zinc, dissolved	mg/l	--	5	0.009	0.009	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.005	0.002	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 22-Nov-2018	07-1D 19-Jun-2019	07-1D 20-Nov-2019	07-1D 21-May-2020	07-1D 26-Nov-2020
				07-1D	07-1D	07-1D	07-1D	07-1D
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	545	426	361	391	426
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	546	428	361	393	428
Ammonia Nitrogen	mg/l	--	--	0.04	0.26	0.10	0.23	0.20
Chemical Oxygen Demand	mg/l	--	--	30	68	52	142	93
Chloride	mg/l	--	250	35	17	28	21	26
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	971	1025	1178	1019	1111
Hardness, Calcium Carbonate	mg/l	--	--	592	485	539	466	513
Nitrate as N	mg/l	10.0	--	0.6	0.8	1.7	1.8	0.2
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	2.2	1.2	4.2	1.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.86	1.94	1.1	3.97	1.7
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.17	7.05	6.8	8.06	7.05
Phosphorus	mg/l	--	--	0.73	1.42	0.61	2.89	0.91
Sulphate	mg/l	--	500 [6]	207	197	215	253	254
Temperature (Field)	deg c	--	15	7	12.6	7.8	7.86	6.8
Total Dissolved Solids	mg/l	--	500	822	686	752	716	764
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.877	0.247	0.286	0.185	0.248
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	122	119	134	116	127
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0042	0.0032	0.0031	0.0047	0.0031
Iron, dissolved	mg/l	--	0.3	2.61	<0.1	0.662	0.195	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	69.7	45.6	49.7	42.8	47.6
Manganese, dissolved	mg/l	--	0.05	1.03	0.67	0.344	0.392	0.07
Potassium, dissolved	mg/l	--	--	9.11	7.07	7.56	5.54	6.08
Sodium, dissolved	mg/l	--	200 [7]	139	63.8	63.3	55	62.9
Zinc, dissolved	mg/l	--	5	0.007	0.008	<0.005	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 09-Jun-1992	92-1 01-Nov-1992	92-1 15-Jun-1994	92-1 02-Nov-1994	92-1 22-Nov-1995	92-1 12-Oct-1996
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	996	1061	--	771	848	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	10	--
Alkalinity (Total as CaCO3)	mg/l	--	--	816	870	706	642	712	716
Ammonia Nitrogen	mg/l	--	--	--	--	--	1.09	0.77	1.12
Chemical Oxygen Demand	mg/l	--	--	--	--	323	363	27	20
Chloride	mg/l	--	250	307	404	390	266	235	186
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2486	2579	2210	2140	2180	1910
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	4.14	--	--
Hardness, Calcium Carbonate	mg/l	--	--	73.89	66	63	49	40	36
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	3.1	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	2.33	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.21	8.12	8.52	8.82	9.13	8.31
Phosphate	mg/l	--	--	--	--	--	--	1.7	--
Phosphorus	mg/l	--	--	--	--	1.63	1.095	--	--
Sulphate	mg/l	--	500 [6]	70	87.5	5.3	6	5	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1120	1080	1090	960
Total Organic Carbon	mg/l	--	--	--	--	11.8	23.3	10.8	8.9
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	4560
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.199	--	--
Boron, dissolved	mg/l	5	--	--	--	0.98	0.868	0.89	0.8
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.001	--
Calcium, dissolved	mg/l	--	--	7	7.77	9	3.8	4.5	4.4
Chromium, dissolved	mg/l	0.05	--	--	--	0.012	0.01	0.03	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0154	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	2.993	1.19	2.11	2.4
Lead, dissolved	mg/l	0.01	--	--	--	0.0012	0.1	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	13.7	11.4	10	2.115	7.01	5.96
Manganese, dissolved	mg/l	--	0.05	--	--	0.062	0.032	0.04	0.04
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	22.49	18	22	8.481	13.3	12.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	555.9	728	423	414.9	461	386
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.072	0.001	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 06-Nov-1997	92-1 05-Jun-1998	92-1 26-Aug-1998	92-1 29-Oct-1998	92-1 06-May-1999	92-1 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	359	910	824	997
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	640	450	294	746	710	817
Ammonia Nitrogen	mg/l	--	--	0.7	0.63	0.21	6.05	1.34	0.06
Chemical Oxygen Demand	mg/l	--	--	17	35	49	392	310	--
Chloride	mg/l	--	250	196	450	20.9	275	285	275
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1900	1893	1130	2040	1930	2130
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	36	552	559	54	36	28
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	1	1.1	--	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	7.18	9.11	1.56
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	1.13	7.77	1.5
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.01	--	7.21	8.4	8.4	8.59
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	1.59
Sulphate	mg/l	--	500 [6]	1	39	314	2	1	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	950	946	563	1020	960	1170
Total Organic Carbon	mg/l	--	--	9.6	7.4	22	11.7	16.5	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	244
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.91	1.04	0.47	1.08	1.03	0.96
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	4.14	165	136	6.61	2.32	2.39
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.06	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.29	19.6	2.6	0.45	0.06	0.07
Lead, dissolved	mg/l	0.01	--	0.0002	0.0067	0.0002	0.0002	0.0015	**0.022**
Magnesium, dissolved	mg/l	--	--	6.1	33.4	52.6	9.01	6.69	5.3
Manganese, dissolved	mg/l	--	0.05	0.03	1.05	1.16	0.02	0.01	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.06	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	13.8	20.9	6.5	28.5	10.2	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	384	281	78.6	499	532	490
Zinc, dissolved	mg/l	--	5	0.01	0.14	0.52	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 14-Jun-2001	92-1 06-Nov-2002	92-1 30-May-2003	92-1 19-Nov-2004	92-1 16-Nov-2005	92-1 15-May-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	865	955	893	889	188	770
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	1	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	741	783	732	729	770	770
Ammonia Nitrogen	mg/l	--	--	1.26	0.74	0.62	1.03	0.95	0.67
Chemical Oxygen Demand	mg/l	--	--	27	39	27	41	35	84
Chloride	mg/l	--	250	219	334	236	248	240	268
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1550	2020	1780	2180	1900	1500
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	25	30	29	27	32	31
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	<1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.69	1.33	1.32	1.67	1.56	2.05
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.43	0.59	0.7	0.64	0.61	1.38
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.4	8.2	7.3	8.4	--	8.9
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.37	1.27	1.26	1.48	0.98	--
Sulphate	mg/l	--	500 [6]	1	1	1	10	<1	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	10.2
Total Dissolved Solids	mg/l	--	500	966	1160	1150	1090	1260	1210
Total Organic Carbon	mg/l	--	--	10.4	11	12	10	12	--
Total Suspended Solids	mg/l	--	--	2490	102	80	114	50	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.001	0.001	<0.001	0.0013
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.94	0.99	0.94	1	1.02	0.927
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.00002
Calcium, dissolved	mg/l	--	--	2.26	3.08	3.44	2.22	3.11	3.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.07	0.02	0.07	0.041	0.039	0.131
Lead, dissolved	mg/l	0.01	--	0.0002	0.0013	0.0005	0.0007	<0.0002	0.00006
Magnesium, dissolved	mg/l	--	--	4.6	5.48	4.85	5.14	5.8	5.74
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.003	0.004	0.017
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	<0.01	--
Potassium, dissolved	mg/l	--	--	6.8	10.7	11.1	11.7	13.8	12.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	--
Sodium, dissolved	mg/l	--	200 [7]	423	499	449	477	548	458
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.005	0.006	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.039	0.001	0.001	0.001	<0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 10-Nov-2008	92-1 26-Nov-2009 M-4	92-1 24-May-2011 [4] G-19	92-1 28-Nov-2012 92-1	92-1 29-May-2014 92-1	92-1 26-Nov-2015 92-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	750	724	713	700	700	746
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	27	37	25	30	16
Alkalinity (Total as CaCO3)	mg/l	--	--	750	751	750	730	730	762
Ammonia Nitrogen	mg/l	--	--	0.9	1.01	0.96	1.2	1.2	1.22
Chemical Oxygen Demand	mg/l	--	--	<100	93	35	37	40	67
Chloride	mg/l	--	250	286	277	299	290	320	347
Conductivity	uS/cm	--	--	--	2250	2340	--	--	--
Conductivity (Field)	uS/cm	--	--	1900	1995	2089	2191	2031	2262
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	41	35	39	36	36	28.4
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.010	0.014	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	7.62	1.32	1.37	2.7	6.2	1.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	<0.10	--
Nitrogen, Organic	mg/l	--	--	6.72	0.31	0.41	1.5	5	0.58
pH	-	--	--	--	8.60	8.74	--	8.66	--
pH (Field)	-	--	--	8.2	8.55	8.72	8.53	8.39	8.69
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	2.98	1.31	1.3	1.2	1.13
Sulphate	mg/l	--	500 [6]	2	2	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	9	10	12.5	6.0	11.1	9.7
Total Dissolved Solids	mg/l	--	500	1280	1460	1520	1360	1350	1370
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0025	0.002	<0.01	<0.001	<0.0010	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.939	0.9	1.0	1.2	1.1	1.16
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	4.14	4	4	3.5	3.5	2.5
Chromium, dissolved	mg/l	0.05	--	<0.002	0.007	<0.005	<0.005	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.0002	0.0003	<0.0005	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.001	0.002	<0.001	0.0020	<0.0005
Iron, dissolved	mg/l	--	0.3	0.065	0.09	0.03	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.0005	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	7.35	6	7	6.6	6.7	5.39
Manganese, dissolved	mg/l	--	0.05	0.013	0.02	0.01	0.004	0.0036	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.3	11	12	13	13	11.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	511	449	552	550	550	592
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	<0.005	<0.0050	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.002 [10]
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 24-May-2017	92-1 22-Nov-2018	92-1 21-May-2020
				92-1	92-1	92-1
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	776	830	729
Alkalinity, Carbonate as CaCO3	mg/l	--	--	18	11	31
Alkalinity (Total as CaCO3)	mg/l	--	--	795	841	760
Ammonia Nitrogen	mg/l	--	--	1.21	1.15	1.13
Chemical Oxygen Demand	mg/l	--	--	41	68	71
Chloride	mg/l	--	250	334	372	423
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2309	2096	2186
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	36	63	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	74.5
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.0	2.1	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.79	0.95	0.57
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.63	8.47	8.06
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	1.13	1.40	1.22
Sulphate	mg/l	--	500 [6]	<1	<1	<1
Temperature (Field)	deg c	--	15	11.4	9.1	13.0
Total Dissolved Solids	mg/l	--	500	1360	1390	1410
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.002	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	1.08	1.08	0.83
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3.3	11.9	14.5
Chromium, dissolved	mg/l	0.05	--	0.01	<0.001	0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0007	0.0020	0.0032
Iron, dissolved	mg/l	--	0.3	<0.1	0.111	0.825
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0003
Magnesium, dissolved	mg/l	--	--	6.69	8.06	9.26
Manganese, dissolved	mg/l	--	0.05	<0.005	0.016	0.055
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13.1	14.9	14
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	557	549	563
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.008
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	0.004	0.007
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 09-Jun-1992	92-5 01-Nov-1992	92-5 08-Jun-1993	92-5 04-Nov-1993	92-5 15-Jun-1994	92-5 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	922	928	926	910	--	669
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	<1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	756	761	759	746	752	724
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	1.73
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	138	242
Chloride	mg/l	--	250	928	1240	1315	1375	1480	1090
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4255	4404	3990	4380	4890	4880
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	6.02
Hardness, Calcium Carbonate	mg/l	--	--	361.84	361	286	276	318	320
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	0.3	8.17	0.1	0.4
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.67	8.05	7.9	8.06	7.94	8.27
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	1.45	0.577
Sulphate	mg/l	--	500 [6]	29	25.5	4.8	7.1	1.9	1.9
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	2555	2520	2460	2440
Total Organic Carbon	mg/l	--	--	--	--	--	--	22.2	26.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	0.139	0.068	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.088
Boron, dissolved	mg/l	5	--	--	--	--	--	1.19	1.068
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**
Calcium, dissolved	mg/l	--	--	47.6	46	36.1	35	42.1	28.04
Chromium, dissolved	mg/l	0.05	--	--	--	**0.1**	<0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.017	0.01	0.0151	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.247	<0.1	0.436	0.159
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	**0.116**	0.0013	**0.1**
Magnesium, dissolved	mg/l	--	--	59	59.8	47.6	45.7	51.6	23.816
Manganese, dissolved	mg/l	--	0.05	--	--	0.087	0.01	0.192	0.075
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.023	<0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	23	28.1	28.3	26.7	35	21.69
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	827.7	1050	909	945	791	848.8
Zinc, dissolved	mg/l	--	5	--	--	0.083	<0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.007	0.063	0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 28-Jun-1995	92-5 23-Nov-1995	92-5 12-Oct-1996	92-5 06-Nov-1997	92-5 05-Jun-1998	92-5 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	871	893	--	--	--	900
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	714	732	764	808	672	738
Ammonia Nitrogen	mg/l	--	--	2.3	1.34	2.18	1.25	0.93	1.98
Chemical Oxygen Demand	mg/l	--	--	188	68	43	36	31	51
Chloride	mg/l	--	250	167	1100	1110	944	1120	1110
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4820	5080	4550	4600	4550	4400
Dissolved Oxygen (Field)	mg/l	--	--	4.64	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	221	269	239	266	252	246
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.6	0.1	0.1	2.8	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	8	4.5	--	--	--	5.84
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.7	3.16	--	--	--	3.86
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.85	8.75	7.76	7.48	--	7.8
Phosphate	mg/l	--	--	--	0.7	--	--	--	--
Phosphorus	mg/l	--	--	4.3	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	6	1	4	1	39	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2410	2540	2280	2310	2270	2200
Total Organic Carbon	mg/l	--	--	24.6	19.9	17.5	18.4	18.8	22.4
Total Suspended Solids	mg/l	--	--	--	--	1730	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.83	0.91	0.96	1.8	1.18	1.13
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	28.5	32.1	28	32.7	30	31.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.06	0.38	0.97	0.54	1.27	0.45
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0008
Magnesium, dissolved	mg/l	--	--	36.1	45.2	40.5	44.2	42.5	40.3
Manganese, dissolved	mg/l	--	0.05	0.1	0.12	0.11	0.1	0.13	0.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	26.2	25.4	24.7	31	27.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	693	841	937	908	1140	951
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.13	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 24-Oct-2000	92-5 14-Jun-2001	92-5 06-Nov-2002	92-5 30-May-2003	92-5 19-Nov-2004	92-5 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1050	936	977	911	982	198
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	861	768	801	747	805	810
Ammonia Nitrogen	mg/l	--	--	1.07	1.99	2.63	2.14	2.38	1.7
Chemical Oxygen Demand	mg/l	--	--	--	51	99	68	67	74
Chloride	mg/l	--	250	1230	1100	1120	1190	1200	1120
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4660	4350	4530	4270	4710	3400
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	272	214	250	227	231	253
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	0.2	1	1.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.77	3.14	4.89	3.63	3.3	3.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.7	1.15	2.26	1.49	0.92	1.6
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.06	7.8	7.8	7.1	7.9	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.42	2.79	4.96	1.2	1	1.62
Sulphate	mg/l	--	500 [6]	3	1	2	2	10	<1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2700	2300	2610	--	2355	2700
Total Organic Carbon	mg/l	--	--	--	18.7	19.1	17.9	16.3	20.6
Total Suspended Solids	mg/l	--	--	4360	2070	2220	856	710	28
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.001	0.003	0.003	0.001	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.15	1.18	1.18	1.11	1.14	1.21
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0001
Calcium, dissolved	mg/l	--	--	28.7	26.9	29.5	29	29.4	32.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.27	0.12	0.56	1.06	0.404	0.312
Lead, dissolved	mg/l	0.01	--	0.022	0.0002	0.0059	0.0006	0.0013	0.0007
Magnesium, dissolved	mg/l	--	--	48.6	35.6	42.8	37.5	38.3	41.9
Manganese, dissolved	mg/l	--	0.05	0.09	0.08	0.1	0.08	0.083	0.081
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	26.4	21	25.8	27.7	28.2	31.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	937	923	984	812	877	1010
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.006
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.003	0.08	0.001	0.001	0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 15-May-2007	92-5 10-Nov-2008	92-5 26-Nov-2009 [22]	92-5 24-May-2011 [4]	92-5 28-Nov-2012	92-5 29-May-2014
						M-2	G-23	92-5	92-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	840	810	796	766	750	760
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [8]	23	9.7	15
Alkalinity (Total as CaCO3)	mg/l	--	--	840	810	796	789	760	770
Ammonia Nitrogen	mg/l	--	--	1.16	1.64	2.01	1.92	1.9	1.7
Chemical Oxygen Demand	mg/l	--	--	107	61	60	65	68	53
Chloride	mg/l	--	250	1200	1230	1110	1100	1100	1200
Conductivity	uS/cm	--	--	--	--	4850	4890	--	--
Conductivity (Field)	uS/cm	--	--	3500	4350	>3999	>3999	3871	3903
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	235	229	224	244	250	260
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.76	3.25	2.99	3.05	2.7	2.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	1.6	1.61	0.98	1.13	0.8	0.8
pH	-	--	--	--	--	8.19	8.50	--	8.33
pH (Field)	-	--	--	8.4	8	7.9	8.09	8.04	7.63
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.95	1.52	1.5	0.98
Sulphate	mg/l	--	500 [6]	2	1	4	<1	<1	<1
Temperature (Field)	deg c	--	15	10.2	8	10.8	12.5	8.5	11.6
Total Dissolved Solids	mg/l	--	500	2700	2680	3150	3180	2590	2590
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0076	0.0064	0.009	<0.01	0.002	0.0037 [19]
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.1	1.11	0.96	1.3	1.4	1.3
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	30.3	29.2	27	30	31	32
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0006	0.0008	0.0005	0.00059
Copper, dissolved	mg/l	--	1	0.006	0.003	0.007	0.006	0.003	0.0028
Iron, dissolved	mg/l	--	0.3	0.413	0.015	<0.03	<0.03	<0.1	0.18
Lead, dissolved	mg/l	0.01	--	0.00016	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	38.7	37.9	38	41	42	44
Manganese, dissolved	mg/l	--	0.05	0.023	0.032	<0.01	0.02	<0.002	0.036
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	29.9	27.8	24	27	27	27
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	887	864	884	833	930	830
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.01	0.02	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00025	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.00020

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	92-5 26-Nov-2015	92-5 24-May-2017	92-5 29-Nov-2018	92-5 21-May-2020
				92-5	92-5	92-5	92-5
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	790	834	884	766
Alkalinity, Carbonate as CaCO3	mg/l	--	--	13	12	15	13
Alkalinity (Total as CaCO3)	mg/l	--	--	803	847	899	779
Ammonia Nitrogen	mg/l	--	--	0.05	0.01	0.20	1.44
Chemical Oxygen Demand	mg/l	--	--	105	111	147	127
Chloride	mg/l	--	250	1180	1160	1120	1400
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	271	94	327	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	290
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25[9]	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.3	1.7	2.1	2.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.25	1.69	1.9	1.16
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.01	8.00	8.1	8.14
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.96	0.92	1.43	1.50
Sulphate	mg/l	--	500[6]	<1	1	<1	<1
Temperature (Field)	deg c	--	15	9.8	11.9	6.9	13.6
Total Dissolved Solids	mg/l	--	500	2730	2620	2600	2680
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.008	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.35	0.981	1.26	0.92
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29	31.1	41.8	35.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.017	0.002	0.002
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0012	0.0011
Copper, dissolved	mg/l	--	1	<0.0005	0.0013	0.0046	0.0035
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.645	0.998
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	48.2	3.9	54	48.8
Manganese, dissolved	mg/l	--	0.05	0.011	0.12	0.024	0.122
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	22.7	27.9	33.6	28.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	1060	981	1010	899
Zinc, dissolved	mg/l	--	5	0.008	<0.005	<0.005	0.006
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.004[10]	<0.010[10]	<0.001	0.005
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 09-Jun-1992	92-7 01-Nov-1992	92-7 08-Jun-1993	92-7 04-Nov-1993	92-7 15-Jun-1994	92-7 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	561	529	515	538	--	503
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	<1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	460	434	422	441	442	420
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	0.89
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	143	115
Chloride	mg/l	--	250	298	407	465	568	720	410
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1822	1687	1780	1930	2060	2050
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	8.72
Hardness, Calcium Carbonate	mg/l	--	--	219.79	161	145	147	167	169
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	0.3	3.1	0.1	1.08
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.76	8.02	7.3	7.7	7.53	7.94
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	3.85	0.356
Sulphate	mg/l	--	500 [6]	13	4.7	1.8	4.4	2.6	2.3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1176	1000	1040	1030
Total Organic Carbon	mg/l	--	--	--	--	--	--	15.2	19
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	2.91	0.344	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.04
Boron, dissolved	mg/l	5	--	--	--	--	--	0.4	0.442
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**
Calcium, dissolved	mg/l	--	--	34.9	24	21.1	22.5	25.5	20.64
Chromium, dissolved	mg/l	0.05	--	--	--	0.018	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.1	0.01	0.0116	0.029
Iron, dissolved	mg/l	--	0.3	--	--	1.587	0.1	1.891	0.742
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	**0.0356**	0.0012	**0.1**
Magnesium, dissolved	mg/l	--	--	32.18	24.6	22.3	22	25.2	10.426
Manganese, dissolved	mg/l	--	0.05	--	--	0.238	0.261	0.405	0.213
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.024	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.06	13.1	15.7	13.4	35.3	8.746
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	313.3	369	349	388	320	331
Zinc, dissolved	mg/l	--	5	--	--	0.059	0.01	0.01	0.456
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.019	0.087	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 09-Jun-1992	92-7 01-Nov-1992	92-7 08-Jun-1993	92-7 04-Nov-1993	92-7 15-Jun-1994	92-7 02-Nov-1994
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 28-Jun-1995	92-7 23-Nov-1995	92-7 12-Jun-1996	92-7 12-Oct-1996	92-7 18-Jun-1997	92-7 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	524	597	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	430	462	462	479	452	466
Ammonia Nitrogen	mg/l	--	--	0.8	0.39	0.7	0.99	0.49	0.68
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	125	48	45	30	34	34
Chloride	mg/l	--	250	300	342	377	320	404	396
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2030	2100	1970	1800	1980	2020
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.07	--	--	--	2.77	--
Hardness, Calcium Carbonate	mg/l	--	--	155	158	159	149	176	176
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.8	0.6	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.8	1.8	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	6	1.41	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.49	8.16	7.69	7.23	7.69	7.27
Phosphate	mg/l	--	--	--	0.3	--	--	--	--
Phosphorus	mg/l	--	--	4.1	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	2	4	4	9	1	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1020	1050	990	900	990	1010
Total Organic Carbon	mg/l	--	--	15.8	14.8	15.2	15	13.5	14.7
Total Suspended Solids	mg/l	--	--	--	--	1960	546	1340	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.37	0.36	0.387	0.39	0.52	0.45
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	24.4	23.8	22.6	21.3	26.8	27.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	0.82	1.27	1.6	0.57	2.67
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	0.0002	0.0002	0.0002	0.0008
Magnesium, dissolved	mg/l	--	--	22.5	23.6	24.5	22.9	26.1	25.9
Manganese, dissolved	mg/l	--	0.05	0.38	0.4	0.361	0.39	0.33	0.45
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	14	16.2	11.4	12.9	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	339	371	38.1	321	325	331
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 28-Jun-1995	92-7 23-Nov-1995	92-7 12-Jun-1996	92-7 12-Oct-1996	92-7 18-Jun-1997	92-7 06-Nov-1997
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 05-Jun-1998	92-7 30-Oct-1998	92-7 06-May-1999	92-7 19-Oct-1999	92-7 05-May-2000	92-7 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	366	372	471	684	620
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	23	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	456	300	305	424	561	508
Ammonia Nitrogen	mg/l	--	--	0.5	0.93	0.27	0.9	0.03	0.41
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	43	28	21	21	33	--
Chloride	mg/l	--	250	388	250	226	368	375	410
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2020	1562	1180	1740	1800	2100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	173	142	165	176	166	168
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.6	--	--	0.1	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.93	1.44	--	--	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	3	1.17	--	--	0.69
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.3	7.1	7.6	7.6	7.57
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.46
Sulphate	mg/l	--	500 [6]	47	29	31	13	9	8
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1000	783	590	870	900	1100
Total Organic Carbon	mg/l	--	--	13.7	9.4	9.2	10.6	11.8	--
Total Suspended Solids	mg/l	--	--	--	--	--	1640	210	116
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.54	0.4	0.25	0.46	0.53	0.45
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.1	28.2	32.6	32.3	28.7	25.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.49	0.39	0.14	2.34	0.68	0.18
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0003	0.0002	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	25.9	17.4	20	22.8	22.6	25.4
Manganese, dissolved	mg/l	--	0.05	0.37	0.27	0.24	0.19	0.03	0.37
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	14.4	12.5	11.3	12.7	6.2	11.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	443	244	226	334	382	459
Zinc, dissolved	mg/l	--	5	0.22	0.01	0.01	0.13	0.1	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 05-Jun-1998	92-7 30-Oct-1998	92-7 06-May-1999	92-7 19-Oct-1999	92-7 05-May-2000	92-7 24-Oct-2000
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 14-Jun-2001	92-7 23-Nov-2001	92-7 23-May-2002	92-7 06-Nov-2002	92-7 30-May-2003	92-7 09-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	561	583	542	597	575	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	18	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	460	478	474	489	471	480
Ammonia Nitrogen	mg/l	--	--	0.74	0.86	0.59	0.95	0.44	1.15
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	3
Chemical Oxygen Demand	mg/l	--	--	30	32	19	42	68	43
Chloride	mg/l	--	250	414	400	396	388	410	396
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1700	1750	1980	2000	1940	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	112
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	135	179	178	166	159	161
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.1	0.2	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.57	1.73	1.09	1.89	1.33	1.83
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.83	0.87	0.5	0.94	0.89	0.68
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.03	7.17	7.7	7	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.65	0.3	0.27	0.62	0.34	0.55
Sulphate	mg/l	--	500 [6]	5	12	7	8	6	4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1100	1040	1080	1180	970	1139
Total Organic Carbon	mg/l	--	--	12.9	17	13	13.2	13.2	15
Total Suspended Solids	mg/l	--	--	167	82	45	202	76	100
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.47	0.56	0.47	0.44	0.44	0.445
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	20.9	28.6	29.5	25.3	24.9	23.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.006
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.003
Iron, dissolved	mg/l	--	0.3	0.16	0.15	0.05	0.05	0.2	2.19
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.001	0.0005	0.0009
Magnesium, dissolved	mg/l	--	--	20	26.2	25.4	25	23.4	24.6
Manganese, dissolved	mg/l	--	0.05	0.01	0.36	0.31	0.57	0.27	0.296
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	9.5	13.7	15.3	12.8	13.2	13.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	382	388	366	348	385	386
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.01	0.01	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.054	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 14-Jun-2001	92-7 23-Nov-2001	92-7 23-May-2002	92-7 06-Nov-2002	92-7 30-May-2003	92-7 09-Oct-2003
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 14-May-2004	92-7 19-Nov-2004	92-7 24-May-2005	92-7 16-Nov-2005	92-7 25-May-2006	92-7 21-Nov-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	597	634	605	303	515	528
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	489	520	496	496	515	528
Ammonia Nitrogen	mg/l	--	--	0.71	1.12	0.58	1.08	0.72	1.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	44	43	33	39	35	38
Chloride	mg/l	--	250	397	397	381	387	413	387
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2090	2290	2500	2000	1700	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	167	169	174	178	160	175
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	1	0.2	0.6	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.53	1.8	1.27	1.63	1.79	1.72
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.82	0.68	0.69	0.55	1.07	0.67
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.3	7.9	7.1	--	7.7	6.7
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.35	0.57	0.31	0.44	--	--
Sulphate	mg/l	--	500 [6]	10	20	9	10	10	12
Temperature (Field)	deg c	--	15	--	--	10.6	--	5.5	11.5
Total Dissolved Solids	mg/l	--	500	1045	1145	1130	1210	1180	1200
Total Organic Carbon	mg/l	--	--	11.7	12.5	12.8	14.6	--	--
Total Suspended Solids	mg/l	--	--	43	910	31	110	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	0.0015
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.451	0.478	0.451	0.489	0.404	0.448
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	0.0002	<0.005	<0.0001
Calcium, dissolved	mg/l	--	--	25.8	26.3	25.8	27.2	24	26.7
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.052	0.747	0.039	0.667	0.053	1.19
Lead, dissolved	mg/l	0.01	--	0.0003	0.0006	0.0011	0.0009	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	24.9	25.2	26.5	26.8	24.4	26.2
Manganese, dissolved	mg/l	--	0.05	0.163	0.349	0.098	0.319	0.267	0.718
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	14.3	14.1	15	16.2	13.2	14.3
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [7]	411	397	384	456	402	410
Zinc, dissolved	mg/l	--	5	0.005	0.005	0.005	0.009	<0.005	0.006
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.003	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 14-May-2004	92-7 19-Nov-2004	92-7 24-May-2005	92-7 16-Nov-2005	92-7 25-May-2006	92-7 21-Nov-2006
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 15-May-2007	92-7 30-Nov-2007	92-7 22-May-2008	92-7 10-Nov-2008	92-7 19-May-2009 G-9	92-7 26-Nov-2009 M-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	531	540	531	543	517	534
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	531	540	531	543	517	534
Ammonia Nitrogen	mg/l	--	--	<0.01	0.94	0.46	1.08	0.36	1.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	55	72	26	34	30	40
Chloride	mg/l	--	250	437	432	413	413	402	421
Conductivity	uS/cm	--	--	--	--	--	--	2240	2280
Conductivity (Field)	uS/cm	--	--	2190	1500	1900	1850	--	1998
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	168	170	166	174	165	163
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.6	0.2	0.1	0.1	0.29	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.69	1.58	1.25	1.69	0.93	1.41
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	<0.69	0.64	0.79	0.61	0.57	0.34
pH	-	--	--	--	--	--	--	7.97	8.21
pH (Field)	-	--	--	8.1	7.9	7.7	7.5	--	7.66
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.36	0.45
Sulphate	mg/l	--	500 [6]	9	4	8	13	7	7
Temperature (Field)	deg c	--	15	10	8	12	8	--	11.6
Total Dissolved Solids	mg/l	--	500	1250	1330	1230	1220	1460	1480
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0019	0.0015	0.0021	0.0013	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.468	0.469	0.43	0.435	1.62	0.49
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25.4	26	25.1	26.5	25	24
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.005	0.008
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0002	0.0003
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	0.003	0.001
Iron, dissolved	mg/l	--	0.3	0.019	0.728	0.025	0.009	<0.03	0.28
Lead, dissolved	mg/l	0.01	--	0.00004	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	25.4	25.5	25.1	26.3	25	25
Manganese, dissolved	mg/l	--	0.05	0.004	0.325	0.32	0.025	<0.01	0.29
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	15.5	13.6	14.6	13	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	417	502	422	403	389	427
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 15-May-2007	92-7 30-Nov-2007	92-7 22-May-2008	92-7 10-Nov-2008	92-7 19-May-2009 G-9	92-7 26-Nov-2009 M-6
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 25-May-2010 [4] M-13	92-7 20-Oct-2010 [4] G-9	92-7 24-May-2011 [4] G-15	92-7 29-Nov-2011 [4] 92-7	92-7 31-May-2012 92-7	92-7 28-Nov-2012 92-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	513	534	541	552	530	540
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	12	12	8.7	4.3
Alkalinity (Total as CaCO3)	mg/l	--	--	513	534	553	565	540	550
Ammonia Nitrogen	mg/l	--	--	0.34	0.95	0.56	0.74	0.10	1.1
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	55	35	38	45	50
Chloride	mg/l	--	250	387	393	403	399	370	380
Conductivity	uS/cm	--	--	2260	2210	2300	2350	--	--
Conductivity (Field)	uS/cm	--	--	2306	2108	2099	2165	2011	1979
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	179	197	176	186	170	190
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.028	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.64	1.67	0.90	0.90	1.1	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	0.3	0.72	0.34	0.16	1	0.4
pH	-	--	--	8.25	7.94	8.38	8.38	8.24	--
pH (Field)	-	--	--	7.69	7.62	7.73	8.12	7.79	7.77
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.31	0.43	0.27	0.46	0.21	0.47
Sulphate	mg/l	--	500 [6]	10	7	6	14	9	7
Temperature (Field)	deg c	--	15	17.6	11.3	12.2	9.2	11.0	9.8
Total Dissolved Solids	mg/l	--	500	1470	1440	1500	1530	1240	1250
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	<0.0010	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.49	0.47	0.48	0.46	0.52	0.58
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	27	31	26	30	26	28
Chromium, dissolved	mg/l	0.05	--	<0.005	0.009	<0.005	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0005	0.0003	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.002	0.001	0.003	0.001	0.0018	<0.001
Iron, dissolved	mg/l	--	0.3	0.49	0.90	0.18	0.58	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	27	29	27	27	26	30
Manganese, dissolved	mg/l	--	0.05	0.54	0.41	0.41	0.10	0.042	0.003
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	14	14	13	14	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	387	388	384	378	420	440
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	<0.01	<0.0050	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 25-May-2010 [4] M-13	92-7 20-Oct-2010 [4] G-9	92-7 24-May-2011 [4] G-15	92-7 29-Nov-2011 [4] 92-7	92-7 31-May-2012 92-7	92-7 28-Nov-2012 92-7
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	0.0005	<0.0004	<0.00025	<0.00050
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0025
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0010
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 29-May-2013 [5]	92-7 26-Nov-2013 [5]	92-7 29-May-2014	92-7 19-Nov-2014	92-7 02-Jun-2015	92-7 26-Nov-2015
				92-7	GW-21	92-7	92-7	92-7	92-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	540	570	570	560	585	598
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6.3	6.4	9.8	6.0	6	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	540	570	580	570	591	602
Ammonia Nitrogen	mg/l	--	--	1.0	1.2	0.59	1.1	0.47	1.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	41	45	42	83	72
Chloride	mg/l	--	250	400	380	390	420	428	431
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1818	1891	1939	2268	2185	2257
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	190	190	210	210	159	167
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.026	0.029	0.026	0.022	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.5	1.9	1.5	1.7	0.9	1.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.11	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	0.5	0.7	0.91	0.6	0.43	0.73
pH	-	--	--	8.09	8.08	8.27	8.06	--	--
pH (Field)	-	--	--	7.18	7.09	7.52	7.76	7.73	8.04
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.47	0.77	0.35	0.56	0.19	0.46
Sulphate	mg/l	--	500 [6]	3	4	<1	1	4	2
Temperature (Field)	deg c	--	15	10.6	10.5	10.9	7.4	10.2	9.5
Total Dissolved Solids	mg/l	--	500	1260	1240	1230	1270	1320	1320
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0017	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.48	0.47	0.56	0.53	0.334	0.522
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	28	29	32	33	26.2	26.5
Chromium, dissolved	mg/l	0.05	--	0.012	<0.0050	<0.0050	<0.0050	<0.001	0.002
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0020	<0.0010	0.0024	<0.0020	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	0.56	<0.1	0.68	0.214	0.404
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	28	29	32	32	22.8	24.4
Manganese, dissolved	mg/l	--	0.05	0.02	0.42	0.33	0.5	0.236	0.431
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	14	15	15	12.5	12.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	440	410	460	450	466	491
Zinc, dissolved	mg/l	--	5	0.0062	0.0096	<0.0050	0.039	0.055	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 29-May-2013 [5]	92-7 26-Nov-2013 [5]	92-7 29-May-2014	92-7 19-Nov-2014	92-7 02-Jun-2015	92-7 26-Nov-2015
				92-7	GW-21	92-7	92-7	92-7	92-7
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 26-May-2016	92-7 17-Nov-2016	92-7 24-May-2017	92-7 29-Nov-2017	92-7 24-May-2018	92-7 22-Nov-2018
				92-7	92-7	92-7	92-7	92-7	92-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	609	617	635	645	673	697
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	5	6	5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	612	620	640	651	678	702
Ammonia Nitrogen	mg/l	--	--	0.72	1.30	0.69	1.17	0.71	1.20
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	63	84	46	41	74	35
Chloride	mg/l	--	250	446	434	433	462	430	429
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2242	2376	2262	2053	2308	2153
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	209	208	199	206	212	265
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.5	2.0	1.2	1.6	1.4	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.78	0.7	0.51	0.43	0.69	1
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.30	7.55	7.72	7.56	7.59	7.83
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.51	0.65	0.28	0.40	0.28	0.49
Sulphate	mg/l	--	500 [6]	4	2	3	5	4	4
Temperature (Field)	deg c	--	15	14.7	11.6	10.3	9.2	10.3	9.2
Total Dissolved Solids	mg/l	--	500	1360	1270	1300	1330	1390	1320
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.001	0.002	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.555	0.711	0.46	0.535	0.527	0.57
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31	31.2	31.3	30.1	33.3	38.4
Chromium, dissolved	mg/l	0.05	--	<0.001	0.009	0.011	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0020	0.0008	0.0013	0.0014	0.0011	0.0033
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.574
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	31.9	31.7	29.3	31.7	31.3	41.2
Manganese, dissolved	mg/l	--	0.05	0.019	0.023	0.197	<0.005	0.13	0.411
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.6	14.6	14	15.1	14.4	18
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	436	464	469	441	426	529
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.005	0.003	<0.002 [10]	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 26-May-2016	92-7 17-Nov-2016	92-7 24-May-2017	92-7 29-Nov-2017	92-7 24-May-2018	92-7 22-Nov-2018
				92-7	92-7	92-7	92-7	92-7	92-7
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Jun-2019	92-7 20-Nov-2019	92-7 21-May-2020	92-7 26-Nov-2020
				92-7	92-7	92-7	92-7
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	640	621	617	628
Alkalinity, Carbonate as CaCO3	mg/l	--	--	9	6	13	9
Alkalinity (Total as CaCO3)	mg/l	--	--	649	627	630	637
Ammonia Nitrogen	mg/l	--	--	0.38	1.03	0.17	0.27
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	41	51	79
Chloride	mg/l	--	250	428	457	564	450
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2202	2390	2247	2134
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	394	288	--	241
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	239	--
Nitrate as N	mg/l	10.0	--	<0.1	0.3	<0.1	<0.5 [11]
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.7	1.3	0.7	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.32	0.27	0.53	0.63
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.71	7.74	8.68	8.07
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.20	0.38	0.25	0.35
Sulphate	mg/l	--	500 [6]	4	8	3	1
Temperature (Field)	deg c	--	15	13.3	8.8	12.0	8.1
Total Dissolved Solids	mg/l	--	500	1350	1290	1410	1310
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.765	0.453	0.41	0.43
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	58.8	42.5	35.6	34.6
Chromium, dissolved	mg/l	0.05	--	0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0046	0.0015	0.0035	0.0043
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	60	44.2	36.5	37.5
Manganese, dissolved	mg/l	--	0.05	<0.005	0.047	0.203	0.039
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	26.7	20.3	16.3	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	444	448	459	465
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.005	0.007
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.005	<0.001	<0.004 [11]

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	92-7 19-Jun-2019	92-7 20-Nov-2019	92-7 21-May-2020	92-7 26-Nov-2020
				92-7	92-7	92-7	92-7
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 09-Jun-1992	92-8 01-Nov-1992	92-8 22-Jun-1994	92-8 02-Nov-1994	92-8 28-Jun-1995	92-8 23-Nov-1995
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	503	1010	--	763	500	694
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	412	828	804	637	410	569
Ammonia Nitrogen	mg/l	--	--	--	--	--	4.62	3.1	0.15
Chemical Oxygen Demand	mg/l	--	--	--	--	214	194	138	85
Chloride	mg/l	--	250	173	213	310	156	102	148
Conductivity (Field)	uS/cm	--	--	1613	2300	2200	1650	1270	2200
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	9.22	7.64	--
Hardness, Calcium Carbonate	mg/l	--	--	485.3	760	596	416	341	890
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.54	1.3	0.8
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	10.8	5.7
Nitrogen, Organic	mg/l	--	--	--	--	--	--	7.7	5.55
pH (Field)	-	--	--	7.07	7.04	6.5	7.06	6.74	7.06
Phosphate	mg/l	--	--	--	--	--	--	--	0.3
Phosphorus	mg/l	--	--	--	--	0.82	0.249	3.25	--
Sulphate	mg/l	--	500 [6]	159	223.5	67.3	55.1	492	352
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1110	830	640	1100
Total Organic Carbon	mg/l	--	--	--	--	55.6	32	35.7	26.4
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.058	--	--
Boron, dissolved	mg/l	5	--	--	--	2.1	1.635	1.84	2.4
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	0.0001
Calcium, dissolved	mg/l	--	--	130.9	174	132	68.36	75.3	179
Chromium, dissolved	mg/l	0.05	--	--	--	0.01	0.01	0.01	0.03
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0198	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.433	0.491	0.07	10.4
Lead, dissolved	mg/l	0.01	--	--	--	0.0003	0.1	0.0012	0.0002
Magnesium, dissolved	mg/l	--	--	38.44	78.9	64.6	25.716	36.8	106
Manganese, dissolved	mg/l	--	0.05	--	--	4.193	1.802	1.85	3.26
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.59	21.5	27.9	9.917	--	21.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	143.4	233	166	171.6	130	144
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.021	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.142	0.001	0.001	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 09-Jun-1992	92-8 01-Nov-1992	92-8 22-Jun-1994	92-8 02-Nov-1994	92-8 28-Jun-1995	92-8 23-Nov-1995
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 12-Jun-1996	92-8 12-Oct-1996	92-8 18-Jun-1997	92-8 06-Nov-1997	92-8 26-Aug-1998	92-8 29-Oct-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	826	468
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	12	1
Alkalinity (Total as CaCO3)	mg/l	--	--	416	410	341	396	697	384
Ammonia Nitrogen	mg/l	--	--	6.2	1.96	0.18	4.66	1.01	1.24
Chemical Oxygen Demand	mg/l	--	--	72	45	44	82	56	7
Chloride	mg/l	--	250	68	29.3	72.8	26	387	39.4
Conductivity (Field)	uS/cm	--	--	1360	1250	1470	1200	2370	1310
Dissolved Oxygen (Field)	mg/l	--	--	--	--	4.23	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	429	575	756	745	59	553
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	1.43
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	0.19
pH (Field)	-	--	--	6.81	6.53	7.1	6.74	8.4	6.5
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	214	299	365	348	5	325
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	680	620	740	600	1200	660
Total Organic Carbon	mg/l	--	--	29	18.9	7.9	28.8	7	18
Total Suspended Solids	mg/l	--	--	379	146	435	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.19	0.78	0.33	0.22	1.14	0.44
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	93.1	135	179	181	6.12	144
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	27.2	12.2	5.19	22.2	5.02	9.21
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002
Magnesium, dissolved	mg/l	--	--	47	57.1	74.2	70.2	10.6	47.1
Manganese, dissolved	mg/l	--	0.05	3.05	3.48	1.08	0.66	0.11	3.83
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	14.4	11.7	5.3	10.2	16.2	8.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	165	75.6	88.6	56.7	621	93
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.08	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 12-Jun-1996	92-8 12-Oct-1996	92-8 18-Jun-1997	92-8 06-Nov-1997	92-8 26-Aug-1998	92-8 29-Oct-1998
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 06-May-1999	92-8 19-Oct-1999	92-8 05-May-2000	92-8 24-Oct-2000	92-8 14-Jun-2001	92-8 23-Nov-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	344	512	803	741	403	604
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	282	420	659	607	330	495
Ammonia Nitrogen	mg/l	--	--	0.01	0.47	0.01	1	1.52	1.94
Chemical Oxygen Demand	mg/l	--	--	39	19	372	--	47	45
Chloride	mg/l	--	250	18.7	12.9	30	50.7	18.8	45.8
Conductivity (Field)	uS/cm	--	--	1230	1000	1500	1400	1050	1400
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	710	481	814	703	507	618
Nitrate as N	mg/l	10.0	--	--	0.1	0.1	0.1	0.1	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	1.24	--	--	3.35	2.08	2.6
Nitrogen, Organic	mg/l	--	--	1.23	--	--	2.35	0.56	0.66
pH (Field)	-	--	--	6.9	6.9	6.7	6.57	6.7	6.31
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.67	0.38	0.28
Sulphate	mg/l	--	500 [6]	460	110	240	184	315	208
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	615	500	750	870	830	868
Total Organic Carbon	mg/l	--	--	14	9.5	122	--	14.8	23
Total Suspended Solids	mg/l	--	--	--	128	428	1800	170	204
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.09	0.45	0.27	0.21	0.21	0.4
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	188	130	178	143	115	139
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	7.93	3.91	52.7	12.6	16	32.7
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	0.0002	0.0012	0.0002	--
Magnesium, dissolved	mg/l	--	--	57.6	37.4	88.5	84.1	53.5	65.9
Manganese, dissolved	mg/l	--	0.05	0.83	0.85	4.48	4.53	1.88	2.35
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	1.1	4.2	0.4	6.5	1.5	2.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	27.1	53.6	60	74.9	50	94.7
Zinc, dissolved	mg/l	--	5	0.02	0.47	0.03	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.006	0.073	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 06-May-1999	92-8 19-Oct-1999	92-8 05-May-2000	92-8 24-Oct-2000	92-8 14-Jun-2001	92-8 23-Nov-2001
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 23-May-2002	92-8 06-Nov-2002 [3]	92-8 30-May-2003	92-8 09-Oct-2003 [3]	92-8 14-May-2004	92-8 19-Nov-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	401	--	641	--	772	750
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	329	--	525	--	633	615
Ammonia Nitrogen	mg/l	--	--	1.16	--	1.12	--	0.83	0.94
Chemical Oxygen Demand	mg/l	--	--	37	--	74	--	55	50
Chloride	mg/l	--	250	51.8	--	24.4	--	67.7	28
Conductivity (Field)	uS/cm	--	--	980	--	1150	--	1600	1750
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	486	--	468	--	781	778
Nitrate as N	mg/l	10.0	--	0.1	--	0.2	--	0.2	1
Nitrogen, Total Kjeldahl	mg/l	--	--	1.95	--	3.63	--	1.81	1.76
Nitrogen, Organic	mg/l	--	--	0.79	--	2.51	--	0.98	0.82
pH (Field)	-	--	--	6.82	--	6.4	--	6.9	6.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.3	--	0.41	--	0.31	0.24
Sulphate	mg/l	--	500 [6]	208	--	197	--	269	290
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	736	--	--	--	800	875
Total Organic Carbon	mg/l	--	--	13	--	13.8	--	10.6	10.7
Total Suspended Solids	mg/l	--	--	184	--	200	--	112	100
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	--	0.001	--	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.21	--	0.25	--	0.484	0.446
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	119	--	117	--	178	189
Chromium, dissolved	mg/l	0.05	--	0.01	--	0.01	--	0.001	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	--	0.01	--	0.002	0.002
Iron, dissolved	mg/l	--	0.3	8.87	--	3.92	--	9.73	6.9
Lead, dissolved	mg/l	0.01	--	0.0002	--	0.0002	--	0.0011	0.0002
Magnesium, dissolved	mg/l	--	--	45.8	--	42.7	--	81.9	74.4
Manganese, dissolved	mg/l	--	0.05	1.5	--	1	--	2.2	2.76
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	--	0.02	--	0.01	0.01
Potassium, dissolved	mg/l	--	--	5.2	--	6	--	6.4	6.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	56.7	--	107	--	109	71.9
Zinc, dissolved	mg/l	--	5	0.02	--	0.01	--	0.005	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	0.001	--	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 23-May-2002	92-8 06-Nov-2002 [3]	92-8 30-May-2003	92-8 09-Oct-2003 [3]	92-8 14-May-2004	92-8 19-Nov-2004
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 24-May-2005	92-8 16-Nov-2005 [3]	92-8 25-May-2006	92-8 19-Dec-2008
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	714	--	685	1540
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	585	--	685	1540
Ammonia Nitrogen	mg/l	--	--	0.76	--	1.03	0.35
Chemical Oxygen Demand	mg/l	--	--	35	--	42	214
Chloride	mg/l	--	250	23.3	--	15.2	280
Conductivity (Field)	uS/cm	--	--	1800	--	1200	3100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	757	--	696	1310
Nitrate as N	mg/l	10.0	--	0.1	--	<0.1	0.2
Nitrogen, Total Kjeldahl	mg/l	--	--	1.43	--	1.81	4.19
Nitrogen, Organic	mg/l	--	--	0.67	--	0.78	3.84
pH (Field)	-	--	--	6.6	--	6.9	6.6
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.24	--	--	--
Sulphate	mg/l	--	500 [6]	260	--	208	34
Temperature (Field)	deg c	--	15	9.4	--	5	4
Total Dissolved Solids	mg/l	--	500	980	--	964	2050
Total Organic Carbon	mg/l	--	--	12	--	--	--
Total Suspended Solids	mg/l	--	--	80	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.001	--	<0.001	0.0048
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.382	--	0.284	9.88
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	<0.005	<0.00002
Calcium, dissolved	mg/l	--	--	177	--	166	307
Chromium, dissolved	mg/l	0.05	--	<0.002	--	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	--	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	18.2	--	35.1	0.873
Lead, dissolved	mg/l	0.01	--	0.0007	--	<0.0002	<0.00002
Magnesium, dissolved	mg/l	--	--	76.9	--	68	133
Manganese, dissolved	mg/l	--	0.05	2.16	--	2.28	5.08
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	5.5	--	5	8
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	74.7	--	57.2	353
Zinc, dissolved	mg/l	--	5	0.006	--	0.011	0.007
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 24-May-2005	92-8 16-Nov-2005 [3]	92-8 25-May-2006	92-8 19-Dec-2008
Semi-VOCs							
Naphthalene	mg/l	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	<0.0006	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	<0.0002	--	--	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	0.001
Bromodichloromethane	mg/l	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	<0.0002	--	--	--
Chloroform	mg/l	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 09-Jun-1992	92-9 01-Nov-1992	92-9 08-Jun-1993	92-9 04-Nov-1993	92-9 15-Jun-1994	92-9 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	849	931	910	921	--	853
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	696	763	746	755	764	710
Ammonia Nitrogen	mg/l	--	--	1.57	2.34	--	--	--	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	4.6	8.3	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	219	97.8	--	--	79	90
Chloride	mg/l	--	250	820	1003	1005	1450	1290	882
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3813	3938	3580	3890	4170	3990
Dissolved Inorganic Carbon	mg/l	--	--	153.6	175.2	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	5.59
Hardness, Calcium Carbonate	mg/l	--	--	258	238	213	224	280	269
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.54	0.24	0.3	9.1	1.3	1.51
Nitrite as N	mg/l	1.0	--	0.1	0.17	0.1	0.12	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.64	8.12	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.07	5.78	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.18	8.1	7.65	8.07	7.73	7.99
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.57	0.71	--	--	1	0.626
Sulphate	mg/l	--	500 [6]	46	13	8.5	13	18	21.4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2168	2164	2248	2290	2100	2000
Total Organic Carbon	mg/l	--	--	25.2	23.9	--	--	21.7	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.25	0.423	0.01	--	0.148
Arsenic, dissolved	mg/l	0.01	--	0.001	0.004	--	--	--	**0.1**
Barium, dissolved	mg/l	1	--	0.05	0.11	--	--	--	0.037
Boron, dissolved	mg/l	5	--	0.99	1.05	--	--	0.97	0.92
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**
Calcium, dissolved	mg/l	--	--	30.15	26.3	23.6	25.9	35.1	23.15
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.014	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.01	0.01	0.0186	0.01
Iron, dissolved	mg/l	--	0.3	0.4	0.13	0.249	0.1	0.243	0.223
Lead, dissolved	mg/l	0.01	--	**0.1**	**0.17**	**0.1**	**0.105**	0.0015	**0.1**
Magnesium, dissolved	mg/l	--	--	44.39	41.8	37.5	38.7	46.7	20.626
Manganese, dissolved	mg/l	--	0.05	0.13	0.05	0.057	0.053	0.06	0.044
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.023	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	22.56	28.8	30.8	26.4	34.7	17.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	690.1	931	762	819	689	716.5
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.042	0.01	0.01	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.014	0.002	0.002	0.002	0.114	0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 28-Jun-1995	92-9 22-Nov-1995	92-9 12-Oct-1996	92-9 06-Nov-1997	92-9 05-Jun-1998	92-9 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	883	880	--	--	--	961
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	8	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	724	734	748	780	790	788
Ammonia Nitrogen	mg/l	--	--	0.97	0.51	1.41	1.04	1.05	1.24
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	65	60	5	56	37	70
Chloride	mg/l	--	250	875	838	858	840	1110	980
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4130	4260	--	3900	4220	3970
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.86	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	220	194	225	228	222	230
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	1.7	0.7	0.1	1.9	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	5	2.45	--	--	--	3.07
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	4.03	1.94	--	--	--	1.83
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.63	8.12	--	6.95	--	7.9
Phosphate	mg/l	--	--	--	0.3	--	--	--	--
Phosphorus	mg/l	--	--	0.99	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	15	20	13	6	38	10
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2070	2140	--	1960	2100	1990
Total Organic Carbon	mg/l	--	--	25.2	16.9	17.9	19.6	18.3	23.5
Total Suspended Solids	mg/l	--	--	--	--	93	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.83	1.23	0.86	0.98	1.05	1.04
Cadmium, dissolved	mg/l	0.005	--	0.0005	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.2	24.3	25.7	20.1	24.4	26.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	0.18	0.94	0.69	0.4	0.44
Lead, dissolved	mg/l	0.01	--	0.0006	0.0002	0.0002	0.0002	0.0002	0.0004
Magnesium, dissolved	mg/l	--	--	37.2	31.8	38.5	42.6	38.6	39.4
Manganese, dissolved	mg/l	--	0.05	0.04	0.03	0.1	0.06	0.05	0.05
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	23.9	24.4	25.6	30.9	25.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	682	880	668	653	983	865
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.13	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 24-Oct-2000	92-9 14-Jun-2001	92-9 06-Nov-2002	92-9 30-May-2003	92-9 19-Nov-2004	92-9 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1050	781	910	886	1020	189
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	47	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	861	720	846	726	835	775
Ammonia Nitrogen	mg/l	--	--	1.33	1.59	1.86	0.62	1.74	1.82
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	52	70	57	66	50
Chloride	mg/l	--	250	950	883	844	904	929	857
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3660	3500	3990	1150	4050	2900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	229	214	219	197	208	215
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.2	0.3	1	0.8
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.22	2.85	3.02	1.99	2.76	2.95
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.89	1.26	1.16	1.37	1.02	1.13
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.03	7.9	7.7	6.4	7.9	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.04	0.68	0.71	0.81	0.85	0.97
Sulphate	mg/l	--	500 [6]	2	8	6	5	10	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	12.8
Total Dissolved Solids	mg/l	--	500	2400	2000	2220	575	2025	2230
Total Organic Carbon	mg/l	--	--	--	16.7	19	16.6	17.8	21.6
Total Suspended Solids	mg/l	--	--	182	70	47	25	122	25
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.001	0.002	0.003	0.002	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.97	1.04	0.98	0.93	1.02	1.01
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0003
Calcium, dissolved	mg/l	--	--	23.7	27.8	26.1	24.5	25.6	26.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.2	0.05	0.03	0.46	0.279	0.473
Lead, dissolved	mg/l	0.01	--	0.022	0.0002	0.0028	0.0007	0.002	0.001
Magnesium, dissolved	mg/l	--	--	41.3	35.2	37.3	32.9	35.1	36
Manganese, dissolved	mg/l	--	0.05	0.04	0.03	0.03	0.05	0.046	0.061
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	24.1	20.6	24.8	24	26	28
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	796	768	840	688	744	832
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.003	0.102	0.001	0.001	0.001	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 15-May-2007	92-9 10-Nov-2008	92-9 26-Nov-2009 J-22	92-9 24-May-2011 [4] G-17	92-9 28-Nov-2012 92-9	92-9 29-May-2014 92-9
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	800	765	760	754	710	710
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [8]	21	7.7	16
Alkalinity (Total as CaCO3)	mg/l	--	--	800	765	760	776	720	730
Ammonia Nitrogen	mg/l	--	--	1.78	2.01	1.59	1.78	2.0	1.8
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	82	72	60	58	63	54
Chloride	mg/l	--	250	923	1010	852	834	790	850
Conductivity	uS/cm	--	--	--	--	3960	4100	--	--
Conductivity (Field)	uS/cm	--	--	2800	3300	3421	3488	3281	3349
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	195	196	159	200	200	210
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	<0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	0.151
Nitrogen, Total Kjeldahl	mg/l	--	--	3.16	3.24	2.41	3.26	3.0	2.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	0.16
Nitrogen, Organic	mg/l	--	--	1.38	1.23	0.82	1.48	1	1.1
pH	-	--	--	--	--	8.23	8.48	--	8.37
pH (Field)	-	--	--	8.2	7.8	7.79	7.92	8.08	7.63
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.94	1.01	1.0	0.79
Sulphate	mg/l	--	500 [6]	1	<1	4	<1	<1	<1
Temperature (Field)	deg c	--	15	9.8	7	10.5	14.4	8.1	12.5
Total Dissolved Solids	mg/l	--	500	2220	2270	2570	2660	2120	2120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0058	0.0063	0.008	<0.01	0.001	0.0031
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.893	0.935	0.93	0.79	1.1	1
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	24.7	24.5	19	24	25	26
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.007	<0.005	0.0007	0.0007	0.0006	0.00063
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.001	<0.001	<0.001	0.0021
Iron, dissolved	mg/l	--	0.3	0.047	0.035	0.79	0.32	<0.1	0.31
Lead, dissolved	mg/l	0.01	--	0.00005	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	32.3	32.8	27	34	35	36
Manganese, dissolved	mg/l	--	0.05	0.027	0.061	0.06	0.07	0.13	0.033
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	26.1	25.1	21	24	23	23
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	729	721	726	810	780	670
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01	<0.01	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00050	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00050	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0025	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 26-Nov-2015	92-9 24-May-2017	92-9 22-Nov-2018	92-9 21-May-2020
				92-9	92-9	92-9	92-9
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	772	785	838	737
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	13	16	14
Alkalinity (Total as CaCO3)	mg/l	--	--	784	798	854	751
Ammonia Nitrogen	mg/l	--	--	2.25	0.02	2.37	2.18
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	221	96	74	82
Chloride	mg/l	--	250	855	813	853	1070
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3698	3695	3439	3566
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	164	190	255	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	235
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.2
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [9]	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.4	1.4	3.1	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.15	1.38	0.73	0.82
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.03	8.06	7.85	7.41
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.99	0.85	0.99	0.96
Sulphate	mg/l	--	500 [6]	<1	1	<1	<1
Temperature (Field)	deg c	--	15	9.6	11.6	9.4	12.3
Total Dissolved Solids	mg/l	--	500	2100	2080	2120	2230
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.005	0.002	0.007
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.926	0.804	0.949	0.997
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	22.7	24	33.9	28.6
Chromium, dissolved	mg/l	0.05	--	<0.001	0.029	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0005	0.0009	0.0007
Copper, dissolved	mg/l	--	1	<0.0005	0.0015	0.0027	0.0039
Iron, dissolved	mg/l	--	0.3	0.507	<0.1	0.499	0.421
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	26	31.5	41.3	39.6
Manganese, dissolved	mg/l	--	0.05	0.069	0.035	0.079	0.081
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	19.4	24.4	27.1	25.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	835	795	855	728
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.002 [10]	<0.001	0.007
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 09-Jun-1992	92-10 01-Nov-1992	92-10 08-Jun-1993	92-10 04-Nov-1993	92-10 15-Jun-1994	92-10 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1078	980	937	939	--	907
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	884	803	768	770	760	756
Ammonia Nitrogen	mg/l	--	--	0.74	0.48	--	--	--	0.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	1.4	2.5	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	187	64.5	--	--	54	93
Chloride	mg/l	--	250	221	260	170	289	600	177
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2250	2100	1820	2100	2110	2070
Dissolved Inorganic Carbon	mg/l	--	--	201.6	224.4	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	8.12
Hardness, Calcium Carbonate	mg/l	--	--	793.65	515	589	600	621	615
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.24	0.24	0.3	2.39	0.1	0.42
Nitrite as N	mg/l	1.0	--	0.1	0.1	0.1	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.68	1.21	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.94	0.73	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.88	7.89	6.85	7.34	6.92	7.27
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.28	0.86	--	--	1.45	0.362
Sulphate	mg/l	--	500 [6]	95	95	103	116	98	110
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1492	1268	1220	1180	1070	1040
Total Organic Carbon	mg/l	--	--	27.7	22.4	--	--	15.6	19
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.21	0.152	0.044	--	0.069
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	--	--	--	**0.1**
Barium, dissolved	mg/l	1	--	0.07	0.14	--	--	--	0.052
Boron, dissolved	mg/l	5	--	1.1	1.31	--	--	1.18	1.517
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**
Calcium, dissolved	mg/l	--	--	132.9	37.9	89.2	99.7	97	92.06
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.03	0.01	0.0142	0.01
Iron, dissolved	mg/l	--	0.3	0.66	0.3	0.341	0.1	0.431	0.366
Lead, dissolved	mg/l	0.01	--	**0.1**	**0.05**	**0.1**	**0.0235**	0.0007	**0.1**
Magnesium, dissolved	mg/l	--	--	112.1	102	88.9	85.1	91.9	71.786
Manganese, dissolved	mg/l	--	0.05	1.45	0.92	0.97	0.787	0.558	1.039
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.028	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	13.03	18.1	16.1	18.9	18.4	12.13
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	211.2	260	227	289	200	228.9
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.101	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.006	0.002	0.002	0.002	0.223	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 09-Jun-1992	92-10 01-Nov-1992	92-10 08-Jun-1993	92-10 04-Nov-1993	92-10 15-Jun-1994	92-10 02-Nov-1994
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 28-Jun-1995	92-10 22-Nov-1995	92-10 12-Jun-1996	92-10 12-Oct-1996	92-10 18-Jun-1997	92-10 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	915	969	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	750	794	783	752	749	630
Ammonia Nitrogen	mg/l	--	--	0.16	0.1	0.24	0.62	0.1	0.34
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	60	40	29	5	27	29
Chloride	mg/l	--	250	120	125	145	142	139	174
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1950	2040	1830	1790	1850	1900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.44	--	--	--	3.31	--
Hardness, Calcium Carbonate	mg/l	--	--	619	229	631	551	735	638
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.7	0.5	0.6	0.6	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4	1.3	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	3.84	1.2	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	8.09	7.12	6.86	7.24	6.28
Phosphate	mg/l	--	--	--	0.1	--	--	--	--
Phosphorus	mg/l	--	--	1.84	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	15	101	128	120	140	136
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	980	1020	920	900	920	980
Total Organic Carbon	mg/l	--	--	14.3	12.9	13.2	12.8	12	12.1
Total Suspended Solids	mg/l	--	--	--	--	380	1290	2170	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.49	0.76	1.47	1.62	1.88	1.59
Cadmium, dissolved	mg/l	0.005	--	0.0011	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	107	25.4	106	92.2	142	120
Chromium, dissolved	mg/l	0.05	--	0.02	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	0.2	0.665	0.78	2.12	0.93
Lead, dissolved	mg/l	0.01	--	0.0017	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	84.4	39.6	87.7	76.9	91.1	81
Manganese, dissolved	mg/l	--	0.05	0.52	0.56	0.745	0.68	1.06	0.64
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	26	17.4	15.3	10.4	15.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	195	739	214	214	184	213
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 28-Jun-1995	92-10 22-Nov-1995	92-10 12-Jun-1996	92-10 12-Oct-1996	92-10 18-Jun-1997	92-10 06-Nov-1997
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 05-Jun-1998	92-10 30-Oct-1998	92-10 06-May-1999	92-10 19-Oct-1999	92-10 06-May-2000	92-10 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	810	773	732	833	732
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	656	664	634	600	683	600
Ammonia Nitrogen	mg/l	--	--	0.41	0.49	0.47	0.35	0.01	0.23
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	44	13	26	6	11	--
Chloride	mg/l	--	250	214	190	210	156	59.2	232
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1970	1860	1780	1600	1500	1590
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	528	504	477	384	358	394
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.3	--	--	0.8	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	1.3	1.39	--	--	1.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	0.81	0.92	--	--	0.94
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.1	7.3	7.6	7.4	7.36
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.73
Sulphate	mg/l	--	500 [6]	132	122	105	100	82	66
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	980	920	890	800	750	1030
Total Organic Carbon	mg/l	--	--	13.2	14.6	12.4	9.4	8.4	--
Total Suspended Solids	mg/l	--	--	--	--	--	1380	210	852
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.5	1.27	1.3	1.33	1.05	1.08
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	87.5	77.1	82.1	65.4	58.3	58.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.17	1.71	1.08	2.54	1.86	0.38
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0004	0.0002	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	74.3	75.8	65.1	52.8	51	60.3
Manganese, dissolved	mg/l	--	0.05	0.92	0.81	0.64	0.47	0.59	0.41
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	17.5	19.7	12.6	15.7	5.9	12.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	280	247	217	285	250	235
Zinc, dissolved	mg/l	--	5	0.12	0.01	0.01	0.1	0.17	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 05-Jun-1998	92-10 30-Oct-1998	92-10 06-May-1999	92-10 19-Oct-1999	92-10 06-May-2000	92-10 24-Oct-2000
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 14-Jun-2001	92-10 23-Nov-2001	92-10 23-May-2002	92-10 06-Nov-2002	92-10 30-May-2003	92-10 09-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	620	588	638	659	684	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	4	12	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	518	482	543	540	561	570
Ammonia Nitrogen	mg/l	--	--	0.34	0.33	0.25	0.26	0.26	0.54
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	2
Chemical Oxygen Demand	mg/l	--	--	10	21	12	19	16	68
Chloride	mg/l	--	250	128	194	141	116	158	195
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1200	1270	1590	1550	1560	1640
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	127
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	413	408	445	361	395	350
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.2	0.4	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.85	1.57	0.46	0.77	0.88	1.07
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.51	1.24	0.21	0.51	0.62	0.53
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.3	6.4	6.92	7.2	6.7	7.3
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.49	1.36	0.21	0.34	0.5	0.53
Sulphate	mg/l	--	500 [6]	60	58	104	96	89	68
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	796	912	824	810	780	992
Total Organic Carbon	mg/l	--	--	8.3	14	8	7.3	7.7	14
Total Suspended Solids	mg/l	--	--	360	832	190	460	256	280
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.13	1.35	1.06	0.97	0.94	0.845
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	75.6	65.9	77.4	60	69.1	58.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002
Iron, dissolved	mg/l	--	0.3	0.18	0.03	0.56	0.76	0.7	0.599
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0005
Magnesium, dissolved	mg/l	--	--	54.4	59.2	61.2	51.4	53.9	49.7
Manganese, dissolved	mg/l	--	0.05	0.26	0.46	0.23	0.39	0.27	0.356
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	7.9	11.3	13.2	14.8	13.5	14.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	164	206	167	221	196	264
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.01	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.037	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 14-Jun-2001	92-10 23-Nov-2001	92-10 23-May-2002	92-10 06-Nov-2002	92-10 30-May-2003	92-10 09-Oct-2003
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 14-May-2004	92-10 19-Nov-2004	92-10 24-May-2005	92-10 16-Nov-2005	92-10 25-May-2006	92-10 21-Nov-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	688	732	702	148	590	624
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	564	600	575	605	590	624
Ammonia Nitrogen	mg/l	--	--	0.25	0.32	0.58	0.05	0.06	0.25
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	26	23	19	15	7	11
Chloride	mg/l	--	250	186	147	168	172	160	126
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1650	1670	2000	1600	1400	1500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	338	459	410	501	490	471
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	<1	0.3	0.3	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.96	0.74	1.16	0.49	0.55	0.64
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.71	0.42	0.58	0.44	0.49	0.39
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.4	7.3	6.6	--	7.3	6.7
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.47	0.2	0.65	0.26	--	--
Sulphate	mg/l	--	500 [6]	83	110	156	124	176	178
Temperature (Field)	deg c	--	15	--	--	9.8	12.6	5	10.5
Total Dissolved Solids	mg/l	--	500	825	835	1080	1030	1020	1060
Total Organic Carbon	mg/l	--	--	7.4	7	8	9.2	--	--
Total Suspended Solids	mg/l	--	--	136	526	3220	139	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.002	<0.001	0.0011
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.826	1.1	0.879	1.08	0.873	0.986
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.005	<0.0001
Calcium, dissolved	mg/l	--	--	56.5	81.3	67.3	90.2	87.6	83.2
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.002	0.004	0.009	0.002
Iron, dissolved	mg/l	--	0.3	0.526	0.479	0.379	0.057	0.029	0.531
Lead, dissolved	mg/l	0.01	--	0.0003	0.0005	0.0006	<0.0002	0.0003	<0.0001
Magnesium, dissolved	mg/l	--	--	48	62.2	58.7	67.1	65.9	64
Manganese, dissolved	mg/l	--	0.05	0.284	0.237	0.432	0.169	0.464	1.31
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	15.8	14.9	17.2	17.2	13.6	15.7
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	<0.001	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	294	185	286	214	175	215
Zinc, dissolved	mg/l	--	5	0.005	0.005	<0.005	0.011	0.007	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.002	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 14-May-2004	92-10 19-Nov-2004	92-10 24-May-2005	92-10 16-Nov-2005	92-10 25-May-2006	92-10 21-Nov-2006
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 15-May-2007	92-10 30-Nov-2007	92-10 22-May-2008	92-10 10-Nov-2008	92-10 19-May-2009 G-7	92-10 26-Nov-2009 J-18
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	612	595	550	720	949 [8]	784
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	612	595	550	720	949	784
Ammonia Nitrogen	mg/l	--	--	0.15	0.54	0.18	0.55	0.43	0.49
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	59	19	38	65	53
Chloride	mg/l	--	250	171	190	191	192	150	229
Conductivity	uS/cm	--	--	--	--	--	--	2240	2180
Conductivity (Field)	uS/cm	--	--	1300	1400	1500	1700	1700	1911
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	442	420	402	460	871	463
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	0.1	0.2	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.66	1	0.87	1.22	1.49	0.94
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.51	0.46	0.69	0.67	1.06	0.45
pH	-	--	--	--	--	--	--	7.16	7.86
pH (Field)	-	--	--	7.7	8	7.3	7.1	--	6.95
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.06	0.68
Sulphate	mg/l	--	500 [6]	155	122	131	124	139	92
Temperature (Field)	deg c	--	15	10.5	9	10.5	10	10	10.9
Total Dissolved Solids	mg/l	--	500	1080	1090	1050	1160	1460	1420
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0011	0.002	0.0014	0.0016	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.869	0.85	0.778	0.949	3.96	1.3
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	77.8	73.2	70.2	82.2	189	80
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.005	0.006
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0028	0.0004
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	0.003	0.001
Iron, dissolved	mg/l	--	0.3	0.201	1.38	0.479	0.466	1.91	4.74
Lead, dissolved	mg/l	0.01	--	0.00004	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	60.3	57.7	55.2	61.9	97	64
Manganese, dissolved	mg/l	--	0.05	0.133	0.994	4.32	3	2.91	1.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.7	15.8	14.2	16	9	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	236	276	257	245	151	272
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 15-May-2007	92-10 30-Nov-2007	92-10 22-May-2008	92-10 10-Nov-2008	92-10 19-May-2009 G-7	92-10 26-Nov-2009 J-18
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 25-May-2010 [4]	92-10 20-Oct-2010 [4]	92-10 24-May-2011	92-10 29-Nov-2011 [4]	92-10 31-May-2012	92-10 28-Nov-2012
				M-10	G-7	G-22	92-10	92-10	92-10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	728	720	688	688	660	650
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	5.7	5.8
Alkalinity (Total as CaCO3)	mg/l	--	--	728	720	688	688	660	660
Ammonia Nitrogen	mg/l	--	--	0.45	0.52	0.30	0.63	0.46	0.83
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	43	38	45	36	40
Chloride	mg/l	--	250	199	195	187	193	210	210
Conductivity	uS/cm	--	--	2080	2000	1940	2010	--	--
Conductivity (Field)	uS/cm	--	--	2051	1991	1865	1529	1723	1807
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	548	540	457	477	440	440
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.14	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.013	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.75	1.64	0.74	0.78	1.3	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	0.3	1.12	0.44	0.15	0.84	0.67
pH	-	--	--	7.97	7.63	8.20	8.14	7.97	--
pH (Field)	-	--	--	7.33	7.17	7.30	7.36	7.30	7.40
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.39	0.41	0.42	0.40	0.28	0.48
Sulphate	mg/l	--	500 [6]	96	98	103	78	69	58
Temperature (Field)	deg c	--	15	15.3	10.7	12.6	8.8	10.0	9.4
Total Dissolved Solids	mg/l	--	500	1350	1300	1260	1310	1140	1180
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.001	<0.01	<0.0010	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.6	1.5	1.0	1.4	1	1.1
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	94	96	76	84	71	70
Chromium, dissolved	mg/l	0.05	--	0.006	0.006	<0.005	0.007	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0006	0.0006	0.0005	0.0004	0.00054	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.001	0.005	0.002	0.0021	0.001
Iron, dissolved	mg/l	--	0.3	0.38	5.89	<0.03	0.55	0.18	1.9
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	76	73	65	65	63	64
Manganese, dissolved	mg/l	--	0.05	0.82	1.77	0.62	1.98	0.84	0.99
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17	15	16	16	16	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	231	251	247	243	300	280
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	0.01	<0.01	<0.0050	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 25-May-2010 [4]	92-10 20-Oct-2010 [4]	92-10 24-May-2011	92-10 29-Nov-2011 [4]	92-10 31-May-2012	92-10 28-Nov-2012
				M-10	G-7	G-22	92-10	92-10	92-10
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.00050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 29-May-2013 [5]	92-10 26-Nov-2013 [5]	92-10 29-May-2014	92-10 19-Nov-2014	92-10 02-Jun-2015	92-10 26-Nov-2015
				92-10	GW-24	92-10	92-10	92-10	92-10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	620	650	640	630	660	589
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.7	4.7	7.8	4.3	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	630	650	640	640	664	591
Ammonia Nitrogen	mg/l	--	--	0.57	0.62	0.52	0.59	0.09	0.75
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	36	25	29	72	116
Chloride	mg/l	--	250	180	170	230	200	218	128
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1462	1543	1706	1761	1803	1489
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	390	400	390	420	339	382
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	0.2
Nitrite as N	mg/l	1.0	--	0.037	<0.010	<0.010	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.1	1.5	1.7	1.1	0.6	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	0.53	0.88	1.18	0.51	0.51	1.45
pH	-	--	--	7.90	7.89	8.11	7.86	--	--
pH (Field)	-	--	--	6.87	6.92	7.07	7.34	7.54	7.31
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.40	0.43	0.42	0.14	2.10
Sulphate	mg/l	--	500 [6]	74	77	55	67	68	112
Temperature (Field)	deg c	--	15	9.8	10.0	11.0	8.9	9.1	10.4
Total Dissolved Solids	mg/l	--	500	1110	1060	1090	1040	1140	914
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.91	0.96	0.9	0.95	0.694	0.772
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	66	68	64	72	39.9	49.5
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	0.0026	0.0033	0.0032	<0.0005	0.0012
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.29	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	56	56	56	58	58	62.7
Manganese, dissolved	mg/l	--	0.05	0.74	0.33	0.48	0.26	<0.005	0.011
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16	15	16	15	12.4	12.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	310	220	310	270	274	317
Zinc, dissolved	mg/l	--	5	<0.0050	0.0059	0.018	<0.0050	0.008	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 29-May-2013 [5]	92-10 26-Nov-2013 [5]	92-10 29-May-2014	92-10 19-Nov-2014	92-10 02-Jun-2015	92-10 26-Nov-2015
				92-10	GW-24	92-10	92-10	92-10	92-10
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 26-May-2016	92-10 17-Nov-2016	92-10 24-May-2017	92-10 29-Nov-2017	92-10 24-May-2018	92-10 22-Nov-2018
				92-10	92-10	92-10	92-10	92-10	92-10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	660	662	678	661	725	808
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	664	665	682	666	729	811
Ammonia Nitrogen	mg/l	--	--	0.16	0.62	0.03	0.49	0.35	0.62
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	76	78	39	34	67	77
Chloride	mg/l	--	250	210	201	194	218	180	200
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1732	1849	1760	1576	1827	1777
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	390	399	374	376	434	552
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.8	1.0	0.5	0.9	1.4	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.64	0.38	0.47	0.41	1.05	1.08
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.42	7.09	7.45	7.29	7.23	7.18
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.60	0.57	0.14	0.45	0.87	0.93
Sulphate	mg/l	--	500 [6]	82	82	74	80	76	70
Temperature (Field)	deg c	--	15	12.5	11.0	11.0	8.7	11.1	10.4
Total Dissolved Solids	mg/l	--	500	1080	1020	1010	970	1080	1010
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.881	1.14	0.805	0.856	0.888	1.03
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	66.1	69.1	68.4	63.8	77	93.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.007	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.0028	0.0027	0.0028	0.0018	0.0028	0.0044
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.362	<0.1	0.824
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	54.7	55	49.4	52.7	58.8	77.4
Manganese, dissolved	mg/l	--	0.05	<0.005	1.28	<0.005	0.333	0.006	0.785
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.5	14.4	13.9	14.3	14.5	18.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	246	261	261	224	236	283
Zinc, dissolved	mg/l	--	5	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	0.002	<0.001	<0.001	0.003

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 26-May-2016	92-10 17-Nov-2016	92-10 24-May-2017	92-10 29-Nov-2017	92-10 24-May-2018	92-10 22-Nov-2018
				92-10	92-10	92-10	92-10	92-10	92-10
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Jun-2019	92-10 20-Nov-2019	92-10 21-May-2020	92-10 26-Nov-2020
				92-10	92-10	92-10	92-10
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	827	774	798	804
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	<5	11	5
Alkalinity (Total as CaCO3)	mg/l	--	--	832	779	809	809
Ammonia Nitrogen	mg/l	--	--	0.24	0.58	0.52	0.60
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	84	86	71	91
Chloride	mg/l	--	250	227	226	278	232
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1925	2040	1936	1844
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	589	588	--	515
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	538	--
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.2	<0.5 [11]
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	1.2	1.4	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.66	0.62	0.88	0.7
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.26	7.18	7.69	7.51
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.15	0.66	0.82	0.60
Sulphate	mg/l	--	500 [6]	60	57	63	45
Temperature (Field)	deg c	--	15	12.2	9.6	11.7	7.7
Total Dissolved Solids	mg/l	--	500	1240	1160	1220	1180
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.09	0.903	0.882	0.834
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	103	101	91.1	85.6
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.004	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0005	0.0017	<0.0005
Copper, dissolved	mg/l	--	1	0.0053	0.0023	0.0065	0.0026
Iron, dissolved	mg/l	--	0.3	<0.1	0.66	5.69	1.44
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0016	0.0001
Magnesium, dissolved	mg/l	--	--	80.7	81.5	75.5	73.2
Manganese, dissolved	mg/l	--	0.05	0.876	1.2	1.34	0.911
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	19.6	21.6	17.7	17.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	272	290	291	292
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.014	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	0.010	<0.004 [11]

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	92-10 19-Jun-2019	92-10 20-Nov-2019	92-10 21-May-2020	92-10 26-Nov-2020
				92-10	92-10	92-10	92-10
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 09-Jun-1992	92-11 01-Nov-1992	92-11 15-Jun-1994	92-11 02-Nov-1994	92-11 28-Jun-1995	92-11 22-Nov-1995
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	795	705	--	907	754	664
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	652	578	796	756	618	544
Ammonia Nitrogen	mg/l	--	--	--	--	--	3.65	4.3	0.46
Chemical Oxygen Demand	mg/l	--	--	--	--	87	128	113	65
Chloride	mg/l	--	250	145	93	79	35	139	55
Conductivity (Field)	uS/cm	--	--	2014	1937	1990	2020	1620	1890
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	10.47	7	--
Hardness, Calcium Carbonate	mg/l	--	--	647.71	662	740	869	679	658
Nitrate as N	mg/l	10.0	--	--	--	1.56	5.92	0.1	1.7
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	20.3	2.5
Nitrogen, Organic	mg/l	--	--	--	--	--	--	16	2.04
pH (Field)	-	--	--	7.76	7.13	6.68	7.34	7.03	7.52
Phosphate	mg/l	--	--	--	--	--	--	--	0.5
Phosphorus	mg/l	--	--	--	--	0.54	0.376	14.4	--
Sulphate	mg/l	--	500 [6]	204	423.5	189	229	99	362
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1000	1010	820	940
Total Organic Carbon	mg/l	--	--	--	--	22.4	25.5	37.7	15.8
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.116	--	--
Boron, dissolved	mg/l	5	--	--	--	2.74	2.339	1.92	1.31
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	0.0001
Calcium, dissolved	mg/l	--	--	179.4	188	202	234.6	194	225
Chromium, dissolved	mg/l	0.05	--	--	--	--	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0212	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.702	0.526	0.04	0.14
Lead, dissolved	mg/l	0.01	--	--	--	0.0003	0.1	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	48.4	46.7	57.2	42.426	46.5	50.8
Manganese, dissolved	mg/l	--	0.05	--	--	2.892	3.357	2.82	0.66
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.06
Potassium, dissolved	mg/l	--	--	28.2	19	31.8	22.39	--	23.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	189.9	199	110	92.17	92.5	125
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.134	0.002	0.001	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 09-Jun-1992	92-11 01-Nov-1992	92-11 15-Jun-1994	92-11 02-Nov-1994	92-11 28-Jun-1995	92-11 22-Nov-1995
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 12-Jun-1996	92-11 12-Oct-1996	92-11 18-Jun-1997	92-11 06-Nov-1997	92-11 05-Jun-1998	92-11 30-Oct-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	420
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	605	603	604	390	512	344
Ammonia Nitrogen	mg/l	--	--	2.5	1.07	0.16	0.04	0.14	0.13
Chemical Oxygen Demand	mg/l	--	--	45	33	41	30	41	12
Chloride	mg/l	--	250	34	43.3	88.5	109	85.4	19.9
Conductivity (Field)	uS/cm	--	--	1690	1640	1620	1770	1518	940
Dissolved Oxygen (Field)	mg/l	--	--	--	--	6.17	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	886	753	793	759	695	500
Nitrate as N	mg/l	10.0	--	1.5	1.1	0.1	1	1.6	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	0.73
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	0.6
pH (Field)	-	--	--	6.85	6.81	7.05	6.27	--	6.7
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	320	352	273	398	283	183
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	850	820	810	930	760	470
Total Organic Carbon	mg/l	--	--	18.5	16.8	16.1	12.9	12.6	12.7
Total Suspended Solids	mg/l	--	--	481	323	3460	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.54	1.85	1.96	1.28	1.45	1.25
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	236	204	199	204	172	140
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.89	0.88	0.94	0.16	0.18	1.13
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	71	58.3	70.9	59.8	63.7	36.4
Manganese, dissolved	mg/l	--	0.05	2.23	2.45	2.44	0.1	1.04	1.05
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	20.8	20.2	15.1	15.3	11.2	16.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	110	110	106	100	118	40
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.36	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 12-Jun-1996	92-11 12-Oct-1996	92-11 18-Jun-1997	92-11 06-Nov-1997	92-11 05-Jun-1998	92-11 30-Oct-1998
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 06-May-1999	92-11 19-Oct-1999	92-11 05-May-2000	92-11 24-Oct-2000	92-11 14-Jun-2001	92-11 23-Nov-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	380	427	388	549	421	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	312	350	318	450	345	227
Ammonia Nitrogen	mg/l	--	--	0.01	0.06	0.01	0.07	0.01	0.01
Chemical Oxygen Demand	mg/l	--	--	7	10	18	--	7	15
Chloride	mg/l	--	250	10.2	9.5	9	41.5	22.5	51.7
Conductivity (Field)	uS/cm	--	--	860	740	700	1320	900	1300
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	473	385	354	577	535	696
Nitrate as N	mg/l	10.0	--	--	0.2	0.1	0.2	0.6	0.2
Nitrogen, Total Kjeldahl	mg/l	--	--	0.36	--	--	0.68	0.5	0.51
Nitrogen, Organic	mg/l	--	--	0.35	--	--	0.61	0.49	0.5
pH (Field)	-	--	--	7.1	7.4	6.9	6.91	6.9	6.41
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.3	0.28	0.29
Sulphate	mg/l	--	500 [6]	185	110	91	263	179	395
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	430	370	350	884	632	952
Total Organic Carbon	mg/l	--	--	6.2	4.8	4.3	--	6.6	11
Total Suspended Solids	mg/l	--	--	--	123	170	346	218	326
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.48	0.89	0.5	0.9	0.39	0.53
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	130	100	104	152	160	190
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	0.16	0.1	0.16	0.02	0.03
Lead, dissolved	mg/l	0.01	--	0.0004	0.0002	0.0002	0.0022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	35.6	32.4	22.7	47.9	32.9	53.8
Manganese, dissolved	mg/l	--	0.05	0.1	0.03	0.02	0.16	0.01	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.03	0.02	0.02
Potassium, dissolved	mg/l	--	--	0.7	5.7	1.1	6.2	2.4	2.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	36.9	50	28	58.9	36.9	91.1
Zinc, dissolved	mg/l	--	5	0.01	0.27	0.22	0.03	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.026	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 06-May-1999	92-11 19-Oct-1999	92-11 05-May-2000	92-11 24-Oct-2000	92-11 14-Jun-2001	92-11 23-Nov-2001
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 23-May-2002	92-11 06-Nov-2002	92-11 30-May-2003	92-11 09-Oct-2003 [3]	92-11 14-May-2004	92-11 19-Nov-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	410	659	780	--	651	802
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	1	1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	352	540	639	--	534	657
Ammonia Nitrogen	mg/l	--	--	0.13	0.04	0.09	--	0.04	0.5
Chemical Oxygen Demand	mg/l	--	--	3	29	14	--	24	45
Chloride	mg/l	--	250	52	66	80	--	95.2	34
Conductivity (Field)	uS/cm	--	--	1150	1630	1300	--	1980	1900
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	536	554	471	--	832	667
Nitrate as N	mg/l	10.0	--	3.1	0.2	0.4	--	0.3	1
Nitrogen, Total Kjeldahl	mg/l	--	--	0.62	0.54	0.65	--	0.5	1.47
Nitrogen, Organic	mg/l	--	--	0.49	0.5	0.56	--	0.46	0.97
pH (Field)	-	--	--	6.96	6.6	6.5	--	7.2	6.9
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.24	0.05	0.21	--	0.14	0.15
Sulphate	mg/l	--	500 [6]	407	323	325	--	831	350
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	990	1100	650	--	990	950
Total Organic Carbon	mg/l	--	--	6	8.3	6.9	--	6.7	10.2
Total Suspended Solids	mg/l	--	--	306	137	15	--	52	118
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	--	0.001	0.008
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.73	0.99	0.7	--	0.606	0.833
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	138	178	133	--	219	171
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	--	0.001	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	--	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.21	--	0.015	21.4
Lead, dissolved	mg/l	0.01	--	0.0003	0.0007	0.0002	--	0.0002	0.0008
Magnesium, dissolved	mg/l	--	--	31.1	44.1	33.8	--	69.1	58.4
Manganese, dissolved	mg/l	--	0.05	0.01	0.02	0.01	--	0.002	8.21
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	--	0.01	0.01
Potassium, dissolved	mg/l	--	--	5.5	11.8	7.9	--	10.4	10.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	150	164	191	--	232	185
Zinc, dissolved	mg/l	--	5	0.01	0.02	0.01	--	0.005	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	--	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 23-May-2002	92-11 06-Nov-2002	92-11 30-May-2003	92-11 09-Oct-2003 [3]	92-11 14-May-2004	92-11 19-Nov-2004
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	92-11 24-May-2005	92-11 16-Nov-2005	92-11 25-May-2006	92-11 19-Dec-2008
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	799	176	595	1590
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	655	720	595	1590
Ammonia Nitrogen	mg/l	--	--	0.35	0.39	0.14	0.5
Chemical Oxygen Demand	mg/l	--	--	34	38	17	314
Chloride	mg/l	--	250	32.8	14.5	17.2	300
Conductivity (Field)	uS/cm	--	--	2150	1600	1300	2700
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	628	663	487	1230
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.3	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	1.31	1.4	0.61	5.76
Nitrogen, Organic	mg/l	--	--	0.96	1.01	0.47	5.26
pH (Field)	-	--	--	6.5	--	7.1	6.1
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.23	0.2	--	--
Sulphate	mg/l	--	500[6]	370	220	410	92
Temperature (Field)	deg c	--	15	11.4	--	4	6
Total Dissolved Solids	mg/l	--	500	1210	1090	1110	2150
Total Organic Carbon	mg/l	--	--	6.6	9	--	--
Total Suspended Solids	mg/l	--	--	94	94	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	<0.001	0.0032
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.529	0.784	0.551	**10.4**
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00002
Calcium, dissolved	mg/l	--	--	159	173	119	298
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.01	<0.002
Iron, dissolved	mg/l	--	0.3	10.3	8.74	0.828	0.657
Lead, dissolved	mg/l	0.01	--	0.0006	0.0002	<0.0002	<0.00002
Magnesium, dissolved	mg/l	--	--	55.8	56.2	45.9	119
Manganese, dissolved	mg/l	--	0.05	3.08	2.92	1.62	3.39
Mercury, dissolved	mg/l	0.001	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	9.1	11.6	6.2	11.6
Selenium, dissolved	mg/l	0.05	--	0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200[7]	181	186	157	373
Zinc, dissolved	mg/l	--	5	<0.005	0.008	<0.005	0.007
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.004	<0.001	<0.001	0.004

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 24-May-2005	92-11 16-Nov-2005	92-11 25-May-2006	92-11 19-Dec-2008
Semi-VOCs							
Naphthalene	mg/l	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	<0.0006	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	<0.0002	--	--	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	0.0009
Bromodichloromethane	mg/l	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	<0.0002	--	--	--
Chloroform	mg/l	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	0.0011
m,p-Xylenes	mg/l	--	--	<0.001	--	<0.001	0.0032
Methylene Chloride	mg/l	0.05	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	0.0009
Tetrachloroethylene	mg/l	0.01	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 09-Jan-1990	94-1 02-Mar-1990	94-1 28-Mar-1990	94-1 01-Aug-1990	94-1 06-Nov-1990	94-1 29-Nov-1991
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1210	1220	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	2256	1000	950	1014	1060
Ammonia Nitrogen	mg/l	--	--	0.64	--	--	2.2	1.8	0.5
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--
Chloride	mg/l	--	250	993	978	954	950	920	746
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2742	--	4352	4664	4368	7500
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	260	265	278	229	180	186
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	**18**	**59.6**	**19.5**	3.83	1.88	--
Nitrite as N	mg/l	1.0	--	**1.3**	--	--	0.21	0.001	**1.97**
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.67	8.25	8.11	8.26	8.2	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	34	30.3	30	20	11	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	2256	2412	--	--	--
Total Organic Carbon	mg/l	--	--	35.5	--	--	27	22.3	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	0.58	--	--	0.1	--	0.5
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	30.3	31	34	27	21	21.8
Chromium, dissolved	mg/l	0.05	--	**0.13**	--	--	0.05	--	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	--	--	0.05	--	0.02
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--
Lead, dissolved	mg/l	0.01	--	**0.58**	--	--	**0.05**	--	0.001
Magnesium, dissolved	mg/l	--	--	44.9	50	52	39	31	32
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.04	--	--	0.05	--	0.07
Potassium, dissolved	mg/l	--	--	62.5	31	31	23	23	21
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	790	1357	995	1063	1157	717
Zinc, dissolved	mg/l	--	5	0.17	--	--	0.05	--	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	--	--	0.003	0.002	0.002
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 09-Jun-1992	94-1 01-Nov-1992	94-1 08-Jun-1993	94-1 04-Nov-1993	94-1 15-Jun-1994	94-1 02-Nov-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1205	1561	1276	1300	--	1233
Alkalinity, Carbonate as CaCO3	mg/l	--	--	14.4	1	1	<1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1012	1280	1046	1063	1040	1030
Ammonia Nitrogen	mg/l	--	--	2.28	1.86	--	--	--	1.35
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	3	20.8	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	94	72.8	--	--	153	221
Chloride	mg/l	--	250	890	1018	1020	1250	1430	1040
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4685	4485	3760	4380	5340	5070
Cyanide	mg/l	0.2	--	**0.276**	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	213	250.3	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	6.06
Hardness, Calcium Carbonate	mg/l	--	--	202.56	198	200	237	293	278
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	1.5	0.48	**10.8**	0.1	1.98
Nitrite as N	mg/l	1.0	--	0.1	0.18	0.1	0.14	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.36	4.01	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.08	2.15	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.37	7.99	7.82	8.18	7.96	8.19
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.36	1.1	--	--	2.63	1.1
Sulphate	mg/l	--	500 [6]	0.35	2	1.8	4.6	64	30.9
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2737	2915	2692	2640	2680	2550
Total Organic Carbon	mg/l	--	--	33.8	22.5	--	--	21.6	25
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.14	0.102	<0.01	--	0.01
Arsenic, dissolved	mg/l	0.01	--	0.001	0.003	--	--	--	**0.1**
Barium, dissolved	mg/l	1	--	0.04	0.1	--	--	--	0.057
Boron, dissolved	mg/l	5	--	1.42	1.34	--	--	1.37	1.143
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**
Calcium, dissolved	mg/l	--	--	20.6	22.1	22	29.3	40.4	22.63
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.01	<0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.01	<0.01	0.0225	0.01
Iron, dissolved	mg/l	--	0.3	0.2	0.1	0.1	<0.1	0.299	0.1
Lead, dissolved	mg/l	0.01	--	**0.1**	**0.09**	**0.1**	**0.13**	0.0018	**0.1**
Magnesium, dissolved	mg/l	--	--	36.7	34.6	35.2	39.7	46.6	19.606
Manganese, dissolved	mg/l	--	0.05	0.03	0.05	0.062	0.057	0.129	0.093
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.02	<0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	16.5	25.4	24	25	37.7	15.33
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1049	1110	984	1020	897	95.5
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.031	<0.01	0.01	0.011
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.002	0.002	0.002	0.01	0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 28-Jun-1995	94-1 23-Nov-1995	94-1 12-Oct-1996	94-1 06-Nov-1997	94-1 05-Jun-1998	94-1 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1268	1370	--	--	--	1430
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1040	1120	1140	1130	1020	1170
Ammonia Nitrogen	mg/l	--	--	1.47	0.6	2.31	1.34	1.03	1.34
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	100	65	43	36	55	35
Chloride	mg/l	--	250	1095	1070	928	1060	1130	1190
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5300	5520	5340	4980	5090	4950
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.13	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	191	212	215	211	208	226
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.8	2.2	0.1	0.1	4.6	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.5	4.3	--	--	--	5.69
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.03	3.7	--	--	--	4.35
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.06	8.41	7.83	7.78	--	7.9
Phosphate	mg/l	--	--	--	0.5	--	--	--	--
Phosphorus	mg/l	--	--	2.41	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	23	20	10	3	41	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2570	2770	2680	2500	2550	2490
Total Organic Carbon	mg/l	--	--	20.3	17.9	16.4	17	16.2	23.5
Total Suspended Solids	mg/l	--	--	--	--	2310	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.04	1.03	1.15	1.18	1.36	1.37
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	23	24	24.5	24.7	23.2	28.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	1.14	1.43	0.83	3.19	0.02
Lead, dissolved	mg/l	0.01	--	0.001	0.0003	0.0002	0.0002	0.0012	0.0005
Magnesium, dissolved	mg/l	--	--	31.9	36.6	36.9	35.8	35.9	37.3
Manganese, dissolved	mg/l	--	0.05	0.06	0.02	0.1	0.08	0.11	0.08
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	28.9	28.1	25.4	30.8	26
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	864	949	1000	1010	1330	1150
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.13	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 24-Oct-2000	94-1 14-Jun-2001	94-1 06-Nov-2002	94-1 30-May-2003	94-1 19-Nov-2004	94-1 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1540	1100	1440	1310	1400	279
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	97	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1260	1060	1180	1070	1150	1150
Ammonia Nitrogen	mg/l	--	--	0.72	1.26	2.01	0.27	1.83	1.81
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	41	94	60	60	64
Chloride	mg/l	--	250	1200	1100	1080	1100	1140	997
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5210	4800	4860	4410	5320	1700
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	219	204	196	178	191	199
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.5	0.3	0.2	1.2	1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.5	2.86	0.41	1.77	3.11	3.22
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.78	1.6	0	1.5	1.28	1.41
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.15	8	7.9	7.3	7.9	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.02	3.15	0.58	2.17	0.99	1.17
Sulphate	mg/l	--	500 [6]	7	4	4	3	10	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3200	2800	2910	2205	2660	2900
Total Organic Carbon	mg/l	--	--	--	15.1	15.3	14.6	15.6	19.4
Total Suspended Solids	mg/l	--	--	1410	2700	4730	2370	99	32
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.003	0.002	0.003	0.003	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.27	1.37	1.2	1.2	1.28	1.34
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0002
Calcium, dissolved	mg/l	--	--	22.9	26.5	24.5	22	23.9	24.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.37	0.13	0.02	0.26	0.071	0.345
Lead, dissolved	mg/l	0.01	--	0.022	0.0002	0.0094	0.0012	0.0009	0.0006
Magnesium, dissolved	mg/l	--	--	39.3	33.4	32.8	29.9	32	33.5
Manganese, dissolved	mg/l	--	0.05	0.08	0.06	0.08	0.06	0.059	0.084
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	26.7	21.4	24.6	25.2	28.1	30
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1110	1060	1120	921	1200	1150
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.01	0.005	0.006
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 15-May-2007	94-1 10-Nov-2008	94-1 26-Nov-2009 [23] M-1	94-1 24-May-2011 [4] G-35	94-1 28-Nov-2012 94-1	94-1 29-May-2014 94-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1120	1090	1100	1080	1100	1100
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	23	39	20	38
Alkalinity (Total as CaCO3)	mg/l	--	--	1120	1090	1120	1120	1100	1100
Ammonia Nitrogen	mg/l	--	--	0.76	0.58	2.49	2.50	2.6	2.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	151	72	110	65	65	59
Chloride	mg/l	--	250	1050	1100	1090	1010	1000	1100
Conductivity	uS/cm	--	--	--	--	5220	5250	--	--
Conductivity (Field)	uS/cm	--	--	3600	4450	>3999	>3999	3972	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	174	163	173	193	200	190
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.8	0.49	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	0.020	0.080
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	2.33	3.43	3.27	4.9	5.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	0.11
Nitrogen, Organic	mg/l	--	--	0.44	1.75	0.94	0.77	2.3	2.5
pH	-	--	--	--	--	8.35	8.58	--	8.58
pH (Field)	-	--	--	8.5	7.9	7.69	8.17	8.12	7.89
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	3.85	2.30	4.1	2.2
Sulphate	mg/l	--	500 [6]	2	2	5	<1	1	2
Temperature (Field)	deg c	--	15	9.4	10	10.3	15.4	8.8	11.7
Total Dissolved Solids	mg/l	--	500	2820	2820	3390	3410	2860	2850
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0096	0.0071	<0.01	<0.01	0.002	0.0025 [19]
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.13	1.12	1.8	1.3	1.5	1.4
Cadmium, dissolved	mg/l	0.005	--	0.00005	<0.00002	<0.001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	22.1	20.3	20	23	24	23
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	0.014	<0.005	<0.01
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.002	0.0007	0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.005	0.003	<0.01	0.005	<0.001	0.0020
Iron, dissolved	mg/l	--	0.3	0.178	0.006	<0.3	<0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00021	<0.00002	<0.01	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	28.8	27.4	30	33	34	32
Manganese, dissolved	mg/l	--	0.05	0.017	0.049	<0.1	0.03	0.14	0.065
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.5	25.2	23	27	25	24
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1020	984	1001	1100	1100	990
Zinc, dissolved	mg/l	--	5	0.013	<0.005	<0.1	0.02	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs									
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 26-Nov-2015	94-1 24-May-2017	94-1 22-Nov-2018	94-1 21-May-2020
				94-1	94-1	94-1	94-1
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1060	1030	1140	1110
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [14]	<25 [9]	<25 [9]	<25 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	1070	1050	1160	1130
Ammonia Nitrogen	mg/l	--	--	1.04	0.02	0.36	2.27
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	542	69	231	84
Chloride	mg/l	--	250	1110	1100	1110	1360
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	>3999	>3999
Cyanide	mg/l	0.2	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	170	191	270	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	265
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [9]	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.1	1.2	2.2	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.06	1.18	1.84	0.73
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.08	8.14	8.25	7.22
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.20	1.05	2.78	1.29
Sulphate	mg/l	--	500 [6]	<1	1	2	<1
Temperature (Field)	deg c	--	15	7.3	11.6	8.6	13.7
Total Dissolved Solids	mg/l	--	500	2940	2870	2910	3000
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.008	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.44	1.12	1.47	1.43
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	22.4	23.9	33.9	32.8
Chromium, dissolved	mg/l	0.05	--	<0.001	0.02	<0.001	0.004
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0006	0.0025
Copper, dissolved	mg/l	--	1	<0.0005	0.0016	0.0033	0.0013
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	4.61
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	0.0048
Magnesium, dissolved	mg/l	--	--	27.7	31.9	44.9	44.4
Manganese, dissolved	mg/l	--	0.05	0.123	0.018	0.021	0.272
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	21.3	25.9	31	27.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1230	1130	1050	1020
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	0.016
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.010 [10]	<0.001	0.011
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-2 09-Jan-1990	94-2 02-Mar-1990	94-2 20-Mar-1990	94-2 01-Aug-1990	94-2 06-Nov-1990	94-2 29-Nov-1991
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	995	1000	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	14.4	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1196	840	820	782	858	857
Ammonia Nitrogen	mg/l	--	--	0.1	--	--	1.24	0.57	0.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--
Chloride	mg/l	--	250	2070	539	549	553	513	532
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5180	--	3076	3290	2891	2890
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	710	294	302	244	212	204
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	**68**	**38.9**	**11.5**	2.81	0.52	1.02
Nitrite as N	mg/l	1.0	--	0.1	--	--	0.1	0.01	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.92	8.39	8.18	8.32	8.2	8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500[6]	43	35.6	42	25	27	10
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	1548	1628	--	--	--
Total Organic Carbon	mg/l	--	--	--	--	--	23	18.1	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	0.1	--	0.5
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	77.3	35	35	30	27	27.6
Chromium, dissolved	mg/l	0.05	--	--	--	--	0.05	--	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	--	0.05	--	0.002
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--
Lead, dissolved	mg/l	0.01	--	--	--	--	**0.05**	--	0.001
Magnesium, dissolved	mg/l	--	--	126	43	47	41	35	32.7
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	0.05	--	0.05
Potassium, dissolved	mg/l	--	--	2070	539	549	553	17	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	1919	800	688	693	66	532
Zinc, dissolved	mg/l	--	5	--	--	--	0.05	--	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.13	0.002	0.002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 09-Jan-1990	94-2 02-Mar-1990	94-2 20-Mar-1990	94-2 01-Aug-1990	94-2 06-Nov-1990	94-2 29-Nov-1991
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-2 09-Jun-1992	94-2 01-Nov-1992	94-2 15-Jun-1994	94-2 02-Nov-1994	94-2 28-Jun-1995	94-2 23-Nov-1995	94-2 12-Jun-1996
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	927	1058	--	868	952	1030	--
Alkalinity, Carbonate as CaCO3	mg/l	--	–	1	1	--	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	–	–	760	868	756	724	780	840	813
Ammonia Nitrogen	mg/l	–	–	0.27	1.69	--	0.15	0.17	0.04	0.12
Biochemical Oxygen Demand, 5 Day	mg/l	–	–	1.9	21.3	--	--	--	--	--
Chemical Oxygen Demand	mg/l	–	–	178	58.2	84	115	65	50	38
Chloride	mg/l	–	250	505	667	530	392	430	400	455
Conductivity	uS/cm	–	–	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	3077	3120	2970	2930	2880	3060	2970
Dissolved Inorganic Carbon	mg/l	–	–	165.1	213.2	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	–	--	--	--	9.09	8.7	--	--
Hardness, Calcium Carbonate	mg/l	–	–	209.78	203	409	323	270	268	265
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	–	0.66	1.35	0.3	0.1	0.1	0.3	0.1
Nitrite as N	mg/l	1.0	–	0.1	0.16	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	–	–	1.4	2.24	--	--	8.8	1.11	--
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	–	1.13	0.55	--	--	8.63	1.07	--
pH	-	–	–	--	--	--	--	--	--	--
pH (Field)	-	–	–	8.27	8.1	7.07	7.68	7.65	8.32	8.03
Phosphate	mg/l	–	–	--	--	--	--	--	0.3	--
Phosphorus	mg/l	–	–	0.47	1.3	0.85	0.266	0.36	--	--
Sulphate	mg/l	–	500[6]	19	8	127	116	81	98	55
Temperature (Field)	deg c	–	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	–	500	1660	1884	1490	1470	1460	1530	1490
Total Organic Carbon	mg/l	–	–	27.4	18.9	18.4	19	16.1	15	15.5
Total Suspended Solids	mg/l	–	–	--	--	--	--	--	--	343
Metals										
Aluminum, dissolved	mg/l	–	–	--	0.1	--	0.111	--	--	--
Arsenic, dissolved	mg/l	0.01	–	0.001	0.003	--	**0.1**	--	--	--
Barium, dissolved	mg/l	1	–	0.04	0.1	--	0.058	--	--	--
Boron, dissolved	mg/l	5	–	0.88	0.96	1.12	0.89	0.62	0.62	0.728
Cadmium, dissolved	mg/l	0.005	–	--	--	--	**0.01**	0.0015	0.0001	--
Calcium, dissolved	mg/l	–	–	22.45	24.3	64.6	34.69	37.1	35.1	33.1
Chromium, dissolved	mg/l	0.05	–	0.02	0.05	0.01	0.01	0.01	0.02	0.01
Cobalt, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Copper, dissolved	mg/l	–	1	0.02	0.05	0.0194	0.016	0.02	0.01	0.01
Iron, dissolved	mg/l	–	0.3	0.2	0.07	0.421	0.38	0.04	0.35	0.549
Lead, dissolved	mg/l	0.01	–	**0.1**	**0.05**	0.0008	**0.1**	0.0051	0.0002	0.0002
Magnesium, dissolved	mg/l	–	–	37.26	34.5	62	25.676	42.6	43.2	43.8
Manganese, dissolved	mg/l	–	0.05	0.02	0.13	0.725	0.359	0.4	0.32	0.339
Mercury, dissolved	mg/l	0.001	–	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	–	–	0.02	0.05	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	–	–	12.56	17.3	17.8	10.8	--	14.6	19.7
Selenium, dissolved	mg/l	0.05	–	--	--	--	--	--	--	--
Silver, dissolved	mg/l	–	–	0.01	--	--	--	--	--	--
Sodium, dissolved	mg/l	–	200[7]	513.4	768	415	514.6	492	542	586
Zinc, dissolved	mg/l	–	5	0.02	0.05	0.1	0.076	0.01	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	0.002	0.002	0.011	0.005	0.001	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-2 09-Jun-1992	94-2 01-Nov-1992	94-2 15-Jun-1994	94-2 02-Nov-1994	94-2 28-Jun-1995	94-2 23-Nov-1995	94-2 12-Jun-1996
Semi-VOCs										
Naphthalene	mg/l	–	–	--	--	--	--	--	--	--
Styrene	mg/l	–	–	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	–	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	–	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	–	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	–	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	–	–	--	--	--	--	--	--	--
Bromoform	mg/l	–	–	--	--	--	--	--	--	--
Bromomethane	mg/l	–	–	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	–	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	–	–	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	–	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	–	–	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	–	--	--	--	--	--	--	--
o-Xylene	mg/l	–	–	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	–	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	–	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	–	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-2 18-Jun-1997	94-2 06-Nov-1997	94-2 05-Jun-1998	94-2 30-Oct-1998	94-2 06-May-1999	94-2 19-Oct-1999	94-2 05-May-2000
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	--	--	--	986	1090	900	1161
Alkalinity, Carbonate as CaCO3	mg/l	--	–	--	--	--	1	1	59	1
Alkalinity (Total as CaCO3)	mg/l	–	–	917	800	874	808	897	826	952
Ammonia Nitrogen	mg/l	–	–	0.37	0.32	0.23	0.11	0.23	0.22	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	–	–	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	–	–	26	38	48	9	42	33	38
Chloride	mg/l	–	250	458	520	509	470	552	532	370
Conductivity	uS/cm	–	–	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	2760	2800	3020	2930	3010	2800	2850
Dissolved Inorganic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	–	3.88	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	–	261	243	241	197	244	240	237
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	–	0.1	0.1	1	--	--	0.1	0.1
Nitrite as N	mg/l	1.0	–	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	–	–	--	--	--	0.94	1.19	--	--
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	–	--	--	--	0.83	0.96	--	--
pH	-	–	–	--	--	--	--	--	--	--
pH (Field)	-	–	–	7.76	7.56	--	7.6	7.6	7.6	7.6
Phosphate	mg/l	–	–	--	--	--	--	--	--	--
Phosphorus	mg/l	–	–	--	--	--	--	--	--	--
Sulphate	mg/l	–	500[6]	58	47	53	52	21	40	90
Temperature (Field)	deg c	–	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	–	500	1380	1410	1510	1480	1510	1390	1425
Total Organic Carbon	mg/l	–	–	13.9	13.9	14	16.4	16.6	13.6	13.2
Total Suspended Solids	mg/l	–	–	567	--	--	--	--	208	100
Metals										
Aluminum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	–	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	–	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	–	0.88	0.76	0.93	0.95	0.87	1.02	0.84
Cadmium, dissolved	mg/l	0.005	–	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	–	–	34.5	32.6	30.6	26.5	32.4	33.9	31.9
Chromium, dissolved	mg/l	0.05	–	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Copper, dissolved	mg/l	–	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	–	0.3	0.77	0.48	0.48	0.46	0.29	1.15	0.51
Lead, dissolved	mg/l	0.01	–	0.0002	0.0002	0.0002	0.0002	0.0005	0.0003	0.0002
Magnesium, dissolved	mg/l	–	–	41.8	38.7	39.4	31.8	39.2	37.2	37.8
Manganese, dissolved	mg/l	–	0.05	0.25	0.22	0.32	0.27	0.24	0.13	0.25
Mercury, dissolved	mg/l	0.001	–	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	–	–	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	–	–	12.5	16.3	15.1	16.4	5.4	15.9	9.4
Selenium, dissolved	mg/l	0.05	–	--	--	--	--	--	--	--
Silver, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	–	200[7]	496	495	709	599	625	700	623
Zinc, dissolved	mg/l	–	5	0.01	0.01	0.16	0.01	0.01	0.12	0.08
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-2 18-Jun-1997	94-2 06-Nov-1997	94-2 05-Jun-1998	94-2 30-Oct-1998	94-2 06-May-1999	94-2 19-Oct-1999	94-2 05-May-2000
Semi-VOCs										
Naphthalene	mg/l	–	–	--	--	--	--	--	--	--
Styrene	mg/l	–	–	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	–	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	–	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	–	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	–	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	–	–	--	--	--	--	--	--	--
Bromoform	mg/l	–	–	--	--	--	--	--	--	--
Bromomethane	mg/l	–	–	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	–	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	–	–	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	–	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	–	–	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	–	--	--	--	--	--	--	--
o-Xylene	mg/l	–	–	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	–	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	–	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	–	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-2 24-Oct-2000	94-2 14-Jun-2001	94-2 23-Nov-2001	94-2 23-May-2002	94-2 06-Nov-2002	94-2 30-May-2003	94-2 09-Oct-2003
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	1100	826	859	765	867	982	--
Alkalinity, Carbonate as CaCO3	mg/l	--	–	1	58	1	49	1	1	--
Alkalinity (Total as CaCO3)	mg/l	–	–	901	773	704	708	711	805	805
Ammonia Nitrogen	mg/l	–	–	0.03	0.06	0.02	0.06	0.06	0.07	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	–	–	--	--	--	--	--	--	1
Chemical Oxygen Demand	mg/l	–	–	--	30	25	15	32	39	35
Chloride	mg/l	–	250	453	371	362	347	383	420	421
Conductivity	uS/cm	–	–	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	2910	2400	2360	2660	2670	2560	2700
Dissolved Inorganic Carbon	mg/l	–	–	--	--	--	--	--	--	185
Dissolved Oxygen (Field)	mg/l	–	–	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	–	248	242	240	224	221	204	201
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	–	0.3	0.1	0.2	0.3	0.2	0.1	0.1
Nitrite as N	mg/l	1.0	–	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	–	–	0.64	0.95	0.66	0.54	0.6	0.78	0.68
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	–	0.61	0.89	0.64	0.48	0.54	0.71	0.63
pH	-	–	–	--	--	--	--	--	--	--
pH (Field)	-	–	–	7.41	7.7	6.97	7.23	7.6	7	7.5
Phosphate	mg/l	–	–	--	--	--	--	--	--	--
Phosphorus	mg/l	–	–	0.41	0.33	0.29	0.36	0.32	0.45	0.43
Sulphate	mg/l	–	500[6]	67	68	86	73	59	43	38
Temperature (Field)	deg c	–	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	–	500	1530	1440	1340	1330	1500	1280	1541
Total Organic Carbon	mg/l	–	–	--	11	10	11	10.7	10.7	14
Total Suspended Solids	mg/l	–	–	55	55	137	152	44	35	56
Metals										
Aluminum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	–	0.003	0.001	0.003	0.001	0.003	0.002	0.004
Barium, dissolved	mg/l	1	–	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	–	0.74	0.9	0.99	0.71	0.79	0.66	0.667
Cadmium, dissolved	mg/l	0.005	–	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	–	–	30	36.3	33.4	33.7	29.2	28.9	26.8
Chromium, dissolved	mg/l	0.05	–	0.01	0.01	0.01	0.01	0.01	0.01	0.003
Cobalt, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Copper, dissolved	mg/l	–	1	0.01	0.01	0.01	0.01	0.01	0.01	0.004
Iron, dissolved	mg/l	–	0.3	0.28	0.08	0.03	0.02	0.11	0.2	1.33
Lead, dissolved	mg/l	0.01	–	0.0022	0.0002	0.0002	0.0002	0.0021	0.0008	0.0009
Magnesium, dissolved	mg/l	–	–	42	36.7	38	33.9	35.9	32.1	32.7
Manganese, dissolved	mg/l	–	0.05	0.45	0.13	0.13	0.12	0.12	0.01	0.17
Mercury, dissolved	mg/l	0.001	–	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	–	–	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	–	–	17.7	7	7.8	13.9	12.8	12.8	13.8
Selenium, dissolved	mg/l	0.05	–	--	--	--	--	--	--	--
Silver, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	–	200[7]	645	487	509	452	468	505	524
Zinc, dissolved	mg/l	–	5	0.01	0.01	0.01	0.01	0.02	0.01	0.005
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	0.001	0.084	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-2 24-Oct-2000	94-2 14-Jun-2001	94-2 23-Nov-2001	94-2 23-May-2002	94-2 06-Nov-2002	94-2 30-May-2003	94-2 09-Oct-2003
Semi-VOCs										
Naphthalene	mg/l	–	–	--	--	--	--	--	--	--
Styrene	mg/l	–	–	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	–	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	–	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	–	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	–	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	–	–	--	--	--	--	--	--	--
Bromoform	mg/l	–	–	--	--	--	--	--	--	--
Bromomethane	mg/l	–	–	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	–	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	–	–	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	–	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	–	–	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	–	--	--	--	--	--	--	--
o-Xylene	mg/l	–	–	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	–	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	–	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	–	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-2 14-May-2004	94-2 19-Nov-2004	94-2 24-May-2005	94-2 16-Nov-2005	94-2 25-May-2006	94-2 21-Nov-2006	94-2 15-May-2007
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	952	1090	1050	209	865	904	890
Alkalinity, Carbonate as CaCO3	mg/l	--	–	1	1	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	–	–	780	890	860	855	865	904	890
Ammonia Nitrogen	mg/l	–	–	0.03	0.01	0.12	0.17	0.01	0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	–	–	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	–	–	34	41	33	45	26	29	49
Chloride	mg/l	–	250	421	491	438	386	449	446	430
Conductivity	uS/cm	–	–	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	2710	2900	3300	2400	2400	2600	1900
Dissolved Inorganic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	–	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	–	219	213	226	228	210	194	214
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	–	0.2	1	0.2	0.4	0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	–	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	–	–	0.7	0.63	0.9	0.73	0.98	0.62	0.68
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	–	0.67	0.62	0.78	0.56	0.97	0.61	<0.68
pH	-	–	–	--	--	--	--	--	--	--
pH (Field)	-	–	–	7.8	7.8	7.2	--	7.7	7.1	8.1
Phosphate	mg/l	–	–	--	--	--	--	--	--	--
Phosphorus	mg/l	–	–	0.31	0.38	0.4	0.46	--	--	--
Sulphate	mg/l	–	500[6]	46	30	34	43	32	30	23
Temperature (Field)	deg c	–	15	--	--	10.1	--	5	10	9.3
Total Dissolved Solids	mg/l	–	500	1355	1450	1620	1670	1660	1660	1610
Total Organic Carbon	mg/l	–	–	9.8	11.4	11	13	--	--	--
Total Suspended Solids	mg/l	–	–	35	28	43	33	--	--	--
Metals										
Aluminum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	–	0.002	0.001	0.002	0.002	<0.001	0.0067	0.0068
Barium, dissolved	mg/l	1	–	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	–	0.678	0.763	0.717	0.726	0.595	0.579	0.621
Cadmium, dissolved	mg/l	0.005	–	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004
Calcium, dissolved	mg/l	–	–	30	29.4	29	31.3	28.1	26.9	29.8
Chromium, dissolved	mg/l	0.05	–	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	–	–	--	--	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	–	1	0.002	0.002	<0.002	<0.002	0.002	<0.002	<0.002
Iron, dissolved	mg/l	–	0.3	0.049	0.137	0.061	0.276	0.055	0.761	0.453
Lead, dissolved	mg/l	0.01	–	0.0007	0.0005	0.0012	0.0002	0.0004	<0.0001	0.00004
Magnesium, dissolved	mg/l	–	–	35.1	33.9	37.3	36.5	33.9	30.9	34
Manganese, dissolved	mg/l	–	0.05	0.3	0.151	0.135	0.396	0.175	0.346	0.331
Mercury, dissolved	mg/l	0.001	–	--	--	<0.00006	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	<0.01	<0.01	--	--	--
Nickel, dissolved	mg/l	–	–	0.01	0.01	<0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	–	–	14.7	15.1	16.2	16.5	13.6	14.1	15.1
Selenium, dissolved	mg/l	0.05	–	--	--	<0.001	<0.001	--	--	--
Silver, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	–	200[7]	547	572	569	657	597	567	545
Zinc, dissolved	mg/l	–	5	0.005	0.005	<0.005	0.008	<0.005	0.008	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	0.001	0.001	0.002	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-2 14-May-2004	94-2 19-Nov-2004	94-2 24-May-2005	94-2 16-Nov-2005	94-2 25-May-2006	94-2 21-Nov-2006	94-2 15-May-2007
Semi-VOCs										
Naphthalene	mg/l	–	–	--	--	<0.0007	--	--	--	--
Styrene	mg/l	–	–	--	--	<0.0006	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	–	–	--	--	<0.0001	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	–	--	--	<0.0001	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	–	--	--	<0.0004	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	–	--	--	<0.0001	--	--	--	--
1,1-Dichloroethane	mg/l	–	–	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	–	--	--	<0.0001	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	–	--	--	<0.0002	--	--	--	--
1,2-Dibromoethane	mg/l	–	–	--	--	<0.0001	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	–	--	--	<0.0001	--	--	--	--
1,2-Dichloropropane	mg/l	–	–	--	--	<0.0001	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	–	--	--	<0.0001	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--	--
Benzene	mg/l	0.001	–	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	–	–	--	--	<0.0001	--	--	--	--
Bromoform	mg/l	–	–	--	--	<0.0001	--	--	--	--
Bromomethane	mg/l	–	–	--	--	<0.002	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	–	--	--	<0.0002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--	--
Chloroform	mg/l	–	–	--	--	<0.0003	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	–	--	--	<0.0001	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	–	--	--	<0.0001	--	--	--	--
Dibromochloromethane	mg/l	–	–	--	--	<0.0001	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	–	--	--	<0.001	--	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	–	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	–	–	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	–	--	--	<0.0002	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	–	–	--	--	<0.0001	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	–	--	--	<0.0001	--	--	--	--
Trichloroethene	mg/l	0.005	–	--	--	<0.0001	--	--	--	--
Vinyl Chloride	mg/l	0.001	–	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 30-Nov-2007	94-2 22-May-2008	94-2 10-Nov-2008	94-2 19-May-2009 G-21	94-2 26-Nov-2009 M-5	94-2 25-May-2010 [4] M-18	94-2 20-Oct-2010 [4] G-15
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	900	840	880	862	877	838	860
Alkalinity, Carbonate as CaCO3	mg/l	--	–	<5	<5	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	–	–	900	840	880	862	877	838	860
Ammonia Nitrogen	mg/l	–	–	0.1	<0.01	0.1	0.07	0.04	0.04	0.11
Biochemical Oxygen Demand, 5 Day	mg/l	–	–	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	–	–	68	27	31	35	35	38	45
Chloride	mg/l	–	250	470	472	500	455	478	432	471
Conductivity	uS/cm	–	–	--	--	--	2950	2990	2920	2960
Conductivity (Field)	uS/cm	–	–	1300	2500	2500	2500	2799	2876	2780
Dissolved Inorganic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	–	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	–	215	213	211	219	195	221	211
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	–	0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	–	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	–	–	0.81	0.76	0.69	0.49	0.40	0.55	0.47
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	–	0.71	<0.76	0.59	0.42	0.36	0.51	0.36
pH	-	–	–	--	--	--	8.10	8.07	8.28	8.09
pH (Field)	-	–	–	7.8	7.8	7.7	--	7.47	7.82	7.75
Phosphate	mg/l	–	–	--	--	--	--	--	--	--
Phosphorus	mg/l	–	–	--	--	--	0.68	0.52	0.57	0.63
Sulphate	mg/l	–	500 [6]	23	21	14	14	15	17	12
Temperature (Field)	deg c	–	15	6.5	9.5	9	10	10.5	22.3	14.9
Total Dissolved Solids	mg/l	–	500	1830	1640	1660	1920	1940	1900	1920
Total Organic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	–	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	–	0.0054	0.0047	0.0047	0.006	0.006	<0.01	<0.01
Barium, dissolved	mg/l	1	–	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	–	0.714	0.602	0.606	0.74	0.90	0.68	0.58
Cadmium, dissolved	mg/l	0.005	–	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	–	–	29.6	29.4	29.3	30	27	29	30
Chromium, dissolved	mg/l	0.05	–	<0.002	<0.002	<0.002	<0.005	0.006	<0.005	<0.005
Cobalt, dissolved	mg/l	–	–	<0.005	<0.005	<0.005	0.0004	0.0004	0.0005	0.0005
Copper, dissolved	mg/l	–	1	<0.002	<0.002	<0.002	0.002	0.001	0.002	0.001
Iron, dissolved	mg/l	–	0.3	0.378	0.302	<0.005	<0.03	0.95	0.34	0.73
Lead, dissolved	mg/l	0.01	–	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	–	–	34.3	33.9	33.4	35	31	36	33
Manganese, dissolved	mg/l	–	0.05	0.134	0.289	0.036	<0.01	0.25	0.20	0.25
Mercury, dissolved	mg/l	0.001	–	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	–	–	17.5	13.7	14.2	13	12	14	12
Selenium, dissolved	mg/l	0.05	–	--	--	--	--	--	--	--
Silver, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	–	200 [7]	710	566	543	542	569	536	592
Zinc, dissolved	mg/l	–	5	<0.005	<0.005	<0.005	<0.01	0.01	<0.01	<0.01
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 30-Nov-2007	94-2 22-May-2008	94-2 10-Nov-2008	94-2 19-May-2009 G-21	94-2 26-Nov-2009 M-5	94-2 25-May-2010 [4] M-18	94-2 20-Oct-2010 [4] G-15
Semi-VOCs										
Naphthalene	mg/l	–	–	--	--	--	--	--	--	--
Styrene	mg/l	–	–	--	<0.0006	<0.0006	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	–	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	–	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	–	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	–	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	–	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	–	–	--	--	--	--	--	--	--
Bromoform	mg/l	–	–	--	--	--	--	--	--	--
Bromomethane	mg/l	–	–	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	–	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	–	–	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	–	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	–	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	–	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	–	–	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	–	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	–	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	–	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 24-May-2011 [4] G-28	94-2 29-Nov-2011 [4] 94-2	94-2 31-May-2012 94-2	94-2 28-Nov-2012 94-2	94-2 29-May-2013 [5] 94-2	94-2 26-Nov-2013 GW-9	94-2 29-May-2014 94-2
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	854	859	840	840	840	860	830
Alkalinity, Carbonate as CaCO3	mg/l	--	–	27	19	12	14	12	13	15
Alkalinity (Total as CaCO3)	mg/l	–	–	881	878	850	850	850	880	850
Ammonia Nitrogen	mg/l	–	–	0.17	0.06	<0.050	0.18	0.31	0.28	0.20
Biochemical Oxygen Demand, 5 Day	mg/l	–	–	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	–	–	33	35	33	43	39	41	33
Chloride	mg/l	–	250	476	458	440	420	500	510	460
Conductivity	uS/cm	–	–	3070	3000	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	2735	2590	2530	2438	2460	2399	2515
Dissolved Inorganic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	–	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	–	227	191	220	230	240	200	250
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	–	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	–	<0.10	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	–	–	0.62	0.48	1.2	0.87	1.0	1.0	1.1
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	–	–	0.45	0.42	<1.2	0.69	0.69	0.72	0.9
pH	-	–	–	8.52	8.38	8.20	--	8.17	8.22	8.29
pH (Field)	-	–	–	7.79	7.68	7.78	7.72	7.60	7.61	7.90
Phosphate	mg/l	–	–	--	--	--	--	--	--	--
Phosphorus	mg/l	–	–	0.69	0.46	0.41	0.49	0.56	0.61	0.42
Sulphate	mg/l	–	500 [6]	10	11	<20	13	<1	<1	<1
Temperature (Field)	deg c	–	15	15.6	9.7	11.1	9.7	11.4	8.5	10.8
Total Dissolved Solids	mg/l	–	500	2000	1950	1610	1680	1810	1700	1670
Total Organic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	–	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	–	<0.01	<0.01	0.0026	0.002	0.0017	0.0026	0.0019
Barium, dissolved	mg/l	1	–	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	–	0.7	0.59	0.63	0.7	0.72	0.55	0.79
Cadmium, dissolved	mg/l	0.005	–	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	–	–	30	27	30	31	33	29	33
Chromium, dissolved	mg/l	0.05	–	<0.005	<0.005	<0.0050	<0.005	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	–	–	0.0005	0.0003	<0.00050	<0.0005	<0.00050	0.00051	<0.00050
Copper, dissolved	mg/l	–	1	0.004	0.002	0.0025	0.002	0.0017	0.0014	0.0021
Iron, dissolved	mg/l	–	0.3	<0.03	0.08	<0.1	<0.1	<0.1	0.19	0.51
Lead, dissolved	mg/l	0.01	–	<0.001	<0.001	<0.00050	<0.0005	0.00057	<0.00050	<0.00050
Magnesium, dissolved	mg/l	–	–	37	30	35	37	38	32	40
Manganese, dissolved	mg/l	–	0.05	0.03	0.02	0.0029	<0.002	0.22	0.33	0.2
Mercury, dissolved	mg/l	0.001	–	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	–	–	15	12	13	14	14	13	15
Selenium, dissolved	mg/l	0.05	–	--	--	--	--	--	--	--
Silver, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	–	200 [7]	564	543	550	590	550	550	580
Zinc, dissolved	mg/l	–	5	0.02	<0.01	<0.0050	<0.005	<0.0050	0.027	0.039
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 24-May-2011 [4] G-28	94-2 29-Nov-2011 [4] 94-2	94-2 31-May-2012 94-2	94-2 28-Nov-2012 94-2	94-2 29-May-2013 [5] 94-2	94-2 26-Nov-2013 GW-9	94-2 29-May-2014 94-2
Semi-VOCs										
Naphthalene	mg/l	–	–	--	--	--	--	--	--	--
Styrene	mg/l	–	–	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	–	<0.0004	<0.0004	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	–	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	–	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	–	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	–	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Bromodichloromethane	mg/l	–	–	--	--	--	--	--	--	--
Bromoform	mg/l	–	–	--	--	--	--	--	--	--
Bromomethane	mg/l	–	–	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	–	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	–	–	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	–	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
m,p-Xylenes	mg/l	–	–	<0.0010	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	–	<0.0040	<0.0040	<0.00050	<0.00050	<0.0013	<0.00050	<0.00050
o-Xylene	mg/l	–	–	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	–	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00020	<0.00020	<0.00050	0.00043	<0.00020
trans-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	–	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	–	<0.0002	<0.0002	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 19-Nov-2014 [5] 94-2	94-2 02-Jun-2015 94-2	94-2 26-Nov-2015 94-2	94-2 26-May-2016 94-2	94-2 17-Nov-2016 94-2	94-2 24-May-2017 94-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	870	902	885	922	925	949
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	13	9	9	9	11
Alkalinity (Total as CaCO3)	mg/l	--	--	880	915	894	931	934	960
Ammonia Nitrogen	mg/l	--	--	0.14	0.33	0.32	0.28	0.43	0.92
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	42	56	44	44	58
Chloride	mg/l	--	250	560	564	527	559	584	596
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2674	2864	2895	2853	3019	3060
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	185	219	245	244	228
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.25 [9]
Nitrogen, Total Kjeldahl	mg/l	--	--	0.75	0.9	1.1	0.9	0.9	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.61	0.57	0.78	0.62	0.47	0.78
pH	-	--	--	8.16	--	--	--	--	--
pH (Field)	-	--	--	7.82	7.80	7.74	8.11	7.94	7.82
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.40	0.61	0.48	0.55	0.73
Sulphate	mg/l	--	500 [6]	<1	6	7	6	4	4
Temperature (Field)	deg c	--	15	6.5	11.3	8.0	15.1	11.1	13.1
Total Dissolved Solids	mg/l	--	500	1680	1760	1700	1870	1810	1840
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0020	0.001	0.002	0.002	0.005	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.61	0.549	0.539	0.663	0.862	0.63
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31	28.9	28.3	34.2	33.2	32.3
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.012	0.011
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0020	<0.0005	<0.0005	0.0009	0.0008	0.0016
Iron, dissolved	mg/l	--	0.3	0.62	<0.1	0.5	0.135	0.352	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	36	27.4	36.1	38.8	39.1	35.9
Manganese, dissolved	mg/l	--	0.05	0.34	0.036	0.259	0.092	0.408	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	12.3	11.4	15	13.6	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	600	611	632	542	639	629
Zinc, dissolved	mg/l	--	5	<0.0050	<0.005	0.008	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.002 [10]	<0.002 [10]	0.008	0.004	<0.004 [10]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 19-Nov-2014 [5] 94-2	94-2 02-Jun-2015 94-2	94-2 26-Nov-2015 94-2	94-2 26-May-2016 94-2	94-2 17-Nov-2016 94-2	94-2 24-May-2017 94-2
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-2 29-Nov-2017 94-2	94-2 24-May-2018 94-2	94-2 22-Nov-2018 94-2	94-2 19-Jun-2019[24] 94-2	94-2 20-Nov-2019 94-2	94-2 21-May-2020 94-2	94-2 26-Nov-2020 94-2
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	–	941	959	981	--	873	871	878
Alkalinity, Carbonate as CaCO3	mg/l	--	–	13	12	12	--	16	22	20
Alkalinity (Total as CaCO3)	mg/l	–	–	954	971	993	--	889	893	898
Ammonia Nitrogen	mg/l	–	–	0.37	0.25	0.51	--	0.35	0.09	0.30
Biochemical Oxygen Demand, 5 Day	mg/l	–	–	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	–	–	60	61	76	--	54	57	80
Chloride	mg/l	–	250	629	548	544	--	588	612	495
Conductivity	uS/cm	–	–	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	–	2593	2981	2725	--	3010	2793	2576
Dissolved Inorganic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	–	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	–	210	245	280	--	295	--	269
Hardness, Calcium Carbonate, dissolved	mg/l	–	–	--	--	--	--	--	266	--
Nitrate as N	mg/l	10.0	–	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.5[11]
Nitrite as N	mg/l	1.0	–	<0.05	<0.05	<0.05	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	–	1.0	1.0	1.8	--	0.8	0.9	1.1
Nitrogen, Nitrate-Nitrite	mg/l	–	–	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	–	0.63	0.75	1.29	--	0.45	0.81	0.8
pH	-	–	–	--	--	--	--	--	--	--
pH (Field)	-	–	–	7.68	7.58	8.09	--	7.94	8.11	8.07
Phosphate	mg/l	–	–	--	--	--	--	--	--	--
Phosphorus	mg/l	–	–	0.60	0.51	1.52	--	0.68	0.60	0.83
Sulphate	mg/l	–	500[6]	6	6	9	--	5	11	5
Temperature (Field)	deg c	–	15	8.6	14.9	5.9	--	8.5	12.1	7.1
Total Dissolved Solids	mg/l	–	500	1820	1850	1730	--	1760	1680	1630
Total Organic Carbon	mg/l	–	–	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	–	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	–	0.003	0.002	0.003	--	0.003	0.001	0.002
Barium, dissolved	mg/l	1	–	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	–	0.6	0.655	0.604	--	0.433	0.491	0.445
Cadmium, dissolved	mg/l	0.005	–	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	–	–	29.9	35.2	38.5	--	40.7	37.1	36.6
Chromium, dissolved	mg/l	0.05	–	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	–	–	<0.0005	<0.0005	0.0008	--	0.0006	<0.0005	<0.0005
Copper, dissolved	mg/l	–	1	0.0007	0.0010	0.0037	--	0.0014	0.0053	0.0012
Iron, dissolved	mg/l	–	0.3	0.612	0.222	0.178	--	0.462	<0.1	0.536
Lead, dissolved	mg/l	0.01	–	<0.0001	<0.0001	0.0001	--	0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	–	–	33	38.1	44.6	--	47	42.1	43
Manganese, dissolved	mg/l	–	0.05	0.42	0.258	0.544	--	0.354	0.026	0.377
Mercury, dissolved	mg/l	0.001	–	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	–	–	14	14.1	16.3	--	20.4	16	14.5
Selenium, dissolved	mg/l	0.05	–	--	--	--	--	--	--	--
Silver, dissolved	mg/l	–	–	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	–	200[7]	598	565	641	--	636	599	587
Zinc, dissolved	mg/l	–	5	<0.005	<0.005	<0.005	--	0.005	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	–	–	<0.001	<0.001	<0.001	--	0.003	0.004	<0.004[11]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-Nov-2017 94-2	94-2 24-May-2018 94-2	94-2 22-Nov-2018 94-2	94-2 19-Jun-2019 [24] 94-2	94-2 20-Nov-2019 94-2	94-2 21-May-2020 94-2	94-2 26-Nov-2020 94-2
Semi-VOCs										
Naphthalene	mg/l	–	–	--	--	--	--	--	--	--
Styrene	mg/l	–	–	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	–	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	–	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	–	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	–	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	–	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	–	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	–	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	–	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	–	–	--	--	--	--	--	--	--
Bromoform	mg/l	–	–	--	--	--	--	--	--	--
Bromomethane	mg/l	–	–	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	–	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	–	–	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	–	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	–	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	–	<0.0050	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	–	–	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	–	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	–	–	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	–	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	–	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	–	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 15-Jun-1994	94-3 02-Nov-1994	94-3 28-Jun-1995	94-3 23-Nov-1995	94-3 12-Jun-1996	94-3 12-Oct-1996
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	907	453	850	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	940	756	372	697	466	533
Ammonia Nitrogen	mg/l	--	--	--	2.23	1.2	1.38	0.94	1.39
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	260	158	85	78	33	30
Chloride	mg/l	--	250	360	132	223	274	132	138
Conductivity (Field)	uS/cm	--	--	3070	2270	1960	2650	1680	1960
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	10.19	8.2	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	878	783	787	853	588	514
Nitrate as N	mg/l	10.0	--	0.1	4.38	1.7	2	0.6	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	6.4	4.6	--	--
Nitrogen, Organic	mg/l	--	--	--	--	5.2	3.22	--	--
pH (Field)	-	--	--	6.69	7.08	7.55	7.52	7.06	6.68
Phosphate	mg/l	--	--	--	--	--	0.4	--	--
Phosphorus	mg/l	--	--	2.25	0.392	1.08	--	--	--
Sulphate	mg/l	--	500 [6]	369	359	355	272	279	234
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1550	1140	999	1330	840	980
Total Organic Carbon	mg/l	--	--	42.2	--	29	23.7	16.1	16.4
Total Suspended Solids	mg/l	--	--	--	--	--	--	853	396
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.097	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.1	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.104	--	--	--	--
Boron, dissolved	mg/l	5	--	5.41	3.981	0.68	0.76	1.06	1.36
Cadmium, dissolved	mg/l	0.005	--	--	0.001	0.0004	0.0001	--	--
Calcium, dissolved	mg/l	--	--	170	165.1	198	212	133	117
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0233	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.691	0.435	0.46	6.46	5.73	4.67
Lead, dissolved	mg/l	0.01	--	0.0007	0.1	0.0007	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	110	61.336	70.2	77.6	61.6	53.3
Manganese, dissolved	mg/l	--	0.05	1.708	1.313	1.05	1.69	1.47	1.22
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.05	0.02	0.02
Potassium, dissolved	mg/l	--	--	48	22.77	--	20.4	15.9	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	285	172.1	107	219	217	214
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.048	--	0.001	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 15-Jun-1994	94-3 02-Nov-1994	94-3 28-Jun-1995	94-3 23-Nov-1995	94-3 12-Jun-1996	94-3 12-Oct-1996
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 18-Jun-1997	94-3 06-Nov-1997	94-3 05-Jun-1998	94-3 29-Oct-1998	94-3 06-May-1999	94-3 19-Oct-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	556	588	650
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	10
Alkalinity (Total as CaCO3)	mg/l	--	--	511	620	530	456	482	549
Ammonia Nitrogen	mg/l	--	--	0.73	0.82	0.29	0.19	0.12	0.18
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	16	46	39	3	10	92
Chloride	mg/l	--	250	86.6	212	145	62.9	71	226
Conductivity (Field)	uS/cm	--	--	1370	1900	1700	1571	1450	1800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	2.47	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	445	492	435	363	527	456
Nitrate as N	mg/l	10.0	--	0.1	0.1	1.4	--	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	0.75	0.94	--
Nitrogen, Organic	mg/l	--	--	--	--	--	0.56	0.82	--
pH (Field)	-	--	--	7.25	6.55	--	6.6	6.7	7.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	190	137	234	203	280	163
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	680	1010	842	788	720	900
Total Organic Carbon	mg/l	--	--	8.9	17.8	14.5	12.5	8.8	14.9
Total Suspended Solids	mg/l	--	--	1590	--	--	--	--	2020
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.43	1.63	1.71	1.7	1.01	1.67
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	102	103	97	87.5	128	96.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.02	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.44	4.05	3.24	2.3	0.21	6.74
Lead, dissolved	mg/l	0.01	--	0.0002	0.0005	0.0002	0.0002	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	45.7	56.3	46.1	35.2	49.6	51.6
Manganese, dissolved	mg/l	--	0.05	1.04	0.89	0.67	0.92	0.66	1
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.04	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	9.5	16.4	16.5	7.9	1.2	10.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	173	251	268	161	152	307
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.71	0.01	0.01	0.25
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 18-Jun-1997	94-3 06-Nov-1997	94-3 05-Jun-1998	94-3 29-Oct-1998	94-3 06-May-1999	94-3 19-Oct-1999
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 05-May-2000	94-3 24-Oct-2000	94-3 14-Jun-2001	94-3 23-Nov-2001	94-3 23-May-2002	94-3 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	708	732	476	405	412	754
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	15	1
Alkalinity (Total as CaCO3)	mg/l	--	--	580	600	390	332	362	618
Ammonia Nitrogen	mg/l	--	--	0.01	0.02	0.03	0.02	0.17	0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	11	--	10	12	13	18
Chloride	mg/l	--	250	39	127	51.1	45.9	43.6	56.5
Conductivity (Field)	uS/cm	--	--	1400	1900	1130	1240	980	1380
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	570	404	408	531	374	515
Nitrate as N	mg/l	10.0	--	0.2	0.4	0.1	0.2	0.2	1.9
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	0.75	0.45	0.68	0.52	0.5
Nitrogen, Organic	mg/l	--	--	--	0.73	0.42	0.66	0.35	0.48
pH (Field)	-	--	--	6.8	6.81	6.9	6.19	6.77	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.24	0.26	0.29	0.21	0.17
Sulphate	mg/l	--	500 [6]	300	203	195	209	128	147
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	700	1000	782	770	564	868
Total Organic Carbon	mg/l	--	--	7.8	--	6.1	9	5	6.1
Total Suspended Solids	mg/l	--	--	182	376	172	414	224	153
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.96	1.53	1.12	1.1	0.48	0.98
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	141	78.2	98.2	132	94.6	126
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.16	0.07	0.02	0.03	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0007
Magnesium, dissolved	mg/l	--	--	52.1	50.7	39.5	48.9	33.4	48.6
Manganese, dissolved	mg/l	--	0.05	0.1	0.31	0.08	0.03	0.34	0.09
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	0.6	8.6	0.4	5.5	5	7.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	135	224	147	120	77.3	122
Zinc, dissolved	mg/l	--	5	0.2	0.01	0.01	0.01	0.02	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.001	0.034	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 05-May-2000	94-3 24-Oct-2000	94-3 14-Jun-2001	94-3 23-Nov-2001	94-3 23-May-2002	94-3 06-Nov-2002
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 30-May-2003	94-3 09-Oct-2003	94-3 14-May-2004	94-3 19-Nov-2004	94-3 24-May-2005	94-3 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	671	--	776	824	781	179
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	550	579	636	675	640	735
Ammonia Nitrogen	mg/l	--	--	0.16	0.38	0.31	0.16	0.28	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	2	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	17	21	23	28	20	15
Chloride	mg/l	--	250	27.9	97.8	41.2	58	54.4	63.9
Conductivity (Field)	uS/cm	--	--	1240	1500	1490	1760	1950	1700
Dissolved Inorganic Carbon	mg/l	--	--	--	129	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	529	434	553	530	589	659
Nitrate as N	mg/l	10.0	--	2.7	0.1	0.3	1	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.92	1.04	0.81	0.9	0.79	0.44
Nitrogen, Organic	mg/l	--	--	0.76	0.66	0.5	0.74	0.51	<0.44
pH (Field)	-	--	--	6.5	7	6.9	7	6.8	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.23	0.64	0.21	0.57	0.14	0.16
Sulphate	mg/l	--	500 [6]	161	138	179	170	186	200
Temperature (Field)	deg c	--	15	--	--	--	--	9	--
Total Dissolved Solids	mg/l	--	500	620	958	745	880	989	1120
Total Organic Carbon	mg/l	--	--	6.9	11	6.2	7.5	6.7	9.2
Total Suspended Solids	mg/l	--	--	188	519	108	17	99	90
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.64	1.24	0.797	1.16	0.95	1.51
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	139	98.9	137	131	140	159
Chromium, dissolved	mg/l	0.05	--	0.01	0.001	0.001	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.003	0.003	0.002	<0.002	0.006
Iron, dissolved	mg/l	--	0.3	0.27	0.126	0.03	0.05	0.533	0.013
Lead, dissolved	mg/l	0.01	--	0.0002	0.0003	0.0003	0.0002	0.0009	0.0003
Magnesium, dissolved	mg/l	--	--	44.1	45.4	51.3	49.2	58.3	63.8
Manganese, dissolved	mg/l	--	0.05	0.55	0.501	0.544	0.259	1.3	0.019
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	7.6	10.6	8.8	8.6	8.8	11.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	0.001	<0.001
Sodium, dissolved	mg/l	--	200 [7]	104	219	159	172	164	200
Zinc, dissolved	mg/l	--	5	0.01	0.009	0.005	0.005	<0.005	0.009
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 30-May-2003	94-3 09-Oct-2003	94-3 14-May-2004	94-3 19-Nov-2004	94-3 24-May-2005	94-3 16-Nov-2005
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	<0.0007	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 25-May-2006	94-3 19-Dec-2008	94-3 19-Jun-2019 94-3
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	660	770	930
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	660	770	934
Ammonia Nitrogen	mg/l	--	--	0.2	0.08	0.31
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	24	<5	81
Chloride	mg/l	--	250	39.7	49.7	49
Conductivity (Field)	uS/cm	--	--	1325	1600	1556
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	662	756	708
Nitrate as N	mg/l	10.0	--	0.2	0.4	<0.1
Nitrite as N	mg/l	1.0	--	--	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.98	0.52	0.8
Nitrogen, Organic	mg/l	--	--	0.78	0.44	0.49
pH (Field)	-	--	--	7.9	7.3	6.96
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.11
Sulphate	mg/l	--	500 [6]	330	270	64
Temperature (Field)	deg c	--	15	5.5	4	13.1
Total Dissolved Solids	mg/l	--	500	1150	1250	1020
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Aluminum, dissolved	mg/l	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0006	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.773	1.1	0.59
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.00002	0.0001
Calcium, dissolved	mg/l	--	--	156	176	145
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0006
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.0020
Iron, dissolved	mg/l	--	0.3	0.014	0.024	0.424
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.00002	<0.0001
Magnesium, dissolved	mg/l	--	--	66.1	77.1	83.8
Manganese, dissolved	mg/l	--	0.05	0.777	0.392	3.43
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.4	11	11
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	157	200	116
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 25-May-2006	94-3 19-Dec-2008	94-3 19-Jun-2019 94-3
Semi-VOCs						
Naphthalene	mg/l	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 05-May-2000	MW-C 24-Oct-2000	MW-C 14-Jun-2001	MW-C 23-Nov-2001	MW-C 23-May-2002	MW-C 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	454	628	366	381	412	666
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	10	1
Alkalinity (Total as CaCO3)	mg/l	--	--	372	515	300	312	395	546
Ammonia Nitrogen	mg/l	--	--	0.12	0.37	0.33	0.01	0.35	0.65
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	8	77	56	120
Chloride	mg/l	--	250	103	212	122	206	117	279
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1150	1660	1100	1670	1410	1900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	212	182	224	331	344	147
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	15.5	2.66	3.43	2.26	3.26
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	15.13	2.33	3.42	1.91	2.61
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	7.5	7.1	6.94	6.94	7.8
Phosphorus	mg/l	--	--	--	7.27	5.4	5.15	2.81	8.71
Sulphate	mg/l	--	500 [6]	155	77	156	315	220	56
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	575	890	706	958	876	1100
Total Organic Carbon	mg/l	--	--	--	--	13.5	21	14	18.1
Total Suspended Solids	mg/l	--	--	22300	37000	5930	9420	3440	6550
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.004
Boron, dissolved	mg/l	5	--	0.99	0.75	1.06	1.36	1.34	0.72
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	40.5	28.5	42.2	57	62.9	22.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.02	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.09	6.35	0.04	0.04	0.03	0.05
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0019
Magnesium, dissolved	mg/l	--	--	26.5	27	28.8	45.8	45.4	21.9
Manganese, dissolved	mg/l	--	0.05	0.46	0.63	0.22	0.14	0.2	0.2
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	4.7	9.2	2.2	3.2	6.2	7.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	200	353	161	294	216	347
Zinc, dissolved	mg/l	--	5	0.03	0.04	0.01	0.01	0.02	0.04
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.03	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 05-May-2000	MW-C 24-Oct-2000	MW-C 14-Jun-2001	MW-C 23-Nov-2001	MW-C 23-May-2002	MW-C 06-Nov-2002
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 30-May-2003	MW-C 09-Oct-2003	MW-C 14-May-2004	MW-C 19-Nov-2004	MW-C 24-May-2005	MW-C 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	403	--	523	695	539	256
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	330	528	429	570	442	420
Ammonia Nitrogen	mg/l	--	--	0.14	0.59	0.13	0.08	<0.01	0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	3	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	59	89	43	70	59
Chloride	mg/l	--	250	201	171	123	153	67.2	235
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1500	1880	1790	1820	1700	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	122	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	372	125	402	454	423	594
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1	0.1	0.2	1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4.9	2.79	3.77	0.94	2.19	1.37
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	4.76	2.2	3.64	0.86	<2.19	1.36
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7.4	7.5	7.3	6.9	--
Phosphorus	mg/l	--	--	3.01	2.15	2.87	1.09	2.12	2.06
Sulphate	mg/l	--	500 [6]	335	64	320	290	167	420
Temperature (Field)	deg c	--	15	--	--	--	--	10	--
Total Dissolved Solids	mg/l	--	500	750	950	895	910	804	1450
Total Organic Carbon	mg/l	--	--	16.2	15	15.7	11.8	10.2	19.4
Total Suspended Solids	mg/l	--	--	5900	1130	4360	1010	233	1430
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	1.12	0.716	1.25	1.38	1.18	1.24
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	67.1	19.4	71.8	86.2	74	116
Chromium, dissolved	mg/l	0.05	--	0.01	0.016	0.001	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.012	0.007	0.002	<0.002	0.003
Iron, dissolved	mg/l	--	0.3	0.33	0.42	1.13	0.346	1.93	0.76
Lead, dissolved	mg/l	0.01	--	0.0002	0.0007	0.0003	0.0007	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	49.7	18.7	54.1	58.1	57.8	74.1
Manganese, dissolved	mg/l	--	0.05	0.25	0.401	0.47	1.1	0.591	0.329
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	0.00014	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	4.8	8.6	4.6	5.4	3.9	7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001
Sodium, dissolved	mg/l	--	200 [7]	266	351	274	288	170	351
Zinc, dissolved	mg/l	--	5	0.01	0.027	0.006	0.005	0.008	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.003	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 30-May-2003	MW-C 09-Oct-2003	MW-C 14-May-2004	MW-C 19-Nov-2004	MW-C 24-May-2005	MW-C 16-Nov-2005
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	<0.0007	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 25-May-2006	MW-C 21-Nov-2006	MW-C 15-May-2007	MW-C 30-Nov-2007	MW-C 22-May-2008	MW-C 10-Nov-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	448	458	507	447	410	570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	448	458	507	447	410	570
Ammonia Nitrogen	mg/l	--	--	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	20	27	120	80	<5	31
Chloride	mg/l	--	250	159	76.9	62.9	197	99.8	157
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1450	1200	800	1425	1350	1400
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	395	351	433	459	396	454
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.47	0.9	1.4	1.72	0.8	0.63
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.45	<0.9	<1.4	<1.72	<0.8	<0.63
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	8.1	7.9	7.8	7.3	7.1
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	360	182	139	370	250	240
Temperature (Field)	deg c	--	15	6.5	6.5	9.2	6.5	14.5	6
Total Dissolved Solids	mg/l	--	500	1220	864	772	1320	957	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0016	0.0024	0.0016	0.0015	0.0008
Boron, dissolved	mg/l	5	--	1.15	1.1	0.778	0.932	1.06	1.22
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	69.5	61.4	81.4	82.4	71.6	83.9
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	1.86	2.64	3.31	0.879	0.778	0.086
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0001	0.00005	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	53.8	48.1	55.8	61.5	52.8	59.5
Manganese, dissolved	mg/l	--	0.05	0.254	0.373	0.517	0.434	0.188	0.078
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.5	5	3.6	6.5	4.8	6.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	306	212	121	335	227	268
Zinc, dissolved	mg/l	--	5	0.018	0.007	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 25-May-2006	MW-C 21-Nov-2006	MW-C 15-May-2007	MW-C 30-Nov-2007	MW-C 22-May-2008	MW-C 10-Nov-2008
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	<0.0006
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-May-2009 G-16	MW-C 26-Nov-2009 J-8	MW-C 25-May-2010 M-20	MW-C 20-Oct-2010 G-19	MW-C 24-May-2011 G-27	MW-C 29-Nov-2011 [4] MW-C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	511	546	390	434	384	580
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	511	546	390	434	384	580
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	0.04	0.02	<0.02	0.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	23	40	23	40	25	50
Chloride	mg/l	--	250	86	108	53	121	47	269
Conductivity	uS/cm	--	--	1420	1600	1080	1570	1060	2060
Conductivity (Field)	uS/cm	--	--	1150	1457	917	1527	1202	1863
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	380	411	334	390	329	195
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.32	0.23	0.41	0.35	0.16	1.18
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	<0.32	<0.23	0.37	0.33	<0.16	0.66
pH	-	--	--	7.66	7.82	7.96	7.69	8.28	8.15
pH (Field)	-	--	--	--	6.29	7.18	7.1	7.11	7.65
Phosphorus	mg/l	--	--	0.71	0.90	0.85	0.87	0.35	2.17
Sulphate	mg/l	--	500 [6]	133	160	102	222	116	103
Temperature (Field)	deg c	--	15	7	8	20.2	11.8	12.4	8.5
Total Dissolved Solids	mg/l	--	500	923	1040	702	1020	689	1340
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	<0.01
Boron, dissolved	mg/l	5	--	0.94	0.9	0.69	1.1	0.86	0.80
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	68	79	66	72	69	32
Chromium, dissolved	mg/l	0.05	--	0.004	0.004	0.004	0.005	0.004	0.009
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0003	0.0002	0.0003	0.0003	0.0003
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	0.001	0.002	<0.001
Iron, dissolved	mg/l	--	0.3	0.39	0.83	0.78	0.39	1.62	0.72
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	51	52	41	51	38	28
Manganese, dissolved	mg/l	--	0.05	0.06	0.29	0.09	0.58	0.11	0.42
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	4	4	7	4	8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	160	193	105	223	114	355
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-May-2009 G-16	MW-C 26-Nov-2009 J-8	MW-C 25-May-2010 M-20	MW-C 20-Oct-2010 G-19	MW-C 24-May-2011 G-27	MW-C 29-Nov-2011 [4] MW-C
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 31-May-2012	MW-C 28-Nov-2012	MW-C 29-May-2013 [25]	MW-C 26-Nov-2013 [26]	MW-C 29-May-2014	MW-C 19-Nov-2014
				MW-C	MW-C	MW-C	GW-2	MW-C	MW-C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	350	510	390	540	350	510
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.8	2.4	2.7	6.7	3.0	3.0
Alkalinity (Total as CaCO3)	mg/l	--	--	350	520	400	550	350	510
Ammonia Nitrogen	mg/l	--	--	<0.050	0.16	0.20	0.33	0.11	0.080
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	31	35	87	52	25	38
Chloride	mg/l	--	250	120	190	63	240	100	140
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1633	1949	1090	1711	1420	1776
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	420	470	340	280	340	340
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	0.021	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.87	1.3	2.7	2.2	2.2	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	<0.87	1.14	2.5	1.87	2.09	1.12
pH	-	--	--	7.74	--	7.86	8.12	7.96	7.79
pH (Field)	-	--	--	7.39	7.23	7.36	7.54	7.61	7.39
Phosphorus	mg/l	--	--	0.40	0.83	4.8	1.6	1.3	1.6
Sulphate	mg/l	--	500 [6]	370	350	220	160	350	250
Temperature (Field)	deg c	--	15	10.6	6.3	10.7	6.7	11.6	6.4
Total Dissolved Solids	mg/l	--	500	1130	1410	900	1250	1040	1060
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0011	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	1.1	1.2	0.9	0.78	0.92	0.9
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	85	81	67	47	63	61
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.00050	0.00052	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.0019	<0.001	<0.0010	<0.0010	0.0035	<0.0020
Iron, dissolved	mg/l	--	0.3	0.19	0.39	<0.1	0.2	0.17	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	50	64	41	39	43	46
Manganese, dissolved	mg/l	--	0.05	0.44	0.97	0.19	0.62	0.14	0.42
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.4	8.7	5	8.2	5.5	7.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	220	330	180	400	210	310
Zinc, dissolved	mg/l	--	5	<0.0050	<0.005	<0.0050	0.0052	<0.0050	0.034
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	0.0054	0.015	0.0012	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 31-May-2012	MW-C 28-Nov-2012	MW-C 29-May-2013 [25]	MW-C 26-Nov-2013 [26]	MW-C 29-May-2014	MW-C 19-Nov-2014
				MW-C	MW-C	MW-C	GW-2	MW-C	MW-C
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0013	<0.0013	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00050	0.00073	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 02-Jun-2015	MW-C 26-Nov-2015	MW-C 26-May-2016	MW-C 17-Nov-2016	MW-C 24-May-2017	MW-C 29-Nov-2017
				MW-C	MW-C	MW-C	MW-C	MW-C	MW-C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	431	580	303	574	332	472
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	433	583	304	577	333	475
Ammonia Nitrogen	mg/l	--	--	0.13	0.64	0.13	0.54	0.04	0.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	217	131	83	55	40
Chloride	mg/l	--	250	89	322	65	269	134	102
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1464	1997	1203	2136	1829	1375
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	382	276	283	216	396	343
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	0.2	<0.1	0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.6	3.0	1.2	1.7	0.8	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.47	2.36	1.07	1.16	0.76	1.21
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.18	7.74	7.89	8.07	7.75	7.98
Phosphorus	mg/l	--	--	0.55	3.70	1.41	1.41	0.64	1.64
Sulphate	mg/l	--	500 [6]	342	140	263	165	473	339
Temperature (Field)	deg c	--	15	10.4	7.2	11.5	10.3	10.8	5.7
Total Dissolved Solids	mg/l	--	500	978	1220	802	1180	1270	958
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.728	0.833	0.429	0.94	0.482	0.665
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	60.8	32.3	62.3	36.9	83.6	60.8
Chromium, dissolved	mg/l	0.05	--	<0.001	0.001	<0.001	0.008	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0011	0.0015	0.0061	0.0016
Iron, dissolved	mg/l	--	0.3	0.396	0.408	0.134	0.11	0.124	0.349
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0001
Magnesium, dissolved	mg/l	--	--	55.9	47.3	30.9	30.2	45.5	46.4
Manganese, dissolved	mg/l	--	0.05	0.158	0.814	0.066	0.202	0.119	0.607
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.55	7.9	4.72	7.87	5.25	6.53
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	195	509	101	414	172	235
Zinc, dissolved	mg/l	--	5	<0.005	0.01	0.006	<0.005	0.006	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.003	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 02-Jun-2015	MW-C 26-Nov-2015	MW-C 26-May-2016	MW-C 17-Nov-2016	MW-C 24-May-2017	MW-C 29-Nov-2017
				MW-C	MW-C	MW-C	MW-C	MW-C	MW-C
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 24-May-2018	MW-C 22-Nov-2018	MW-C 19-Jun-2019	MW-C 20-Nov-2019	MW-C 21-May-2020	MW-C 26-Nov-2020
				MW-C	MW-C	MW-C	MW-C	MW-C	MW-C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	518	573	457	565	357	593
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	10
Alkalinity (Total as CaCO3)	mg/l	--	--	520	576	460	570	362	603
Ammonia Nitrogen	mg/l	--	--	0.07	0.06	0.16	0.31	0.04	0.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	107	105	140	127	63	91
Chloride	mg/l	--	250	57	201	68	283	151	282
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1248	1649	1351	2040	1616	1942
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	326	430	427	298	--	259
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	562	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.4	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	1.5	1.2	1.7	1.0	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.13	1.44	1.04	1.39	0.96	0.68
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.29	7.75	7.32	7.69	7.83	7.88
Phosphorus	mg/l	--	--	1.18	1.69	1.39	1.78	0.40	0.79
Sulphate	mg/l	--	500 [6]	186	197	317	165	146	154
Temperature (Field)	deg c	--	15	10.9	5.8	13	7.9	10.5	7.3
Total Dissolved Solids	mg/l	--	500	818	1090	986	1220	1250	1240
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.407	0.781	0.392	0.633	0.403	0.582
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	68.9	85.3	86.8	48.7	114	41
Chromium, dissolved	mg/l	0.05	--	<0.001	0.004	0.004	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0015	0.0012	0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0010	0.0087	0.0050	0.0028	0.0031	0.0016
Iron, dissolved	mg/l	--	0.3	0.312	1.77	1.56	0.223	0.734	0.622
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0009	0.0010	<0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	37.3	52.7	51.1	42.9	67.1	37.9
Manganese, dissolved	mg/l	--	0.05	0.054	0.076	0.168	0.426	0.165	0.545
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.5	9.27	6.44	10.5	7.38	9.26
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	94.5	298	141	376	196	402
Zinc, dissolved	mg/l	--	5	<0.005	0.008	0.009	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	<0.001	0.002	0.004	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 24-May-2018	MW-C 22-Nov-2018	MW-C 19-Jun-2019	MW-C 20-Nov-2019	MW-C 21-May-2020	MW-C 26-Nov-2020
				MW-C	MW-C	MW-C	MW-C	MW-C	MW-C
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0050
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0050
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 05-May-2000	MW-E 24-Oct-2000	MW-E 14-Jun-2001	MW-E 23-Nov-2001	MW-E 23-May-2002	MW-E 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	388	668	390	400	338	615
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	7	1
Alkalinity (Total as CaCO3)	mg/l	--	--	318	548	320	328	289	504
Ammonia Nitrogen	mg/l	--	--	0.16	0.29	0.36	0.02	0.37	0.09
Chemical Oxygen Demand	mg/l	--	--	--	--	61	84	184	87
Chloride	mg/l	--	250	32.8	154	130	59	53.9	143
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	850	1770	1500	1230	570	--
Hardness, Calcium Carbonate	mg/l	--	--	295	607	483	628	304	667
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.2	0.1	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.12	2.94	3.27	4.31	1.99
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	2.83	2.58	3.25	3.94	1.9
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	7.07	7	6.22	7.26	--
Phosphorus	mg/l	--	--	--	2.45	2.25	3.81	5.09	2.7
Sulphate	mg/l	--	500 [6]	102	320	354	340	163	420
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	1152	1070	942	636	1320
Total Organic Carbon	mg/l	--	--	--	--	22.5	31	27	19.1
Total Suspended Solids	mg/l	--	--	452	3890	2140	2740	4670	1910
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.99	1.47	1.41	2.26	0.94	1.63
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	70.1	111	108	120	67.7	133
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.2	0.7	0.71	0.47	0.31	0.16
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0025
Magnesium, dissolved	mg/l	--	--	28.8	80	51.7	49.5	32.7	81.3
Manganese, dissolved	mg/l	--	0.05	0.54	2.23	1.51	0.61	0.01	0.13
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	4.8	11.8	4.7	4	4.7	12.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	87.5	180	135	119	97.8	186
Zinc, dissolved	mg/l	--	5	0.04	0.01	0.01	0.01	0.02	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.016	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 05-May-2000	MW-E 24-Oct-2000	MW-E 14-Jun-2001	MW-E 23-Nov-2001	MW-E 23-May-2002	MW-E 06-Nov-2002
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 30-May-2003	MW-E 09-Oct-2003 [3]	MW-E 14-May-2004	MW-E 19-Nov-2004	MW-E 24-May-2005	MW-E 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	244	--	490	527	398	131
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	200	--	402	432	326	531
Ammonia Nitrogen	mg/l	--	--	0.08	--	0.17	0.08	<0.01	<0.01
Chemical Oxygen Demand	mg/l	--	--	38	--	62	49	49	35
Chloride	mg/l	--	250	22.7	--	47.4	65	21.5	94.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	980	--	1510	1360	1650	1600
Hardness, Calcium Carbonate	mg/l	--	--	264	--	602	549	330	511
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	--	0.2	1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.27	--	2.13	1.38	1.46	0.98
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.19	--	1.96	1.3	<1.46	<0.98
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	--	7.2	7.6	6.9	--
Phosphorus	mg/l	--	--	0.69	--	1.12	0.85	0.66	0.31
Sulphate	mg/l	--	500 [6]	95	--	273	300	98	250
Temperature (Field)	deg c	--	15	--	--	--	--	7.8	--
Total Dissolved Solids	mg/l	--	500	382	--	755	680	477	989
Total Organic Carbon	mg/l	--	--	13.6	--	14.5	15.4	15.1	15.1
Total Suspended Solids	mg/l	--	--	628	--	700	304	516	232
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	--	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.8	--	1.16	1.4	0.804	1.33
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	67.5	--	156	148	84.9	134
Chromium, dissolved	mg/l	0.05	--	0.01	--	0.001	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	--	0.002	0.005	0.002	0.005
Iron, dissolved	mg/l	--	0.3	0.58	--	0.305	0.071	0.364	0.057
Lead, dissolved	mg/l	0.01	--	0.0003	--	0.0002	0.0003	0.0007	<0.0002
Magnesium, dissolved	mg/l	--	--	23.2	--	51.7	43.5	28.6	42.6
Manganese, dissolved	mg/l	--	0.05	0.26	--	0.52	0.086	0.728	0.077
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	--	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	3.1	--	4	4.1	2.1	4.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	0.001
Sodium, dissolved	mg/l	--	200 [7]	64.3	--	107	119	47.6	149
Zinc, dissolved	mg/l	--	5	0.01	--	0.005	0.005	0.007	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	0.001	0.001	0.002	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 30-May-2003	MW-E 09-Oct-2003 [3]	MW-E 14-May-2004	MW-E 19-Nov-2004	MW-E 24-May-2005	MW-E 16-Nov-2005
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	<0.0007	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 25-May-2006	MW-E 21-Nov-2006	MW-E 15-May-2007	MW-E 30-Nov-2007	MW-E 22-May-2008	MW-E 10-Nov-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	242	308	380	567	222	290
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	242	308	380	567	222	290
Ammonia Nitrogen	mg/l	--	--	0.06	<0.01	<0.01	0.02	<0.01	0.08
Chemical Oxygen Demand	mg/l	--	--	38	33	74	71	35	30
Chloride	mg/l	--	250	21.5	22	23.3	120	25.5	69
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	525	650	700	1200	450	1000
Hardness, Calcium Carbonate	mg/l	--	--	261	339	338	549	170	397
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	0.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.85	0.92	0.81	0.91	0.84	0.74
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.79	<0.92	<0.81	0.89	<0.84	0.66
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	8	7.9	7.8	7.1	7.2
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	75	127	71	270	66	167
Temperature (Field)	deg c	--	15	7	6	10.4	4.5	10.5	6
Total Dissolved Solids	mg/l	--	500	394	513	484	1130	332	661
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0007	0.0005	0.0007	0.0006	0.0004
Boron, dissolved	mg/l	5	--	0.732	0.807	0.683	1.32	0.535	0.84
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00004	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	64.9	91.9	93.3	117	43	97.5
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.006	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	0.003	<0.002	0.003	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.153	0.042	0.12	0.039	0.387	0.069
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0001	0.00006	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	24.1	26.7	25.5	62.3	15.3	37.2
Manganese, dissolved	mg/l	--	0.05	0.383	0.158	0.119	0.029	0.272	0.037
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.7	3.1	1.9	12.1	2.3	6.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	62.9	57.6	39.7	213	45.2	110
Zinc, dissolved	mg/l	--	5	0.005	0.007	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 25-May-2006	MW-E 21-Nov-2006	MW-E 15-May-2007	MW-E 30-Nov-2007	MW-E 22-May-2008	MW-E 10-Nov-2008
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	<0.0006
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-May-2009 G-11	MW-E 26-Nov-2009 J-6	MW-E 25-May-2010 M-23	MW-E 20-Oct-2010 G-20	MW-E 24-May-2011 G-34	MW-E 29-Nov-2011 MW-E
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	336	361	464	316	243	485
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	336	361	464	316	243	485
Ammonia Nitrogen	mg/l	--	--	0.05	0.08	0.21	<0.02	0.03	0.05
Chemical Oxygen Demand	mg/l	--	--	43	88	43	50	20	50
Chloride	mg/l	--	250	61	50	84	66	30	126
Conductivity	uS/cm	--	--	1050	1040	1430	1050	629	1590
Conductivity (Field)	uS/cm	--	--	550	1140	1070	1012	470	1538
Hardness, Calcium Carbonate	mg/l	--	--	327	379	426	436	252	443
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.59	0.49	0.71	0.47	0.23	0.83
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.54	0.41	0.5	<0.47	0.2	0.78
pH	-	--	--	7.64	7.99	7.89	7.76	8.10	8.12
pH (Field)	-	--	--	--	6.69	7.36	7.4	7.07	7.32
Phosphorus	mg/l	--	--	1.00	0.26	0.30	0.24	0.12	0.06
Sulphate	mg/l	--	500 [6]	125	125	163	152	44	205
Temperature (Field)	deg c	--	15	8	7.8	21.1	11.4	12.5	8.0
Total Dissolved Solids	mg/l	--	500	683	676	930	683	409	1030
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.55	0.9	0.73	0.61	0.31	0.97
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	78	99	88	122	68	95
Chromium, dissolved	mg/l	0.05	--	0.002	0.003	0.003	0.003	0.003	0.004
Cobalt, dissolved	mg/l	--	--	0.0003	0.0006	0.0006	0.0003	0.0008	0.0003
Copper, dissolved	mg/l	--	1	0.003	0.003	0.004	0.003	0.004	0.005
Iron, dissolved	mg/l	--	0.3	0.59	0.17	1.59	0.33	0.59	0.07
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	32	32	50	32	20	50
Manganese, dissolved	mg/l	--	0.05	0.14	0.36	0.27	0.09	0.37	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5	8	9	3	3	9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	86	77	137	74	36	167
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-May-2009 G-11	MW-E 26-Nov-2009 J-6	MW-E 25-May-2010 M-23	MW-E 20-Oct-2010 G-20	MW-E 24-May-2011 G-34	MW-E 29-Nov-2011 MW-E
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 31-May-2012 [27]	MW-E 28-Nov-2012	MW-E 29-May-2013	MW-E 26-Nov-2013	MW-E 29-May-2014 [21]	MW-E 19-Nov-2014 [18]
				MW-E	MW-E	MW-E	GW-14	MW-E	MW-E
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	270	280	460	240	460
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.6	2.0	1.5	2.9	1.3	2.5
Alkalinity (Total as CaCO3)	mg/l	--	--	310	270	280	460	240	460
Ammonia Nitrogen	mg/l	--	--	<0.050	0.092	0.11	0.12	0.13	0.073
Chemical Oxygen Demand	mg/l	--	--	30	30	58	120	60	72
Chloride	mg/l	--	250	46	48	32	120	54	41
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	918	1194	630	1455	601	1192
Hardness, Calcium Carbonate	mg/l	--	--	260	420	300	570	210	660
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.74	0.88	2.1	6.4	7.0	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	<0.74	0.79	1.99	6.28	6.87	2.73
pH	-	--	--	7.73	--	7.76	7.83	7.77	7.76
pH (Field)	-	--	--	7.16	7.46	7.19	7.41	7.61	7.34
Phosphorus	mg/l	--	--	0.16	0.18	1.7	3.1	1.2	2.2
Sulphate	mg/l	--	500 [6]	150	260	99	320	120	240
Temperature (Field)	deg c	--	15	12.6	5.7	11.2	7.0	11.6	5.3
Total Dissolved Solids	mg/l	--	500	760	832	554	1110	588	850
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.37	0.53	0.38	1	0.25	0.79
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	68	110	82	130	56	180
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	0.00082	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.0033	0.003	0.0025	0.0027	0.0048	0.0033
Iron, dissolved	mg/l	--	0.3	0.22	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	21	32	23	60	16	49
Manganese, dissolved	mg/l	--	0.05	0.14	0.023	0.36	0.023	<0.0020	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	2.7	3.2	1.9	10	1.5	3.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	63	86	47	200	31	100
Zinc, dissolved	mg/l	--	5	<0.0050	<0.005	<0.0050	0.02	<0.0050	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 31-May-2012 [27]	MW-E 28-Nov-2012	MW-E 29-May-2013	MW-E 26-Nov-2013	MW-E 29-May-2014 [21]	MW-E 19-Nov-2014 [18]
				MW-E	MW-E	MW-E	GW-14	MW-E	MW-E
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00040
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00040

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 02-Jun-2015	MW-E 26-Nov-2015	MW-E 26-May-2016	MW-E 17-Nov-2016	MW-E 24-May-2017	MW-E 29-Nov-2017
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	509	621	529	374	393	469
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	511	623	531	375	384	471
Ammonia Nitrogen	mg/l	--	--	0.21	0.09	0.29	0.07	0.09	0.10
Chemical Oxygen Demand	mg/l	--	--	14	105	73	49	50	47
Chloride	mg/l	--	250	114	124	120	111	82	88
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1293	1692	1472	1728	1080	1221
Hardness, Calcium Carbonate	mg/l	--	--	404	718	395	830	533	609
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.7	1.6	1.2	0.8	0.9	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.49	1.51	0.91	0.73	0.81	0.7
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.12	7.40	7.64	7.81	7.46	7.67
Phosphorus	mg/l	--	--	0.17	0.95	0.45	0.21	0.43	0.24
Sulphate	mg/l	--	500 [6]	227	225	241	436	272	393
Temperature (Field)	deg c	--	15	11.0	7.6	11.3	9.7	10.8	5.6
Total Dissolved Solids	mg/l	--	500	922	1090	1070	1120	908	1090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.39	1.42	0.503	1.24	0.457	0.448
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	103	139	104	214	128	163
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.006	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0017	0.0034	0.0024	0.0026
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	35.5	90	32.9	71.5	52.2	49.1
Manganese, dissolved	mg/l	--	0.05	<0.005	0.035	0.032	<0.005	0.031	0.012
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.43	10.6	3.55	8.2	3.35	4.21
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	71	218	65.5	173	122	87.7
Zinc, dissolved	mg/l	--	5	<0.005	0.009	0.005	<0.005	0.006	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	0.004	0.002	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 02-Jun-2015	MW-E 26-Nov-2015	MW-E 26-May-2016	MW-E 17-Nov-2016	MW-E 24-May-2017	MW-E 29-Nov-2017
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 24-May-2018	MW-E 22-Nov-2018	MW-E 19-Jun-2019	MW-E 20-Nov-2019	MW-E 21-May-2020	MW-E 26-Nov-2020
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	492	416	366	472	244	521
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	10
Alkalinity (Total as CaCO3)	mg/l	--	--	494	418	368	476	245	531
Ammonia Nitrogen	mg/l	--	--	0.10	0.06	0.26	0.05	0.02	0.03
Chemical Oxygen Demand	mg/l	--	--	59	113	103	102	44	56
Chloride	mg/l	--	250	71	140	70	124	33	135
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1183	1298	935	1887	631	1783
Hardness, Calcium Carbonate	mg/l	--	--	371	798	388	627	--	739
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	267	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	2.2	1.6	1.5	0.8	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.8	2.14	1.34	1.45	0.78	0.77
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.19	7.72	7.12	7.78	7.79	7.98
Phosphorus	mg/l	--	--	0.36	1.39	0.93	1.32	0.25	0.19
Sulphate	mg/l	--	500 [6]	289	407	138	60	86	451
Temperature (Field)	deg c	--	15	10.9	4.9	13.9	7.4	11.6	6.7
Total Dissolved Solids	mg/l	--	500	1030	1160	662	1360	400	1300
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.255	1.12	0.235	0.854	0.217	0.871
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	104	187	100	150	73.3	168
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.001	0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005
Copper, dissolved	mg/l	--	1	0.0017	0.0046	0.0034	0.0035	0.0070	0.0045
Iron, dissolved	mg/l	--	0.3	<0.1	0.157	<0.1	0.151	0.924	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0001
Magnesium, dissolved	mg/l	--	--	27.2	80.1	33.5	61.2	20.3	77.6
Manganese, dissolved	mg/l	--	0.05	0.639	0.11	0.342	<0.005	0.142	0.046
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	1.59	13.2	4.77	10.4	1.59	12.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	37.9	198	76.4	152	35.5	191
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	0.008	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 24-May-2018	MW-E 22-Nov-2018	MW-E 19-Jun-2019	MW-E 20-Nov-2019	MW-E 21-May-2020	MW-E 26-Nov-2020
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Footnotes:	
	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Monitoring location was dry during this sampling event. No sample was collected.
(4)	Arsenic MRL elevated due to matrix interference.
(5)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(6)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(7)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(8)	pH < 8.3. Calculations not available.
(9)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(10)	Elevated Reporting Limit due to matrix interference.
(11)	GEN02 Elevated Reporting Limit due to matrix interference.
(12)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(13)	Field Parameters were not measured
(14)	Elevated detection limit due to dilution required because of high target analyte concentration.
(15)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(16)	Nitrite/Nitrate: Due to the colour interferences, sample required dilution. Detection limits were adjusted accordingly.
(17)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(18)	VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(19)	Detection Limit was raised due to matrix interferences.
(20)	pH Parameter was not measured.
(21)	Elevated ion balance was confirmed by re-analysis.
(22)	TKN results may be biased low due to elevated dissolved salt content.
(23)	Metals MRL elevated due to matrix interference.
(24)	Inadvertently, no sample was collected at this location.
(25)	VOC Analysis: Due to high concentrations of non-target analytes, sample required dilution. Detection limits were adjusted accordingly.
(26)	VOC Analysis: Due to high concentrations of non- target analytes, sample required dilution. Detection limits were adjusted accordingly.
(27)	Elevated ion balance result was confirmed by re-analysis.

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1A 12-Feb-2010 [3]	09-1A 26-Jan-2011 [3]	09-1A 18-Jan-2012 [3]	09-1A 12-Feb-2013 [3]	09-1A 27-Aug-2014	09-1A 25-Aug-2015
				A	09-1A	1A	09-1A	MW 09-1A	MW09-1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	820	853
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	22	26
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	--	--	840	880
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	1.4	1.26
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	39	27
Chloride	mg/l	--	250	--	--	--	--	410	433
Conductivity (Field)	uS/cm	--	--	--	--	--	--	2658	2694
Hardness, Calcium Carbonate	mg/l	--	--	--	--	--	--	36	33.7
Nitrate as N	mg/l	10.0	--	--	--	--	--	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	4.7	1.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	3.3	0.54
pH	-	--	--	--	--	--	--	8.45	--
pH (Field)	-	--	--	--	--	--	--	8.6	9.48
Phosphorus	mg/l	--	--	--	--	--	--	0.56	0.14
Sulphate	mg/l	--	500 [6]	--	--	--	--	2	<1
Temperature (Field)	deg c	--	15	--	--	--	--	10.0	10.3
Total Dissolved Solids	mg/l	--	500	--	--	--	--	1640	1710
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	--	--	--	--	1.1	1.01
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	--	--	--	--	3.2	1.89
Chromium, dissolved	mg/l	0.05	--	--	--	--	--	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	--	--	--	--	<0.0050	<0.0005
Iron, dissolved	mg/l	--	0.3	--	--	--	--	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	--	--	--	--	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	--	--	--	--	6.8	7.03
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	0.0059	0.006
Potassium, dissolved	mg/l	--	--	--	--	--	--	9.9	11.4
Sodium, dissolved	mg/l	--	200 [7]	--	--	--	--	640	628
Zinc, dissolved	mg/l	--	5	--	--	--	--	0.0063	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	<0.0010	0.002
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.00010	<0.0005
Benzene	mg/l	0.001	--	--	--	--	--	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.00050	<0.0050
o-Xylene	mg/l	--	--	--	--	--	--	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1A 18-Aug-2016	09-1A 28-Aug-2017 [4]	09-1A 29-Nov-2017 [3]	09-1A 30-Aug-2018	09-1A 28-Aug-2019 [5]	09-1A 26-Nov-2020 [3]
				09-1A	09-1A	09-1A	09-1A	1A	1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	865	--	--	911	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	17	--	--	19	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	882	--	--	930	--	--
Ammonia Nitrogen	mg/l	--	--	1.26	--	--	1.47	--	--
Chemical Oxygen Demand	mg/l	--	--	67	--	--	38	--	--
Chloride	mg/l	--	250	438	--	--	445	--	--
Conductivity (Field)	uS/cm	--	--	2649	--	--	2630	--	--
Hardness, Calcium Carbonate	mg/l	--	--	34	--	--	47	--	--
Nitrate as N	mg/l	10.0	--	<0.1	--	--	<0.1	--	--
Nitrite as N	mg/l	1.0	--	<0.05	--	--	<0.05	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.9	--	--	2.1	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.64	--	--	0.63	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.59	--	--	8.44	--	--
Phosphorus	mg/l	--	--	0.34	--	--	0.13	--	--
Sulphate	mg/l	--	500 [6]	<1	--	--	3	--	--
Temperature (Field)	deg c	--	15	11.8	--	--	10.1	--	--
Total Dissolved Solids	mg/l	--	500	1630	--	--	1560	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	--	--	<0.001	--	--
Boron, dissolved	mg/l	5	--	1.08	--	--	0.942	--	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	--	<0.0001	--	--
Calcium, dissolved	mg/l	--	--	2.59	--	--	6.04	--	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--	--	<0.001	--	--
Cobalt, dissolved	mg/l	--	--	<0.0005	--	--	<0.0005	--	--
Copper, dissolved	mg/l	--	1	<0.0005	--	--	0.0008	--	--
Iron, dissolved	mg/l	--	0.3	<0.1	--	--	<0.1	--	--
Lead, dissolved	mg/l	0.01	--	<0.0001	--	--	<0.0001	--	--
Magnesium, dissolved	mg/l	--	--	6.67	--	--	7.8	--	--
Manganese, dissolved	mg/l	--	0.05	0.006	--	--	0.011	--	--
Potassium, dissolved	mg/l	--	--	11.6	--	--	11.5	--	--
Sodium, dissolved	mg/l	--	200 [7]	597	--	--	647	--	--
Zinc, dissolved	mg/l	--	5	<0.005	--	--	0.006	--	--
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--	<0.001	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	--	<0.0005	--	--
Benzene	mg/l	0.001	--	<0.0005	--	--	<0.0005	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	<0.0005	--	--
m,p-Xylenes	mg/l	--	--	<0.0005	--	--	<0.0005	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--	--	<0.0050	--	--
o-Xylene	mg/l	--	--	<0.0005	--	--	<0.0005	--	--
Toluene	mg/l	0.06	0.024	<0.0005	--	--	<0.0005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	--	<0.0005	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1B 12-Feb-2010 [8]	09-1B 26-Jan-2011 [3]	09-1B 18-Jan-2012 [3]	09-1B 12-Feb-2013 [3]	09-1B 27-Aug-2014	09-1B 25-Aug-2015
				1B	09-1B	1B	091B	MW 09-1B	MW09-1B
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1270	--	--	--	1200	1170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	--	--	--	19	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1270	--	--	--	1300	1180
Ammonia Nitrogen	mg/l	--	--	4.01	--	--	--	4.2	3.94
Chemical Oxygen Demand	mg/l	--	--	110	--	--	--	81	136
Chloride	mg/l	--	250	1350	--	--	--	1500	1420
Conductivity	uS/cm	--	--	6500	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>5000	--	--	--	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	296	--	--	--	290	276
Nitrate as N	mg/l	10.0	--	<0.10	--	--	--	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	--	--	--	0.041	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.85	--	--	--	8.9	6.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--
Nitrogen, Organic	mg/l	--	--	0.84	--	--	--	4.7	2.26
pH	-	--	--	8.13	--	--	--	8.20	--
pH (Field)	-	--	--	8.29	--	--	--	7.95	9.66
Phosphorus	mg/l	--	--	2.72	--	--	--	3.3	4.00
Sulphate	mg/l	--	500 [6]	23	--	--	--	<1	6
Temperature (Field)	deg c	--	15	3.1	--	--	--	10.9	11.6
Total Dissolved Solids	mg/l	--	500	4220	--	--	--	3530	3580
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.02	--	--	--	0.0064	0.007
Boron, dissolved	mg/l	5	--	1.7	--	--	--	1.8	1.82
Cadmium, dissolved	mg/l	0.005	--	<0.001	--	--	--	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	31	--	--	--	32	28.7
Chromium, dissolved	mg/l	0.05	--	<0.005	--	--	--	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	<0.002	--	--	--	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.01	--	--	--	<0.0050	<0.0005
Iron, dissolved	mg/l	--	0.3	2.2	--	--	--	0.93	0.763
Lead, dissolved	mg/l	0.01	--	<0.01	--	--	--	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	53	--	--	--	50	49.5
Manganese, dissolved	mg/l	--	0.05	0.2	--	--	--	0.076	0.079
Potassium, dissolved	mg/l	--	--	32	--	--	--	32	30.2
Sodium, dissolved	mg/l	--	200 [7]	1340	--	--	--	1400	1170
Zinc, dissolved	mg/l	--	5	<0.1	--	--	--	0.0084	0.023
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--	--	<0.0010	<0.020 [10]
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	--	--	--	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	--	--	--	0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	--	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	--	--	--	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	--	--	--	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	--	--	--	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	--	--	--	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	--	--	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1B 18-Aug-2016	09-1B 28-Aug-2017 [4]	09-1B 29-Nov-2017	09-1B 30-Aug-2018	09-1B 28-Aug-2019 [5]
				09-1B	09-1B	09-1B	09-1B	1B
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1100	--	1120	1070	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	--	<25 [11]	<25 [11]	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1110	--	1130	1090	--
Ammonia Nitrogen	mg/l	--	--	4.47	--	4.58	4.46	--
Chemical Oxygen Demand	mg/l	--	--	152	--	101	122	--
Chloride	mg/l	--	250	1540	--	1620	1500	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	--	3999	>3999	--
Hardness, Calcium Carbonate	mg/l	--	--	283	--	308	363	--
Nitrate as N	mg/l	10.0	--	<0.1	--	<0.1	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.50 [11]	--	<0.05	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	7.1	--	7.8	6.0	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.63	--	3.22	1.54	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	9.06	--	8.06	8.04	--
Phosphorus	mg/l	--	--	6.45	--	8.13	2.79	--
Sulphate	mg/l	--	500 [6]	5	--	1	6	--
Temperature (Field)	deg c	--	15	11.3	--	6.3	9.5	--
Total Dissolved Solids	mg/l	--	500	3740	--	3740	3550	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.005	--	0.005	0.003	--
Boron, dissolved	mg/l	5	--	1.82	--	1.87	1.3	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	29.7	--	37.4	42	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--	<0.001	<0.001	--
Cobalt, dissolved	mg/l	--	--	<0.0005	--	0.0013	<0.0005	--
Copper, dissolved	mg/l	--	1	<0.0005	--	0.0029	0.0010	--
Iron, dissolved	mg/l	--	0.3	<0.1	--	<0.1	0.743	--
Lead, dissolved	mg/l	0.01	--	<0.0001	--	<0.0001	<0.0001	--
Magnesium, dissolved	mg/l	--	--	50.7	--	52.2	62.7	--
Manganese, dissolved	mg/l	--	0.05	0.063	--	0.066	0.082	--
Potassium, dissolved	mg/l	--	--	32.6	--	34.9	33.8	--
Sodium, dissolved	mg/l	--	200 [7]	1280	--	1320	1340	--
Zinc, dissolved	mg/l	--	5	<0.005	--	<0.005	0.009	--
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.004	--	<0.002 [10]	<0.001	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--	<0.0050	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1B 20-Nov-2019 09-1B	09-1B 26-Nov-2020 09-1B
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1260	1300
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25	25
Alkalinity (Total as CaCO3)	mg/l	--	--	1270	1320
Ammonia Nitrogen	mg/l	--	--	3.97	4.52
Chemical Oxygen Demand	mg/l	--	--	88	88
Chloride	mg/l	--	250	1570	1470
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6430	>3999
Hardness, Calcium Carbonate	mg/l	--	--	363	401
Nitrate as N	mg/l	10.0	--	<0.1	<0.5 [12]
Nitrite as N	mg/l	1.0	--	<0.05	<1.00 [13]
Nitrogen, Total Kjeldahl	mg/l	--	--	4.6	4.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.63	0.38
pH	-	--	--	--	--
pH (Field)	-	--	--	8.18	8.47
Phosphorus	mg/l	--	--	2.19	3.01
Sulphate	mg/l	--	500 [6]	2	<1
Temperature (Field)	deg c	--	15	6.6	6.2
Total Dissolved Solids	mg/l	--	500	3690	3610
Metals					
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004
Boron, dissolved	mg/l	5	--	1.78	1.75
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	41	38.1
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0011	0.0010
Copper, dissolved	mg/l	--	1	0.0011	0.0039
Iron, dissolved	mg/l	--	0.3	0.486	0.207
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	63.2	74.3
Manganese, dissolved	mg/l	--	0.05	0.09	0.07
Potassium, dissolved	mg/l	--	--	36.8	33.5
Sodium, dissolved	mg/l	--	200 [7]	1220	1270
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.004 [10]	<0.004 [12]
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	09-1C 12-Feb-2010	09-1C 26-Jan-2011[14]	09-1C 18-Jan-2012[3]	09-1C 12-Feb-2013[3]	09-1C 27-Aug-2014	09-1C 25-Aug-2015
				1C	S-2	1C	09-1C	MW 09-1C	MW09-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	804	914	--	--	880	892
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2[9]	<2[9]	--	--	9.8	9
Alkalinity (Total as CaCO3)	mg/l	--	--	804	914	--	--	890	901
Ammonia Nitrogen	mg/l	--	--	2.15	1.54	--	--	2.7	2.14
Chemical Oxygen Demand	mg/l	--	--	43	150	--	--	280	221
Chloride	mg/l	--	250	624	710	--	--	780	799
Conductivity	uS/cm	--	--	3570	3910	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3240	3000	--	--	3545	3931
Hardness, Calcium Carbonate	mg/l	--	--	271	275	--	--	260	232
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	--	--	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	--	--	0.044	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.59	2.47	--	--	27	6.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--
Nitrogen, Organic	mg/l	--	--	0.44	0.93	--	--	24.3	4.16
pH	-	--	--	7.97	7.88	--	--	8.07	--
pH (Field)	-	--	--	7.99	6.28	--	--	7.66	9.42
Phosphorus	mg/l	--	--	18.6	14.2	--	--	19	8.92
Sulphate	mg/l	--	500[6]	41	20	--	--	<1	8
Temperature (Field)	deg c	--	15	3.5	4.2	--	--	9.8	10.7
Total Dissolved Solids	mg/l	--	500	2320	2540	--	--	1960	1980
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.006	<0.01	--	--	0.0036	0.004
Boron, dissolved	mg/l	5	--	0.70	0.91	--	--	0.8	0.755
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	--	--	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	41	41	--	--	37	30
Chromium, dissolved	mg/l	0.05	--	<0.005	0.020	--	--	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0014	0.0014	--	--	0.00082	0.0008
Copper, dissolved	mg/l	--	1	0.002	0.002	--	--	<0.0050	<0.0005
Iron, dissolved	mg/l	--	0.3	0.70	1.52	--	--	0.23	0.181
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	41	42	--	--	40	38.2
Manganese, dissolved	mg/l	--	0.05	0.77	0.92	--	--	0.71	0.971
Potassium, dissolved	mg/l	--	--	15	13	--	--	13	11.5
Sodium, dissolved	mg/l	--	200[7]	657	810	--	--	670	552
Zinc, dissolved	mg/l	--	5	0.02	0.02	--	--	0.0062	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	--	--	<0.0010	0.005
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0008	--	--	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.001	--	--	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.001	--	--	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0020	--	--	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0080	--	--	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.001	--	--	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.001	--	--	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0004	--	--	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	09-1C 18-Aug-2016	09-1C 28-Aug-2017[4]	09-1C 29-Nov-2017	09-1C 30-Aug-2018	09-1C 28-Aug-2019[5]
				09-1C	09-1C	09-1C	09-1C	1C
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	979	--	1010	1000	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5	--	18	9	--
Alkalinity (Total as CaCO3)	mg/l	--	--	984	--	1030	1010	--
Ammonia Nitrogen	mg/l	--	--	2.47	--	2.15	1.55	--
Chemical Oxygen Demand	mg/l	--	--	414	--	103	277	--
Chloride	mg/l	--	250	875	--	900	830	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3268	--	3394	3639	--
Hardness, Calcium Carbonate	mg/l	--	--	265	--	278	257	--
Nitrate as N	mg/l	10.0	--	<0.1	--	<0.1	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.50[11]	--	<0.05	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	8.0	--	4.2	3.8	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.53	--	2.05	2.25	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.22	--	7.97	7.96	--
Phosphorus	mg/l	--	--	11.8	--	7.18	2.82	--
Sulphate	mg/l	--	500[6]	6	--	5	5	--
Temperature (Field)	deg c	--	15	12.1	--	6.4	9.4	--
Total Dissolved Solids	mg/l	--	500	2330	--	2290	2230	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.002	--	0.004	0.003	--
Boron, dissolved	mg/l	5	--	0.748	--	0.785	0.629	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	36.4	--	39.7	38.1	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--	<0.001	<0.001	--
Cobalt, dissolved	mg/l	--	--	0.0007	--	0.0007	0.0008	--
Copper, dissolved	mg/l	--	1	<0.0005	--	0.0018	0.0042	--
Iron, dissolved	mg/l	--	0.3	0.262	--	0.118	0.115	--
Lead, dissolved	mg/l	0.01	--	<0.0001	--	<0.0001	0.0002	--
Magnesium, dissolved	mg/l	--	--	42.2	--	43.4	39.4	--
Manganese, dissolved	mg/l	--	0.05	0.746	--	0.437	0.628	--
Potassium, dissolved	mg/l	--	--	14.8	--	13.9	12.8	--
Sodium, dissolved	mg/l	--	200[7]	623	--	654	577	--
Zinc, dissolved	mg/l	--	5	<0.005	--	<0.005	0.01	--
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.002	--	<0.002[10]	<0.001	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--	<0.0050	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1C 20-Nov-2019 09-1C	09-1C 26-Nov-2020 09-1C
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	937	901
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	947	913
Ammonia Nitrogen	mg/l	--	--	1.49	1.80
Chemical Oxygen Demand	mg/l	--	--	80	105
Chloride	mg/l	--	250	788	736
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3730	3035
Hardness, Calcium Carbonate	mg/l	--	--	375	294
Nitrate as N	mg/l	10.0	--	0.6	<0.5 [12]
Nitrite as N	mg/l	1.0	--	0.25	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.01	1
pH	-	--	--	--	--
pH (Field)	-	--	--	7.9	8.13
Phosphorus	mg/l	--	--	1.64	1.39
Sulphate	mg/l	--	500 [6]	2	3
Temperature (Field)	deg c	--	15	7.1	6.0
Total Dissolved Solids	mg/l	--	500	2250	2050
Metals					
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002
Boron, dissolved	mg/l	5	--	0.672	0.609
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	52.3	40.7
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0010	0.0009
Copper, dissolved	mg/l	--	1	0.0061	0.0037
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	59.3	46.8
Manganese, dissolved	mg/l	--	0.05	0.837	0.832
Potassium, dissolved	mg/l	--	--	20.1	12.8
Sodium, dissolved	mg/l	--	200 [7]	717	619
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	0.004	<0.004 [12]
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	09-1D 12-Feb-2010[16] 1D	09-1D 26-Jan-2011[17] S-1	09-1D 18-Jan-2012[18] 09-1B	09-1D 12-Feb-2013[19] 09-1B	09-1D 27-Aug-2014[20] 09-1D	09-1D 25-Aug-2015 MW09-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	155	86	105	90	--	64
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2[9]	<2[9]	<2[9]	<1.0	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	155	86	105	90	--	64
Ammonia Nitrogen	mg/l	--	--	1.15	0.97	1.26	1.4	--	1.46
Chemical Oxygen Demand	mg/l	--	--	1980	1020	85	140	--	232
Chloride	mg/l	--	250	99	83	97	84	--	70
Conductivity	uS/cm	--	--	619	437	517	--	--	--
Conductivity (Field)	uS/cm	--	--	325	--[21]	745	586	--	519
Hardness, Calcium Carbonate	mg/l	--	--	96	42	46	27	--	24.8
Nitrate as N	mg/l	10.0	--	<1	<0.10	<1.0	<1.0	--	<0.1
Nitrite as N	mg/l	1.0	--	<1	<0.10	<1.0	<0.10	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.81	4.80	2.55	4.6	--	7.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<1.0	--	--
Nitrogen, Organic	mg/l	--	--	0.66	3.83	1.29	3.2	--	6.34
pH	-	--	--	7.32	7.06	6.89	7.12	--	--
pH (Field)	-	--	--	7.68	--[21]	7.51	7.20	--	7.55
Phosphorus	mg/l	--	--	0.19	0.45	0.03	<0.40[22]	--	0.86
Sulphate	mg/l	--	500[6]	<1	<1	<1	<1	--	<1
Temperature (Field)	deg c	--	15	0.4	--[21]	0.4	2.8	--	18.6
Total Dissolved Solids	mg/l	--	500	402	284	336	320	--	196
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	--	<0.001
Boron, dissolved	mg/l	5	--	0.07	0.06	0.06	0.027	--	0.037
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	--	--	22	7	7	4.8	--	4.07
Chromium, dissolved	mg/l	0.05	--	0.004	0.004	0.002	<0.005	--	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0005	<0.0005	--	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	0.003	--	<0.0005
Iron, dissolved	mg/l	--	0.3	0.86	1.29	1.24	0.65	--	0.682
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.0005	--	<0.0001
Magnesium, dissolved	mg/l	--	--	10	6	7	3.7	--	3.55
Manganese, dissolved	mg/l	--	0.05	0.19	0.14	0.15	0.091	--	0.089
Potassium, dissolved	mg/l	--	--	4	2	2	1.5	--	1.6
Sodium, dissolved	mg/l	--	200[7]	101	67	86	41	--	40.8
Zinc, dissolved	mg/l	--	5	0.02	<0.01	0.02	0.015	--	0.024
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	<0.001	<0.0010	--	0.005
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0008	<0.0004	<0.00010	--	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0020	<0.0005	<0.00010	--	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0080	<0.0040	<0.00050	--	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005
Toluene	mg/l	0.06	0.024	0.0007	<0.001	<0.0005	<0.00020	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0004	<0.0002	<0.00020	--	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	09-1D 18-Aug-2016[20] 91D	09-1D 28-Aug-2017 09-1D	09-1D 30-Aug-2018[20] 09-1D	09-1D 28-Aug-2019[5] 1D	09-1D 21-Nov-2019 09-1D	09-1D 26-Nov-2020 09-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	50	--	--	72	103
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	--	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	50	--	--	72	103
Ammonia Nitrogen	mg/l	--	--	--	0.94	--	--	1.19	1.35
Chemical Oxygen Demand	mg/l	--	--	--	441	--	--	1400	187
Chloride	mg/l	--	250	--	62	--	--	74	107
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	313	--	--	506	505
Hardness, Calcium Carbonate	mg/l	--	--	--	42	--	--	35.4	46.7
Nitrate as N	mg/l	10.0	--	--	<0.1	--	--	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	<0.05	--	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	--	6.2	--	--	12.5	3.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	5.26	--	--	11.31	1.95
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	6.80	--	--	6.82	6.92
Phosphorus	mg/l	--	--	--	0.23	--	--	0.62	0.11
Sulphate	mg/l	--	500[6]	--	<1	--	--	2	<1
Temperature (Field)	deg c	--	15	--	18.1	--	--	4.9	5.3
Total Dissolved Solids	mg/l	--	500	--	212	--	--	238	328
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	<0.001	--	--	<0.001	<0.001
Boron, dissolved	mg/l	5	--	--	0.064	--	--	0.044	0.058
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	--	6.48	--	--	5.97	7.29
Chromium, dissolved	mg/l	0.05	--	--	<0.001	--	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	--	<0.0005	--	--	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	--	<0.0005	--	--	0.0014	0.0030
Iron, dissolved	mg/l	--	0.3	--	0.984	--	--	0.679	1.32
Lead, dissolved	mg/l	0.01	--	--	0.0001	--	--	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	--	6.31	--	--	4.97	6.91
Manganese, dissolved	mg/l	--	0.05	--	0.14	--	--	0.098	0.187
Potassium, dissolved	mg/l	--	--	--	2.2	--	--	2.86	2.29
Sodium, dissolved	mg/l	--	200[7]	--	71.4	--	--	63.2	76.3
Zinc, dissolved	mg/l	--	5	--	<0.005	--	--	<0.005	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	--	--	0.008	<0.002[12]
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	<0.0005	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	--	<0.0005	--	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.0005	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0050	--	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	<0.0005	--	--	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	<0.0005	--	--	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-Jun-1994	94-4 01-Nov-1994	94-4 28-Jun-1995	94-4 22-Nov-1995	94-4 12-Oct-1996	94-4 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1347	1442	1030	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1092	1123	1182	840	1280	1270
Ammonia Nitrogen	mg/l	--	--	--	2.77	4.6	3.75	3.47	4.84
Chemical Oxygen Demand	mg/l	--	--	437	283	188	100	70	62
Chloride	mg/l	--	250	1900	1530	1685	1610	1570	1730
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6150	6900	7000	7440	7120	6190
Dissolved Oxygen (Field)	mg/l	--	--	--	6.64	3.08	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	570	598	436	461	421	476
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	1.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	11.3	5.75	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	6.7	2	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.77	8.08	7.89	8.36	7.69	8.5
Phosphate	mg/l	--	--	--	--	--	1.6	--	--
Phosphorus	mg/l	--	--	39.6	0.797	6.5	--	--	--
Sulphate	mg/l	--	500 [6]	27.4	13.8	5	32	15	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3090	3460	3510	3720	3570	3470
Total Organic Carbon	mg/l	--	--	19	25.9	22.5	17.5	19.2	18.5
Total Suspended Solids	mg/l	--	--	--	--	--	--	4520	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.02	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	**0.1**	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.124	--	--	--	--
Boron, dissolved	mg/l	5	--	1.34	1.465	1.3	1.19	1.43	1.47
Cadmium, dissolved	mg/l	0.005	--	--	**0.01**	0.0001	0.0001	--	--
Calcium, dissolved	mg/l	--	--	69	39.34	45.3	45.9	41.3	50
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.04	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0201	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.409	0.1	0.03	1.31	1.07	0.92
Lead, dissolved	mg/l	0.01	--	0.002	**0.1**	0.0009	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	96.6	58.416	77.4	83.1	76.3	84.2
Manganese, dissolved	mg/l	--	0.05	0.116	0.153	0.18	0.2	0.17	0.18
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.025	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	54.9	25.61	--	37.7	33.2	37.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1040	1327	1045	1150	1330	1210
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.049	--	0.001	--	--	--
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 05-Jun-1998	94-4 06-May-1999	94-4 24-Oct-2000	94-4 14-Jun-2001	94-4 06-Nov-2002	94-4 30-May-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1600	1730	1300	1720	1480
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	90	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1220	1310	1420	1210	1410	1220
Ammonia Nitrogen	mg/l	--	--	3.84	3.92	3.47	4.48	4.05	3.62
Chemical Oxygen Demand	mg/l	--	--	64	64	--	61	76	66
Chloride	mg/l	--	250	1580	1690	1760	1500	1680	1650
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6720	6540	6790	5000	6700	5400
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	431	456	474	449	439	397
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1	--	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	5.4	5.32	5.28	5.8	5.84
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	1.48	1.85	0.8	1.75	2.22
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.8	8.22	8	7.8	6.9
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.03	2.21	2.59	2.42
Sulphate	mg/l	--	500 [6]	38	1	1	6	2	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3350	3280	3850	3860	4040	2700
Total Organic Carbon	mg/l	--	--	18.4	24	--	17.3	17.5	17.1
Total Suspended Solids	mg/l	--	--	--	--	932	1560	1110	720
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	0.004	0.003	0.001	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.65	1.67	1.61	1.75	1.58	1.48
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	42.1	46.1	41.4	49.6	43.4	42.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.15	1.03	0.66	0.41	0.32	1.05
Lead, dissolved	mg/l	0.01	--	0.0003	0.0005	**0.022**	0.0002	0.004	0.0009
Magnesium, dissolved	mg/l	--	--	78.1	81.8	90.1	79	80.2	70.8
Manganese, dissolved	mg/l	--	0.05	0.19	0.17	0.14	0.11	0.14	0.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	39.6	34.3	29.2	33.2	34	35.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1660	1400	1410	1350	1430	1150
Zinc, dissolved	mg/l	--	5	0.12	0.01	0.01	0.01	0.02	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.003	0.054	0.001	0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-4 19-Nov-2004	94-4 16-Nov-2005	94-4 15-May-2007	94-4 10-Nov-2008	94-4 26-Nov-2009[23] J-2	94-4 24-May-2011[24] G-25
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1610	160	1320	1230	1320	1260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<2[9]	39
Alkalinity (Total as CaCO3)	mg/l	--	--	1320	1310	1320	1230	1320	1300
Ammonia Nitrogen	mg/l	--	--	3.66	3.94	3.56	4	3.93	3.60
Chemical Oxygen Demand	mg/l	--	--	69	99	114	76	68	60
Chloride	mg/l	--	250	1700	1600	1750	1690	1630	1620
Conductivity	uS/cm	--	--	--	--	--	--	7080	7310
Conductivity (Field)	uS/cm	--	--	7110	5500	4100	>5000	799	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	412	430	393	342	405	414
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1	0.1	0.1	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	4.97	6.08	5.51	5.22	4.59	5.60
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.31	2.14	1.95	1.22	0.66	2
pH	-	--	--	--	--	--	--	8.21	8.52
pH (Field)	-	--	--	8	--	8.4	7.9	6.89	7.94
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.25	3.18	--	--	1.20	1.50
Sulphate	mg/l	--	500[6]	10	1	1	<1	<1	<1
Temperature (Field)	deg c	--	15	--	--	8.8	5	7.8	11.1
Total Dissolved Solids	mg/l	--	500	3555	3990	4200	3770	4600	4750
Total Organic Carbon	mg/l	--	--	17.1	21.1	--	--	--	--
Total Suspended Solids	mg/l	--	--	184	43	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.009	0.0057	<0.01	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.58	1.61	1.37	1.39	1.6	1.8
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.00005	<0.00002	<0.001	<0.0001
Calcium, dissolved	mg/l	--	--	42.8	45.9	41.8	33.6	42	42
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.002	0.0008
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	<0.002	<0.01	0.003
Iron, dissolved	mg/l	--	0.3	0.266	0.57	0.465	0.265	<0.3	0.34
Lead, dissolved	mg/l	0.01	--	0.0016	0.0004	0.00012	<0.00002	<0.01	<0.001
Magnesium, dissolved	mg/l	--	--	74.2	76.7	70.3	62.8	73	75
Manganese, dissolved	mg/l	--	0.05	0.117	0.125	0.105	0.06	0.1	0.11
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	37.3	40.6	38.1	34.2	32	37
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	1590	1470	1500	1200	1390	1430
Zinc, dissolved	mg/l	--	5	0.005	0.006	<0.005	<0.005	<0.1	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	<0.0006	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010	<0.01
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040	<0.04
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.002

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-4 29-Nov-2012[25]	94-4 29-May-2014[26]	94-4 26-Nov-2015	94-4 24-May-2017	94-4 22-Nov-2018
				94-4	94-4	94-4	94-4	94-4
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1300	1300	1240	1320	1310
Alkalinity, Carbonate as CaCO3	mg/l	--	--	25	29	<25[27]	<25[11]	<25[11]
Alkalinity (Total as CaCO3)	mg/l	--	--	1300	1300	1240	1330	1330
Ammonia Nitrogen	mg/l	--	--	4.2	4.1	4.03	5.16[28]	4.05
Chemical Oxygen Demand	mg/l	--	--	65	70	99	107	102
Chloride	mg/l	--	250	1500	1700	1710	1690	1810
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	>3999	>3999	3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	400	410	378	373	589
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.05	<0.50[11]	<1.00[11]
Nitrogen, Total Kjeldahl	mg/l	--	--	5.3	5.3	5.6	4.9	5.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	--	--	--
Nitrogen, Organic	mg/l	--	--	1.1	1.2	1.57	0	1.85
pH	-	--	--	8.32	8.39	--	--	--
pH (Field)	-	--	--	8.02	7.29	8.04	8.00	8.03
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.6	1.4	1.60	1.11	1.95
Sulphate	mg/l	--	500[6]	<1	<1	<1	<1	1
Temperature (Field)	deg c	--	15	6.7	10.0	9.0	10.6	5.7
Total Dissolved Solids	mg/l	--	500	3860	3600	3860	4040	3960
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0062	<0.0050	0.002	0.01	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.6	1.6	1.47	1.17	1.58
Cadmium, dissolved	mg/l	0.005	--	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	43	41	26.1	41.7	61.8
Chromium, dissolved	mg/l	0.05	--	<0.025	<0.025	<0.001	0.021	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0025	<0.0025	<0.0005	0.0005	0.0009
Copper, dissolved	mg/l	--	1	<0.0050	0.0058	<0.0005	0.0012	0.0033
Iron, dissolved	mg/l	--	0.3	<0.5	<0.5	<0.1	<0.1	0.208
Lead, dissolved	mg/l	0.01	--	<0.0025	<0.0025	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	72	73	75.9	65.3	105
Manganese, dissolved	mg/l	--	0.05	0.12	0.12	0.089	0.089	0.138
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	31	31	27	32.5	42.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	1400	1300	1350	1360	1290
Zinc, dissolved	mg/l	--	5	<0.025	<0.025	0.009	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.002[10]	<0.010[10]	<0.001
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0010	<0.0010	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00040	<0.00040	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00040	<0.00040	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 19-Jun-2019	94-4 21-May-2020
				94-4	94-4
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1070	1280
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [11]	<25 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	1080	1300
Ammonia Nitrogen	mg/l	--	--	4.36	4.15
Chemical Oxygen Demand	mg/l	--	--	84	121
Chloride	mg/l	--	250	1640	1980
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	443	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	537
Nitrate as N	mg/l	10.0	--	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.50 [11]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	5.0	4.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.64	0.25
pH	-	--	--	--	--
pH (Field)	-	--	--	7.98	7.45
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	1.41	1.47
Sulphate	mg/l	--	500 [6]	<1	<1
Temperature (Field)	deg c	--	15	11.2	10.4
Total Dissolved Solids	mg/l	--	500	3690	4020
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Aluminum, dissolved	mg/l	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002
Barium, dissolved	mg/l	1	--	--	--
Boron, dissolved	mg/l	5	--	0.14	1.64
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	48.2	52.2
Chromium, dissolved	mg/l	0.05	--	<0.001	0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0007
Copper, dissolved	mg/l	--	1	0.0012	0.0028
Iron, dissolved	mg/l	--	0.3	0.21	1.21
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	78.4	98.7
Manganese, dissolved	mg/l	--	0.05	0.112	0.13
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	32.5	37
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1060	1300
Zinc, dissolved	mg/l	--	5	0.007	0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.012
Semi-VOCs					
Styrene	mg/l	--	--	--	--
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 15-Jun-1994	94-5 02-Nov-1994	94-5 28-Jun-1995	94-5 22-Nov-1995	94-5 12-Jun-1996	94-5 12-Oct-1996
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	841	929	81	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	622	701	762	804	796	840
Ammonia Nitrogen	mg/l	--	--	--	0.66	0.86	0.5	0.85	1.14
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	171	150	275	63	33	26
Chloride	mg/l	--	250	1400	795	880	915	900	870
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3550	4050	4060	4480	3850	4450
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	7.95	7.27	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	448	474	425	444	449	419
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	--	0.1	1.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	15.5	3.25	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	14.64	2.75	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.17	7.66	7.4	8.22	8.03	7.25
Phosphate	mg/l	--	--	--	--	--	0.8	--	--
Phosphorus	mg/l	--	--	6.7	0.391	7.22	--	--	--
Sulphate	mg/l	--	500 [6]	32.5	17.1	5	4	5	4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1790	2040	2060	2240	2070	2230
Total Organic Carbon	mg/l	--	--	12	16.5	22	9.1	12.2	11
Total Suspended Solids	mg/l	--	--	--	--	--	--	2940	1070
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.062	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	**0.1**	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.061	--	--	--	--
Boron, dissolved	mg/l	5	--	0.44	0.601	0.45	0.4	0.48	0.61
Cadmium, dissolved	mg/l	0.005	--	--	**0.01**	0.0001	0.0001	--	--
Calcium, dissolved	mg/l	--	--	66.6	48.11	57.2	57	56.6	53
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0173	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.39	0.175	0.02	0.9	1.2	0.55
Lead, dissolved	mg/l	0.01	--	0.0011	**0.1**	0.0005	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	68.5	44.206	67.8	72.4	73.8	68.7
Manganese, dissolved	mg/l	--	0.05	0.78	0.933	1.29	1.37	1.47	1.22
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.9	8.244	--	15.2	17.7	13.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	508	651.7	630	711	694	658
Zinc, dissolved	mg/l	--	5	0.01	0.012	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.12	0.005	0.001	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-5 15-Jun-1994	94-5 02-Nov-1994	94-5 28-Jun-1995	94-5 22-Nov-1995	94-5 12-Jun-1996	94-5 12-Oct-1996
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 18-Jun-1997	94-5 06-Nov-1997	94-5 05-Jun-1998	94-5 30-Oct-1998	94-5 06-May-1999	94-5 19-Oct-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	996	1040	983
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	26
Alkalinity (Total as CaCO3)	mg/l	--	--	871	276	869	816	852	850
Ammonia Nitrogen	mg/l	--	--	0.85	0.68	0.56	0.79	0.36	0.97
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	13	35	42	24	30	12
Chloride	mg/l	--	250	881	812	1020	910	970	951
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3900	3930	4280	4350	4030	3800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	2.34	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	499	468	440	361	457	443
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.6	1.8	--	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	2.14	2.08	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	1.35	1.72	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.54	7.88	--	7.2	7.2	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	1	98	37	2	2	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1830	1990	2150	2180	2020	1900
Total Organic Carbon	mg/l	--	--	9.9	11.6	11.5	11.4	12.2	11.2
Total Suspended Solids	mg/l	--	--	1880	--	--	--	--	1320
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.69	0.62	0.64	0.75	0.6	0.84
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	69	65	55.8	49.4	59.4	61.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.53	0.44	1.69	0.2	0.93	1.53
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	78.3	73.4	72.1	57.6	74	69.5
Manganese, dissolved	mg/l	--	0.05	1.56	1.68	1.85	1.8	1.93	1.58
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	14.6	15.6	13.4	16.2	17.4	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	608	613	893	762	765	876
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.14	0.01	0.01	0.11
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-5 18-Jun-1997	94-5 06-Nov-1997	94-5 05-Jun-1998	94-5 30-Oct-1998	94-5 06-May-1999	94-5 19-Oct-1999
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 05-May-2000	94-5 24-Oct-2000	94-5 14-Jun-2001	94-5 23-Nov-2001	94-5 23-May-2002	94-5 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1220	1140	826	991	888	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	39	1	38	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1000	935	741	812	791	936
Ammonia Nitrogen	mg/l	--	--	0.01	0.27	0.98	0.84	0.91	0.26
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	40	--	28	37	15	34
Chloride	mg/l	--	250	845	1010	910	898	925	855
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4025	4250	3750	3560	770	4000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	463	475	458	465	455	435
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.8	0.3	0.2	0.1	0.9
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	1.02	2	1.94	1.68	1.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	0.75	1.02	1.1	0.77	0.91
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.67	7.5	7.22	6.74	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.68	1.37	1.31	0.85	0.64
Sulphate	mg/l	--	500 [6]	2	1	2	3	3	5
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	4910	2260	2160	2260	2000	2300
Total Organic Carbon	mg/l	--	--	12.1	--	10.3	16	12	11.4
Total Suspended Solids	mg/l	--	--	--	556	1120	1130	792	454
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.78	0.66	0.64	0.8	0.61	0.7
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	60.1	56.4	65.8	59.6	61.5	64.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	4.96	0.22	0.85	0.11	0.87	0.33
Lead, dissolved	mg/l	0.01	--	0.0002	0.022	0.0032	0.0002	0.0002	0.006
Magnesium, dissolved	mg/l	--	--	75.1	81.1	71.3	76.9	73.1	71.1
Manganese, dissolved	mg/l	--	0.05	1.62	1.88	2.03	1.95	2.17	1.7
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	11.1	13.7	5.2	7.3	13.8	13.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	770	763	714	811	657	731
Zinc, dissolved	mg/l	--	5	0.21	0.01	0.01	0.01	0.02	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.001	0.113	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-5 05-May-2000	94-5 24-Oct-2000	94-5 14-Jun-2001	94-5 23-Nov-2001	94-5 23-May-2002	94-5 06-Nov-2002
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 30-May-2003	94-5 09-Oct-2003	94-5 14-May-2004	94-5 19-Nov-2004	94-5 24-May-2005	94-5 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	915	--	939	1070	1040	220
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	750	845	770	875	850	900
Ammonia Nitrogen	mg/l	--	--	0.92	1.01	0.85	0.32	0.92	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	5	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	25	25	38	34	25	25
Chloride	mg/l	--	250	840	798	950	943	853	886
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3280	3980	3950	4370	4200	3000
Dissolved Inorganic Carbon	mg/l	--	--	--	189	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	419	395	444	415	437	417
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.4	0.4	1	0.2	0.7
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.16	2.09	2.31	1.22	1.97	0.97
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.24	1.08	1.46	0.9	1.05	0.93
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7.4	7.6	7.6	7.2	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.18	1.21	1.4	0.54	0.78	1.86
Sulphate	mg/l	--	500 [6]	3	3	4	10	5	4
Temperature (Field)	deg c	--	15	--	--	--	--	8.4	--
Total Dissolved Solids	mg/l	--	500	1640	2118	1975	2185	2170	2340
Total Organic Carbon	mg/l	--	--	11.1	24	9.2	10	9.2	11.2
Total Suspended Solids	mg/l	--	--	708	580	648	1450	852	436
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003	0.001	0.001	0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.5	0.617	0.548	0.651	0.534	0.671
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	57.6	53.4	59.4	56.9	57.5	58.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.002	0.001	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.002	0.002	0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	3.09	0.541	0.898	0.676	0.226	0.149
Lead, dissolved	mg/l	0.01	--	0.0015	0.001	0.0015	0.0017	0.0017	0.0004
Magnesium, dissolved	mg/l	--	--	66.9	63.7	71.8	66.5	71.3	66.1
Manganese, dissolved	mg/l	--	0.05	1.99	1.53	2.07	1.86	2.04	1.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	12.3	13.3	13.4	14.7	14.1	15.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001
Sodium, dissolved	mg/l	--	200 [7]	626	677	686	712	672	779
Zinc, dissolved	mg/l	--	5	0.02	0.005	0.005	0.005	0.008	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-5 30-May-2003	94-5 09-Oct-2003	94-5 14-May-2004	94-5 19-Nov-2004	94-5 24-May-2005	94-5 16-Nov-2005
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	<0.0007	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 25-May-2006	94-5 21-Nov-2006	94-5 15-May-2007	94-5 30-Nov-2007	94-5 22-May-2008	94-5 10-Nov-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	860	892	880	895	820	860
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	860	892	880	895	820	860
Ammonia Nitrogen	mg/l	--	--	0.98	0.54	0.94	0.6	0.57	0.78
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	25	49	89	75	7	33
Chloride	mg/l	--	250	942	906	928	939	866	879
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3300	3450	2600	2000	3950	3500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	425	396	404	408	407	379
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.3	0.1	0.4	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.89	2.2	2	1.72	2.1	1.64
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.91	1.66	1.06	1.12	1.53	0.86
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7.2	8.1	8.1	7.6	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	5	4	5	4	5	4
Temperature (Field)	deg c	--	15	4.5	7.5	7.3	5	12	7
Total Dissolved Solids	mg/l	--	500	2370	2290	2240	2490	2220	2190
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0035	0.0056	0.0038	0.0052	0.0033
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.586	0.629	0.487	0.619	0.543	0.584
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00004	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	56.7	52.6	54.7	57	55.1	51
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.007	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	1.93	0.759	1.35	0.076	1.65	0.022
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0001	0.00004	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	69	64.4	65.1	64.5	65.6	61.1
Manganese, dissolved	mg/l	--	0.05	1.56	1.41	1.88	1.66	1.63	1.42
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	14.6	13	16.8	13.7	13.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	775	709	646	870	718	664
Zinc, dissolved	mg/l	--	5	<0.005	0.008	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-5 25-May-2006	94-5 21-Nov-2006	94-5 15-May-2007	94-5 30-Nov-2007	94-5 22-May-2008	94-5 10-Nov-2008
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	<0.0006
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-5 19-May-2009 G-13	94-5 26-Nov-2009 J-5	94-5 20-Oct-2010[29] G-24	94-5 24-May-2011[29] G-38	94-5 29-Nov-2011[29] 94-5	94-5 31-May-2012[30] 94-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	832	869	863	853	852	810
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2[9]	<2[9]	<2[9]	20	<2[9]	7.6
Alkalinity (Total as CaCO3)	mg/l	--	--	832	869	863	873	852	820
Ammonia Nitrogen	mg/l	--	--	0.82	0.66	0.76	0.90	0.61	0.97
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	55	50	60	45	35
Chloride	mg/l	--	250	822	868	872	798	823	750
Conductivity	uS/cm	--	--	4010	4170	4120	4080	4050	--
Conductivity (Field)	uS/cm	--	--	3400	3511	3808	2603	3657	3337
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	385	363	411	352	398	310
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.19	0.12	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	0.12
Nitrogen, Total Kjeldahl	mg/l	--	--	1.47	1.12	1.37	1.67	1.05	1.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	0.13
Nitrogen, Organic	mg/l	--	--	0.65	0.46	0.61	0.77	0.44	0.83
pH	-	--	--	7.94	8.17	8.04	8.40	7.95	8.00
pH (Field)	-	--	--	--	7.12	7.67	7.41	7.57	7.48
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	7.56	1.44	2.58	1.65	1.09	2.8
Sulphate	mg/l	--	500[6]	5	7	6	5	5	<1
Temperature (Field)	deg c	--	15	10	3.0	10.8	19.1	7.6	10.5
Total Dissolved Solids	mg/l	--	500	2610	2710	2680	2650	2630	2050
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.005	<0.01	<0.01	<0.01	0.0015
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.60	0.73	0.62	0.42	0.63	0.46
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	52	48	54	47	54	44
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	0.009	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0009	0.0011	0.0009	0.0010	0.0009	0.00080
Copper, dissolved	mg/l	--	1	0.002	0.002	0.001	0.003	0.002	0.0023
Iron, dissolved	mg/l	--	0.3	<0.03	0.34	0.75	0.43	0.17	0.7
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	0.0018
Magnesium, dissolved	mg/l	--	--	62	59	67	57	64	49
Manganese, dissolved	mg/l	--	0.05	1.74	1.60	1.67	1.53	1.87	1.6
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11	13	12	10	12	9.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	680	780	720	698	684	520
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	0.02	<0.01	0.0061
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-May-2009 G-13	94-5 26-Nov-2009 J-5	94-5 20-Oct-2010 [29] G-24	94-5 24-May-2011 [29] G-38	94-5 29-Nov-2011 [29] 94-5	94-5 31-May-2012 [30] 94-5
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-5 29-Nov-2012	94-5 29-May-2013[31]	94-5 26-Nov-2013	94-5 29-May-2014	94-5 19-Nov-2014	94-5 02-Jun-2015
				94-5	94-5	GW-16	94-5	94-5	94-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	830	820	870	810	840	756
Alkalinity, Carbonate as CaCO3	mg/l	--	--	11	7.3	9.2	10	7.9	8
Alkalinity (Total as CaCO3)	mg/l	--	--	840	830	880	820	850	765
Ammonia Nitrogen	mg/l	--	--	0.78	1.5	0.81	1.3	1.0	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	40	70	47	38	76	122
Chloride	mg/l	--	250	770	890	860	840	860	754
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3227	3096	3225	3227	3726	3707
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	390	430	410	370	410	305
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.14	0.68	0.22	<0.10	0.18	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.10	0.023	0.095	0.059	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.6	4.5	5.6	4.9	4.3	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.14	0.78	0.24	0.12	0.24	--
Nitrogen, Organic	mg/l	--	--	1.82	3	4.79	3.6	3.3	1.12
pH	-	--	--	8.16	7.98	8.05	8.13	8.00	--
pH (Field)	-	--	--	7.66	6.95	7.54	6.60	7.59	7.43
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.1	8.7	4.0	3.4	10	1.27
Sulphate	mg/l	--	500[6]	1	<1	<1	<1	<1	8
Temperature (Field)	deg c	--	15	6.2	9.8	6.3	9.5	7.8	7.7
Total Dissolved Solids	mg/l	--	500	2190	2370	2220	2100	2170	1910
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0028	<0.0010	<0.0010	0.0013	0.0014	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.67	0.6	0.64	0.52	0.72	0.223
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	51	60	54	49	58	40.9
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.01[33]	<0.001
Cobalt, dissolved	mg/l	--	--	0.00075	0.0011	0.0011	0.00085	0.0010	0.0006
Copper, dissolved	mg/l	--	1	0.0012	0.0020	0.0019	0.0023	0.0011	<0.0005
Iron, dissolved	mg/l	--	0.3	0.27	<0.1	<0.1	0.48	0.48	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	64	68	67	61	66	49.3
Manganese, dissolved	mg/l	--	0.05	2.1	2.2	1.5	1.7	1.9	1.78
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	12	13	10	13	6.72
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	720	650	660	580	740	507
Zinc, dissolved	mg/l	--	5	<0.0050	<0.0050	0.0065	<0.0050	<0.0050	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002[10]

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-5 29-Nov-2012	94-5 29-May-2013[31]	94-5 26-Nov-2013	94-5 29-May-2014	94-5 19-Nov-2014	94-5 02-Jun-2015
				94-5	94-5	GW-16	94-5	94-5	94-5
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 26-Nov-2015	94-5 26-May-2016	94-5 17-Nov-2016	94-5 24-May-2017	94-5 29-Nov-2017	94-5 24-May-2018
				94-5	94-5	94-5	94-5	94-5	94-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	871	878	912	905	902	929
Alkalinity, Carbonate as CaCO3	mg/l	--	--	9	7	7	7	10	9
Alkalinity (Total as CaCO3)	mg/l	--	--	880	885	918	912	912	938
Ammonia Nitrogen	mg/l	--	--	0.64	1.38	1.14	0.68	0.74	1.43
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	233	114	88	205	98	391
Chloride	mg/l	--	250	874	871	909	882	892	855
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3815	3748	3999	3702	3308	3860
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	381	324	377	459	368	334
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.2	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.25 [11]	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	2.1	2.8	2.3	1.6	4.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.06	0.72	1.66	1.62	0.86	3.37
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.58	7.39	7.89	7.48	7.08	7.44
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.56	1.32	4.88	3.83	3.42	6.74
Sulphate	mg/l	--	500 [6]	10	7	7	8	13	8
Temperature (Field)	deg c	--	15	8.5	9.8	9.7	11.7	7.5	9.5
Total Dissolved Solids	mg/l	--	500	2210	2260	2270	2180	2080	2250
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.004	0.003	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.627	0.457	0.775	0.396	0.601	0.455
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	37.6	45.2	51.6	55	51	50.8
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.012	0.008	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0008	0.0007	0.0007	0.0006	0.0009	0.0007
Copper, dissolved	mg/l	--	1	<0.0005	0.0007	0.0010	0.0024	0.0011	<0.0005
Iron, dissolved	mg/l	--	0.3	0.221	0.293	0.23	0.246	0.214	0.741
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	69.6	51.3	60.3	78.2	58.4	50.3
Manganese, dissolved	mg/l	--	0.05	1.62	1.67	2.17	1.78	2	1.82
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.2	10.4	10.7	8.18	11.7	8.73
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	731	498	699	807	675	507
Zinc, dissolved	mg/l	--	5	0.008	0.008	<0.005	0.006	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	0.004	<0.002 [10]	<0.002 [12]	<0.002 [10]	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 26-Nov-2015	94-5 26-May-2016	94-5 17-Nov-2016	94-5 24-May-2017	94-5 29-Nov-2017	94-5 24-May-2018
				94-5	94-5	94-5	94-5	94-5	94-5
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-5 22-Nov-2018	94-5 19-Jun-2019[32]	94-5 20-Nov-2019	94-5 21-May-2020	94-5 26-Nov-2020
				94-5	94-5	94-5	94-5	94-5
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	977	--	848	819	838
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	--	12	9	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	987	--	860	828	848
Ammonia Nitrogen	mg/l	--	--	0.71	--	0.94	0.97	0.68
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	89	--	159	104	91
Chloride	mg/l	--	250	886	--	995	1000	776
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3411	--	3810	2660	3270
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	497	--	471	--	416
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	426	--
Nitrate as N	mg/l	10.0	--	<0.1	--	0.8	<0.1	<0.5[12]
Nitrite as N	mg/l	1.0	--	<0.05	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.3	--	3.1	2.0	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.59	--	2.16	1.03	0.72
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.64	--	7.61	8.23	7.86
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.34	--	4.76	3.96	0.72
Sulphate	mg/l	--	500[6]	11	--	10	18	13
Temperature (Field)	deg c	--	15	6.3	--	7.7	7.7	6.6
Total Dissolved Solids	mg/l	--	500	1560	--	2220	2120	2080
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.12	--	0.387	0.432	0.463
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	65	--	63.8	57.1	55.3
Chromium, dissolved	mg/l	0.05	--	<0.001	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0013	--	0.0008	0.0009	0.0009
Copper, dissolved	mg/l	--	1	0.0040	--	0.0014	0.0031	0.0030
Iron, dissolved	mg/l	--	0.3	0.155	--	0.297	1.19	0.292
Lead, dissolved	mg/l	0.01	--	<0.0001	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	81.4	--	75.6	68.7	67.5
Manganese, dissolved	mg/l	--	0.05	1.52	--	1.81	1.94	2.04
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.1	--	19	11.9	11.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	795	--	745	665	665
Zinc, dissolved	mg/l	--	5	<0.005	--	<0.005	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	0.002	0.005	<0.002[12]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 22-Nov-2018	94-5 19-Jun-2019 [32]	94-5 20-Nov-2019	94-5 21-May-2020	94-5 26-Nov-2020
				94-5	94-5	94-5	94-5	94-5
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 15-Jun-1994	94-6 02-Nov-1994	94-6 28-Jun-1995	94-6 22-Nov-1995	94-6 12-Jun-1996	94-6 12-Oct-1996
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	322	529	610	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	276	268	434	500	412	420
Ammonia Nitrogen	mg/l	--	--	--	0.11	0.01	0.03	0.1	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	141	105	80	70	35	33
Chloride	mg/l	--	250	245	266	275	236	216	248
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1280	1710	1850	1840	1730	2030
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	9.02	6.31	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	180	290	254	234	248	191
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.6	0.1	2.7	0.1	0.1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	3.3	2.45	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	3.29	2.42	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.2	7.17	6.78	7.29	7.03	6.82
Phosphate	mg/l	--	--	--	--	--	0.8	--	--
Phosphorus	mg/l	--	--	4.39	0.196	1.68	--	--	--
Sulphate	mg/l	--	500[6]	87	105	88	81	76	91
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	660	860	930	910	870	1020
Total Organic Carbon	mg/l	--	--	15.8	15.9	13.7	13.9	15.8	13
Total Suspended Solids	mg/l	--	--	--	--	--	--	1780	1430
Metals									
Aluminum, dissolved	mg/l	--	--	--	0.056	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.1	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.042	--	--	--	--
Boron, dissolved	mg/l	5	--	0.15	0.169	0.14	0.02	0.158	0.18
Cadmium, dissolved	mg/l	0.005	--	--	0.01	0.0001	0.0001	--	--
Calcium, dissolved	mg/l	--	--	38.4	47.33	51.7	40.4	39.8	31.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0095	0.01	0.02	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.291	0.14	0.03	0.54	0.811	0.4
Lead, dissolved	mg/l	0.01	--	0.0006	0.1	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	20.4	16.666	30	32	35.5	26.7
Manganese, dissolved	mg/l	--	0.05	0.108	0.176	0.32	0.24	1.41	0.7
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.5	0.864	--	6	6.15	6.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	171	236.1	284	294	353	312
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.15	0.001	0.001	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 15-Jun-1994	94-6 02-Nov-1994	94-6 28-Jun-1995	94-6 22-Nov-1995	94-6 12-Jun-1996	94-6 12-Oct-1996
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 18-Jun-1997	94-6 06-Nov-1997	94-6 05-Jun-1998	94-6 29-Oct-1998	94-6 06-May-1999	94-6 19-Oct-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	454	506	366
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	430	534	336	372	415	300
Ammonia Nitrogen	mg/l	--	--	0.2	0.88	0.07	0.19	0.09	0.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	14	47	37	4	29	92
Chloride	mg/l	--	250	347	176	307	260	326	193
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1880	1870	1720	2080	1770	1240
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.05	5.05	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	309	142	160	161	215	204
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	1.1	--	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	1.58	1.29	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	1.39	1.2	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.02	7.41	--	6.7	6.7	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500[6]	74	2.1	95	80	71	93
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	930	1030	859	1030	890	620
Total Organic Carbon	mg/l	--	--	9	15.1	11.8	13.5	13.1	27.5
Total Suspended Solids	mg/l	--	--	953	--	--	--	--	416
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.22	0.14	0.21	0.24	0.15	0.27
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	52.7	25.8	26.7	32.6	37.8	42.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.47	0.66	0.52	0.31	1.72	1.82
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0006
Magnesium, dissolved	mg/l	--	--	42.5	18.6	22.3	19.4	29	23.7
Manganese, dissolved	mg/l	--	0.05	1.57	0.22	0.21	0.93	0.69	0.55
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5.5	2.9	6.4	5.1	1.7	4.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	315	260	337	287	312	220
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.23	0.01	0.01	0.16
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 18-Jun-1997	94-6 06-Nov-1997	94-6 05-Jun-1998	94-6 29-Oct-1998	94-6 06-May-1999	94-6 19-Oct-1999
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 05-May-2000	94-6 24-Oct-2000	94-6 14-Jun-2001	94-6 23-Nov-2001	94-6 23-May-2002	94-6 06-Nov-2002
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	536	617	453	373	462	340
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	39	1	17	1
Alkalinity (Total as CaCO3)	mg/l	--	--	439	506	435	306	407	279
Ammonia Nitrogen	mg/l	--	--	0.01	0.01	0.11	0.08	0.08	0.06
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	--	40	60	46	56
Chloride	mg/l	--	250	315	427	268	182	95.8	330
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1750	2520	1850	1290	1060	2140
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	304	433	308	224	205	233
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	1.16	1.61	1.62	1.47	1.33
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	1.15	1.5	1.54	1.39	1.27
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	6.85	6.8	6.91	6.87	7.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.63	0.94	0.59	0.68	0.45
Sulphate	mg/l	--	500 [6]	131	300	170	92	30	190
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	875	1490	1130	860	596	1110
Total Organic Carbon	mg/l	--	--	14	--	17.3	28	20	19.4
Total Suspended Solids	mg/l	--	--	1090	508	700	716	394	348
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.27	0.37	0.2	0.11	0.1	0.3
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	55.1	61.9	66.8	58.1	54.2	52.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.43	1.88	0.46	0.03	0.58	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0007	0.0013
Magnesium, dissolved	mg/l	--	--	40	67.5	34.2	19.1	16.9	24.9
Manganese, dissolved	mg/l	--	0.05	1.43	0.83	1.52	0.13	0.57	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	0.4	5.3	0.4	0.4	2.8	1.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	371	510	301	218	150	299
Zinc, dissolved	mg/l	--	5	0.24	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.077	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 05-May-2000	94-6 24-Oct-2000	94-6 14-Jun-2001	94-6 23-Nov-2001	94-6 23-May-2002	94-6 06-Nov-2002
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 30-May-2003	94-6 09-Oct-2003	94-6 14-May-2004	94-6 19-Nov-2004	94-6 24-May-2005	94-6 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	337	--	545	512	598	259
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	276	408	447	420	490	420
Ammonia Nitrogen	mg/l	--	--	0.06	0.3	0.14	0.22	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	7	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	58	92	64	54	71	49
Chloride	mg/l	--	250	205	357	167	179	149	238
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1440	2150	1560	1670	2200	620
Dissolved Inorganic Carbon	mg/l	--	--	--	109	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	206	259	258	302	287	186
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.2	1	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.79	2.37	1.83	1.64	1.62	1.49
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.73	2.07	1.69	1.42	<1.62	<1.49
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	7.1	7	6.8	7	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.39	1.93	0.81	0.68	0.65	0.67
Sulphate	mg/l	--	500[6]	127	146	109	150	75	77
Temperature (Field)	deg c	--	15	--	--	--	--	8	--
Total Dissolved Solids	mg/l	--	500	720	1221	780	835	863	820
Total Organic Carbon	mg/l	--	--	19.6	18	18.8	15	23.8	10.6
Total Suspended Solids	mg/l	--	--	442	3610	656	434	392	352
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.14	0.477	0.394	0.517	0.284	0.15
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	49.6	43.2	48	55.6	49.2	41.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.001	0.001	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.002	0.007	0.006	0.002	0.005
Iron, dissolved	mg/l	--	0.3	0.13	0.846	0.022	0.013	0.029	0.012
Lead, dissolved	mg/l	0.01	--	0.0002	0.0007	0.0008	0.0003	0.0006	0.0003
Magnesium, dissolved	mg/l	--	--	19.9	36.7	33.7	39.6	39.9	20.2
Manganese, dissolved	mg/l	--	0.05	0.02	1.41	0.117	0.081	0.62	0.071
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	2.3	6.2	3.1	2.9	3.8	14.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001
Sodium, dissolved	mg/l	--	200[7]	237	385	267	242	255	190
Zinc, dissolved	mg/l	--	5	0.01	0.005	0.006	0.005	0.01	0.009
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 30-May-2003	94-6 09-Oct-2003	94-6 14-May-2004	94-6 19-Nov-2004	94-6 24-May-2005	94-6 16-Nov-2005
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	<0.0007	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 25-May-2006	94-6 21-Nov-2006	94-6 15-May-2007	94-6 30-Nov-2007[20]	94-6 22-May-2008	94-6 10-Nov-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	340	492	452	--	309	430
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	--	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	340	492	452	--	309	430
Ammonia Nitrogen	mg/l	--	--	0.04	<0.01	<0.01	--	0.02	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	52	59	107	--	65	64
Chloride	mg/l	--	250	113	155	207	--	71.1	220
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	800	1150	950	--	625	1400
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	172	275	262	--	105	246
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	--	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.19	1.14	1.99	--	3.09	1.79
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.15	<1.14	<1.99	--	3.07	<1.79
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.7	7.6	--	7.4	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500[6]	62	53	83	--	26	120
Temperature (Field)	deg c	--	15	5	6	7.9	--	13	5
Total Dissolved Solids	mg/l	--	500	593	828	881	--	458	960
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0012	0.0014	--	0.0017	0.0016
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.107	0.25	0.22	--	0.138	0.378
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00004	--	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	39.4	57.4	50.3	--	25.2	44.6
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	--	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.013	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.004	0.004	<0.002	--	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.037	0.057	0.051	--	0.942	0.423
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0001	0.00006	--	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	17.8	31.9	33.1	--	10.3	32.8
Manganese, dissolved	mg/l	--	0.05	0.368	0.99	0.332	--	1.64	0.245
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.9	13.3	10.5	--	28.2	11.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	156	222	225	--	108	271
Zinc, dissolved	mg/l	--	5	0.009	0.021	<0.005	--	0.007	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	--	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 25-May-2006	94-6 21-Nov-2006	94-6 15-May-2007	94-6 30-Nov-2007[20]	94-6 22-May-2008	94-6 10-Nov-2008
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	<0.0006
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	0.0008	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 19-May-2009 G-17	94-6 26-Nov-2009 J-3	94-6 25-May-2010[29] M-22	94-6 20-Oct-2010[29] G-25	94-6 24-May-2011[29] G-37	94-6 29-Nov-2011[29] 94-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	453	501	432	538	490	475
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2[9]	<2[9]	<2[9]	<2[9]	<2[9]	<2[9]
Alkalinity (Total as CaCO3)	mg/l	--	--	453	501	432	538	490	475
Ammonia Nitrogen	mg/l	--	--	0.04	0.05	0.04	0.03	0.04	<0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	55	40	80	60	45
Chloride	mg/l	--	250	190	195	161	124	160	236
Conductivity	uS/cm	--	--	1590	1610	1470	1420	1500	1740
Conductivity (Field)	uS/cm	--	--	1200	1144	1400	1363	1319	1373
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	271	282	271	336	332	291
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.95	0.65	0.61	0.92	1.34	1.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.91	0.6	0.57	0.89	1.3	<1.17
pH	-	--	--	7.34	7.69	7.40	7.53	8.03	7.63
pH (Field)	-	--	--	--	4.87	6.61	7.67	6.46	6.62
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.00	0.55	0.58	0.97	0.59	0.25
Sulphate	mg/l	--	500[6]	77	56	56	35	42	89
Temperature (Field)	deg c	--	15	7	6.7	27.1	11.8	15.0	6.5
Total Dissolved Solids	mg/l	--	500	1030	1050	956	923	975	1130
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.01	<0.001	<0.01	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.35	0.20	0.27	0.23	0.27	0.40
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	54	62	49	77	57	54
Chromium, dissolved	mg/l	0.05	--	0.006	0.004	0.006	0.008	0.009	0.006
Cobalt, dissolved	mg/l	--	--	0.0022	0.0010	0.0023	0.0005	0.0027	0.0009
Copper, dissolved	mg/l	--	1	0.003	0.003	0.002	0.003	0.004	0.002
Iron, dissolved	mg/l	--	0.3	<0.03	0.06	0.62	0.03	1.12	0.90
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	33	31	36	35	46	38
Manganese, dissolved	mg/l	--	0.05	1.17	0.75	1.73	0.09	1.88	2.25
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	15	9	14	7	6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	234	208	198	166	224	244
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	0.01	0.02	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 19-May-2009 G-17	94-6 26-Nov-2009 J-3	94-6 25-May-2010 [29] M-22	94-6 20-Oct-2010 [29] G-25	94-6 24-May-2011 [29] G-37	94-6 29-Nov-2011 [29] 94-6
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	0.0005	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 31-May-2012	94-6 29-Nov-2012 [30]	94-6 29-May-2013 [34]	94-6 26-Nov-2013	94-6 29-May-2014	94-6 19-Nov-2014 [35]
				94-6	94-6	94-6	GW-11	94-6	94-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	370	360	380	360	310	420
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<1.0	<1.0	1.3	<1.0	<1.0	<1.0
Alkalinity (Total as CaCO3)	mg/l	--	--	370	360	380	360	310	420
Ammonia Nitrogen	mg/l	--	--	<0.050	0.14	0.25	<0.050	0.099	0.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	76	58	140	39	50	70
Chloride	mg/l	--	250	150	160	270	200	140	260
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1246	1258	1149	1303	960	1311
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	280	340	310	330	270	320
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	2.6	5.7	2.4	4.7	<2.0 [22]
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	<1.7	2.46	5.45	<2.4	4.6	<1.88
pH	-	--	--	7.42	7.44	7.56	7.31	7.36	7.33
pH (Field)	-	--	--	6.86	6.91	7.49	7.32	6.77	6.74
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.80	0.96	9.1	0.59	0.55	2.0
Sulphate	mg/l	--	500 [6]	120	130	130	150	55	62
Temperature (Field)	deg c	--	15	11.8	4.1	11.6	5.5	12.1	5.6
Total Dissolved Solids	mg/l	--	500	896	936	934	902	624	1060
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.29	0.35	0.27	0.31	0.15	0.32
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	47	59	52	56	53	58
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.00052	0.00073	0.0012	0.00063	0.00050	0.0014
Copper, dissolved	mg/l	--	1	0.0025	0.0020	0.0020	0.0015	0.0041	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	1	0.13	<0.1	<0.1	1.3
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	40	46	43	46	34	43
Manganese, dissolved	mg/l	--	0.05	0.64	2.3	0.67	1.2	0.61	2.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.7	7.1	4.1	5.7	4.4	6.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	240	330	180	290	160	330
Zinc, dissolved	mg/l	--	5	<0.0050	0.0055	<0.0050	0.011	0.0065	0.0054
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	0.0072	<0.0010	<0.0010	0.0011

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 31-May-2012	94-6 29-Nov-2012 [30]	94-6 29-May-2013 [34]	94-6 26-Nov-2013	94-6 29-May-2014	94-6 19-Nov-2014 [35]
				94-6	94-6	94-6	GW-11	94-6	94-6
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0025	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.0010	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.0010	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 02-Jun-2015	94-6 26-Nov-2015	94-6 26-May-2016	94-6 17-Nov-2016	94-6 24-May-2017	94-6 29-Nov-2017
				94-6	94-6	94-6	94-6	94-6	94-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	483	521	578	547	436	513
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	484	522	579	548	424	514
Ammonia Nitrogen	mg/l	--	--	0.52	0.58	0.37	0.27	0.38	0.15
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	73	156	101	63	58	91
Chloride	mg/l	--	250	332	372	459	428	306	396
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1405	1598	1517	1736	1574	1555
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	218	276	317	261	364	255
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.3	5.3	1.3	0.9	2.3	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.78	4.72	0.93	0.63	1.92	0.95
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.70	6.91	7.19	7.74	7.03	7.39
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.35	6.20	0.56	0.35	0.38	0.46
Sulphate	mg/l	--	500 [6]	64	81	70	81	102	101
Temperature (Field)	deg c	--	15	10.0	7.2	12.6	9.2	11.6	5.7
Total Dissolved Solids	mg/l	--	500	1050	1210	1380	1280	1050	1160
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.001	0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.142	0.202	0.154	0.332	0.185	0.201
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	39.2	47.8	65.7	51.9	70.2	53.2
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.006	0.005	<0.001
Cobalt, dissolved	mg/l	--	--	0.0015	0.0009	0.0027	<0.0005	0.0007	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0018	0.0037	0.0040	0.0019
Iron, dissolved	mg/l	--	0.3	0.214	0.131	0.168	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	29.1	38	37.3	31.9	45.7	29.6
Manganese, dissolved	mg/l	--	0.05	1.28	1.29	1.7	0.148	1.4	0.18
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.46	3.72	4.51	3.83	4.03	4.02
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	147	212	160	182	292	166
Zinc, dissolved	mg/l	--	5	0.006	0.012	0.008	0.006	0.006	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.004 [10]	0.003	<0.001	<0.002 [10]	<0.002 [10]

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 02-Jun-2015	94-6 26-Nov-2015	94-6 26-May-2016	94-6 17-Nov-2016	94-6 24-May-2017	94-6 29-Nov-2017
				94-6	94-6	94-6	94-6	94-6	94-6
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	94-6 24-May-2018	94-6 29-Nov-2018	94-6 19-Jun-2019	94-6 20-Nov-2019	94-6 21-May-2020	94-6 26-Nov-2020
				94-6	94-6	94-6	94-6	94-6	94-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	551	448	461	516	338	364
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	552	449	463	518	339	364
Ammonia Nitrogen	mg/l	--	--	0.43	0.04	0.32	0.19	0.06	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	100	62	86	80	52	58
Chloride	mg/l	--	250	382	240	263	460	292	276
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1737	1451	1427	1531	1616	1372
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	323	394	411	390	--	256
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	331	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.3	1.2	1.8	1.1	0.9	0.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.87	1.16	1.48	0.91	0.84	0.54
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.72	7.58	7.22	6.91	7.62	6.93
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.43	0.77	0.66	0.88	0.39	0.24
Sulphate	mg/l	--	500[6]	87	150	149	112	271	231
Temperature (Field)	deg c	--	15	11.7	4.3	15.2	6.3	8.9	5.5
Total Dissolved Solids	mg/l	--	500	1260	948	1070	1400	1010	1070
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.241	0.42	0.147	0.262	0.201	0.174
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	67	78.4	96.6	66.3	64.8	51.3
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0021	0.0010	0.0008	0.0007	0.0011	<0.0005
Copper, dissolved	mg/l	--	1	0.0010	0.0018	0.0052	0.0076	0.0047	0.0035
Iron, dissolved	mg/l	--	0.3	<0.1	0.918	<0.1	0.64	1.01	0.117
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0015	0.0001
Magnesium, dissolved	mg/l	--	--	37.7	48.1	41.2	54.4	41	31
Manganese, dissolved	mg/l	--	0.05	2.19	0.899	1.11	1.45	1.08	0.368
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.29	7.01	7.68	9.81	4.6	3.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	202	316	218	411	212	151
Zinc, dissolved	mg/l	--	5	0.007	<0.005	0.007	0.006	0.008	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.003	<0.001	<0.001	0.006	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 24-May-2018	94-6 29-Nov-2018	94-6 19-Jun-2019	94-6 20-Nov-2019	94-6 21-May-2020	94-6 26-Nov-2020
				94-6	94-6	94-6	94-6	94-6	94-6
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-1 28-Jun-1995	95-1 23-Nov-1995	95-1 12-Oct-1996	95-1 06-Nov-1997	95-1 05-Jun-1998	95-1 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1076	1260	--	--	--	1570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	116	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	882	1220	1280	1060	1050	1290
Ammonia Nitrogen	mg/l	--	--	1.27	7.5	9.15	4.42	6.05	2.83
Chemical Oxygen Demand	mg/l	--	--	700	250	115	56	392	1740
Chloride	mg/l	--	250	615	853	836	784	998	925
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3660	4460	4000	4380	4250	4320
Dissolved Oxygen (Field)	mg/l	--	--	2.66	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	175	194	165	185	170	178
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.4	0.1	3.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	19.5	28.8	--	--	--	24.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	18.23	21.3	--	--	--	21.77
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.4	8.77	7.96	8.84	--	8.1
Phosphate	mg/l	--	--	--	54.2	--	--	--	--
Phosphorus	mg/l	--	--	2.86	--	--	--	--	--
Sulphate	mg/l	--	500[6]	10	19	6	1	162	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1830	2250	2000	2200	2110	2170
Total Organic Carbon	mg/l	--	--	31.8	24.5	20.1	23.9	28	26.5
Total Suspended Solids	mg/l	--	--	--	--	106	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.07	1.22	1.19	1.34	1.59	1.52
Cadmium, dissolved	mg/l	0.005	--	0.0009	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.4	24.3	20.2	22.8	20.5	22.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.04	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	4.05	4.96	5.67	3.58	1.39
Lead, dissolved	mg/l	0.01	--	0.0008	0.0013	0.0002	0.0003	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	26.2	31.8	27.4	30.8	28.5	28.8
Manganese, dissolved	mg/l	--	0.05	0.17	0.18	0.18	0.21	0.15	0.11
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	23.9	21.4	26.1	29.3	29.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	639	871	977	896	1200	1080
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.09	0.04
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 24-Oct-2000	95-1 14-Jun-2001	95-1 06-Nov-2002	95-1 30-May-2003	95-1 19-Nov-2004	95-1 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1690	1300	1780	1500	1560	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	102	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1390	1240	1460	1230	1280	1140
Ammonia Nitrogen	mg/l	--	--	1.33	3.15	2.4	2.53	2.33	2.14
Chemical Oxygen Demand	mg/l	--	--	--	56	72	71	81	65
Chloride	mg/l	--	250	890	880	820	879	864	731
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4660	4200	4430	4110	4540	3100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	182	170	211	157	158	170
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	0.1	0.2	1	1	0.7
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.49	3.75	4.17	4.3	3.7	3.88
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.16	0.6	1.77	1.77	1.37	1.74
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.26	8.3	8.1	7.2	8.1	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.81	2.29	0.79	2.43	2.78	1.96
Sulphate	mg/l	--	500 [6]	4.5	1	2	1	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2600	2520	2720	2055	2270	2540
Total Organic Carbon	mg/l	--	--	--	19.8	19.6	19.1	16.2	21.8
Total Suspended Solids	mg/l	--	--	1210	127	184	168	380	35
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	0.003	0.001	0.001
Boron, dissolved	mg/l	5	--	1.5	1.59	1.51	1.42	1.47	1.5
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0002
Calcium, dissolved	mg/l	--	--	20.3	23.2	23.8	20.4	20.6	22.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.33	0.23	0.27	2	0.186	0.251
Lead, dissolved	mg/l	0.01	--	0.022	0.0002	0.0063	0.0004	0.0028	0.0007
Magnesium, dissolved	mg/l	--	--	31.9	27.2	28.5	25.7	26	27.9
Manganese, dissolved	mg/l	--	0.05	0.09	0.08	0.08	0.1	0.066	0.072
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	17.2	16.2	23	24.2	24.2	27.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	0.001
Sodium, dissolved	mg/l	--	200 [7]	1030	997	978	876	1130	1070
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.009
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.024	0.001	0.001	0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 15-May-2007	95-1 10-Nov-2008	95-1 26-Nov-2009 [36] M-10	95-1 24-May-2011 [29] G-13	95-1 28-Nov-2012 95-1	95-1 29-May-2014 [35] 95-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1370	1200	1260	1150	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	27	42	19	38
Alkalinity (Total as CaCO3)	mg/l	--	--	1370	1200	1290	1190	1300	1200
Ammonia Nitrogen	mg/l	--	--	2.15	1.07	2.35	1.35	2.7	2.6
Chemical Oxygen Demand	mg/l	--	--	108	47	70	43	73	67
Chloride	mg/l	--	250	782	650	827	626	810	770
Conductivity	uS/cm	--	--	--	--	4690	3970	--	--
Conductivity (Field)	uS/cm	--	--	2500	3300	3930	2624	3795	3830
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	161	205	142	227	160	130
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	0.047
Nitrogen, Total Kjeldahl	mg/l	--	--	4	2.25	3.40	2.42	3.5	4.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	1.85	1.18	1.05	1.07	0.8	1.6
pH	-	--	--	--	--	8.35	8.59	--	8.53
pH (Field)	-	--	--	8.5	8	7.8	8.10	8.29	8.03
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.13	0.85	2.7	2.0
Sulphate	mg/l	--	500 [6]	1	1	4	1	<1	1
Temperature (Field)	deg c	--	15	8.4	6	8.9	13.3	6.5	9.3
Total Dissolved Solids	mg/l	--	500	2660	2200	3050	2580	2690	2650
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0074	0.0033	0.008	<0.01	0.002	0.0024
Boron, dissolved	mg/l	5	--	1.41	1.03	1.6	0.92	1.6	1.2
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	21.4	25.3	19	30	20	16
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.01	<0.005	0.0004	0.0005	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.001	0.003	0.001	0.0028
Iron, dissolved	mg/l	--	0.3	0.361	0.014	0.15	0.28	0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00017	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	26.3	34.4	23	37	26	20
Manganese, dissolved	mg/l	--	0.05	0.079	0.004	0.06	0.06	0.047	0.035
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	27.1	17.5	23	14	22	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	979	754	1140	873	1000	720
Zinc, dissolved	mg/l	--	5	0.006	<0.005	<0.01	0.02	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs									
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 26-Nov-2015	95-1 24-May-2017	95-1 22-Nov-2018	95-1 21-May-2020
				95-1	95-1	95-1	95-1
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1210	1270	1150	1270
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [27]	<25 [11]	<25 [11]	27
Alkalinity (Total as CaCO3)	mg/l	--	--	1230	1280	1170	1300
Ammonia Nitrogen	mg/l	--	--	3.78	3.13	3.58	2.46
Chemical Oxygen Demand	mg/l	--	--	284	97	306	94
Chloride	mg/l	--	250	863	873	760	1050
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	3179	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	139	163	215	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	195
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [11]	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	9.9	4.5	7.7	3.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	6.12	1.37	4.12	0.84
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.25	8.21	8.58	7.96
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	12.3	4.02	9.90	1.94
Sulphate	mg/l	--	500 [6]	1	<1	1	<1
Temperature (Field)	deg c	--	15	6.7	11.6	4.8	15.0
Total Dissolved Solids	mg/l	--	500	2880	2700	2440	2790
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.002	0.005	0.002	0.002
Boron, dissolved	mg/l	5	--	1.55	0.994	1.53	1.58
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	18.5	15.4	33.1	24.6
Chromium, dissolved	mg/l	0.05	--	<0.001	0.014	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0006	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0008	0.0011	0.0014
Iron, dissolved	mg/l	--	0.3	0.138	<0.1	0.2	0.223
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	22.6	30.2	32	32.4
Manganese, dissolved	mg/l	--	0.05	0.053	0.028	0.066	0.063
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	20	15.7	27	24.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1050	1010	1010	963
Zinc, dissolved	mg/l	--	5	0.01	<0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.004 [10]	<0.001	0.004
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Jun-1995	95-2 23-Nov-1995	95-2 12-Jun-1996	95-2 12-Oct-1996	95-2 18-Jun-1997	95-2 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1139	1400	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	15	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	934	1180	1240	1200	1280	1190
Ammonia Nitrogen	mg/l	--	--	0.88	0.63	1.18	1.49	0.01	0.77
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	50	18	30	19	62
Chloride	mg/l	--	250	528	628	636	656	629	632
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3480	4170	4000	4180	3850	3900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.2	--	--	--	2.36	--
Hardness, Calcium Carbonate	mg/l	--	--	214	244	247	231	264	265
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	1.7	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.3	4	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.42	3.37	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	8.48	8.08	7.8	8.22	8.5
Phosphate	mg/l	--	--	--	1	--	--	--	--
Phosphorus	mg/l	--	--	4.39	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	26	8	4	6	3	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1750	2090	1940	2100	1930	1960
Total Organic Carbon	mg/l	--	--	12.1	14.8	15.5	14.5	16.5	16.7
Total Suspended Solids	mg/l	--	--	--	--	1480	780	1910	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.79	0.92	0.965	1.01	1.27	1.07
Cadmium, dissolved	mg/l	0.005	--	0.0009	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	32.4	30.2	30.1	29	34.4	34.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.09	0.2	0.545	0.62	0.62	0.41
Lead, dissolved	mg/l	0.01	--	0.0012	0.0002	0.0005	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	32	40.5	41.3	38	42.8	43.1
Manganese, dissolved	mg/l	--	0.05	0.13	0.09	0.138	0.14	0.16	0.11
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	19.4	23	19.3	18.5	19.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	608	754	777	867	662	789
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-2 28-Jun-1995	95-2 23-Nov-1995	95-2 12-Jun-1996	95-2 12-Oct-1996	95-2 18-Jun-1997	95-2 06-Nov-1997
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 05-Jun-1998	95-2 29-Oct-1998	95-2 06-May-1999	95-2 19-Oct-1999	95-2 05-May-2000	95-2 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1340	1430	1160	1577	1550
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	91	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1080	1100	1170	1100	1293	1273
Ammonia Nitrogen	mg/l	--	--	0.68	0.8	0.12	1.21	0.07	0.2
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	36	38	37	47	--
Chloride	mg/l	--	250	615	660	690	695	645	703
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3720	3980	3720	3860	3750	3970
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	239	195	250	239	227	255
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	2.1	--	--	0.1	0.2	0.9
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	2.14	2.67	--	--	1.32
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	1.34	2.55	--	--	1.12
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.7	7.9	8.1	7.9	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.85
Sulphate	mg/l	--	500 [6]	10	3	1	6	3	4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1840	2000	1870	1130	1875	2230
Total Organic Carbon	mg/l	--	--	16.6	17.1	19.4	16.8	16.6	--
Total Suspended Solids	mg/l	--	--	--	--	--	492	180	90
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Boron, dissolved	mg/l	5	--	1.17	1.25	1.18	1.29	1.19	1.15
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	28.6	24.3	32.2	32.6	30	28.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.96	0.45	0.45	1.1	2.3	0.17
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0005	0.0002	**0.022**
Magnesium, dissolved	mg/l	--	--	40.2	32.6	40.7	37.9	36.5	44.6
Manganese, dissolved	mg/l	--	0.05	0.12	0.12	0.11	0.11	0.13	0.11
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	18.7	20.8	13.6	18	11.2	19.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1000	842	902	926	798	831
Zinc, dissolved	mg/l	--	5	0.06	0.01	0.01	0.1	0.06	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-2 05-Jun-1998	95-2 29-Oct-1998	95-2 06-May-1999	95-2 19-Oct-1999	95-2 05-May-2000	95-2 24-Oct-2000
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-2 14-Jun-2001	95-2 23-Nov-2001	95-2 23-May-2002	95-2 06-Nov-2002	95-2 30-May-2003	95-2 09-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1230	1420	1240	1600	1400	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	67	1	110	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1120	1160	1200	1310	1150	1160
Ammonia Nitrogen	mg/l	--	--	1.23	0.88	1.2	1.33	1.34	1.45
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	5
Chemical Oxygen Demand	mg/l	--	--	37	31	43	55	50	52
Chloride	mg/l	--	250	671	682	675	646	657	639
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3600	3620	3100	3690	2630	3550
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	280
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	232	254	242	233	215	214
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	0.4	0.1	0.3	0.3	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.3	2.51	2.23	2.47	2.67	2.48
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.07	1.63	1.03	1.14	1.33	1.03
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.1	7.55	7.41	8	7.1	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.95	0.94	0.89	0.82	1.18	0.89
Sulphate	mg/l	--	500[6]	3	3	2	2	2	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2060	2200	2170	2160	1315	2203
Total Organic Carbon	mg/l	--	--	14.9	18	18	16.1	1.2	20
Total Suspended Solids	mg/l	--	--	51	43	51	36	164	46
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.002	0.002	0.001	0.002
Boron, dissolved	mg/l	5	--	1.11	1.38	1.18	1.18	1.03	1.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	32.6	30.8	32.3	28.9	28.7	27.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002
Iron, dissolved	mg/l	--	0.3	0.08	0.11	0.31	0.31	0.49	0.552
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0035	0.0005	0.0012
Magnesium, dissolved	mg/l	--	--	36.5	43.1	39.2	39.1	34.7	35.5
Manganese, dissolved	mg/l	--	0.05	0.09	0.1	0.12	0.1	0.09	0.076
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	9.1	12.3	18.4	17.2	16.9	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	782	898	802	809	719	785
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.054	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-2 14-Jun-2001	95-2 23-Nov-2001	95-2 23-May-2002	95-2 06-Nov-2002	95-2 30-May-2003	95-2 09-Oct-2003
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 14-May-2004	95-2 19-Nov-2004	95-2 24-May-2005	95-2 16-Nov-2005	95-2 25-May-2006	95-2 21-Nov-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1379	1410	1450	281	1220	1260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1130	1160	1190	1150	1220	1260
Ammonia Nitrogen	mg/l	--	--	1.23	1.04	1.38	1.22	1.18	1.24
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	56	75	51	68	50	51
Chloride	mg/l	--	250	687	658	619	587	689	673
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3503	3730	3800	3640	3300	3500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	220	216	228	230	213	215
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	2	0.3	1.4	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.69	2.57	2.9	2.6	2.34	2.42
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.46	1.53	1.52	1.38	1.16	1.18
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.2	8	7.4	--	8	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.92	2.07	1.34	1.26	--	--
Sulphate	mg/l	--	500 [6]	3	10	2	3	1	1
Temperature (Field)	deg c	--	15	--	--	10	--	4.5	6.5
Total Dissolved Solids	mg/l	--	500	1750	1865	2200	2220	2290	2310
Total Organic Carbon	mg/l	--	--	14.1	12.9	15.3	15.8	--	--
Total Suspended Solids	mg/l	--	--	42	40	431	7	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	0.001	<0.001	0.0035
Boron, dissolved	mg/l	5	--	1.06	1.11	1.1	1.14	0.984	1.07
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.005	<0.0001
Calcium, dissolved	mg/l	--	--	29	28.9	28.9	30.3	27.9	26.6
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.002	0.003	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.3	0.391	0.633	0.138	0.253	0.304
Lead, dissolved	mg/l	0.01	--	0.0013	0.0005	0.0015	0.0011	0.0006	<0.0001
Magnesium, dissolved	mg/l	--	--	36	35.1	38	37.4	35	36.1
Manganese, dissolved	mg/l	--	0.05	0.097	0.099	0.089	0.099	0.092	0.057
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	17.9	18.7	19.9	20.1	17.4	18.3
Selenium, dissolved	mg/l	0.05	--	--	--	0.001	0.001	--	--
Sodium, dissolved	mg/l	--	200 [7]	761	770	791	860	801	794
Zinc, dissolved	mg/l	--	5	0.005	0.005	<0.005	0.01	0.006	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-2 14-May-2004	95-2 19-Nov-2004	95-2 24-May-2005	95-2 16-Nov-2005	95-2 25-May-2006	95-2 21-Nov-2006
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 15-May-2007	95-2 30-Nov-2007	95-2 22-May-2008	95-2 10-Nov-2008	95-2 19-May-2009 G-22	95-2 26-Nov-2009 M-13
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1290	1230	1180	1220	1130	1190
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [9]	29
Alkalinity (Total as CaCO3)	mg/l	--	--	1290	1230	1180	1215	1130	1220
Ammonia Nitrogen	mg/l	--	--	1.25	1.12	1.05	2.12	1.25	0.61
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	54	80	52	67	73	45
Chloride	mg/l	--	250	601	679	678	812	598	652
Conductivity	uS/cm	--	--	--	--	--	--	3800	4080
Conductivity (Field)	uS/cm	--	--	2000	3000	3350	4100	3300	3370
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	197	220	214	143	201	176
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	0.3	0.19	0.30
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	0.14
Nitrogen, Total Kjeldahl	mg/l	--	--	2.53	2.27	2.52	3.77	2.26	1.47
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.28	1.15	1.47	1.65	1.01	0.86
pH	-	--	--	--	--	--	--	8.25	8.41
pH (Field)	-	--	--	8.5	8.3	8.1	8.1	--	7.47
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.89	0.81
Sulphate	mg/l	--	500 [6]	1	1	<1	<1	3	4
Temperature (Field)	deg c	--	15	6.7	7	12	6	8	8.6
Total Dissolved Solids	mg/l	--	500	2160	2460	2290	2480	2470	2650
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0047	0.0043	0.0039	0.0047	0.004	0.005
Boron, dissolved	mg/l	5	--	0.962	1.07	1.03	1.18	1.33	1.1
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	26.6	29.9	28.4	18.9	26	21
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0003	0.0004
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.223	0.061	0.317	0.706	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	0.00009	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	31.8	35.4	34.8	23.3	33	30
Manganese, dissolved	mg/l	--	0.05	0.088	0.101	0.087	0.044	0.06	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.3	20.2	17.8	29.1	15	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	707	963	817	861	791	801
Zinc, dissolved	mg/l	--	5	0.006	<0.005	<0.005	<0.005	<0.01	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 15-May-2007	95-2 30-Nov-2007	95-2 22-May-2008	95-2 10-Nov-2008	95-2 19-May-2009 G-22	95-2 26-Nov-2009 M-13
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	<0.0006	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 25-May-2010 M-17	95-2 20-Oct-2010 [29] G-16	95-2 24-May-2011 [29] G-20	95-2 29-Nov-2011 [29] 95-2	95-2 31-May-2012 95-2	95-2 28-Nov-2012 95-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1040	1170	1260	1150	1100	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	22	<2 [9]	50	<2 [9]	24	18
Alkalinity (Total as CaCO3)	mg/l	--	--	1060	1170	1309	1150	1100	1200
Ammonia Nitrogen	mg/l	--	--	1.40	1.14	2.18	1.27	1.4	1.3
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	48	50	50	50	50	54
Chloride	mg/l	--	250	529	607	797	602	550	600
Conductivity	uS/cm	--	--	3660	3890	4840	3800	--	--
Conductivity (Field)	uS/cm	--	--	3920	3857	1476	3506	3330	3229
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	218	234	166	214	180	230
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	0.22	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.41	0.043
Nitrogen, Total Kjeldahl	mg/l	--	--	1.91	2.35	3.32	1.59	2.3	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	0.63	<0.10
Nitrogen, Organic	mg/l	--	--	0.51	1.21	1.14	0.32	0.9	1.1
pH	-	--	--	8.36	8.28	8.63	8.25	8.36	--
pH (Field)	-	--	--	8.05	8.18	8.06	8.11	8.07	8.15
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.99	0.88	2.17	0.84	0.72	0.79
Sulphate	mg/l	--	500 [6]	5	1	<1	2	<1	<10 [37]
Temperature (Field)	deg c	--	15	19.7	11.5	20.0	7.7	9.9	6.5
Total Dissolved Solids	mg/l	--	500	2380	2530	3150	2470	2230	2270
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	0.0019	<0.01
Boron, dissolved	mg/l	5	--	1.6	1.3	1.4	1.12	0.99	1.3
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.001
Calcium, dissolved	mg/l	--	--	28	31	22	28	22	29
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.05
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0006	0.0004	<0.00050	<0.005
Copper, dissolved	mg/l	--	1	0.002	<0.001	0.003	<0.001	<0.0010	<0.01
Iron, dissolved	mg/l	--	0.3	0.23	0.27	0.16	0.09	0.27	<1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.005
Magnesium, dissolved	mg/l	--	--	36	38	27	35	29	39
Manganese, dissolved	mg/l	--	0.05	0.10	0.09	0.05	0.11	0.061	0.094
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18	17	23	16	14	18
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	750	842	1110	804	690	900
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	0.02	<0.01	<0.0050	<0.05
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 25-May-2010 M-17	95-2 20-Oct-2010 [29] G-16	95-2 24-May-2011 [29] G-20	95-2 29-Nov-2011 [29] 95-2	95-2 31-May-2012 95-2	95-2 28-Nov-2012 95-2
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 29-May-2013 [31]	95-2 26-Nov-2013	95-2 29-May-2014	95-2 19-Nov-2014	95-2 02-Jun-2015	95-2 26-Nov-2015
				95-2	GW-8	95-2	95-2	95-2	95-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1100	1200	1200	1200	934	1130
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	26	31	25	<50	<25 [27]
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1200	1200	1200	947	1150
Ammonia Nitrogen	mg/l	--	--	1.6	1.3	1.7	1.7	1.66	1.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	56	58	53	93	104	99
Chloride	mg/l	--	250	650	660	670	640	627	676
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3121	3074	3215	3648	3632	3679
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	220	220	250	148	166
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.57	0.33	0.176	0.055	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.6	5.1	3.3	4.9	2.9	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.66	0.40	0.23	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	1	3.8	1.6	3.2	1.24	1.28
pH	-	--	--	8.25	8.37	8.46	8.37	--	--
pH (Field)	-	--	--	7.95	8.14	7.79	8.22	8.16	8.23
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.1	1.4	1.5	5.2	1.75	1.59
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	2	3
Temperature (Field)	deg c	--	15	8.9	7.1	8.8	7.3	9.6	7.2
Total Dissolved Solids	mg/l	--	500	2300	2290	2180	2260	2220	2440
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0012	0.0024	0.0018	0.0022	0.001	0.002
Boron, dissolved	mg/l	5	--	1.2	1	1.1	1.2	0.782	1.21
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	30	27	29	32	20.8	25.1
Chromium, dissolved	mg/l	0.05	--	<0.0050	0.0051	0.0057	0.0055	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.00053	0.00053	<0.00050	<0.00050	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0017	0.0013	0.0035	0.0018	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.13	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00056	<0.00050	<0.00050	<0.00050	0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	37	36	37	40	23.2	32.5
Manganese, dissolved	mg/l	--	0.05	0.092	0.031	0.015	0.11	0.048	0.083
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17	16	17	19	11.9	14.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	760	750	740	830	716	83.2
Zinc, dissolved	mg/l	--	5	0.0065	0.0063	<0.0050	0.0066	0.035	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.0018	0.0013	0.0022	0.0022	<0.004 [10]	<0.004 [10]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 29-May-2013 [31] 95-2	95-2 26-Nov-2013 GW-8	95-2 29-May-2014 95-2	95-2 19-Nov-2014 95-2	95-2 02-Jun-2015 95-2	95-2 26-Nov-2015 95-2
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	0.00070	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 26-May-2016	95-2 17-Nov-2016	95-2 24-May-2017	95-2 29-Nov-2017	95-2 24-May-2018	95-2 22-Nov-2018
				95-2	95-2	95-2	95-2	95-2	95-2
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1020	1090	1120	1040	1050	1220
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [11]	<25 [11]	<25 [11]	<25 [11]	<25 [11]	<25 [11]
Alkalinity (Total as CaCO3)	mg/l	--	--	1030	1100	1140	1050	1060	1240
Ammonia Nitrogen	mg/l	--	--	2.10	1.68	2.61	1.48	1.81	1.39
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	108	89	119	78	97	119
Chloride	mg/l	--	250	685	672	644	719	658	699
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3727	3843	3661	3404	3905	3391
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	184	204	190	215	203	281
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.25 [11]	0.33	0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.2	2.7	3.2	2.9	2.8	2.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.1	1.02	0.59	1.42	0.99	1.31
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.28	7.86	8.14	8.16	8.10	8.39
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.17	2.30	3.53	2.74	2.16	1.78
Sulphate	mg/l	--	500 [6]	3	4	5	4	6	4
Temperature (Field)	deg c	--	15	10.7	9.2	10.0	7.3	10.4	6.3
Total Dissolved Solids	mg/l	--	500	2430	2360	2200	2300	2290	2330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.004	0.005	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.962	1.35	0.919	1.06	1.03	1.16
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	24.5	26.1	25.7	27.4	28.2	36
Chromium, dissolved	mg/l	0.05	--	<0.001	0.014	0.012	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0008	0.0006	0.0008	0.0013	0.0013	0.0050
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	0.106	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	29.8	33.8	30.5	35.5	32.3	46.5
Manganese, dissolved	mg/l	--	0.05	0.081	0.068	0.06	0.049	0.05	0.014
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.8	15.7	15.2	17.2	16.2	20.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	627	767	772	806	718	871
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.011	<0.002 [10]	<0.004 [10]	<0.002 [10]	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-2 26-May-2016	95-2 17-Nov-2016	95-2 24-May-2017	95-2 29-Nov-2017	95-2 24-May-2018	95-2 22-Nov-2018
				95-2	95-2	95-2	95-2	95-2	95-2
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 19-Jun-2019	95-2 20-Nov-2019	95-2 21-May-2020	95-2 26-Nov-2020
				95-2	95-2	95-2	95-2
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1060	1130	1110	1110
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [11]	<25	26	32
Alkalinity (Total as CaCO3)	mg/l	--	--	1070	1150	1140	1140
Ammonia Nitrogen	mg/l	--	--	2.07	1.59	1.35	1.34
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	97	132	76	101
Chloride	mg/l	--	250	587	720	748	627
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3560	3810	3269	3288
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	245	290	--	266
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	269	--
Nitrate as N	mg/l	10.0	--	<0.1	0.7	<0.1	<0.5 [12]
Nitrite as N	mg/l	1.0	--	0.36	0.07	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	3.0	2.3	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.73	1.41	0.95	0.86
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.02	8.31	7.97	8.54
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.57	2.86	0.95	1.17
Sulphate	mg/l	--	500 [6]	3	6	8	3
Temperature (Field)	deg c	--	15	11.4	7.6	12.6	6.6
Total Dissolved Solids	mg/l	--	500	2090	2470	2210	2150
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.002	0.002
Boron, dissolved	mg/l	5	--	0.842	0.864	0.852	0.849
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	32.5	38.4	35.5	31.3
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.003	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0018	<0.0005
Copper, dissolved	mg/l	--	1	0.0025	0.0016	0.0008	0.0021
Iron, dissolved	mg/l	--	0.3	<0.1	0.261	3.11	0.101
Lead, dissolved	mg/l	0.01	--	0.0001	0.0001	0.0018	0.0001
Magnesium, dissolved	mg/l	--	--	39.7	47.1	43.7	45.6
Manganese, dissolved	mg/l	--	0.05	0.048	0.062	0.183	0.066
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.7	25.2	18.3	17.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	720	851	748	813
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.012	0.006
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.004 [10]	0.007	<0.004 [12]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 19-Jun-2019	95-2 20-Nov-2019	95-2 21-May-2020	95-2 26-Nov-2020
				95-2	95-2	95-2	95-2
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Jun-1995	95-3 23-Nov-1995	95-3 12-Jun-1996	95-3 12-Oct-1996	95-3 18-Jun-1997	95-3 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	700	797	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	574	653	634	651	644	660
Ammonia Nitrogen	mg/l	--	--	0.14	0.09	0.19	0.57	0.79	0.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	90	25	23	15	9	17
Chloride	mg/l	--	250	269	261	294	272	266	262
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2170	2340	2150	4000	2200	2130
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	7.36	--	--	--	2.36	--
Hardness, Calcium Carbonate	mg/l	--	--	220	264	221	202	262	239
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	8.5	0.8	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	8.36	0.71	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.03	7.45	7.1	7.96	7.29	7.94
Phosphate	mg/l	--	--	--	0.4	--	--	--	--
Phosphorus	mg/l	--	--	5.86	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	55	128	119	114	100	52
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1090	1170	1080	1120	1110	1070
Total Organic Carbon	mg/l	--	--	19.2	7	7.5	6.8	6.9	7
Total Suspended Solids	mg/l	--	--	--	--	5070	5530	5010	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.61	0.61	0.618	0.77	0.8	0.74
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.6	36	30.2	28.6	35.5	34
Chromium, dissolved	mg/l	0.05	--	0.01	0.05	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.05	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.03	19.9	0.132	0.25	0.16	0.14
Lead, dissolved	mg/l	0.01	--	0.0048	0.0059	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	31.5	41.7	34.8	31.4	38.1	37
Manganese, dissolved	mg/l	--	0.05	0.34	0.74	0.477	0.43	0.53	0.5
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.03	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	15.2	11.3	7.8	7.6	12.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	375	422	428	384	347	362
Zinc, dissolved	mg/l	--	5	0.01	0.05	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-3 28-Jun-1995	95-3 23-Nov-1995	95-3 12-Jun-1996	95-3 12-Oct-1996	95-3 18-Jun-1997	95-3 06-Nov-1997
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 05-Jun-1998	95-3 29-Oct-1998	95-3 06-May-1999	95-3 19-Oct-1999	95-3 05-May-2000	95-3 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	756	810	813	953	927
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	650	620	664	666	781	760
Ammonia Nitrogen	mg/l	--	--	0.18	0.22	0.16	0.25	0.03	0.1
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	30	3	8	20	11	--
Chloride	mg/l	--	250	248	260	285	287	245	303
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2080	2120	2050	2370	2000	2310
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	225	186	218	223	240	237
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1	--	--	0.1	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	1.06	1.19	--	--	1.22
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	0.84	1.03	--	--	1.12
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	6.7	6.8	7.8	7	7.01
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	3.39
Sulphate	mg/l	--	500 [6]	118	117	104	101	101	130
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1019	1070	1040	1130	1000	1240
Total Organic Carbon	mg/l	--	--	6.8	9.6	7	6.5	6.1	--
Total Suspended Solids	mg/l	--	--	--	--	--	3000	1210	6230
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Boron, dissolved	mg/l	5	--	0.85	0.95	0.68	1.02	0.77	0.84
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	29.5	26.7	29.1	33.8	34	30
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.46	0.38	0.28	1.2	2.45	0.08
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0021	0.0002	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	36.2	28.9	34.8	33.2	37.1	39.3
Manganese, dissolved	mg/l	--	0.05	0.54	0.56	0.52	0.35	0.54	0.4
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.9	10.8	2.2	11.1	4.3	12.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	468	414	437	439	432	550
Zinc, dissolved	mg/l	--	5	0.32	0.01	0.01	0.17	0.26	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-3 05-Jun-1998	95-3 29-Oct-1998	95-3 06-May-1999	95-3 19-Oct-1999	95-3 05-May-2000	95-3 24-Oct-2000
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-3 14-Jun-2001	95-3 23-Nov-2001	95-3 23-May-2002	95-3 06-Nov-2002	95-3 30-May-2003	95-3 09-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	753	828	837	1050	487	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	25	1	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	659	679	686	864	399	537
Ammonia Nitrogen	mg/l	--	--	0.23	0.07	0.27	0.16	0.45	0.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	2
Chemical Oxygen Demand	mg/l	--	--	13	13	10	22	25	42
Chloride	mg/l	--	250	251	279	281	262	256	180
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1900	2100	2030	2260	1740	1930
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	147
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	236	243	248	248	225	170
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	0.3	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.62	0.7	0.47	0.8	1.69	0.57
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.39	0.63	0.2	0.64	1.24	0.45
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	6.68	6.8	7	6.6	7.3
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.46	0.67	0.47	0.14	3.24	1.56
Sulphate	mg/l	--	500[6]	112	110	111	114	97	131
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1180	1260	1260	1290	870	1073
Total Organic Carbon	mg/l	--	--	5.8	7	6	5.6	6	12
Total Suspended Solids	mg/l	--	--	1580	2100	1600	4150	9680	8180
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.76	1	0.72	0.87	0.62	0.9
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	36.1	33	35.8	36.5	32.1	26.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.008
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.02	0.02	0.21	0.35
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.001	0.0013	0.0005	0.0005
Magnesium, dissolved	mg/l	--	--	35.3	39	38.4	38	35.2	25.4
Manganese, dissolved	mg/l	--	0.05	0.57	0.19	0.62	0.17	0.55	0.377
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	4.3	7.4	6.9	9.7	8.4	7.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	402	448	395	441	406	379
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.01	0.014
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.051	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-3 14-Jun-2001	95-3 23-Nov-2001	95-3 23-May-2002	95-3 06-Nov-2002	95-3 30-May-2003	95-3 09-Oct-2003
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-3 14-May-2004	95-3 19-Nov-2004	95-3 24-May-2005	95-3 16-Nov-2005	95-3 25-May-2006	95-3 21-Nov-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	802	854	824	172	725	738
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	657	700	675	705	725	738
Ammonia Nitrogen	mg/l	--	--	0.15	0.17	0.06	<0.01	0.18	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	57	32	26	32	15	12
Chloride	mg/l	--	250	242	215	204	190	216	203
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2010	2160	2000	1900	1700	1800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	225	213	228	223	211	213
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	1	0.2	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.51	0.57	0.49	0.28	1.76	0.28
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.36	0.4	0.43	<0.28	1.58	<0.28
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.2	7.4	7.1	--	7.3	7.7
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.21	2.34	1.16	0.09	--	--
Sulphate	mg/l	--	500[6]	115	130	126	136	132	134
Temperature (Field)	deg c	--	15	--	--	13.5	--	4	6
Total Dissolved Solids	mg/l	--	500	1005	1080	1180	1290	1260	1280
Total Organic Carbon	mg/l	--	--	4.5	5.3	4.6	6	--	--
Total Suspended Solids	mg/l	--	--	5720	2200	2810	460	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	0.001
Boron, dissolved	mg/l	5	--	0.681	0.867	0.66	0.933	0.711	0.881
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	0.0001	<0.005	0.0002
Calcium, dissolved	mg/l	--	--	32.5	32	32.6	33.9	30.3	31.6
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.002	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.016	0.005	0.027	0.046	<0.005	0.014
Lead, dissolved	mg/l	0.01	--	0.0008	0.0013	0.0012	0.0005	<0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	34.9	32.4	35.7	33.7	32.9	32.5
Manganese, dissolved	mg/l	--	0.05	0.63	0.487	0.605	0.298	0.408	0.282
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	8.6	8.4	8.9	10.1	8.1	9.2
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200[7]	412	410	376	470	417	426
Zinc, dissolved	mg/l	--	5	0.005	0.005	0.006	0.012	<0.005	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	<0.001	0.002	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-3 14-May-2004	95-3 19-Nov-2004	95-3 24-May-2005	95-3 16-Nov-2005	95-3 25-May-2006	95-3 21-Nov-2006
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 15-May-2007	95-3 30-Nov-2007	95-3 22-May-2008	95-3 10-Nov-2008	95-3 19-May-2009 G-23	95-3 26-Nov-2009 M-14
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	687	750	680	725	724	740
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [9]	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	687	750	680	725	724	740
Ammonia Nitrogen	mg/l	--	--	0.05	0.03	<0.01	<0.01	0.07	0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	63	67	18	<5	15	27
Chloride	mg/l	--	250	211	174	187	177	173	174
Conductivity	uS/cm	--	--	--	--	--	--	2020	2040
Conductivity (Field)	uS/cm	--	--	1400	1000	1750	1650	1700	1777
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	229	200	206	188	192	183
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	1.1	0.2	0.2	0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.58	0.67	0.61	0.48	0.29	0.15
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.53	0.64	<0.61	<0.48	0.22	0.13
pH	-	--	--	--	--	--	--	7.61	7.70
pH (Field)	-	--	--	8	7.7	7.1	7.1	--	6.85
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.51	0.26
Sulphate	mg/l	--	500 [6]	122	125	122	123	103	101
Temperature (Field)	deg c	--	15	5.8	5	8	8	7	8.3
Total Dissolved Solids	mg/l	--	500	1220	1300	1210	1210	1310	1330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.0008	0.0012	0.0005	0.001	0.001
Boron, dissolved	mg/l	5	--	0.679	0.942	0.736	0.967	1.21	1.0
Cadmium, dissolved	mg/l	0.005	--	0.00024	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	34.7	30.9	31	28.4	29	27
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	0.009	0.007
Cobalt, dissolved	mg/l	--	--	0.009	<0.005	<0.005	<0.005	<0.0002	<0.0002
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	0.004	0.003
Iron, dissolved	mg/l	--	0.3	0.072	0.01	0.011	<0.005	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	0.00012	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	34.7	29.8	31.2	28.5	29	28
Manganese, dissolved	mg/l	--	0.05	0.686	0.107	0.331	0.195	0.02	0.03
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.3	8.8	8.3	8.8	7	8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	396	472	424	409	351	380
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 15-May-2007	95-3 30-Nov-2007	95-3 22-May-2008	95-3 10-Nov-2008	95-3 19-May-2009 G-23	95-3 26-Nov-2009 M-14
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	<0.0006	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-3 25-May-2010 M-27	95-3 20-Oct-2010 G-17	95-3 24-May-2011[38] G-32	95-3 29-Nov-2011[39] 95-3	95-3 31-May-2012 95-3	95-3 28-Nov-2012 95-3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	707	737	748	739	710	720
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2[9]	<2[9]	<2[9]	<2[9]	2.8	5.4
Alkalinity (Total as CaCO3)	mg/l	--	--	707	737	748	739	720	730
Ammonia Nitrogen	mg/l	--	--	0.11	0.08	0.08	<0.02	<0.050	0.19
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	20	25	20	15	30	31
Chloride	mg/l	--	250	155	158	169	159	140	140
Conductivity	uS/cm	--	--	1990	1990	2030	1940	--	--
Conductivity (Field)	uS/cm	--	--	1756	1972	1533	1798	1745	1753
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	201	197	207	177	190	200
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.42	1.08	0.19	3.57	0.89	0.93
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	0.31	1	0.11	<3.57	<0.89	0.74
pH	-	--	--	7.93	7.77	8.24	8.06	7.61	--
pH (Field)	-	--	--	6.98	7.22	7.03	7.12	7.32	7.10
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.87	1.20	0.68	0.23	0.61	1.4
Sulphate	mg/l	--	500[6]	99	102	96	89	86	78
Temperature (Field)	deg c	--	15	26.1	11.3	19.5	7.9	9.1	6.5
Total Dissolved Solids	mg/l	--	500	1290	1290	1320	1260	1120	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	0.93	1.3	0.79	1.2	0.87	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	31	31	27	28	29	29
Chromium, dissolved	mg/l	0.05	--	<0.005	0.005	0.008	0.006	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0005	0.0003	0.0004	0.0004	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.003	0.003	0.002	0.0041	0.002
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	<0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	30	29	34	26	30	31
Manganese, dissolved	mg/l	--	0.05	1.16	0.30	0.49	0.51	0.17	0.27
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7	8	7	8	7.1	8.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	368	373	395	358	380	410
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	0.01	<0.01	0.0060	0.008
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 25-May-2010 M-27	95-3 20-Oct-2010 G-17	95-3 24-May-2011 [38] G-32	95-3 29-Nov-2011 [39] 95-3	95-3 31-May-2012 95-3	95-3 28-Nov-2012 95-3
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.004	<0.0008	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.005	<0.001	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.005	<0.001	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.01	<0.001	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.04	<0.0080	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.005	<0.001	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.005	<0.001	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.002	<0.0004	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 29-May-2013 MW-W	95-3 26-Nov-2013 GW-7	95-3 29-May-2014 95-3	95-3 19-Nov-2014 [40] MW-W	95-3 02-Jun-2015 95-3	95-3 26-Nov-2015 95-3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	710	720	720	740	743	747
Alkalinity, Carbonate as CaCO3	mg/l	--	--	3.7	4.4	5.4	4.4	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	710	730	720	740	747	750
Ammonia Nitrogen	mg/l	--	--	0.35	0.12	0.22	0.33	0.31	0.33
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	81	57	35	150	188	348
Chloride	mg/l	--	250	160	140	150	160	173	162
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1617	1615	1686	1842	1824	1803
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	210	180	190	200	151	154
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.5	3.6	6.4	4.6	2.8	5.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	3.15	3.48	6.18	4.27	2.49	5.47
pH	-	--	--	7.75	7.81	7.90	7.80	--	--
pH (Field)	-	--	--	7.62	7.79	7.43	7.19	7.25	7.35
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	8.0	3.0	3.0	13	4.47	9.07
Sulphate	mg/l	--	500 [6]	83	79	71	83	81	87
Temperature (Field)	deg c	--	15	9.5	6.5	9.6	6.8	7.9	6.2
Total Dissolved Solids	mg/l	--	500	1160	1150	1140	1140	1010	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.85	1	1.1	1.1	0.616	1.19
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31	28	28	30	22.6	24.1
Chromium, dissolved	mg/l	0.05	--	0.0065	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.00066	0.00066	<0.00050	<0.00050	0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0025	0.0023	0.0034	<0.0020	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31	27	29	29	22.9	22.6
Manganese, dissolved	mg/l	--	0.05	0.88	0.45	0.55	0.59	0.637	0.536
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.1	7.6	7.2	8.1	5.43	6.83
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	380	370	370	410	325	426
Zinc, dissolved	mg/l	--	5	<0.0050	0.036	<0.0050	<0.0050	<0.005	0.013
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 29-May-2013 MW-W	95-3 26-Nov-2013 GW-7	95-3 29-May-2014 95-3	95-3 19-Nov-2014 [40] MW-W	95-3 02-Jun-2015 95-3	95-3 26-Nov-2015 95-3
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.0010	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	0.00088	<0.00020	<0.00040	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-3 26-May-2016	95-3 17-Nov-2016	95-3 24-May-2017	95-3 29-Nov-2017	95-3 24-May-2018	95-3 22-Nov-2018
				95-3	95-3	95-3	95-3	95-3	95-3
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	768	753	785	1030	805	807
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	770	756	789	1040	810	810
Ammonia Nitrogen	mg/l	--	--	0.51	0.35	0.31	0.26	0.27	0.10
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	184	59	289	25	312	183
Chloride	mg/l	--	250	187	162	181	65	191	172
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1892	1917	1962	1609	1988	1662
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	160	185	178	634	140	232
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	2.1	3.4	0.8	1.8	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.29	1.75	3.09	0.54	1.53	3
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.87	7.94	7.45	6.84	7.42	7.74
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	6.33	4.88	7.14	0.44	3.13	5.58
Sulphate	mg/l	--	500[6]	87	89	82	128	84	86
Temperature (Field)	deg c	--	15	10.6	9.4	9.2	8.1	8.6	6.1
Total Dissolved Solids	mg/l	--	500	1170	1080	1140	1140	1190	1050
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.761	1.43	0.826	0.931	0.634	1.12
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25.2	28.5	27	125	24.4	34.4
Chromium, dissolved	mg/l	0.05	--	<0.001	0.008	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0011	0.0025	0.0014	0.0010	0.0037	0.0050
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	1.3	0.171	0.123
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	23.7	27.7	26.8	78.2	19.1	35.4
Manganese, dissolved	mg/l	--	0.05	0.573	0.294	0.658	0.884	0.727	3.41
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.54	7.96	6.93	12.3	4.98	9.36
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	276	399	345	231	249	455
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.002[10]	<0.001	<0.001	0.003

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-3 26-May-2016	95-3 17-Nov-2016	95-3 24-May-2017	95-3 29-Nov-2017	95-3 24-May-2018	95-3 22-Nov-2018
				95-3	95-3	95-3	95-3	95-3	95-3
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	95-3 19-Jun-2019	95-3 20-Nov-2019	95-3 21-May-2020	95-3 26-Nov-2020
				95-3	95-3	95-3	95-3
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	750	698	659	691
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7	<5	6	9
Alkalinity (Total as CaCO3)	mg/l	--	--	757	703	665	699
Ammonia Nitrogen	mg/l	--	--	0.29	0.11	0.11	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	105	111	37	89
Chloride	mg/l	--	250	189	164	184	163
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1763	1815	1713	1601
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	232	237	--	179
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	225	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	1.6	0.7	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.91	1.49	0.59	0.76
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.55	7.21	8.26	7.49
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.92	2.97	0.66	0.67
Sulphate	mg/l	--	500[6]	85	88	89	90
Temperature (Field)	deg c	--	15	10.8	7.1	10.3	6.2
Total Dissolved Solids	mg/l	--	500	1150	1090	998	1000
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.831	0.904	0.745	0.889
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	36.3	36.5	34.9	28.1
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	<0.0005	0.0020	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	0.0016	0.0021	0.0034
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	2.7	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0040	0.0001
Magnesium, dissolved	mg/l	--	--	34.3	35.5	33.5	26.5
Manganese, dissolved	mg/l	--	0.05	0.599	0.444	0.921	0.069
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.9	11.1	7.71	7.25
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200[7]	375	374	377	345
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.01	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.002	0.003	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 19-Jun-2019	95-3 20-Nov-2019	95-3 21-May-2020	95-3 26-Nov-2020
				95-3	95-3	95-3	95-3
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 28-Jun-1995	95-5 22-Nov-1995	95-5 12-Oct-1996	95-5 06-Nov-1997	95-5 05-Jun-1998	95-5 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1181	1420	--	--	--	1610
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	968	1160	1250	1250	875	1320
Ammonia Nitrogen	mg/l	--	--	1.59	7.5	4.64	4.65	7.51	4.42
Chemical Oxygen Demand	mg/l	--	--	400	260	148	96	288	61
Chloride	mg/l	--	250	703	1430	1370	1340	1390	1510
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5340	6120	2830	6020	5370	5220
Dissolved Oxygen (Field)	mg/l	--	--	3	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	315	467	337	424	347	369
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	13.8	19.3	--	--	--	37.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	12.21	11.8	--	--	--	32.68
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.94	8.33	7.87	8.16	--	7.9
Phosphate	mg/l	--	--	--	41	--	--	--	--
Phosphorus	mg/l	--	--	21	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	14	10	3	9	73	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	268	320	2830	3020	2670	2710
Total Organic Carbon	mg/l	--	--	26.1	19.9	31.8	20.2	27.7	24.5
Total Suspended Solids	mg/l	--	--	--	--	58.8	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.02	1.13	1.28	1.41	1.52	1.62
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	40.4	48.7	35	46.5	35.1	38.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.1	0.01	0.02	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.04	0.01	0.01	0.03	0.01
Iron, dissolved	mg/l	--	0.3	0.04	58.1	0.7	13.3	6.37	0.56
Lead, dissolved	mg/l	0.01	--	0.0008	0.007	0.0002	0.001	0.001	0.0002
Magnesium, dissolved	mg/l	--	--	51.2	82.8	59.8	73.8	62.1	65.3
Manganese, dissolved	mg/l	--	0.05	0.31	1.21	0.18	0.4	0.23	0.13
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.07	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	41.4	32.1	39.3	36.4	41.1
Sodium, dissolved	mg/l	--	200 [7]	832	1050	1230	1140	1370	1340
Zinc, dissolved	mg/l	--	5	0.01	0.11	0.01	0.04	0.22	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 24-Oct-2000	95-5 14-Jun-2001	95-5 06-Nov-2002	95-5 30-May-2003	95-5 19-Nov-2004	95-5 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1620	1290	1680	1460	1550	292
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	85	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1320	1200	1380	1200	1270	1200
Ammonia Nitrogen	mg/l	--	--	2.12	4.14	3.95	3.71	3.89	3.62
Chemical Oxygen Demand	mg/l	--	--	--	52	150	81	315	78
Chloride	mg/l	--	250	1520	1480	1430	1470	1500	1300
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6090	5000	5890	5040	6200	4200
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	417	370	357	327	340	356
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	1	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4.76	5.13	7.66	5.94	4.82	5.18
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.64	0.99	3.71	2.23	0.93	1.56
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.26	8.1	8	7.2	7.9	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.58	1.6	15.3	3.17	9.54	2.19
Sulphate	mg/l	--	500 [6]	1	1	2	1	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3450	3250	3390	3330	3100	3470
Total Organic Carbon	mg/l	--	--	--	17.7	18.1	18.9	16.9	19.7
Total Suspended Solids	mg/l	--	--	1830	323	7160	2590	2850	128
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	0.003	0.001	0.002
Boron, dissolved	mg/l	5	--	1.56	1.69	1.52	1.47	1.53	1.6
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	38.4	43.2	37.1	36.4	37.3	39.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.45	0.4	0.45	0.97	0.324	0.385
Lead, dissolved	mg/l	0.01	--	**0.022**	0.0002	**0.0121**	0.0007	0.0022	0.0017
Magnesium, dissolved	mg/l	--	--	77.9	63.6	64.3	57.3	60.1	62.5
Manganese, dissolved	mg/l	--	0.05	0.12	0.12	0.12	0.1	0.104	0.107
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	30.8	26.7	31.4	33	34.4	38.4
Sodium, dissolved	mg/l	--	200 [7]	1270	1240	1320	1060	1470	1350
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.01	0.019	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.004	0.029	0.001	0.001	0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 15-May-2007	95-5 10-Nov-2008	95-5 26-Nov-2009 [8] M-3	95-5 24-May-2011 [29] G-33	95-5 28-Nov-2012 95-5	95-5 29-May-2014 [31] 95-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1270	1320	1280	1230	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	30	43	14	30
Alkalinity (Total as CaCO3)	mg/l	--	--	1270	1320	1310	1270	1200	1300
Ammonia Nitrogen	mg/l	--	--	3.55	3.52	3.72	3.60	3.9	3.9
Chemical Oxygen Demand	mg/l	--	--	181	84	93	70	77	70
Chloride	mg/l	--	250	1410	1510	1690	1390	1300	1500
Conductivity	uS/cm	--	--	--	--	6570	6570	--	--
Conductivity (Field)	uS/cm	--	--	4400	>5000	>3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	326	320	361	365	360	310
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	5.99	5.37	4.84	4.32	90	9.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	2.44	1.85	1.12	0.72	86.1	6
pH	-	--	--	--	--	8.39	8.57	--	8.42
pH (Field)	-	--	--	8.5	8	7.42	8.05	8.12	7.51
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.78	1.68	2.0	1.7
Sulphate	mg/l	--	500 [6]	2	1	4	<1	<1	<1
Temperature (Field)	deg c	--	15	10.8	7	9.1	19.2	6.8	9.5
Total Dissolved Solids	mg/l	--	500	3470	3590	4270	4270	3460	3460
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0089	0.0073	<0.01	<0.01	0.002	0.0023 [37]
Boron, dissolved	mg/l	5	--	1.42	1.47	2.1	1.9	1.8	1.5
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	36.7	35.7	39	39	38	33
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.01
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.002	0.0008	0.0006	0.00054
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.01	0.002	0.001	0.0014
Iron, dissolved	mg/l	--	0.3	0.893	0.225	<0.3	0.36	0.2	0.27
Lead, dissolved	mg/l	0.01	--	0.00019	<0.00002	<0.01	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	57	56.2	64	65	64	55
Manganese, dissolved	mg/l	--	0.05	0.107	0.09	<0.1	0.09	0.087	0.085
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	37.1	34.4	33	36	33	29
Sodium, dissolved	mg/l	--	200 [7]	1160	1160	1345	1160	1300	1200
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.1	0.02	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0011
Semi-VOCs									
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00020
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	0.00011	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00020
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	0.00018	<0.00020
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.0010
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00020
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00040
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00040

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 26-Nov-2015	95-5 24-May-2017	95-5 22-Nov-2018 [41]	95-5 21-May-2020
				95-5	95-5	95-5	95-5
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1170	1210	1230	1250
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [27]	<25 [11]	38	<25 [13]
Alkalinity (Total as CaCO3)	mg/l	--	--	1190	1230	1270	1280
Ammonia Nitrogen	mg/l	--	--	4.98	5.58	--	3.97
Chemical Oxygen Demand	mg/l	--	--	277	237	--	126
Chloride	mg/l	--	250	1490	1430	1430	1740
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	--	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	317	282	456	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	410
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.50 [11]	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	9.1	11.0	--	4.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	4.12	5.42	--	0.43
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.14	8.05	--	8.10
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	7.23	12.2	--	1.63
Sulphate	mg/l	--	500 [6]	<1	1	6	<1
Temperature (Field)	deg c	--	15	7.1	11.9	--	14.5
Total Dissolved Solids	mg/l	--	500	3420	3630	3600	3700
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.002	0.008	0.002	0.002
Boron, dissolved	mg/l	5	--	1.46	1.18	1.59	1.59
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31.3	33.2	52.4	42.4
Chromium, dissolved	mg/l	0.05	--	<0.001	0.021	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0008	0.0007
Copper, dissolved	mg/l	--	1	<0.0005	0.0010	0.0023	0.0023
Iron, dissolved	mg/l	--	0.3	0.126	<0.1	0.195	0.263
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	58	48.4	79	73.9
Manganese, dissolved	mg/l	--	0.05	0.068	0.065	0.098	0.093
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.6	30	40.7	34.2
Sodium, dissolved	mg/l	--	200 [7]	1110	1140	1140	1170
Zinc, dissolved	mg/l	--	5	0.014	<0.005	<0.005	0.009
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.010 [12]	--	0.010
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Jun-1995	95-6 22-Nov-1995	95-6 12-Jun-1996	95-6 12-Oct-1996	95-6 18-Jun-1997	95-6 06-Nov-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	832	1070	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	8	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	682	886	901	905	914	966
Ammonia Nitrogen	mg/l	--	--	1.14	0.89	1.37	1.46	0.01	0.87
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	115	48	29	25	34	42
Chloride	mg/l	--	250	389	825	839	816	783	952
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3380	4350	4020	4380	3230	4040
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.45	--	--	--	1.97	--
Hardness, Calcium Carbonate	mg/l	--	--	255	338	349	320	387	374
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.8	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.3	3.5	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.16	2.61	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.89	8.09	7.95	7.56	8.02	7.98
Phosphate	mg/l	--	--	--	0.3	--	--	--	--
Phosphorus	mg/l	--	--	6.1	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	21	11	9	8	5	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1700	2190	2010	2190	1630	2030
Total Organic Carbon	mg/l	--	--	14.1	13.5	14.4	14	15.1	14.6
Total Suspended Solids	mg/l	--	--	--	--	2910	1490	1320	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.53	0.59	0.678	0.71	0.91	0.79
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	38.1	43.6	43.3	40.8	52.4	50.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	3.06	0.5	0.44	0.39	0.28
Lead, dissolved	mg/l	0.01	--	0.0008	0.0001	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	38.4	54.8	57.7	52.2	61.4	59.6
Manganese, dissolved	mg/l	--	0.05	0.33	0.27	0.213	0.18	0.19	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	20.7	25.4	19.7	19.3	21.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	566	721	753	668	643	788
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Jun-1995	95-6 22-Nov-1995	95-6 12-Jun-1996	95-6 12-Oct-1996	95-6 18-Jun-1997	95-6 06-Nov-1997
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 05-Jun-1998	95-6 30-Oct-1998	95-6 06-May-1999	95-6 19-Oct-1999	95-6 05-May-2000	95-6 24-Oct-2000
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1090	1130	936	1369	1280
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	55	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	840	892	930	859	1122	1050
Ammonia Nitrogen	mg/l	--	--	0.79	0.99	0.97	1.23	0.05	0.66
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	64	39	50	45	36	--
Chloride	mg/l	--	250	861	850	890	920	855	900
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4290	4060	3800	3600	3775	4020
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	336	278	338	312	337	353
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	2.1	--	--	0.1	--	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	1.82	2.06	--	0.2	1.83
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	0.83	1.09	--	0.15	1.17
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.6	7.6	7.8	8	8.01
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	2.01
Sulphate	mg/l	--	500 [6]	38	4	3	1	3	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2140	2040	2040	1780	1888	2250
Total Organic Carbon	mg/l	--	--	14	16.8	18.2	17.7	16.2	--
Total Suspended Solids	mg/l	--	--	--	--	--	520	360	3200
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.001
Boron, dissolved	mg/l	5	--	0.84	0.94	0.84	0.92	0.93	0.82
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	41.7	38	41.7	43.8	44.2	41.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.45	0.22	0.21	0.68	1.14	0.06
Lead, dissolved	mg/l	0.01	--	0.0018	0.0002	0.0002	0.0003	0.0002	0.022
Magnesium, dissolved	mg/l	--	--	55.7	44.5	56.1	48.5	54.3	60.6
Manganese, dissolved	mg/l	--	0.05	0.18	0.2	0.19	0.17	0.19	0.21
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	20.4	21.9	22.1	19	13.8	19
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	967	803	835	926	810	790
Zinc, dissolved	mg/l	--	5	0.16	0.01	0.01	0.06	0.09	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 05-Jun-1998	95-6 30-Oct-1998	95-6 06-May-1999	95-6 19-Oct-1999	95-6 05-May-2000	95-6 24-Oct-2000
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 14-Jun-2001	95-6 23-Nov-2001	95-6 23-May-2002	95-6 06-Nov-2002	95-6 30-May-2003	95-6 09-Oct-2003
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	923	1050	983	1210	1110	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	62	1	73	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	861	860	928	990	910	915
Ammonia Nitrogen	mg/l	--	--	1.62	1.07	1.24	1.37	2.13	1.91
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	3
Chemical Oxygen Demand	mg/l	--	--	41	37	58	54	79	53
Chloride	mg/l	--	250	836	859	870	801	895	876
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3800	3610	3520	3990	3600	3900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	205
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	320	344	337	320	302	311
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.1	0.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.57	2.54	2.43	2.57	4.34	2.76
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.95	1.47	1.19	1.2	2.21	0.85
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	7.55	7.35	7.8	7.2	7.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.8	0.34	0.51	0.56	2.95	0.57
Sulphate	mg/l	--	500 [6]	3	3	2	3	2	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2060	2110	2190	2220	2200	2348
Total Organic Carbon	mg/l	--	--	14	20	16	14	14.5	30
Total Suspended Solids	mg/l	--	--	186	174	50	228	2670	228
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.002	0.002	0.003	0.004
Boron, dissolved	mg/l	5	--	0.8	0.99	0.85	0.85	0.73	0.784
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	46.5	43.3	45.1	41.6	41.7	41.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002
Iron, dissolved	mg/l	--	0.3	0.26	0.19	0.3	0.21	0.79	0.386
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0018	0.0009	0.0009
Magnesium, dissolved	mg/l	--	--	49.4	57.4	54.6	52.6	48	50.2
Manganese, dissolved	mg/l	--	0.05	0.2	0.23	0.22	0.2	0.19	0.146
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	12.6	14	18.4	18.6	17.9	19.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	750	850	728	760	688	809
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.02	0.01	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.024	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 14-Jun-2001	95-6 23-Nov-2001	95-6 23-May-2002	95-6 06-Nov-2002	95-6 30-May-2003	95-6 09-Oct-2003
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 14-May-2004	95-6 19-Nov-2004	95-6 24-May-2005	95-6 16-Nov-2005	95-6 25-May-2006	95-6 21-Nov-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1000	1060	1110	222	925	940
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	820	870	910	910	925	940
Ammonia Nitrogen	mg/l	--	--	1.38	1.5	1.58	1.3	1.43	1.63
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	52	51	48	52	36	69
Chloride	mg/l	--	250	831	826	793	808	874	896
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3750	4310	3400	3200	3400	3600
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	289	270	325	309	293	288
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	1	<0.1	0.7	0.2	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.53	2.26	2.54	2.19	2.3	3.15
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.15	0.76	0.96	0.89	0.87	1.52
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	7.9	7.3	--	7.9	7
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.67	0.48	0.33	0.33	--	--
Sulphate	mg/l	--	500 [6]	2	10	1	2	1	2
Temperature (Field)	deg c	--	15	--	--	10.2	--	6	7
Total Dissolved Solids	mg/l	--	500	1875	2155	2180	2260	2260	2280
Total Organic Carbon	mg/l	--	--	13.9	14.1	14	38.6	--	--
Total Suspended Solids	mg/l	--	--	176	950	97	244	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.001	0.001	<0.001	0.0049
Boron, dissolved	mg/l	5	--	0.692	0.754	0.763	0.829	0.673	0.72
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.005	<0.0001
Calcium, dissolved	mg/l	--	--	40	38	43.1	43.4	40.3	39.1
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.002	0.002	<0.002	0.004
Iron, dissolved	mg/l	--	0.3	0.245	0.268	0.696	0.024	0.181	0.037
Lead, dissolved	mg/l	0.01	--	0.001	0.0008	0.0024	0.0012	0.0002	0.0001
Magnesium, dissolved	mg/l	--	--	45.9	42.6	52.8	48.8	46.9	46.2
Manganese, dissolved	mg/l	--	0.05	0.22	0.22	0.207	0.19	0.168	0.14
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	17.9	18.5	20.2	21.6	18.5	18.6
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	0.001	--	--
Sodium, dissolved	mg/l	--	200 [7]	689	690	738	810	745	715
Zinc, dissolved	mg/l	--	5	0.005	0.005	<0.005	0.01	<0.005	0.012
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 14-May-2004	95-6 19-Nov-2004	95-6 24-May-2005	95-6 16-Nov-2005	95-6 25-May-2006	95-6 21-Nov-2006
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 15-May-2007	95-6 30-Nov-2007	95-6 22-May-2008	95-6 10-Nov-2008	95-6 19-May-2009 G-27	95-6 26-Nov-2009 [36] J-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	980	985	950	1010	927	947
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [9]	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	980	985	950	1010	927	947
Ammonia Nitrogen	mg/l	--	--	1.52	1.6	1.22	1.54	1.87	1.48
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	64	81	50	53	38	55
Chloride	mg/l	--	250	804	855	919	927	833	814
Conductivity	uS/cm	--	--	--	--	--	--	4190	4230
Conductivity (Field)	uS/cm	--	--	2900	3200	3700	3600	3600	3647
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	303	315	292	302	298	353
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	0.2	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.71	2.55	1.32	2.4	2.33	2.11
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.19	0.95	0.1	0.86	0.46	0.63
pH	-	--	--	--	--	--	--	8.17	8.18
pH (Field)	-	--	--	8.5	8.4	7.9	7.9	--	7.16
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.55	0.48
Sulphate	mg/l	--	500 [6]	1	<1	1	<1	2	4
Temperature (Field)	deg c	--	15	8.9	7.5	9.5	8	9	9.0
Total Dissolved Solids	mg/l	--	500	2210	2500	2360	2380	2720	2750
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0058	0.0049	0.0049	0.0043	0.005	0.007
Boron, dissolved	mg/l	5	--	0.707	0.794	0.747	0.739	0.96	0.95
Cadmium, dissolved	mg/l	0.005	--	0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	41.7	44.7	39.6	41.1	40	44
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	0.012	<0.005	<0.005	<0.005	0.0006	0.0008
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	0.001	0.001
Iron, dissolved	mg/l	--	0.3	0.46	0.175	0.529	0.006	0.52	0.38
Lead, dissolved	mg/l	0.01	--	0.00004	<0.00002	0.00012	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	48.4	49.4	47	48.4	48	59
Manganese, dissolved	mg/l	--	0.05	0.204	0.194	0.159	0.162	0.16	0.17
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18.7	21.9	18.4	18.6	16	23
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	704	934	761	732	819	702
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 15-May-2007	95-6 30-Nov-2007	95-6 22-May-2008	95-6 10-Nov-2008	95-6 19-May-2009 G-27	95-6 26-Nov-2009 [36] J-7
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	<0.0006	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 25-May-2010 [29] M-25	95-6 20-Oct-2010 [29] G-22	95-6 24-May-2011 [29] G-31	95-6 29-Nov-2011 [29] 95-6	95-6 31-May-2012 95-6	95-6 28-Nov-2012 95-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	920	935	926	957	880	910
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	30	<2 [9]	14	13
Alkalinity (Total as CaCO3)	mg/l	--	--	920	935	956	957	900	920
Ammonia Nitrogen	mg/l	--	--	1.55	1.53	1.52	1.49	1.7	1.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	55	45	5	53	57
Chloride	mg/l	--	250	773	844	826	854	750	810
Conductivity	uS/cm	--	--	4210	4200	4300	4270	--	--
Conductivity (Field)	uS/cm	--	--	3944	7400	3216	3681	3499	3493
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	331	300	326	304	290	350
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	0.16	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.31	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.17	2.35	2.26	1.86	2.3	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	0.47	<0.10
Nitrogen, Organic	mg/l	--	--	0.62	0.82	0.74	0.37	0.6	0.7
pH	-	--	--	8.27	8.23	8.54	8.16	8.23	--
pH (Field)	-	--	--	7.92	8.32	7.98	7.92	7.89	8.01
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.51	0.76	0.57	0.47	0.42	0.56
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	21.9	9.5	15.4	8.6	12.2	6.2
Total Dissolved Solids	mg/l	--	500	2740	2730	2800	2780	2260	2400
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	0.0017	<0.001
Boron, dissolved	mg/l	5	--	0.81	1.1	0.80	0.87	0.82	1
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	42	41	45	41	40	45
Chromium, dissolved	mg/l	0.05	--	0.007	<0.005	<0.005	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0007	0.0007	0.0007	0.0007	<0.00050	0.0006
Copper, dissolved	mg/l	--	1	<0.001	<0.001	0.002	0.003	<0.0010	<0.001
Iron, dissolved	mg/l	--	0.3	0.36	0.40	0.22	0.26	0.52	0.19
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	55	48	52	49	47	57
Manganese, dissolved	mg/l	--	0.05	0.16	0.19	0.16	0.18	0.14	0.16
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	21	17	16	18	17	20
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	800	781	882	746	720	840
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	<0.0050	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 25-May-2010 [29] M-25	95-6 20-Oct-2010 [29] G-22	95-6 24-May-2011 [29] G-31	95-6 29-Nov-2011 [29] 95-6	95-6 31-May-2012 95-6	95-6 28-Nov-2012 95-6
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 29-May-2013 [31]	95-6 26-Nov-2013	95-6 29-May-2014 [35]	95-6 19-Nov-2014	95-6 02-Jun-2015	95-6 26-Nov-2015
				95-6	GW-5	95-6	95-6	95-6	95-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	910	940	870	890	871	936
Alkalinity, Carbonate as CaCO3	mg/l	--	--	13	18	21	16	17	16
Alkalinity (Total as CaCO3)	mg/l	--	--	920	960	890	910	888	952
Ammonia Nitrogen	mg/l	--	--	2.0	1.9	2.2	1.9	2.15	2.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	65	80	68	77	108	126
Chloride	mg/l	--	250	850	860	830	870	790	875
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3061	3154	3272	3749	3819	3954
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	340	270	300	320	276	309
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.25	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.41	0.035	0.050	0.032	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.1	7.6	9.9	3.2	3.4	4.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.65	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	1.1	5.7	7.7	1.3	1.25	1.87
pH	-	--	--	8.19	8.31	8.41	8.27	--	--
pH (Field)	-	--	--	7.60	7.67	7.90	8.09	7.87	8.03
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.0	2.7	4.6	3.7	2.20	3.85
Sulphate	mg/l	--	500 [6]	<1	<1	7	<1	2	1
Temperature (Field)	deg c	--	15	10.7	6.4	9.9	5.0	10.0	7.8
Total Dissolved Solids	mg/l	--	500	2310	2340	2180	2200	2000	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0016	0.0030	0.0018	0.0025	0.001	0.001
Boron, dissolved	mg/l	5	--	0.91	0.69	0.86	0.95	0.563	0.848
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	46	36	40	42	34.2	27.1
Chromium, dissolved	mg/l	0.05	--	<0.0050	0.0057	0.0065	<0.01 [33]	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.00068	0.00073	0.00054	0.00058	0.0005	0.0006
Copper, dissolved	mg/l	--	1	<0.0010	0.0013	0.0024	0.0016	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.16	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00059	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	55	45	48	53	46.4	58.5
Manganese, dissolved	mg/l	--	0.05	0.2	0.14	0.15	0.22	0.125	0.152
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	19	17	18	19	13.8	16.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	780	750	630	810	686	865
Zinc, dissolved	mg/l	--	5	<0.0050	0.0075	<0.0050	0.0070	<0.005	0.009
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 29-May-2013 [31]	95-6 26-Nov-2013	95-6 29-May-2014 [35]	95-6 19-Nov-2014	95-6 02-Jun-2015	95-6 26-Nov-2015
				95-6	GW-5	95-6	95-6	95-6	95-6
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 26-May-2016	95-6 17-Nov-2016	95-6 24-May-2017	95-6 29-Nov-2017	95-6 24-May-2018	95-6 22-Nov-2018
				95-6	95-6	95-6	95-6	95-6	95-6
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	940	983	932	1030	1060	1030
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	14	15	19	20	<25 [11]
Alkalinity (Total as CaCO3)	mg/l	--	--	944	997	948	1050	1070	1040
Ammonia Nitrogen	mg/l	--	--	2.80	2.08	2.30	1.99	2.53	2.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	131	89	106	69	86	154
Chloride	mg/l	--	250	846	902	860	974	899	968
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	3836	3566	>3999	3677
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	276	305	261	223	315	399
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.25 [11]	0.25	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.9	2.3	3.3	3.1	3.9	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.1	0.22	1	1.11	1.37	1.01
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.03	7.81	7.99	7.94	7.97	7.92
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.26	3.02	2.57	2.46	3.22	3.10
Sulphate	mg/l	--	500 [6]	2	1	1	1	2	1
Temperature (Field)	deg c	--	15	11.6	9.5	10.0	5.9	10.2	6.6
Total Dissolved Solids	mg/l	--	500	2260	2330	2200	2340	2450	2390
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.005	0.005	0.001	0.001	0.002
Boron, dissolved	mg/l	5	--	0.754	1.06	0.657	0.634	0.843	0.844
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.5	41.3	38.3	29	45.4	51.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.015	0.012	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	<0.0005	<0.0005	0.0005	0.0011
Copper, dissolved	mg/l	--	1	0.0017	0.0007	0.0017	0.0010	0.0014	0.0054
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.176
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	43.8	49	40.2	36.4	49.1	65.7
Manganese, dissolved	mg/l	--	0.05	0.089	0.26	0.096	0.129	0.12	0.132
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18.9	18.8	15.8	14.4	19	24
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	646	790	733	597	752	839
Zinc, dissolved	mg/l	--	5	<0.005	0.005	<0.005	<0.005	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.007	<0.002 [10]	<0.002 [10]	<0.002 [10]	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 26-May-2016	95-6 17-Nov-2016	95-6 24-May-2017	95-6 29-Nov-2017	95-6 24-May-2018	95-6 22-Nov-2018
				95-6	95-6	95-6	95-6	95-6	95-6
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 19-Jun-2019	95-6 20-Nov-2019	95-6 21-May-2020	95-6 26-Nov-2020
				95-6	95-6	95-6	95-6
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	931	924	880	941
Alkalinity, Carbonate as CaCO3	mg/l	--	--	11	<25	15	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	943	932	894	963
Ammonia Nitrogen	mg/l	--	--	1.48	2.13	1.59	1.71
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	75	179	66	90
Chloride	mg/l	--	250	902	994	1020	862
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3757	4170	3352	3416
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	299	409	--	358
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	356	--
Nitrate as N	mg/l	10.0	--	<0.1	0.4	<0.1	<0.5 [12]
Nitrite as N	mg/l	1.0	--	0.07	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.0	3.9	2.3	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.52	1.77	0.71	0.59
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	7.76	8.22	8.00	8.47
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.52	5.46	0.95	0.95
Sulphate	mg/l	--	500 [6]	1	2	<1	2
Temperature (Field)	deg c	--	15	10.8	6.0	14.9	6.4
Total Dissolved Solids	mg/l	--	500	2370	2620	2190	2410
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.686	0.614	0.608	0.599
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	40.6	54.5	47.1	45.1
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0007	0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0023	0.0011	0.0030	0.0029
Iron, dissolved	mg/l	--	0.3	0.108	0.124	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	47.9	66.2	57.9	59.6
Manganese, dissolved	mg/l	--	0.05	0.111	0.201	0.22	0.206
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17	28.8	19.6	18.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	591	882	724	747
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.002 [10]	0.004	<0.002 [12]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 19-Jun-2019	95-6 20-Nov-2019	95-6 21-May-2020	95-6 26-Nov-2020
				95-6	95-6	95-6	95-6
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 28-Jun-1995	95-7 22-Nov-1995	95-7 13-Oct-1996	95-7 18-Jun-1997	95-7 06-Nov-1997	95-7 05-Jun-1998
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	583	649	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	478	538	536	537	440	530
Ammonia Nitrogen	mg/l	--	--	0.58	0.38	0.55	0.52	0.35	0.43
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	100	55	39	23	29	40
Chloride	mg/l	--	250	402	413	420	407	384	399
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2210	2380	--	2330	1900	2160
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.42	--	--	2.72	--	--
Hardness, Calcium Carbonate	mg/l	--	--	202	231	192	243	208	211
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.7	0.1	0.1	0.1	1.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	16.8	5.95	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	16.22	5.57	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.34	7.65	--	7.75	7.81	--
Phosphate	mg/l	--	--	--	0.5	--	--	--	--
Phosphorus	mg/l	--	--	3.21	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	4	3	7	5	12	41
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1110	1280	--	1170	950	1080
Total Organic Carbon	mg/l	--	--	14	13.6	14.5	12.3	13.2	13
Total Suspended Solids	mg/l	--	--	--	--	656	993	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.34	0.31	0.42	0.44	0.42	0.44
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	31.3	33.6	28.7	37.2	31.6	29.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.28	0.63	1.09	0.65	1.33
Lead, dissolved	mg/l	0.01	--	0.0007	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	29.7	35.2	28.9	36	30.6	32.8
Manganese, dissolved	mg/l	--	0.05	1.86	2.21	1.82	2.14	1.98	2
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.03
Potassium, dissolved	mg/l	--	--	--	10.4	6.5	8.5	7.2	15.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	366	426	366	338	335	454
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.16
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 28-Jun-1995	95-7 22-Nov-1995	95-7 13-Oct-1996	95-7 18-Jun-1997	95-7 06-Nov-1997	95-7 05-Jun-1998
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 29-Oct-1998	95-7 06-May-1999	95-7 19-Oct-1999	95-7 05-May-2000	95-7 24-Oct-2000	95-7 14-Jun-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	644	610	732	684	573	540
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	32
Alkalinity (Total as CaCO3)	mg/l	--	--	528	500	600	561	552	497
Ammonia Nitrogen	mg/l	--	--	0.6	0.12	0.52	0.01	0.14	0.63
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	26	25	26	--	27
Chloride	mg/l	--	250	420	432	314	365	440	420
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2130	2040	2040	2000	2220	1900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	172	222	204	240	199	206
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	2.5	0.3	0.5	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.12	1.23	--	--	0.95	1.45
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.52	1.11	--	--	0.81	0.82
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.1	7	7.5	7.4	7.44	7.3
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.87	0.67
Sulphate	mg/l	--	500 [6]	9	6	14	11	15	13
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1070	1010	1020	1000	1120	1160
Total Organic Carbon	mg/l	--	--	16.2	14.2	15.1	12.7	--	12.8
Total Suspended Solids	mg/l	--	--	--	--	624	536	916	528
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.003	0.001
Boron, dissolved	mg/l	5	--	0.57	0.38	0.59	0.45	0.47	0.42
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.5	31.6	32.9	36.6	28.3	34.1
Chromium, dissolved	mg/l	0.05	--	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.52	1.11	2.82	5.2	0.24	0.39
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0022	0.0002
Magnesium, dissolved	mg/l	--	--	25.6	34.3	29.3	35.6	31.2	29.3
Manganese, dissolved	mg/l	--	0.05	2.12	2.15	1.78	2	2.07	2.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.6	4.1	11.1	6.1	9.7	5.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	400	393	417	410	486	377
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.11	0.17	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.011

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 29-Oct-1998	95-7 06-May-1999	95-7 19-Oct-1999	95-7 05-May-2000	95-7 24-Oct-2000	95-7 14-Jun-2001
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 23-Nov-2001	95-7 23-May-2002	95-7 06-Nov-2002	95-7 30-May-2003	95-7 09-Oct-2003	95-7 14-May-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	584	488	662	586	--	531
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	479	400	543	480	324	435
Ammonia Nitrogen	mg/l	--	--	0.27	0.6	0.66	0.47	0.33	0.57
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	2	--
Chemical Oxygen Demand	mg/l	--	--	37	20	39	2	58	59
Chloride	mg/l	--	250	398	382	428	382	298	413
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1930	1940	2240	1970	1620	2090
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	71	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	202	207	194	195	176	198
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.2	0.2	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.52	0.84	1.43	1.06	1.49	2.02
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	1.25	0.24	0.77	0.59	1.16	1.45
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.02	6.97	7.6	6.9	7.2	7.3
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.94	0.4	0.66	0.36	0.51	0.91
Sulphate	mg/l	--	500 [6]	21	16	17	17	31	13
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1190	1020	1260	1150	859	1045
Total Organic Carbon	mg/l	--	--	19	13	14	13.4	31	17.4
Total Suspended Solids	mg/l	--	--	928	348	460	188	417	276
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.002	0.003	0.001	0.001
Boron, dissolved	mg/l	5	--	0.57	0.4	0.51	0.36	0.512	0.362
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	29.6	32.6	33.1	30.2	29.9	31.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.016	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.011	0.006
Iron, dissolved	mg/l	--	0.3	0.07	0.76	0.08	0.79	5.78	0.048
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0012	0.0003	0.0007	0.0007
Magnesium, dissolved	mg/l	--	--	31	30.6	29	29	24.6	29
Manganese, dissolved	mg/l	--	0.05	2.18	2.26	1.92	2.21	1.13	1.48
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	5.6	8.7	7.6	7.8	9.2	7.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	402	357	425	368	265	379
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.016	0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 23-Nov-2001	95-7 23-May-2002	95-7 06-Nov-2002	95-7 30-May-2003	95-7 09-Oct-2003	95-7 14-May-2004
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 19-Nov-2004	95-7 24-May-2005	95-7 16-Nov-2005	95-7 25-May-2006	95-7 21-Nov-2006	95-7 15-May-2007
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	655	593	132	545	615	573
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	537	486	540	545	615	573
Ammonia Nitrogen	mg/l	--	--	0.65	0.46	<0.01	0.52	<0.01	0.15
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	351	7	58	42	54	91
Chloride	mg/l	--	250	448	369	364	430	456	362
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2290	2500	2000	1800	2150	1600
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	209	230	211	211	233	230
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1	0.3	0.5	0.3	0.5	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.44	1.63	1.26	2.12	0.93	1.28
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.79	1.17	<1.26	1.6	<0.93	1.13
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.8	7.3	--	7.9	7.6	8.2
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	4.95	0.5	1.86	--	--	--
Sulphate	mg/l	--	500 [6]	20	10	28	21	9	11
Temperature (Field)	deg c	--	15	--	9.9	--	12.5	7	9.7
Total Dissolved Solids	mg/l	--	500	1145	1120	1220	1250	1370	1190
Total Organic Carbon	mg/l	--	--	23.5	20.2	23.8	--	--	--
Total Suspended Solids	mg/l	--	--	1250	233	319	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.001	<0.001	0.0027	0.0033
Boron, dissolved	mg/l	5	--	0.449	0.363	0.478	0.352	0.466	0.352
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00006
Calcium, dissolved	mg/l	--	--	32.9	34.9	33.4	32.3	36.2	35.6
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.008
Copper, dissolved	mg/l	--	1	0.005	<0.002	0.008	0.003	0.005	0.003
Iron, dissolved	mg/l	--	0.3	0.072	0.097	0.068	0.089	0.067	0.18
Lead, dissolved	mg/l	0.01	--	0.0006	0.0011	0.0007	0.0004	<0.0001	0.00011
Magnesium, dissolved	mg/l	--	--	30.8	34.8	31	31.6	34.7	34.2
Manganese, dissolved	mg/l	--	0.05	1.38	1.59	1.4	1.72	1.56	2
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	8.2	8.4	9.9	7.8	9.5	8
Selenium, dissolved	mg/l	0.05	--	--	<0.001	0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	405	379	441	401	452	388
Zinc, dissolved	mg/l	--	5	0.005	0.007	0.008	0.012	0.009	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 19-Nov-2004	95-7 24-May-2005	95-7 16-Nov-2005	95-7 25-May-2006	95-7 21-Nov-2006	95-7 15-May-2007
Semi-VOCs									
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 30-Nov-2007	95-7 22-May-2008	95-7 10-Nov-2008	95-7 19-May-2009 G-19	95-7 26-Nov-2009 J-12	95-7 25-May-2010 [29] M-19
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	603	540	615	560	599	552
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<2 [9]	<2 [9]	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	603	540	615	560	599	552
Ammonia Nitrogen	mg/l	--	--	<0.01	0.23	<0.01	0.21	0.07	0.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	127	59	45	45	70	55
Chloride	mg/l	--	250	439	413	483	397	447	383
Conductivity	uS/cm	--	--	--	--	--	2320	2490	2350
Conductivity (Field)	uS/cm	--	--	1750	1300	2100	1900	2149	2310
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	221	214	225	221	214	234
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.5	0.1	0.5	<0.10	0.37	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.24	1.93	0.85	0.81	0.64	1.14
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	<2.24	1.7	<0.85	0.6	0.57	0.62
pH	-	--	--	--	--	--	7.89	8.20	8.12
pH (Field)	-	--	--	7.9	7.5	7.6	--	7.21	7.51
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.87	1.71	3.58
Sulphate	mg/l	--	500 [6]	19	21	10	15	16	15
Temperature (Field)	deg c	--	15	4.5	9.5	6	9	8.5	15.7
Total Dissolved Solids	mg/l	--	500	1420	1250	1400	1510	1620	1530
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0069	0.0038	0.0044	0.003	0.004	<0.01
Boron, dissolved	mg/l	5	--	0.46	0.37	0.476	0.49	0.49	0.46
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	35.3	33.6	35.8	34	33	36
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.005	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.0005	0.0006	0.0008
Copper, dissolved	mg/l	--	1	0.004	<0.002	0.003	0.006	0.004	0.003
Iron, dissolved	mg/l	--	0.3	0.084	0.717	0.205	0.11	<0.03	0.52
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	32.4	31.8	33	33	32	35
Manganese, dissolved	mg/l	--	0.05	1.6	2.25	0.938	0.63	0.31	2.16
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	7.8	9.6	7	10	9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	519	417	460	373	420	368
Zinc, dissolved	mg/l	--	5	<0.005	0.008	<0.005	<0.01	0.01	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 30-Nov-2007	95-7 22-May-2008	95-7 10-Nov-2008	95-7 19-May-2009 G-19	95-7 26-Nov-2009 J-12	95-7 25-May-2010 [29] M-19
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	<0.0006	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 20-Oct-2010 [29]	95-7 24-May-2011 [29]	95-7 29-Nov-2011 [42]	95-7 31-May-2012 [30]	95-7 28-Nov-2012	95-7 29-May-2013 [31]
				G-21	G-29	95-7	95-7	95-7	95-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	593	575	579	570	580	560
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	14	11	4.9	7.0	4.3
Alkalinity (Total as CaCO3)	mg/l	--	--	593	589	590	570	590	560
Ammonia Nitrogen	mg/l	--	--	<0.02	0.28	<0.02	0.33	0.10	0.59
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	55	50	60	50	59	64
Chloride	mg/l	--	250	450	400	430	390	410	420
Conductivity	uS/cm	--	--	2460	2420	2430	--	--	--
Conductivity (Field)	uS/cm	--	--	2405	2191	2272	2020	2146	1975
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	235	258	219	180	240	240
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	0.12
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	0.036	<0.010	0.092
Nitrogen, Total Kjeldahl	mg/l	--	--	0.96	0.76	0.82	1.4	1.1	1.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	<0.10	0.21
Nitrogen, Organic	mg/l	--	--	<0.96	0.48	<0.82	1.07	1	1.31
pH	-	--	--	8.07	8.42	8.31	7.96	--	7.92
pH (Field)	-	--	--	7.66	7.40	7.68	7.62	7.71	7.75
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.19	0.67	1.06	0.66	0.88	2.8
Sulphate	mg/l	--	500 [6]	8	10	9	<1	<1	1
Temperature (Field)	deg c	--	15	12.3	13.5	7.9	12.0	6.2	11.0
Total Dissolved Solids	mg/l	--	500	1600	1570	1580	1280	1360	1340
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.01	<0.01	0.0028	0.001	0.0011
Boron, dissolved	mg/l	5	--	0.56	0.48	0.52	0.36	0.58	0.45
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	38	39	35	28	36	37
Chromium, dissolved	mg/l	0.05	--	0.009	<0.005	<0.005	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0009	0.0010	0.0006	0.0012	0.0011	0.00088
Copper, dissolved	mg/l	--	1	0.002	0.003	0.003	0.0026	0.002	0.0041
Iron, dissolved	mg/l	--	0.3	0.12	0.38	<0.03	0.86	0.15	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.00090	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	34	39	32	26	35	35
Manganese, dissolved	mg/l	--	0.05	1.89	2.15	0.83	5.2	2.8	2.2
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9	9	8	6.3	9.4	7.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	445	361	392	320	470	410
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	<0.0050	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 20-Oct-2010 [29] G-21	95-7 24-May-2011 [29] G-29	95-7 29-Nov-2011 [42] 95-7	95-7 31-May-2012 [30] 95-7	95-7 28-Nov-2012 95-7	95-7 29-May-2013 [31] 95-7
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0008	<0.00010	<0.00010	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.001	<0.00010	<0.00010	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.001	<0.00010	<0.00010	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.001	<0.00010	<0.00010	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0080	0.00070	<0.00050	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.001	<0.00010	<0.00010	<0.00025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.001	<0.00020	<0.00020	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0004	<0.00020	<0.00020	<0.00050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 26-Nov-2013 GW-3	95-7 29-May-2014 95-7	95-7 19-Nov-2014 95-7	95-7 02-Jun-2015 95-7	95-7 26-Nov-2015 95-7	95-7 26-May-2016 95-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	570	560	570	609	593	614
Alkalinity, Carbonate as CaCO3	mg/l	--	--	8.1	6.8	6.4	5	5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	580	570	580	614	598	617
Ammonia Nitrogen	mg/l	--	--	<0.050	0.53	0.084	0.46	0.02	0.75
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	55	66	57	93	83	94
Chloride	mg/l	--	250	430	420	460	463	433	463
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2066	2046	2362	2292	2362	2385
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	200	240	158	210	160
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.22	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.019	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.3	1.7	1.4	1.4	0.9	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	0.22	--	--	--
Nitrogen, Organic	mg/l	--	--	<1.3	1.17	1.32	0.94	0.88	0.95
pH	-	--	--	8.18	8.11	8.08	--	--	--
pH (Field)	-	--	--	7.77	7.29	7.67	7.61	7.75	7.86
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.0	1.5	2.2	1.08	0.73	1.17
Sulphate	mg/l	--	500 [6]	2	1	1	10	10	11
Temperature (Field)	deg c	--	15	6.6	10.2	6.7	10.4	7.4	11.1
Total Dissolved Solids	mg/l	--	500	1370	1300	1310	1330	1350	1400
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0018	0.0013	0.0018	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.49	0.4	0.52	0.172	0.504	0.305
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	35	31	36	24.8	24.7	25
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.00096	<0.00050	0.00074	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0040	0.0051	0.0036	0.0005	0.0016	0.0020
Iron, dissolved	mg/l	--	0.3	<0.1	0.2	<0.1	0.509	<0.1	0.376
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	34	30	36	23.4	36	23.8
Manganese, dissolved	mg/l	--	0.05	1.8	1.3	1.6	1.05	0.117	0.951
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9	6.7	9.1	4.81	7.45	5.96
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	450	360	470	322	500	266
Zinc, dissolved	mg/l	--	5	0.039	0.015	<0.0050	<0.005	0.008	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 26-Nov-2013 GW-3	95-7 29-May-2014 95-7	95-7 19-Nov-2014 95-7	95-7 02-Jun-2015 95-7	95-7 26-Nov-2015 95-7	95-7 26-May-2016 95-7
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	0.00078	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 17-Nov-2016	95-7 24-May-2017	95-7 29-Nov-2017	95-7 24-May-2018	95-7 22-Nov-2018	95-7 19-Jun-2019
				95-7	95-7	95-7	95-7	95-7	95-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	618	643	626	657	667	610
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	7	5	6	8
Alkalinity (Total as CaCO3)	mg/l	--	--	622	646	633	662	673	618
Ammonia Nitrogen	mg/l	--	--	0.11	0.60	0.07	0.63	0.10	0.75
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	72	61	82	96	105	73
Chloride	mg/l	--	250	463	480	498	462	460	458
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1257	2322	2145	2436	2112	2213
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	228	255	192	167	287	268
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.3	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	0.07
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.4	1.0	1.7	1.8	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.89	0.8	0.93	1.07	1.7	0.55
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.05	7.48	8.03	7.64	8.2	7.34
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.07	0.88	1.12	1.30	1.44	0.86
Sulphate	mg/l	--	500 [6]	8	9	11	10	8	10
Temperature (Field)	deg c	--	15	9.6	12.4	6.7	10.1	5.4	13.2
Total Dissolved Solids	mg/l	--	500	1340	1400	1330	1410	1340	1410
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.002	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.644	0.361	0.459	0.316	0.558	0.303
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	35.7	33.9	29.6	28	42.9	41.5
Chromium, dissolved	mg/l	0.05	--	0.008	0.006	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0006	<0.0005	0.0007	0.0008
Copper, dissolved	mg/l	--	1	0.0021	0.0018	0.0026	0.0030	0.0106	0.0023
Iron, dissolved	mg/l	--	0.3	<0.1	0.442	<0.1	0.555	<0.1	0.321
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	33.7	41.3	28.8	23.6	43.8	39.9
Manganese, dissolved	mg/l	--	0.05	1.75	2.23	2.1	1.65	0.567	4.25
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.24	6.42	7.89	5.98	11.6	9.46
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	473	464	387	304	536	457
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.015	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.002 [10]	<0.001	<0.001	0.007	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 17-Nov-2016	95-7 24-May-2017	95-7 29-Nov-2017	95-7 24-May-2018	95-7 22-Nov-2018	95-7 19-Jun-2019
				95-7	95-7	95-7	95-7	95-7	95-7
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 20-Nov-2019	95-7 21-May-2020	95-7 26-Nov-2020
				95-7	95-7	95-7
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	588	527	619
Alkalinity, Carbonate as CaCO3	mg/l	--	--	9	5	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	597	532	627
Ammonia Nitrogen	mg/l	--	--	0.05	0.35	0.08
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	85	66	79
Chloride	mg/l	--	250	483	505	459
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2390	2018	2170
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	292	--	255
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	246	--
Nitrate as N	mg/l	10.0	--	0.5	<0.1	<0.5 [12]
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.0	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.95	0.65	0.82
pH	-	--	--	--	--	--
pH (Field)	-	--	--	7.82	8.53	8.13
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	1.59	0.30	0.50
Sulphate	mg/l	--	500 [6]	13	22	11
Temperature (Field)	deg c	--	15	7.1	10.4	6.8
Total Dissolved Solids	mg/l	--	500	1340	1200	1290
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.432	0.357	0.427
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	44.7	38.1	38.4
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0008	<0.0005
Copper, dissolved	mg/l	--	1	0.0075	0.0060	0.0055
Iron, dissolved	mg/l	--	0.3	0.383	0.18	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	43.8	36.6	38.7
Manganese, dissolved	mg/l	--	0.05	0.626	2.54	1.05
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13	8.31	10
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	455	421	466
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.003	<0.002 [12]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 20-Nov-2019	95-7 21-May-2020	95-7 26-Nov-2020
				95-7	95-7	95-7
Semi-VOCs						
Naphthalene	mg/l	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 28-Jun-1995	95-9 22-Nov-1995	95-9 12-Oct-1996	95-9 06-Nov-1997	95-9 05-Jun-1998	95-9 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	834	912	--	--	--	862
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	23	--	--	--	54
Alkalinity (Total as CaCO3)	mg/l	--	--	716	785	--	770	663	796
Ammonia Nitrogen	mg/l	--	--	1.6	5	--	0.86	0.9	2
Chemical Oxygen Demand	mg/l	--	--	850	850	--	23	42	15
Chloride	mg/l	--	250	380	405	--	358	366	382
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2440	2600	2650	2540	2430	2600
Dissolved Oxygen (Field)	mg/l	--	--	1.26	1.26	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	59	71	--	55	57	47
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	0.1	1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	30.3	50	--	--	--	13.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	28.7	45	--	--	--	11.8
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.51	8.81	8.38	8.9	--	8.4
Phosphate	mg/l	--	--	--	2.4	--	--	--	--
Phosphorus	mg/l	--	--	1.63	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	5	10	--	1	44	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1230	1230	1330	1270	1192	1360
Total Organic Carbon	mg/l	--	--	37.1	37.1	--	10.5	8.9	11.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.91	0.91	--	1.02	1.1	1.13
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	7.97	7.7	--	5.73	7.38	4.65
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	--	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.03	0.03	--	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.06	0.06	--	3.05	3.25	1
Lead, dissolved	mg/l	0.01	--	0.0009	0.0009	--	0.0002	0.0002	0.0017
Magnesium, dissolved	mg/l	--	--	9.3	12.4	--	9.66	9.24	8.46
Manganese, dissolved	mg/l	--	0.05	0.03	0.03	--	0.06	0.06	0.03
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	18.6	--	14.4	22.4	20.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	484	556	--	478	644	573
Zinc, dissolved	mg/l	--	5	0.01	0.01	--	0.01	0.04	0.02
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	--	--	--	--
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 24-Oct-2000	95-9 14-Jun-2001	95-9 06-Nov-2002	95-9 30-May-2003	95-9 19-Nov-2004	95-9 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1080	837	1040	897	1030	200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	40	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	887	753	855	735	845	820
Ammonia Nitrogen	mg/l	--	--	1.16	1.94	1.7	1.5	1.59	1.61
Chemical Oxygen Demand	mg/l	--	--	--	23	49	41	30	43
Chloride	mg/l	--	250	442	373	355	305	410	320
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2550	2250	2280	2000	2870	2100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	48	36	39	130	44	48
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	<1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.12	3.65	2.33	2.57	2.03	2.43
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0	1.71	0.63	1.07	0.44	0.82
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.66	8.7	8.6	7.6	8.4	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	5.86	7.94	2.11	3.05	0.98	2.84
Sulphate	mg/l	--	500 [6]	1	1	2	1	10	<1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1440	1420	1410	1310	1435	1500
Total Organic Carbon	mg/l	--	--	--	9.3	8.6	10.4	9.3	9.3
Total Suspended Solids	mg/l	--	--	4940	5210	1900	2990	4200	1460
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	1.16	1.05	1.02	0.98	1.13	1.12
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	4.28	2.76	4.77	31.2	3.62	4.4
Chromium, dissolved	mg/l	0.05	--	--	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.16	0.06	0.06	5.07	0.144	0.1
Lead, dissolved	mg/l	0.01	--	0.022	0.0002	0.0021	0.0029	0.0006	0.0017
Magnesium, dissolved	mg/l	--	--	9.05	7.13	7.67	12.6	8.45	9.08
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.18	0.006	0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	18.1	7.5	13.3	13.8	14.8	16.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	634	535	577	494	567	672
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.02	0.005	0.007
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.063	0.001	0.001	0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 15-May-2007	95-9 10-Nov-2008	95-9 26-Nov-2009	95-9 24-May-2011 [29]	95-9 28-Nov-2012	95-9 29-May-2014 [35]
						J-9	G-30	95-9	95-9
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	815	820	760	756	760	770
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	29	46	22	36
Alkalinity (Total as CaCO3)	mg/l	--	--	815	820	789	802	780	800
Ammonia Nitrogen	mg/l	--	--	1.78	1.6	1.52	1.59	2.0	2.1
Chemical Oxygen Demand	mg/l	--	--	94	28	38	30	35	39
Chloride	mg/l	--	250	355	397	337	344	410	490
Conductivity	uS/cm	--	--	--	--	2490	2620	--	--
Conductivity (Field)	uS/cm	--	--	1800	2100	2294	2266	2245	2276
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	39	40	34	43	52	44
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.78	2.47	1.78	1.98	2.9	3.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	1	0.87	0.26	0.39	0.9	1.3
pH	-	--	--	--	--	8.61	8.81	--	8.70
pH (Field)	-	--	--	8.8	8.6	8.25	8.67	8.74	8.47
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	1.36	1.54	1.6	1.6
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	1	<1
Temperature (Field)	deg c	--	15	11.4	7	8.8	19.3	6.7	10.4
Total Dissolved Solids	mg/l	--	500	1390	1470	1620	1700	1720	1560
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0015	0.0012	0.002	<0.01	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	0.988	1.01	0.99	1.3	1.2	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	2.92	3.25	2	4	5	3.8
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.0002	0.0003	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.001	0.002	<0.001	0.0020
Iron, dissolved	mg/l	--	0.3	0.173	0.044	0.04	0.04	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00013	0.00012	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	7.61	7.82	7	8	9.6	8.5
Manganese, dissolved	mg/l	--	0.05	0.005	0.003	<0.01	<0.01	0.005	0.0033
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.3	14.1	11	14	15	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	519	548	501	596	700	490
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.01	0.01	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs									
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	0.00015	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	0.00031	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 26-Nov-2015	95-9 24-May-2017	95-9 22-Nov-2018	95-9 21-May-2020
				95-9	95-9	95-9	95-9
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	798	802	824	723
Alkalinity, Carbonate as CaCO3	mg/l	--	--	23	21	25	32
Alkalinity (Total as CaCO3)	mg/l	--	--	821	823	849	755
Ammonia Nitrogen	mg/l	--	--	2.03	1.85	1.51	1.84
Chemical Oxygen Demand	mg/l	--	--	53	78	39	35
Chloride	mg/l	--	250	502	406	429	523
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2670	2770	2238	2480
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	37.3	43	66	--
Hardness, Calcium Carbonate, dissolved	mg/l	--	--	--	--	--	102
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	2.9	2.2	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.47	1.05	0.69	0.16
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.78	8.62	8.81	7.71
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.72	1.21	0.71	0.79
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	7.4	11.9	6.4	12.7
Total Dissolved Solids	mg/l	--	500	1670	1490	1560	1520
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1.09	1.15	1.19	0.857
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3.32	3.39	10.6	18.4
Chromium, dissolved	mg/l	0.05	--	<0.001	0.011	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	0.0008
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0021	0.0015
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	1.88
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	0.0023
Magnesium, dissolved	mg/l	--	--	7.04	8.42	9.58	13.7
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	<0.005	0.072
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.3	14.4	15.9	16.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	637	584	614	627
Zinc, dissolved	mg/l	--	5	0.009	<0.005	<0.005	0.009
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.002 [10]	<0.001	0.002
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Footnotes:	
	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Monitoring location was frozen during this sampling event. No sample was collected.
(4)	Monitoring location could not be located during this sampling event.
(5)	Monitoring location was not monitored due to dry conditions observed in the area.
(6)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(7)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(8)	Metals MRL elevated due to matrix interference.
(9)	pH < 8.3. Calculations not available.
(10)	Elevated Reporting Limit due to matrix interference.
(11)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(12)	GEN02 Elevated Reporting Limit due to matrix interference.
(13)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(14)	Due to matrix interference 2 X dilution factor required for VOCs. Arsenic MRL elevated due to matrix interference.
(15)	Waterra tubing could not be extracted from well. No sample was collected.
(16)	N-NO2,N-NO3 MRL elevated due to matrix interference.
(17)	Due to matrix interference 2 X dilution factor required for VOCs. TP MRL elevated due to insufficient sample volume.
(18)	N-NO2,N-NO3 MRL elevated due to matrix interference. Sediment was not included in Metals Analysis.
(19)	Nitrite/Nitrate: Due to colour interferences, sample required dilution. Detection limits were adjusted accordingly.
(20)	Monitoring location was dry during this sampling event. No sample was collected.
(21)	Insufficient sample volume was collected for analysis.
(22)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
(23)	TKN MRL elevated due to matrix interference. Metals MRL elevated due to matrix interference.
(24)	Arsenic MRL elevated due to matrix interference. Due to matrix interference 10x dilution factor required for VOCs.
(25)	Metal Analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
(26)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(27)	Elevated detection limit due to dilution required because of high target analyte concentration.
(28)	INOG6 Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions.
(29)	Arsenic MRL elevated due to matrix interference.
(30)	Elevated ion balance result was confirmed by re-analysis.
(31)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(32)	Inadvertently, no sample was collected at this location.
(33)	Metal Analysis:Detection Limit was raised due to matrix interferences.
(34)	VOC Analysis: Due to high concentrations of non-target analytes, sample required dilution. Detection limits were adjusted accordingly.
(35)	Elevated ion balance was confirmed by re-analysis.
(36)	TKN results may be biased low due to elevated dissolved salt content.
(37)	Detection Limit was raised due to matrix interferences.
(38)	Due to matrix interference 10x dilution factor required for VOCs.
(39)	Due to matrix interference 2x dilution factor required for VOCs.
(40)	VOC Analysis: Due to high sediment in vials resulting in smaller amounts of sample available for analysis, the sample required dilution. The detection limits were adjusted accordingly.
(41)	Insufficient sample volume was collected for analysis. Field Parameters were not measured.
(42)	Due to matrix interference 2x dilution factor required for VOCs. Arsenic MRL elevated due to matrix interference.

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 18-Sep-1992	L5 19-Oct-1992	L5 11-Nov-1992	L5 08-Jun-1993	L5 15-Nov-1993	L5 15-Jun-1994
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	185	1696	1677	1140
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	0.1	--	0.83	22.6	26.51	19.1
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	9.6	10.3	3.8	70	81	1.6
Chemical Oxygen Demand	mg/l	--	--	220	--	69.2	370	331	158
Chloride	mg/l	--	250	410	379	76.5	342	533	370
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	669	3520	3970	3830
Cyanide	mg/l	0.2	--	0.078	0.012	0.014	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	455	--	--
Dissolved Organic Carbon	mg/l	--	5	--	--	17.5	--	107	76
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	1.6	0.1	2.07
Fluoride	mg/l	1.5	--	**1.56**	**1.66**	0.84	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	227	1320	1340	858
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	6.9	0.1	7.18	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.15	0.1	0.1	--
Nitrogen, Total Kjeldahl	mg/l	--	--	37.7	28.7	2.1	32	31.92	23.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	37.6	--	1.27	9.4	5.41	4.4
pH (Field)	-	--	--	7.79	7.51	7.65	6.74	7.52	6.99
Phosphorus	mg/l	--	--	0.28	0.17	0.26	0.3	0.37	0.11
Sulphate	mg/l	--	500 [16]	207.3	164	60.7	42.2	83	109
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	--	2572	2344	1920
Total Organic Carbon	mg/l	--	--	--	--	17.5	--	107	76
Total Suspended Solids	mg/l	--	--	79	25	130	--	--	30
Metals									
Aluminum	mg/l	--	--	4.61	0.1	1.79	--	0.293	--
Antimony	mg/l	0.006	--	0.001	0.001	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.001	0.001	--	--	--
Barium	mg/l	1	--	**1.78**	--	0.1	--	--	--
Bismuth	mg/l	--	--	0.31	0.1	--	--	--	--
Boron	mg/l	5	--	**11.9**	--	0.37	**11.4**	**10.4**	**8.454**
Cadmium	mg/l	0.005	--	**0.051**	**0.008**	0.005	--	--	0.0001
Calcium	mg/l	--	--	--	--	63	344	345	177
Chromium	mg/l	0.05	--	**0.31**	0.05	0.05	**0.064**	0.023	0.01
Cobalt	mg/l	--	--	0.05	0.05	--	--	--	--
Copper	mg/l	--	1	0.05	0.05	0.05	0.004	0.01	0.0131
Iron	mg/l	--	0.3	1.92	7.16	1.55	0.003	8.086	1.918
Lead	mg/l	0.01	--	**0.05**	**0.05**	**0.05**	**0.0104**	**0.1**	0.0021
Magnesium	mg/l	--	--	--	--	17	112	116	101
Manganese	mg/l	--	0.05	8.56	1.71	0.13	1.813	1.637	0.688
Mercury	mg/l	0.001	--	**0.21**	**0.1**	**0.16**	--	--	--
Molybdenum	mg/l	--	--	0.05	0.05	--	--	--	--
Nickel	mg/l	--	--	0.17	0.06	0.05	0.029	0.02	0.02
Potassium	mg/l	--	--	--	--	11.8	76	68	62
Selenium	mg/l	0.05	--	0.001	0.001	--	--	--	--
Silver	mg/l	--	--	0.05	0.05	--	--	--	--
Sodium	mg/l	--	200 [17]	--	--	53.9	367	394	343
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	0.2	0.7	0.1	--	--	--
Titanium	mg/l	--	--	0.1	0.07	--	--	--	--
Vanadium	mg/l	--	--	0.1	0.1	--	--	--	--
Zinc	mg/l	--	5	0.13	0.05	0.05	0.032	0.022	0.031
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.012	0.005	0.003	0.06	0.098	0.055

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 18-Sep-1992	L5 19-Oct-1992	L5 11-Nov-1992	L5 08-Jun-1993	L5 15-Nov-1993	L5 15-Jun-1994
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 02-Nov-1994	L5 28-Jun-1995	L5 24-Nov-1995	L5 12-Jun-1996	L5 12-Oct-1996	L5 17-Jun-1997
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1565	1680	1650	2000	1970	2210
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	12.38	20	25	31	27	5.14
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	31.7	16	15	173	27	95
Chemical Oxygen Demand	mg/l	--	--	321	202	270	600	350	495
Chloride	mg/l	--	250	378	312	342	393	492	525
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4350	3850	4540	4650	4750	4890
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	376	--	16	233	433	132
Dissolved Organic Carbon	mg/l	--	5	107	74.1	114	131	125	140
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.77	9.47	--	0.29	0.36	1.71
Fluoride	mg/l	1.5	--	--	--	--	--	--	0.5
Hardness, Calcium Carbonate	mg/l	--	--	1256	1167	1640	2090	1890	1790
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	--	--	--
Nitrite as N	mg/l	1.0	--	0.1	0.1	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	28	25.5	30	38.8	39.4	34.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	15.62	5.5	5	7.8	12.4	29.56
pH (Field)	-	--	--	--	7.25	7.66	6.26	6.6	6.93
Phosphorus	mg/l	--	--	0.45	0.44	0.43	0.66	0.45	0.8
Sulphate	mg/l	--	500 [16]	61	247	199	--	--	340
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2120	1930	2270	2330	2390	2460
Total Organic Carbon	mg/l	--	--	107	74.1	114	131	125	--
Total Suspended Solids	mg/l	--	--	12	39	85	59	2	13
Metals									
Aluminum	mg/l	--	--	0.37	--	--	--	--	0.17
Antimony	mg/l	0.006	--	--	--	--	--	--	0.003
Arsenic	mg/l	0.01	--	--	--	--	--	--	**0.017**
Barium	mg/l	1	--	--	--	--	--	--	0.396
Bismuth	mg/l	--	--	--	--	--	--	--	14.9
Boron	mg/l	5	--	**6.797**	**9**	**12**	**14.3**	**16.9**	**14.9**
Cadmium	mg/l	0.005	--	0.0001	0.0001	0.0001	--	--	0.0001
Calcium	mg/l	--	--	295	290.6	370	415	383	399
Chromium	mg/l	0.05	--	0.01	0.03	0.02	--	--	0.01
Cobalt	mg/l	--	--	--	--	--	--	--	0.01
Copper	mg/l	--	1	0.0036	--	0.0016	0.005	0.004	0.02
Iron	mg/l	--	0.3	2.44	2.25	2.67	1.66	1.21	0.31
Lead	mg/l	0.01	--	**0.0127**	0.0008	0.0012	0.0024	0.0002	0.0002
Magnesium	mg/l	--	--	126	105.8	171	252	224	189
Manganese	mg/l	--	0.05	1.011	1.06	1.08	0.645	0.84	0.85
Mercury	mg/l	0.001	--	0.0001	--	--	--	--	0.0003
Molybdenum	mg/l	--	--	--	--	--	--	--	0.11
Nickel	mg/l	--	--	0.02	0.03	0.02	0.02	0.02	0.02
Potassium	mg/l	--	--	80	67.2	80.4	97.5	99.2	91.4
Selenium	mg/l	0.05	--	0.005	--	--	--	--	0.015
Silver	mg/l	--	--	0.0073	--	--	--	--	0.02
Sodium	mg/l	--	200 [17]	372	324.7	476	481	514	493
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	0.02
Vanadium	mg/l	--	--	--	--	--	--	--	0.013
Zinc	mg/l	--	5	0.01	0.02	0.01	0.011	0.01	0.08
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.03	0.001	--	0.296	--	0.94

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 02-Nov-1994	L5 28-Jun-1995	L5 24-Nov-1995	L5 12-Jun-1996	L5 12-Oct-1996	L5 17-Jun-1997
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 05-Nov-1997	L5 05-Jun-1998	L5 26-Aug-1998	L5 29-Oct-1998	L5 27-Nov-1998	L5 30-Jun-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1610	1960	1330	1820	1980	1610
Ammonia, unionized	mg/l	--	--	--	--	--	0.05	0.01	--
Ammonia Nitrogen	mg/l	--	--	31.4	32.5	18.6	25.8	1.26	30.3
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	37	40	13	15	14	24
Chemical Oxygen Demand	mg/l	--	--	388	328	212	316	270	324
Chloride	mg/l	--	250	540	471	281	440	470	529
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4680	4610	3360	4210	--	4390
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	407	392	197	308	611	95
Dissolved Organic Carbon	mg/l	--	5	111	82	72	90.6	97.2	101
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	2.85	3.39	2.98	5.49	--	3.59
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1580	1560	1030	1590	1460	1310
Hydrogen Sulfide	mg/l	--	0.05	--	0.37	0.08	--	0.34	0.02
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	38	33.9	20.7	28.6	17.2	37.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	6.6	1.4	2.1	2.8	15.94	7.5
pH (Field)	-	--	--	6.75	--	7.39	6.9	--	7.1
Phosphorus	mg/l	--	--	0.35	0.34	0.3	0.34	0.34	0.31
Sulphate	mg/l	--	500 [16]	--	84	--	--	--	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	2310	1690	2100	--	2200
Total Organic Carbon	mg/l	--	--	111	82	72	90.6	97.2	101
Total Suspended Solids	mg/l	--	--	44	23	73	28	19	48
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	--	--	--	--	--	--
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	14.3	14.3	8.6	14	14.9	13.3
Cadmium	mg/l	0.005	--	--	--	--	--	--	--
Calcium	mg/l	--	--	295	290	240	304	297	270
Chromium	mg/l	0.05	--	--	--	--	--	--	--
Cobalt	mg/l	--	--	--	--	--	--	--	--
Copper	mg/l	--	1	0.0071	0.0281	0.0051	0.008	0.0005	0.003
Iron	mg/l	--	0.3	2.07	2.07	9.31	9.83	5.57	7.05
Lead	mg/l	0.01	--	0.0019	0.0002	0.0002	0.0002	0.0002	0.0006
Magnesium	mg/l	--	--	203	200	104	199	171	153
Manganese	mg/l	--	0.05	1.11	1.39	1.24	1.74	1.33	1.37
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	0.03	0.02	0.02	0.02	0.02	0.02
Potassium	mg/l	--	--	96.8	89.4	66.7	79.3	85.6	88.6
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	486	452	312	532	543	578
Sulfur	mg/l	--	--	--	--	0.08	0.02	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	0.01	0.01	0.05	0.01	0.01	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.016	0.049	0.001	0.001	0.035	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 05-Nov-1997	L5 05-Jun-1998	L5 26-Aug-1998	L5 29-Oct-1998	L5 27-Nov-1998	L5 30-Jun-1999
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 18-Oct-1999	L5 03-May-2000	L5 25-Oct-2000	L5 13-Jun-2001	L5 20-Sep-2001	L5 21-Nov-2001
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1800	1850	2180	1900	--	1890
Ammonia, unionized	mg/l	--	--	--	--	--	0.07	--	<0.02
Ammonia Nitrogen	mg/l	--	--	19	28.5	29.6	33.6	--	38.3
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	23	38	--	319	207	15
Chemical Oxygen Demand	mg/l	--	--	170	240	--	728	490	292
Chloride	mg/l	--	250	473	360	516	530	515	500
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3970	4070	4430	4300	4080	4710
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	469	340	--	312	--	265
Dissolved Organic Carbon	mg/l	--	5	87.2	85.2	--	--	--	139
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	4.98	2.2	3.14	--	--	3.6
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1430	1340	1392	1716	--	1461
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.1	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	19.8	28.4	36.3	40	40.2	48.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.8	0	6.7	6.4	--	9.9
pH (Field)	-	--	--	6.9	6.67	6.97	6.7	7.18	6.53
Phosphorus	mg/l	--	--	0.39	0.31	--	0.58	0.41	0.21
Sulphate	mg/l	--	500 [16]	--	--	22	357	58	25
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2050	--	2820	3080	--	2730
Total Organic Carbon	mg/l	--	--	87.2	85.2	--	249	--	139
Total Suspended Solids	mg/l	--	--	42	54	60	80	124	76
Metals									
Aluminum	mg/l	--	--	--	--	--	--	1.24	--
Antimony	mg/l	0.006	--	--	--	--	--	0.006	--
Arsenic	mg/l	0.01	--	--	--	0.001	0.001	--	0.001
Barium	mg/l	1	--	--	--	--	--	0.615	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	14.5	11.6	18.2	13.5	14.6	17.1
Cadmium	mg/l	0.005	--	--	--	0.0001	0.0001	0.01	0.0001
Calcium	mg/l	--	--	298	267	292	387	--	275
Chromium	mg/l	0.05	--	--	--	0.02	0.01	0.02	0.01
Cobalt	mg/l	--	--	--	--	0.0352	0.147	0.01	0.0267
Copper	mg/l	--	1	0.0042	0.0085	0.0077	0.009	0.01	0.114
Iron	mg/l	--	0.3	7.47	8.27	15.2	18.2	8.22	8.61
Lead	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0024	0.1	0.0041
Magnesium	mg/l	--	--	165	161	161	182	--	188
Manganese	mg/l	--	0.05	1.54	1.56	2.38	1.9	1.54	1.43
Mercury	mg/l	0.001	--	--	--	0.0001	0.0001	--	0.0001
Molybdenum	mg/l	--	--	--	--	0.002	0.041	0.02	0.005
Nickel	mg/l	--	--	0.02	0.02	0.07	0.02	0.02	0.02
Potassium	mg/l	--	--	83.4	77.9	77.6	116	--	95.6
Selenium	mg/l	0.05	--	--	--	0.001	0.001	--	0.001
Silver	mg/l	--	--	--	--	--	--	0.01	--
Sodium	mg/l	--	200 [17]	520	471	590	525	--	542
Sulfur	mg/l	--	--	0.02	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	0.2	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	0.005	--
Zinc	mg/l	--	5	0.01	0.07	0.01	0.2	0.06	0.19
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.039	0.045	0.283	0.197	0.012

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 18-Oct-1999	L5 03-May-2000	L5 25-Oct-2000	L5 13-Jun-2001	L5 20-Sep-2001	L5 21-Nov-2001
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 22-May-2002	L5 08-Nov-2002	L5 31-May-2003	L5 23-Jul-2003	L5 21-Oct-2003	L5 17-May-2004
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1820	2190	1890	1820	2120	2080
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	0.26
Ammonia Nitrogen	mg/l	--	--	1.53	35	31.5	37.4	39.4	30.2
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	49	507	84	58	53	346
Chemical Oxygen Demand	mg/l	--	--	335	986	390	371	416	669
Chloride	mg/l	--	250	404	458	419	470	477	439
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3500	4900	--	3570	4630	--
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	344	550	440	566	525	137
Dissolved Organic Carbon	mg/l	--	5	66	524	141	231	188	203
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	3.16	4.1	--	2.73	--	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1470	1744	1309	1350	1380	1460
Hydrogen Sulfide	mg/l	--	0.05	0.44	24.9	11.7	5.7	4.94	5.6
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.2	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	31.5	41.1	43.3	41.2	48.9	40.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	29.97	6.1	11.8	3.8	9.5	10.1
pH (Field)	-	--	--	6.68	--	--	6.83	7	--
Phosphorus	mg/l	--	--	0.35	0.68	0.42	0.55	0.47	0.42
Sulphate	mg/l	--	500 [16]	107	55	43	30	12	71
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	10300	--	2260	3130	2864	--
Total Organic Carbon	mg/l	--	--	66	524	141	231	--	--
Total Suspended Solids	mg/l	--	--	58	46	30	11	33	30
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	0.241
Antimony	mg/l	0.006	--	--	--	--	--	--	0.001
Arsenic	mg/l	0.01	--	0.001	0.003	0.003	0.004	0.007	0.002
Barium	mg/l	1	--	--	--	--	--	--	0.832
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	13.9	13.2	12.4	15.3	15.5	12.9
Cadmium	mg/l	0.005	--	0.01	0.0001	0.0001	0.0003	0.0001	<0.005
Calcium	mg/l	--	--	300	413	285	285	293	323
Chromium	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.006	0.01
Cobalt	mg/l	--	--	0.01	0.0384	0.002	0.0018	0.005	<0.005
Copper	mg/l	--	1	0.01	0.0161	0.004	0.254	0.002	0.002
Iron	mg/l	--	0.3	7.76	11.6	0.02	6.46	0.64	9.84
Lead	mg/l	0.01	--	0.1	0.0047	0.0005	0.0031	0.0006	0.02
Magnesium	mg/l	--	--	175	173	145	154	158	158
Manganese	mg/l	--	0.05	1.59	1.94	1.24	1.14	1.01	1.22
Mercury	mg/l	0.001	--	0.0001	0.0001	0.0001	0.0001	0.0001	--
Molybdenum	mg/l	--	--	0.02	0.042	0.0006	0.0002	0.01	--
Nickel	mg/l	--	--	0.03	0.02	0.02	0.01	0.01	0.02
Potassium	mg/l	--	--	82.3	88.2	86.6	95.2	104	93.6
Selenium	mg/l	0.05	--	0.001	0.005	0.001	0.006	0.006	0.001
Silver	mg/l	--	--	--	--	--	--	--	<0.005
Sodium	mg/l	--	200 [17]	469	494	463	507	546	505
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	<0.005
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	0.01
Zinc	mg/l	--	5	0.17	0.34	0.02	0.369	0.23	0.48
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.033	0.638	0.162	0.009	0.066	0.419

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 22-May-2002	L5 08-Nov-2002	L5 31-May-2003	L5 23-Jul-2003	L5 21-Oct-2003	L5 17-May-2004
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	0.002
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 23-Aug-2004	L5 18-Nov-2004	L5 25-May-2005	L5 09-Sep-2005	L5 28-Nov-2005	L5 25-May-2006
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	2560	2710	2500	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	<1	<5	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	2190	2330	2100	2220	2050	1940
Ammonia, unionized	mg/l	--	--	--	0.49	0.15	0.16	0.14	--
Ammonia Nitrogen	mg/l	--	--	29.4	37.5	34.3	37.7	32.4	31.3
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	198	237	32	24	45	132
Chemical Oxygen Demand	mg/l	--	--	631	698	377	382	342	1170
Chloride	mg/l	--	250	386	499	360	454	380	329
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3530	2000	4400	3750	--	3690
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	701.2	369	651	710	595	640
Dissolved Organic Carbon	mg/l	--	5	29.8	401.1	108.8	202.5	91.8	122
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	4	--	--	2.8	--	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1550	1690	1630	1370	1370	1390
Hydrogen Sulfide	mg/l	--	0.05	--	8.8	1	1	4	--
Nitrate as N	mg/l	10.0	--	0.3	<1	0.3	<0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	37.3	45.5	41	51.4	38.9	35.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	7.9	8	6.7	13.7	6.5	3.9
pH (Field)	-	--	--	6.7	7.2	6.6	6.9	--	--
Phosphorus	mg/l	--	--	0.57	0.46	0.42	0.36	0.38	0.83
Sulphate	mg/l	--	500 [16]	96	40	30	19	74	97
Temperature (Field)	deg c	--	15	--	--	17.8	17	--	--
Total Dissolved Solids	mg/l	--	500	2940	--	2790	2930	2760	2550
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	45	67	54	16	17	1190
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.001	0.001	0.003	0.003	0.002
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**11.5**	**14.9**	**16.3**	**15.1**	**13.2**	**10.8**
Cadmium	mg/l	0.005	--	<0.0006	<0.001	0.0001	0.0001	0.0003	0.0002
Calcium	mg/l	--	--	369	379	349	288	282	325
Chromium	mg/l	0.05	--	0.008	0.012	0.012	0.008	0.005	0.014
Cobalt	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/l	--	1	<0.002	0.042	0.008	<0.002	<0.002	0.042
Iron	mg/l	--	0.3	13.4	11.2	11.9	7.62	0.793	27.5
Lead	mg/l	0.01	--	0.0021	0.0029	0.0065	0.001	<0.001	0.0097
Magnesium	mg/l	--	--	152	181	185	159	163	139
Manganese	mg/l	--	0.05	1.55	1.38	1.62	1.27	0.649	1.52
Mercury	mg/l	0.001	--	<0.0001	<0.0001	<0.00006	<0.00005	0.00006	--
Molybdenum	mg/l	--	--	<0.01	<0.01	<0.01	<0.01	0.02	--
Nickel	mg/l	--	--	0.01	0.02	0.01	<0.01	<0.01	--
Potassium	mg/l	--	--	88.9	109	106	102	98.6	77.2
Selenium	mg/l	0.05	--	0.001	<0.001	<0.001	0.001	<0.001	--
Silver	mg/l	--	--	--	--	--	<0.005	--	--
Sodium	mg/l	--	200 [17]	566	589	549	624	592	428
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	0.12	0.149	0.045	<0.005	<0.005	--
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.237	0.31	0.03	0.021	0.08	0.028

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 23-Aug-2004	L5 18-Nov-2004	L5 25-May-2005	L5 09-Sep-2005	L5 28-Nov-2005	L5 25-May-2006
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	0.001	<0.0007	0.007	--
Styrene	mg/l	--	--	--	--	<0.0006	<0.0006	<0.006	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	<0.0004	<0.004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
1,1-Dichloroethane	mg/l	--	--	--	--	0.0001	0.0004	<0.001	<0.005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	<0.0001	<0.001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	<0.0002	<0.002	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	0.0001	0.0002	<0.001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.001	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	0.0015	0.0016	<0.002	--
Benzene	mg/l	0.001	--	--	--	**0.0013**	**0.004**	<0.005	<0.03
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
Bromoform	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
Bromomethane	mg/l	--	--	--	--	<0.002	<0.002	<0.02	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	<0.0002	<0.002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	0.0039	0.0049	<0.002	--
Chloroform	mg/l	--	--	--	--	<0.0003	<0.0003	<0.003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	0.001	0.0115	0.006	<0.03
m,p-Xylenes	mg/l	--	--	--	--	0.0015	0.0175	<0.01	<0.05
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	0.0007	0.0027	<0.003	<0.02
o-Xylene	mg/l	--	--	--	--	0.0006	0.0082	<0.005	<0.03
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	<0.0002	<0.002	--
Toluene	mg/l	0.06	0.024	--	--	0.0027	0.0115	0.014	<0.03
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.001	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.002	<0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 15-Aug-2006	L5 16-Nov-2006	L5 17-May-2007	L5 29-Aug-2007	L5 20-Nov-2007	L5 23-May-2008
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	2150	1820	2180	2210	2150	1900
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	34.6	26	37.2	36.4	37.9	39.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	86	40	41	182	<20	447
Chemical Oxygen Demand	mg/l	--	--	442	239	309	560	332	863
Chloride	mg/l	--	250	348	262	380	546	437	448
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3600	2800	3400	2200	1600	4500
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	538	395	632	553	602	494
Dissolved Organic Carbon	mg/l	--	5	201	135	95.7	165.1	83.4	226
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	1.1	2.97	--	1.19	2.46	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1340	1130	1320	1500	1260	1300
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	43.3	35.6	45.2	46.1	47.9	51.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	8.7	9.6	8	9.7	10	11.8
pH (Field)	-	--	--	6.9	--	7.1	6.7	7.9	7.8
Phosphorus	mg/l	--	--	0.34	0.33	0.31	0.27	0.36	0.43
Sulphate	mg/l	--	500 [16]	28	40	47	98	135	260
Temperature (Field)	deg c	--	15	15.5	13.1	13.5	15.2	6.9	16.5
Total Dissolved Solids	mg/l	--	500	2660	2290	2820	3140	2930	2930
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	21	66	20	35	124	308
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.005	0.003	0.0053	0.005	0.004	0.0079
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**13.3**	**11**	**13.8**	**11.6**	**14**	**12.2**
Cadmium	mg/l	0.005	--	<0.001	<0.001	0.00014	<0.0002	<0.0002	<0.005
Calcium	mg/l	--	--	296	241	280	311	261	252
Chromium	mg/l	0.05	--	0.006	0.008	0.006	0.009	0.007	0.011
Cobalt	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/l	--	1	<0.002	0.002	<0.002	<0.002	<0.002	0.002
Iron	mg/l	--	0.3	5.54	10.5	6.39	10.2	14.2	6.71
Lead	mg/l	0.01	--	<0.001	<0.001	<0.00002	<0.0002	<0.0002	<0.02
Magnesium	mg/l	--	--	145	129	151	175	148	163
Manganese	mg/l	--	0.05	0.964	1.4	0.957	0.654	0.924	1.38
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	89.2	76.1	91.5	90.1	94.7	94.8
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	499	408	505	579	500	529
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	--	--	0.007	0.008	0.037	0.12
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.11	0.007	0.015	0.16	0.006	0.33

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 15-Aug-2006	L5 16-Nov-2006	L5 17-May-2007	L5 29-Aug-2007	L5 20-Nov-2007	L5 23-May-2008
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	0.0003	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	**0.0021**	--	--	--	--	**0.0012**
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	0.0075	--	--	--	--	0.0021
m,p-Xylenes	mg/l	--	--	0.0108	--	--	--	--	0.0053
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	0.0021	--	--	--	--	0.0052
o-Xylene	mg/l	--	--	0.0037	--	--	--	--	0.0023
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	0.0143	--	--	--	--	0.0127
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	**0.0014**	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 13-Aug-2008	L5 10-Nov-2008	L5 19-May-2009 [3] L-1	L5 25-Aug-2009 [4] L-1	L5 23-Sep-2009 L-1	L5 30-Nov-2009 [4] L-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	2280	1990	1867	2063	--	1960
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	44	44.7	56.4	50.1	--	41.8
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	484	154	662	320	--	10
Chemical Oxygen Demand	mg/l	--	--	1120	595	1010	782	--	275
Chloride	mg/l	--	250	538	562	569	538	--	397
Conductivity	uS/cm	--	--	--	--	5050	5210	--	4410
Conductivity (Field)	uS/cm	--	--	5000	4400	--	>4000	--	>2999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	499	498	445	462	--	460
Dissolved Organic Carbon	mg/l	--	5	354	147.2	273	247	--	106
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1790	1410	1070	1290	--	1310
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.20	<0.10	--	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	58.2	50.5	68.5	59.2	--	43.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	14.2	5.8	12.1	9.1	--	1.3
pH (Field)	-	--	--	8.3	7.7	--	7.29	--	8.5
Phosphorus	mg/l	--	--	0.54	0.32	0.10	0.34	--	0.24
Sulphate	mg/l	--	500 [16]	72	61	99	108	--	45
Temperature (Field)	deg c	--	15	18	10	--	18.4	--	9
Total Dissolved Solids	mg/l	--	500	3310	3040	3280	3390	--	2870
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	254	152	496	332	--	222
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.0065	0.0042	0.02	<0.05	--	<0.05
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	14.5	14.8	14	15	--	14
Cadmium	mg/l	0.005	--	<0.005	<0.0001	<0.001	<0.01	--	<0.01
Calcium	mg/l	--	--	438	316	184	228	--	269
Chromium	mg/l	0.05	--	0.012	0.01	0.015	<0.05	--	<0.02
Cobalt	mg/l	--	--	<0.005	<0.005	0.003	<0.01	--	0.005
Copper	mg/l	--	1	<0.002	0.015	<0.01	0.01	--	<0.01
Iron	mg/l	--	0.3	5.48	7.48	7.5	32.4	--	32.7
Lead	mg/l	0.01	--	<0.02	<0.0001	<0.01	<0.01	--	<0.01
Magnesium	mg/l	--	--	168	150	148	175	--	155
Manganese	mg/l	--	0.05	1.07	0.592	0.5	0.91	--	1.65
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	105	102	87	99	--	87
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	555	591	555	601	--	533
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	0.105	0.023	<0.1	0.09	--	<0.05
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.438	0.24	0.688	0.469	--	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 13-Aug-2008	L5 10-Nov-2008	L5 19-May-2009 [3] L-1	L5 25-Aug-2009 [4] L-1	L5 23-Sep-2009 L-1	L5 30-Nov-2009 [4] L-1
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	0.0004	<0.0001	<0.0004	--	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	**0.0017**	**0.0017**	**0.0080**	--	**0.0013**	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	0.0038	0.0034	0.0009	--	0.0011	<0.0005
m,p-Xylenes	mg/l	--	--	0.0086	0.0069	0.0024	--	0.0034	<0.0010
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	0.0051	0.0009	<0.0040	--	0.0049	<0.0040
o-Xylene	mg/l	--	--	0.0033	0.0028	0.0019	--	0.0016	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	0.0188	0.0103	0.0047	--	0.0067	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 25-May-2010 [4] L-1	L5 18-Aug-2010 [5] L-1	L5 14-Oct-2010 L-1	L5 24-May-2011 [6] L-1	L5 16-Aug-2011 [7] L-1	L5 30-Nov-2011 L5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1906	2079	1914	1940	2052	2200
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	47.6	40.7	39.6	45.5	63.2	53.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	13	22	18	60	64	45
Chemical Oxygen Demand	mg/l	--	--	300	250	275	450	475	275
Chloride	mg/l	--	250	366	351	320	421	543	553
Conductivity	uS/cm	--	--	4190	4080	4000	4180	4910	4920
Conductivity (Field)	uS/cm	--	--	>3999	3366	2256	>3999	>4000	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	352	417	458	453	2.2	79.8
Dissolved Organic Carbon	mg/l	--	5	91.6	85.6	80.2	112	1.5	103
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	7.34	--	--	1.21	4.45
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1230	1080	1250	1080	1010	1180
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.11	<0.10	<0.10	<0.10	<1.0	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<1.0	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	48.4	43.7	43.3	47.5	69.4	59.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.8	3	3.7	2	6.2	6.2
pH (Field)	-	--	--	7.28	7.65	7.64	7.75	8.31	7.64
Phosphorus	mg/l	--	--	0.34	0.25	0.30	0.27	0.28	0.28
Sulphate	mg/l	--	500 [16]	16	59	25	102	57	42
Temperature (Field)	deg c	--	15	18.2	18.3	14.6	16.6	26.5	11.9
Total Dissolved Solids	mg/l	--	500	2720	2650	2600	2720	3190	3200
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	367	366	204	310	188	60
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	<0.05	<0.01	<0.05	<0.05	<0.05	<0.01
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	18	17	14	15	16	16
Cadmium	mg/l	0.005	--	<0.01	<0.0001	<0.01	<0.01	<0.01	<0.001
Calcium	mg/l	--	--	242	192	263	142	152	229
Chromium	mg/l	0.05	--	<0.05	<0.005	<0.05	<0.05	<0.05	0.008
Cobalt	mg/l	--	--	<0.01	0.0053	<0.01	<0.01	<0.01	0.003
Copper	mg/l	--	1	<0.01	0.002	<0.01	<0.01	<0.01	<0.01
Iron	mg/l	--	0.3	20.1	25.8	12.1	14.3	7.5	9.3
Lead	mg/l	0.01	--	<0.01	<0.001	<0.01	<0.01	<0.01	<0.01
Magnesium	mg/l	--	--	152	147	143	177	152	148
Manganese	mg/l	--	0.05	1.8	1.53	1.18	1	0.62	1.1
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	86	80	75	85	94	90
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	474	486	435	542	790	673
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	<0.05	<0.01	<0.05	<0.05	<0.05	<0.1
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.002	0.001	0.082	0.049	0.003

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 25-May-2010 [4] L-1	L5 18-Aug-2010 [5] L-1	L5 14-Oct-2010 L-1	L5 24-May-2011 [6] L-1	L5 16-Aug-2011 [7] L-1	L5 30-Nov-2011 L5
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.002	<0.0008	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.002	<0.001	0.0010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.002	0.001	0.0019
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0050	<0.0020	0.0040
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.02	<0.0080	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.002	0.001	0.0015
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.002	0.002	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.001	<0.0004	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 04-Jun-2012 [8] L5	L5 22-Aug-2012 [8] L - 5	L5 29-Nov-2012 [9] L5	L5 29-May-2013 [10] L5	L5 15-Aug-2013 [10] L-1	L5 26-Nov-2013 [10] LEACHATE
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1700	1800	2300	1800	1900	1500
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	57	58	73	72 [20]	70	45
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	32	43	45	25	29	13
Chemical Oxygen Demand	mg/l	--	--	370	420	480	410	420	230
Chloride	mg/l	--	250	470	520	620	510	580	380
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3787	3655	>3999	3659	>3999	2974
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	440	450	460	390	420	360
Dissolved Organic Carbon	mg/l	--	5	130	130	150	120	130	74
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	10.4
Dissolved Oxygen (Field)	mg/l	--	--	-- [18]	5.98	1.24	--	8.71	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	980	920	1100	940	840	830
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	0.20	0.30
Nitrite as N	mg/l	1.0	--	0.021	<0.010	<0.010	0.014	0.018	0.037
Nitrogen, Total Kjeldahl	mg/l	--	--	64	62	81	71 [20]	76	47
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	0.21	0.34
Nitrogen, Organic	mg/l	--	--	7	4	8	0	6	2
pH (Field)	-	--	--	8.08	8.25	6.93	8.11	7.26	8.37
Phosphorus	mg/l	--	--	<0.10 [19]	0.28	0.33	0.28	<0.20 [19]	0.17
Sulphate	mg/l	--	500 [16]	99	<1	<1	3	<1	21
Temperature (Field)	deg c	--	15	16.3	19.4	14.2	17.5	19.7	8.9
Total Dissolved Solids	mg/l	--	500	2670	2940	3400	2810	3030	2220
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	96	84	18	100	<2	45
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.0079	0.0090	0.013	0.0096	0.0080	0.0021
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	18	23	23	21	25	17
Cadmium	mg/l	0.005	--	<0.00010	<0.00010	<0.00020	<0.00010	<0.00010	<0.00010
Calcium	mg/l	--	--	140	120	220	170	140	100
Chromium	mg/l	0.05	--	0.0089	0.011	0.016	0.01	0.012	<0.0050
Cobalt	mg/l	--	--	0.0028	0.0029	0.0034	0.0033	0.0038	0.0025
Copper	mg/l	--	1	0.0017	0.0012	<0.0020	<0.0010	<0.0010	<0.0010
Iron	mg/l	--	0.3	0.5	6.3	6.7	8.3	5.4	3.8
Lead	mg/l	0.01	--	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00050
Magnesium	mg/l	--	--	180	200	200	170	180	150
Manganese	mg/l	--	0.05	0.29	0.25	0.87	0.52	0.38	0.27
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	100	110	120	100	120	84
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	650	760	850	610	760	530
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	0.0088	0.0053	<0.01	0.013	0.0055	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.034	0.094	0.11	0.016	0.0037	0.0069

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 04-Jun-2012 [8] L5	L5 22-Aug-2012 [8] L - 5	L5 29-Nov-2012 [9] L5	L5 29-May-2013 [10] L5	L5 15-Aug-2013 [10] L-1	L5 26-Nov-2013 [10] LEACHATE
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0020	<0.0010	<0.00050	<0.0025	<0.0010	<0.0025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0020	<0.0010	0.0065	<0.0025	<0.0010	<0.0025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0020	<0.0010	0.011	<0.0025	<0.0010	<0.0025
m,p-Xylenes	mg/l	--	--	<0.0020	<0.0010	0.014	<0.0025	<0.0010	<0.0025
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.01	<0.0050	<0.0025	<0.013	<0.0050	<0.013
o-Xylene	mg/l	--	--	<0.0020	<0.0010	0.0033	<0.0025	<0.0010	<0.0025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0040	<0.0020	0.0055	<0.0050	<0.0020	<0.0050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0040	<0.0020	<0.0010	<0.0050	<0.0020	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-May-2014 [11] L-5	L5 27-Aug-2014 [12] L-5	L5 13-Nov-2014 [13] L-5	L5 27-May-2015 L-5	L5 25-Aug-2015 L-5	L5 25-Nov-2015 L-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1800	1900	2000	1710	1850	1250
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	66	82 [20]	70	66.3	52.3	37.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	23	29	15	<60 [22]	134	25
Chemical Oxygen Demand	mg/l	--	--	360	430	370	378	384	242
Chloride	mg/l	--	250	500	630	550	553	1000	393
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3765	>3999	3616	>3999	>3999	3742
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	380	460	430	372	317	253
Dissolved Organic Carbon	mg/l	--	5	120	130	120	134	111	73.1
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	8.25	--	7.44	7.56	7.09	5.10
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	890	970	990	172	980	1250
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.50	<0.50	0.26	<0.1	<0.1	0.7
Nitrite as N	mg/l	1.0	--	<0.050	<0.050	0.042	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	71	81 [20]	77	69.5	53.9	45.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.50	<0.50	0.30	--	--	--
Nitrogen, Organic	mg/l	--	--	5	0	7	3.2	1.6	8.3
pH (Field)	-	--	--	8.00	8.03	7.55	7.58	8.60	7.87
Phosphorus	mg/l	--	--	<0.10 [21]	0.33	0.31	0.39	0.25	0.16
Sulphate	mg/l	--	500 [16]	2	2	<1	41	34	403
Temperature (Field)	deg c	--	15	15.7	19.0	12.2	20.4	17.3	7.8
Total Dissolved Solids	mg/l	--	500	2980	3230	2920	2850	2820	2310
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	110	63	70	88	130	41
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	<0.01	<0.02	**0.011**	0.001	0.007	0.003
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**20**	**26**	**22**	4.27	**22.1**	**13.2**
Cadmium	mg/l	0.005	--	<0.0010	<0.0020	<0.0010	<0.0001	<0.0001	<0.0001
Calcium	mg/l	--	--	170	180	160	25.3	154	254
Chromium	mg/l	0.05	--	<0.05	<0.1	<0.05	0.002	0.009	0.006
Cobalt	mg/l	--	--	<0.0050	<0.01	<0.0050	0.0006	0.0032	0.0073
Copper	mg/l	--	1	<0.01	<0.02	<0.01	<0.0005	<0.0005	<0.0005
Iron	mg/l	--	0.3	7.1	7.8	5.4	0.852	7.81	3.47
Lead	mg/l	0.01	--	<0.0050	<0.01	<0.0050	<0.0001	<0.0001	0.0003
Magnesium	mg/l	--	--	160	180	160	26.4	145	148
Manganese	mg/l	--	0.05	0.61	0.64	0.51	0.084	0.606	0.491
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	100	110	110	17.9	94.7	62.9
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	640	750	700	110	571	577
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	<0.05	<0.1	<0.05	<0.005	0.015	0.012
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.012	0.0058	0.072	0.011	0.032	<0.004 [23]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-May-2014 [11] L-5	L5 27-Aug-2014 [12] L-5	L5 13-Nov-2014 [13] L-5	L5 27-May-2015 L-5	L5 25-Aug-2015 L-5	L5 25-Nov-2015 L-5
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.01	<0.0020	<0.0020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.01	<0.0020	<0.0020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 24-May-2016 L-5	L5 18-Aug-2016 L-5	L5 16-Nov-2016 L-5	L5 18-May-2017 L-5	L5 28-Aug-2017 L-5	L5 28-Nov-2017 L-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1500	1520	1870	1850	1660	2050
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	73.2	64.9	87.1	101	45.6 [25]	80.1
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	210	42	58	495	<60 [26]	652
Chemical Oxygen Demand	mg/l	--	--	647	368	427	1240	269	1210
Chloride	mg/l	--	250	654	523	614	689	374	640
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	>3999	>3999	3999	3234	3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	262	110	285	158	299	130
Dissolved Organic Carbon	mg/l	--	5	194	356	125	335	82.4	407
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	9.70	8.46	9.02	6.85	7.47	7.69
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1220	929	1030	1220	1300	1750
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	1.3	<0.1	<0.5 [23]	<0.5 [23]	<0.5 [23]
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [24]	<0.05	<0.05	<0.25 [24]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	139	83.8	94.3	127	34.4	94.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	65.8	18.9	7.2	26	0	14.3
pH (Field)	-	--	--	8.36	8.26	8.00	7.88	7.79	7.70
Phosphorus	mg/l	--	--	0.41	0.33	0.34	0.48	0.14	0.36
Sulphate	mg/l	--	500 [16]	124	43	24	76	19	41
Temperature (Field)	deg c	--	15	19.5	20	14.5	21.0	16.1	10.5
Total Dissolved Solids	mg/l	--	500	3290	2620	3130	3930	2590	3090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	279	13	57	162	140	96
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.009	0.005	0.004	**0.017**	0.001	**0.014**
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**25.5**	**20.2**	**29.3**	**24.7**	**14.2**	**13.4**
Cadmium	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	--	--	196	139	145	229	254	382
Chromium	mg/l	0.05	--	0.012	0.009	0.011	0.024	0.006	0.019
Cobalt	mg/l	--	--	0.0147	0.0034	0.0043	0.0040	0.0028	0.0030
Copper	mg/l	--	1	0.0020	<0.0005	<0.0005	0.0060	<0.0005	0.0018
Iron	mg/l	--	0.3	5.57	7.9	5.9	2.52	8.56	2.44
Lead	mg/l	0.01	--	0.0013	<0.0001	<0.0001	0.0005	<0.0001	0.0017
Magnesium	mg/l	--	--	179	141	161	158	161	193
Manganese	mg/l	--	0.05	0.948	0.541	0.397	1.21	0.704	1.6
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	108	76.2	123	109	94.7	118
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	812	576	717	666	490	622
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	0.01	<0.005	0.009	0.029	0.01	0.031
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.142	0.052	0.025	0.360	<0.004 [23]	0.629

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	L5 24-May-2016 L-5	L5 18-Aug-2016 L-5	L5 16-Nov-2016 L-5	L5 18-May-2017 L-5	L5 28-Aug-2017 L-5	L5 28-Nov-2017 L-5
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	0.0019	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	<0.0005
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	0.0020	<0.0005	0.0288
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 23-May-2018 L-5	L5 30-Aug-2018 L-5	L5 11-Nov-2018 [14] L5	L5 19-Dec-2018 [15] L-5	L5 20-Jun-2019 L-5	L5 28-Aug-2019 L-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1430	975	--	2040	2250	2080
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	81.7	74.2	--	90	112	69.1 [25]
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	43	27	--	22	178	86
Chemical Oxygen Demand	mg/l	--	--	448	330	--	441	497	414
Chloride	mg/l	--	250	572	504	--	662	619	536
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	>3999	--	>3999	>3999	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	302	158	--	368	2.8	818
Dissolved Organic Carbon	mg/l	--	5	123	99.8	--	131	125	129
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	10.12	8.71	--	7.31	7.86	7.74
Fluoride	mg/l	1.5	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1200	976	--	1150	1200	1420
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.1	0.3	--	<0.5 [23]	<0.1	0.2
Nitrite as N	mg/l	1.0	--	<0.05	0.12	--	<0.25 [23]	<0.05	0.09
Nitrogen, Total Kjeldahl	mg/l	--	--	93.7	81.6	--	118	115	68
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	12	7.4	--	28	3	0
pH (Field)	-	--	--	7.91	8.45	--	8.26	7.82	7.26
Phosphorus	mg/l	--	--	0.29	0.18	--	0.58	0.36	0.34
Sulphate	mg/l	--	500 [16]	374	812	--	58	87	135
Temperature (Field)	deg c	--	15	17.6	18.5	--	10.9	17.8	17.2
Total Dissolved Solids	mg/l	--	500	3030	2620	--	3040	3120	3020
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	32	40	--	95	5	48
Metals									
Aluminum	mg/l	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	**0.012**	**0.011**	--	0.004	0.007	**0.019**
Barium	mg/l	1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**16.2**	**10.3**	--	**20.9**	**25.6**	**13.2**
Cadmium	mg/l	0.005	--	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001
Calcium	mg/l	--	--	240	129	--	196	208	287
Chromium	mg/l	0.05	--	0.014	0.011	--	0.011	0.015	0.021
Cobalt	mg/l	--	--	0.0091	0.0051	--	0.0043	0.0055	0.0033
Copper	mg/l	--	1	0.0082	0.0025	--	<0.0005	0.0006	0.0013
Iron	mg/l	--	0.3	3.44	9.53	--	2.39	1.33	11.2
Lead	mg/l	0.01	--	0.0019	0.0014	--	0.0001	<0.0001	0.0005
Magnesium	mg/l	--	--	147	159	--	161	166	171
Manganese	mg/l	--	0.05	0.541	0.066	--	0.308	0.315	13.2
Mercury	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	104	96.3	--	123	123	102
Selenium	mg/l	0.05	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	542	512	--	589	666	503
Sulfur	mg/l	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--
Zinc	mg/l	--	5	0.016	<0.005	--	<0.005	0.015	0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.016	0.009	--	<0.010 [23]	0.008	0.033

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 23-May-2018 L-5	L5 30-Aug-2018 L-5	L5 11-Nov-2018 [14] L5	L5 19-Dec-2018 [15] L-5	L5 20-Jun-2019 L-5	L5 28-Aug-2019 L-5
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0006
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0014
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0008
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0032
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 21-Nov-2019 L-5	L5 14-May-2020 L-5	L5 27-Aug-2020 L-5	L5 25-Nov-2020 L-5
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1940	1580	916	2440
Ammonia, unionized	mg/l	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	89.4	45.3 [25]	33.6	76.9 [25]
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	35	24	23	27
Chemical Oxygen Demand	mg/l	--	--	428	253	236	405
Chloride	mg/l	--	250	658	423	648	544
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5640	3883	>3999	>3999
Cyanide	mg/l	0.2	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	10.1	310	180	359
Dissolved Organic Carbon	mg/l	--	5	122	113	54.0	119
Dissolved Oxygen	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	7.7	6.67	9.44	9.95
Fluoride	mg/l	1.5	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1510	1180	1530	404
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	0.6	1.2	<1.0 [27]
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	0.27	<0.50
Nitrogen, Total Kjeldahl	mg/l	--	--	92.6	43.9	38	72.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	3.2	0	4.4	0
pH (Field)	-	--	--	8.24	7.83	7.97	8.37
Phosphorus	mg/l	--	--	0.25	0.22	0.38	0.19
Sulphate	mg/l	--	500 [16]	143	123	128	47
Temperature (Field)	deg c	--	15	11.4	16.5	17.5	10.1
Total Dissolved Solids	mg/l	--	500	3320	2240	2320	2770
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	47	87	185	59
Metals							
Aluminum	mg/l	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.006	0.001	0.001	0.004
Barium	mg/l	1	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--
Boron	mg/l	5	--	**24.6**	**15.8**	**8.42**	**17.3**
Cadmium	mg/l	0.005	--	<0.0001	<0.0001	0.0002	<0.0001
Calcium	mg/l	--	--	320	205	384	162
Chromium	mg/l	0.05	--	0.019	0.005	**0.075**	0.011
Cobalt	mg/l	--	--	0.0063	0.0020	0.0085	0.0044
Copper	mg/l	--	1	0.0005	<0.0005	0.0124	<0.0005
Iron	mg/l	--	0.3	5.73	10.8	17.2	3.89
Lead	mg/l	0.01	--	0.0003	0.0002	0.0033	<0.0001
Magnesium	mg/l	--	--	172	163	138	171
Manganese	mg/l	--	0.05	0.776	0.592	2.27	0.296
Mercury	mg/l	0.001	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--
Potassium	mg/l	--	--	132	88.2	81.4	106
Selenium	mg/l	0.05	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	714	497	410	643
Sulfur	mg/l	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--
Zinc	mg/l	--	5	0.006	0.014	4.54	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.008	0.006	0.018	0.082

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 21-Nov-2019 L-5	L5 14-May-2020 L-5	L5 27-Aug-2020 L-5	L5 25-Nov-2020 L-5
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	0.0009	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	PWQO [1]	S1 01-Apr-1984	S1 01-May-1987	S1 01-Oct-1987	S1 19-Jun-1990	S1 27-Jun-1990	S1 04-Oct-1990
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	–	–	–	--	–	–
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	192000	194000	184000
Ammonia, unionized	ug/l	20	–	–	–	--	–	–
Ammonia Nitrogen	ug/l	–	–	80	220	150	100	750
Biochemical Oxygen Demand, 5 Day	ug/l	--	–	–	–	2000	5000	1000
Chemical Oxygen Demand	ug/l	--	–	--	–	39000	135000	135000
Chloride	ug/l	–	--	173800	158500	57000	326000	113000
Conductivity	uS/cm	–	--	--	--	--	–	--
Conductivity (Field)	uS/cm	--	300	996	895	590	1152	849
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	–	–	–	980	74000	74000
Dissolved Organic Carbon	ug/l	--	–	–	–	–	–	–
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	6850	6850
Hardness, Calcium Carbonate	ug/l	--	–	–	–	231000	335000	282000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	1140
Nitrite as N	ug/l	--	–	–	--	--	--	100
Nitrogen, Total Kjeldahl	ug/l	--	–	–	–	980	4000	1460
Nitrogen, Nitrate-Nitrite	ug/l	--	–	–	–	–	–	–
Nitrogen, Organic	ug/l	--	--	--	--	330	330	710
pH (Field)	-	6.5 - 8.5	--	7.34	7.59	7.96	8.06	8.16
Phosphate	ug/l	–	--	--	--	100	430	170
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	--	67900	59300	1600	52000	62000
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	150000	500000	450000	295000	575000	425000
Total Organic Carbon	ug/l	--	–	--	–	1100	19000	19000
Total Suspended Solids	ug/l	--	–	–	–	–	–	–
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	100	20	20	50	50
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	--	84700	77900	71000	105000	93000
Chromium	ug/l	– [13]	--	**100**	**10**	--	--	**50**
Cobalt	ug/l	0.9	--	--	--	--	–	--
Copper	ug/l	5	–	**1800**	**500**	**430**	**2390**	**210**
Iron	ug/l	300	--	40	30	30	70	50
Lead	ug/l	– [14]	--	200	130	100	320	90
Magnesium	ug/l	--	–	19200	16100	13000	17000	12000
Manganese	ug/l	–	--	100	20	–	–	50
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	–	--
Nickel	ug/l	25	--	**50**	**70**	**40**	**50**	**80**
Potassium	ug/l	–	--	--	--	5000	13000	23000
Selenium	ug/l	100	--	--	--	–	--	--
Sodium	ug/l	–	--	--	--	31000	157000	102000
Zinc	ug/l	30 [11]	--	--	--	--	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	--	**2**

Parameter	Unit	PWQO [1]	S1 06-Nov-1990	S1 27-Nov-1990	S1 24-Apr-1991	S1 06-Sep-1992	S1 08-Jun-1993	S1 04-Nov-1993
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	134000	114000	132000	134000	115000	134000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	–	180	750	240	<100	100	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	3000	3000	<1000	2000	2100
Chemical Oxygen Demand	ug/l	--	73000	95000	116000	265000	17000	62200
Chloride	ug/l	–	45000	46000	114000	107000	102000	85000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	431	663	622	744	350	651
Cyanide	ug/l	5 [6]	--	--	--	<5	--	--
Dissolved Inorganic Carbon	ug/l	--	33000	27000	31000	27300	32200	37400
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	9400	12300	9300	15900	–	10100
Hardness, Calcium Carbonate	ug/l	--	157000	156000	169000	231650	179000	207000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	940	770	6800	600	2900	7840
Nitrite as N	ug/l	--	20	1	160	<100	100	<100
Nitrogen, Total Kjeldahl	ug/l	--	740	1560	1600	840	560	1490
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	560	810	1360	740	460	1390
pH (Field)	-	6.5 - 8.5	8.11	7.9	8.03	7.51	8.38	7.67
Phosphate	ug/l	–	100	100	100	260	80	260
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	36000	30000	72000	55000	52900	57000
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	216000	332000	311000	440000	425000	356000
Total Organic Carbon	ug/l	--	18000	9000	19000	10300	8800	13700
Total Suspended Solids	ug/l	--	--	--	--	--	--	--
Metals								
Arsenic	ug/l	100 [11]	--	--	--	<1	--	--
Barium	ug/l	–	--	--	--	5	--	--
Boron	ug/l	200 [12]	50	50	60	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	48000	51000	48000	67800	49000	60000
Chromium	ug/l	– [13]	**50**	**50**	**50**	**<20**	**74**	**<10**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	**630**	**2550**	**800**	<10	**12**	3
Iron	ug/l	300	50	50	50	**1000**	**4906**	**793**
Lead	ug/l	– [14]	180	290	180	10	4.7	6.6
Magnesium	ug/l	--	9000	7000	12000	15100	14000	14000
Manganese	ug/l	–	50	50	50	50	114	89
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	**50**	**80**	**50**	<20	20	<20
Potassium	ug/l	–	7000	6000	5000	4300	11000	8100
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	32000	78000	55000	66300	51000	45000
Zinc	ug/l	30 [11]	--	--	--	30	30	**36**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	**18**	**5**	**5**	**2**	**3**

Parameter	Unit	PWQO [1]	S1 15-Jun-1994	S1 02-Nov-1994	S1 28-Jun-1995	S1 14-Nov-1995	S1 12-Jun-1996	S1 12-Oct-1996
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	202000	51000	280000	144000	195000	193000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	–	100	130	50	110	40	70
Biochemical Oxygen Demand, 5 Day	ug/l	--	1800	4000	1000	2000	4000	1000
Chemical Oxygen Demand	ug/l	--	35000	69000	496000	38000	18000	30000
Chloride	ug/l	–	128000	40000	195000	71500	139000	89000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	908	423	1118	690	850	750
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	12000	100000	33100	39800	38200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	8030	12010	8080	13340	6790	10880
Hardness, Calcium Carbonate	ug/l	--	242000	117000	749000	205000	241000	255000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	960	4500	100	1600	–	--
Nitrite as N	ug/l	--	--	100	100	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	5320	6160	670	1660	650	990
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	5220	6030	620	1550	610	–
pH (Field)	-	6.5 - 8.5	7.67	7.8	6.88	7.7	7.18	7.36
Phosphate	ug/l	–	10	440	200	110	100	120
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	48000	52000	74000	60000	--	--
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	456000	212000	714000	350000	430000	370000
Total Organic Carbon	ug/l	--	16200	15300	11800	14700	9000	12400
Total Suspended Solids	ug/l	--	--	64000	38000	37000	35000	3000
Metals								
Arsenic	ug/l	100 [11]	--	--	100	--	--	--
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	**380**	53	30	32	30
Cadmium	ug/l	0.2 [11]	--	0.1	0.1	0.1	--	--
Calcium	ug/l	–	73900	32000	102000	58800	68700	73600
Chromium	ug/l	– [13]	**15**	**10**	**12**	**10**	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	**6.8**	4.1	**7**	2.6	**50.8**	1.7
Iron	ug/l	300	**835**	**1402**	**400**	**1220**	**1220**	**700**
Lead	ug/l	– [14]	1	1.2	2	0.4	0.4	0.2
Magnesium	ug/l	--	14000	8900	23800	14000	16600	16900
Manganese	ug/l	–	124	75	446	90	100	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20
Potassium	ug/l	–	6300	9900	13000	12200	9930	13900
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	78000	23000	78900	61800	93600	58300
Zinc	ug/l	30 [11]	**37**	18	16	20	10	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	1	1	--	1	--

Parameter	Unit	PWQO [1]	S1 17-Jun-1997	S1 05-Nov-1997	S1 05-Jun-1998	S1 26-Aug-1998	S1 30-Oct-1998	S1 30-Jun-1999
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	179000	216000	208000	100000	168000	208000
Ammonia, unionized	ug/l	20	--	--	--	--	10	--
Ammonia Nitrogen	ug/l	--	10	60	20	50	50	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	1000	3000	2000	1000	6000
Chemical Oxygen Demand	ug/l	--	28000	17000	10000	36000	42000	81000
Chloride	ug/l	--	137000	242000	138000	38100	82200	201000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	815	1200	900	360	643	1080
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	33700	40600	39100	17400	39200	27100
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6010	9830	10430	7560	9560	13110
Hardness, Calcium Carbonate	ug/l	--	279000	294000	249000	147000	229000	271000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	900	1050	3120	1240	940	800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.07	7.8	--	7.69	7.3	8.3
Phosphate	ug/l	--	90	90	40	320	80	60
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	409000	600000	451000	180000	323000	540000
Total Organic Carbon	ug/l	--	11100	10000	5900	11000	14000	13600
Total Suspended Solids	ug/l	--	17000	45000	21000	55000	9000	24000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	70	60	30	60	50	30
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	89500	92600	75700	47500	64600	89200
Chromium	ug/l	-- [13]	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	0.5	**12.4**	3.2	3.3	2.6	2.5
Iron	ug/l	300	**1320**	**1310**	**590**	**1810**	**800**	**390**
Lead	ug/l	-- [14]	0.2	0.2	0.2	0.3	0.2	0.2
Magnesium	ug/l	--	13200	15100	14500	6870	16300	11400
Manganese	ug/l	--	330	220	80	70	80	50
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20
Potassium	ug/l	--	3800	5600	1200	5200	9100	2800
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	73900	97200	89700	26400	55400	114000
Zinc	ug/l	30 [11]	10	30	20	**250**	10	20
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**4**	**2**	1	**19**	1	1

Parameter	Unit	PWQO [1]	S1 19-Oct-1999	S1 03-May-2000	S1 25-Oct-2000	S1 13-Jun-2001	S1 27-Sep-2001	S1 21-Nov-2001
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	324000	195000	267000	196000	239000	169000
Ammonia, unionized	ug/l	20	--	10	--	<20	<20	<20
Ammonia Nitrogen	ug/l	-	170	70	10	50	30	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	--	2000	1000	1000
Chemical Oxygen Demand	ug/l	--	23000	30000	--	31000	14000	30000
Chloride	ug/l	-	143000	240000	295000	347000	280000	116000
Conductivity	uS/cm	-	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1300	1250	1540	1250	1290	670
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	84900	31400	--	30200	52900	23700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	7650	11330	7560	10900	9180	11380
Hardness, Calcium Carbonate	ug/l	--	581000	309000	407000	318000	403000	241000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	10	600	700	1000
Nitrite as N	ug/l	--	--	--	1900	--	-	--
Nitrogen, Total Kjeldahl	ug/l	--	570	890	660	770	520	690
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.2	7.22	7.22	7.5	7.94	6.63
Phosphate	ug/l	-	50	20	130	70	50	40
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	-	--	--	103000	76000	126000	76000
Temperature (Field)	deg c	- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	640000	625000	858000	846000	868000	496000
Total Organic Carbon	ug/l	--	8900	9200	--	11800	8300	15000
Total Suspended Solids	ug/l	--	22000	24000	113000	37000	18000	10000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	1	1	1
Barium	ug/l	-	--	--	--	--	--	--
Boron	ug/l	200 [12]	110	40	**730**	110	50	40
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	-	174000	94600	116000	92900	124000	72100
Chromium	ug/l	- [13]	--	--	**20**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	2	**8.4**	**13.2**	**5.5**	3.6	2.3
Iron	ug/l	300	**3010**	**350**	**5620**	**1780**	**1280**	**460**
Lead	ug/l	- [14]	0.2	0.2	0.2	1.2	0.2	0.2
Magnesium	ug/l	--	35100	17400	28500	20900	22600	14900
Manganese	ug/l	-	1100	330	440	470	130	60
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**40**	20	20	20
Potassium	ug/l	-	8700	4900	5700	4500	7100	7600
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	-	91800	131000	149000	187000	149000	68700
Zinc	ug/l	30 [11]	**340**	**240**	**330**	**130**	**100**	30
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	**5**	**2**	**15**	1	1

Parameter	Unit	PWQO [1]	S1 22-May-2002	S1 08-Nov-2002	S1 31-May-2003	S1 03-Jul-2003	S1 22-Oct-2003	S1 17-May-2004
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	130000	234000	152000	158000	143000	228000
Ammonia, unionized	ug/l	20	--	--	--	--	--	<10
Ammonia Nitrogen	ug/l	-	50	10	150	70	50	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	2000	2000	3000
Chemical Oxygen Demand	ug/l	--	40000	32000	49000	56000	68000	42000
Chloride	ug/l	-	144000	361000	105000	308000	97300	312000
Conductivity	uS/cm	-	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	780	1400	740	1310	760	1370
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	26000	64000	39000	58000	34000	38300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	9450	11600	7160	5030	10500	9000
Hardness, Calcium Carbonate	ug/l	--	273000	384000	209000	324000	-	340000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	700	1200	900	22700	1300	400
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	670	620	1040	1460	5650	2680
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.75	7	7.6	7.37	7.73	7.4
Phosphate	ug/l	-	50	60	40	430	500	80
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	-	49000	102000	43000	70000	74000	63000
Temperature (Field)	deg c	- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	492000	700000	397000	1000000	412000	685000
Total Organic Carbon	ug/l	--	9000	10000	22000	13000	16000	9700
Total Suspended Solids	ug/l	--	6000	18000	3000	218000	60000	24000
Metals								
Arsenic	ug/l	100 [11]	1	1	1	1	1	2
Barium	ug/l	-	--	--	--	--	--	--
Boron	ug/l	200 [12]	50	60	30	54	47	48
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	-	59000	123000	63100	103000	69500	107000
Chromium	ug/l	- [13]	**10**	**10**	**10**	3	**12**	2
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	<1	3.1	3	2	**20**	**16**
Iron	ug/l	300	**670**	**1360**	**460**	**4020**	**3460**	**1760**
Lead	ug/l	- [14]	<1	1.3	0.5	3.7	5.4	0.5
Magnesium	ug/l	--	15300	18700	12400	16300	12100	17400
Manganese	ug/l	-	150	190	50	251	152	358
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	10	10	20
Potassium	ug/l	-	8700	11000	5000	7500	8700	7000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	-	88700	194000	67400	184000	64000	190000
Zinc	ug/l	30 [11]	**70**	**150**	20	**270**	**122**	**129**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S1 21-Aug-2004	S1 18-Nov-2004	S1 25-May-2005	S1 09-Sep-2005	S1 09-Nov-2005	S1 24-May-2006
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	268000	334000	273000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	<5000	<5000	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	282000	230000	220000	274000	224000	153000
Ammonia, unionized	ug/l	20	<10	<10	0.19	0.51	0.13	0.11
Ammonia Nitrogen	ug/l	--	60	110	30	40	30	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	<3000	<3000	6000	<3000
Chemical Oxygen Demand	ug/l	--	32000	29000	35000	27000	23000	40000
Chloride	ug/l	--	281000	195000	167000	273000	195000	121000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1270	1180	1200	1500	730	485
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	36200	25300	57200	68500	48600	40200
Dissolved Organic Carbon	ug/l	--	--	--	10800	79400	9800	17800
Dissolved Oxygen (Field)	ug/l	-- [7]	7000	6800	6380	6400	10900	9660
Hardness, Calcium Carbonate	ug/l	--	351000	306000	298000	390000	342000	207000
Hydrogen Sulfide	ug/l	2 [8]	--	--	<10	<10	<10	--
Nitrate as N	ug/l	--	300	1200	600	200	1800	900
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	570	720	750	490	820	850
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	6.9	7.3	7.6	7.7	7.8
Phosphate	ug/l	--	30	30	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	**40**	20	**70**	**40**
Sulphate	ug/l	--	83000	80000	62000	93000	97000	47000
Temperature (Field)	deg c	-- [10]	--	--	16.8	17.2	1	9
Total Dissolved Solids	ug/l	--	635000	590000	580000	863000	696000	413000
Total Organic Carbon	ug/l	--	9400	8700	--	--	--	--
Total Suspended Solids	ug/l	--	3000	5000	<3000	3000	25000	3000
Metals								
Arsenic	ug/l	100 [11]	1	1	<1	1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	84	45	61	85	56	31
Cadmium	ug/l	0.2 [11]	--	--	<0.3	<0.1	<0.5	<0.1
Calcium	ug/l	--	111000	95000	90400	126000	107000	63100
Chromium	ug/l	-- [13]	1	2	<2	2	4	<2
Cobalt	ug/l	0.9	--	--	**30**	**1.1**	0.6	0.3
Copper	ug/l	5	2	2	<2	<2	4	<2
Iron	ug/l	300	**455**	**375**	**543**	**1360**	**1650**	**384**
Lead	ug/l	-- [14]	3.5	0.6	<0.6	<0.5	1	0.6
Magnesium	ug/l	--	17500	16600	17600	17900	18400	11800
Manganese	ug/l	--	162	135	137	191	129	69
Mercury, dissolved	ug/l	0.2 [15]	--	--	<0.05	<0.06	<0.06	--
Molybdenum	ug/l	40	--	--	5.1	1.4	<5	--
Nickel	ug/l	25	10	10	<10	<10	<10	--
Potassium	ug/l	--	6900	7500	6200	8200	9000	4800
Selenium	ug/l	100	--	--	<1	<1	<1	--
Sodium	ug/l	--	196000	124000	109000	186000	137000	73700
Zinc	ug/l	30 [11]	**70**	**40**	**39**	**82**	**79**	17
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S1 15-Aug-2006	S1 16-Nov-2006	S1 08-May-2007	S1 22-Aug-2007	S1 20-Nov-2007	S1 23-May-2008
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	219000	110000	208000	234000	190000	160000
Ammonia, unionized	ug/l	20	<0.19	--	1.56	<0.08	1.32	<0.24
Ammonia Nitrogen	ug/l	-	<10	80	40	<10	90	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	3000	4000	<3000
Chemical Oxygen Demand	ug/l	--	38000	45000	35000	45000	42000	48000
Chloride	ug/l	-	284000	28700	228000	340000	203000	127000
Conductivity	uS/cm	-	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1370	260	900	1250	750	650
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	52600	28600	52000	58700	51300	39500
Dissolved Organic Carbon	ug/l	--	12100	14600	9200	9400	12000	12500
Dissolved Oxygen (Field)	ug/l	-- [7]	**1200**	8280	10340	6140	9690	11500
Hardness, Calcium Carbonate	ug/l	--	295000	86000	273000	283000	277000	178000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	1000	600	200	1400	500
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	470	1140	570	1060	880	950
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.7	--	8.1	7.4	8.2	8
Phosphate	ug/l	-	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	**210**	**40**	**200**	**100**	**50**
Sulphate	ug/l	-	82000	33000	67000	70000	87000	33000
Temperature (Field)	deg c	- [10]	20	8.2	17.2	16.4	1.6	13.8
Total Dissolved Solids	ug/l	--	790000	201000	683000	878000	649000	408000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	21000	57000	5000	99000	34000	<3000
Metals								
Arsenic	ug/l	100 [11]	1.2	1	1.2	2.5	1.3	2.1
Barium	ug/l	-	--	--	--	--	--	--
Boron	ug/l	200 [12]	64	39	55	63	43	24
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	-	90600	23900	83300	84900	89300	54100
Chromium	ug/l	- [13]	2	**12**	<2	3	4	<2
Cobalt	ug/l	0.9	0.6	0.9	<0.5	**1**	**1.2**	<0.5
Copper	ug/l	5	4	**40**	**22**	5	4	<2
Iron	ug/l	300	**978**	**613**	**646**	**1720**	**1840**	**499**
Lead	ug/l	- [14]	0.8	3	0.3	1.7	2.8	<0.1
Magnesium	ug/l	--	16600	6420	15600	17100	13200	10500
Manganese	ug/l	-	79	102	143	145	140	64
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	-	6500	4800	6600	8200	8400	4300
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	-	183000	32700	154000	214000	123000	80300
Zinc	ug/l	30 [11]	28	**36**	29	**76**	**75**	8
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S1 12-Aug-2008	S1 06-Nov-2008	S1 13-May-2009 S-3	S1 25-Aug-2009 A-8	S1 27-Nov-2009 S-11	S1 18-May-2010 S-8
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	220000	218000	172000	197000	306000	303000
Ammonia, unionized	ug/l	20	<1.79	0.18	2	4.06	7.67	<0.37
Ammonia Nitrogen	ug/l	–	<10	10	50	200	130	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<1000	1000	2000	<1000
Chemical Oxygen Demand	ug/l	--	29000	19000	48000	48000	38000	30000
Chloride	ug/l	–	335000	163000	130000	258000	234000	254000
Conductivity	uS/cm	–	--	--	900	2010	1980	1860
Conductivity (Field)	uS/cm	--	1500	900	750	1596	958	1948
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	55200	52400	41400	47100	74400	66800
Dissolved Organic Carbon	ug/l	--	9600	6600	17600	11200	13600	12600
Dissolved Oxygen (Field)	ug/l	-- [7]	7320	9880	9940	9350	12430	**4210**
Hardness, Calcium Carbonate	ug/l	--	265000	294000	230000	525000	598000	559000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	1200	650	140	1260	<100
Nitrite as N	ug/l	--	--	--	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	520	610	1050	700	840	440
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	**8.7**	8	8	7.69	**8.67**	7.74
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	**40**	**140**	**50**	**90**	20
Sulphate	ug/l	–	73000	98000	63000	420000	397000	296000
Temperature (Field)	deg c	– [10]	21.3	9.8	20.7	20.9	5.9	18.2
Total Dissolved Solids	ug/l	--	935000	619000	585000	1410000	1390000	1210000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	4000	32000	15000	18000	5000
Metals								
Arsenic	ug/l	100 [11]	1.6	<0.5	1	2	1	<1
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	50	39	40	190	160	120
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	–	83100	92400	69000	174000	180000	171000
Chromium	ug/l	– [13]	<2	<2	5	6	6	6
Cobalt	ug/l	0.9	<0.5	<0.5	0.5	**1.1**	**1.5**	**1**
Copper	ug/l	5	**7**	3	3	2	5	2
Iron	ug/l	300	274	**374**	**710**	**1050**	**560**	**420**
Lead	ug/l	– [14]	1.2	<0.1	2	<1	<1	<1
Magnesium	ug/l	--	14000	15300	14000	22000	36000	32000
Manganese	ug/l	–	423	87	110	460	320	320
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	9700	7900	6000	28000	23000	14000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	285000	106000	96000	208000	199000	182000
Zinc	ug/l	30 [11]	30	**31**	**60**	20	20	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	**2**

Parameter	Unit	PWQO [1]	S1 18-Aug-2010 [2] S-9	S1 14-Oct-2010 S-9	S1 19-May-2011 [2] W-11	S1 16-Aug-2011 [2] N-9	S1 30-Nov-2011 [3] S1	S1 30-May-2012 S 1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	316000	331000	270000	372000	198000	310000
Ammonia, unionized	ug/l	20	<0.08	0.37	1.16	1.13	1.38	<1.38
Ammonia Nitrogen	ug/l	–	<20	30	50	30	130	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	1000	2000	<1000	6000	<2000
Chemical Oxygen Demand	ug/l	--	30000	35000	55000	35000	65000	53000
Chloride	ug/l	–	202000	174000	231000	270000	106000	280000
Conductivity	uS/cm	–	1860	1660	1670	1860	1160	–
Conductivity (Field)	uS/cm	--	1680	1357	1562	1482	1062	1699
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	66400	74700	63400	88300	25900	76000
Dissolved Organic Carbon	ug/l	--	14100	14300	12300	14000	7100	17000
Dissolved Oxygen (Field)	ug/l	-- [7]	7560	14300	7270	5960	10950	7310
Hardness, Calcium Carbonate	ug/l	--	620000	516000	547000	477000	385000	520000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	830	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<10
Nitrogen, Total Kjeldahl	ug/l	--	570	430	1180	550	1010	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.96	7.73	7.89	7.92	7.93	7.71
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	**40**	**120**	30	**470**	**85**
Sulphate	ug/l	–	370000	275000	243000	197000	201000	220000
Temperature (Field)	deg c	– [10]	20.6	12.8	16.5	22.4	5.1	24.6
Total Dissolved Solids	ug/l	--	1300000	1080000	1090000	1210000	754000	1170000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	6000	76000	8000	372000	19000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	<10	<10	<50	1.4
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	**230**	140	150	130	100	190
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	0.1	<0.1	<10	**0.21**
Calcium	ug/l	–	197000	157000	163000	148000	103000	170000
Chromium	ug/l	– [13]	7	7	**9**	**9**	<50	<5.0
Cobalt	ug/l	0.9	0.8	0.8	**1.5**	0.5	<10	**1.3**
Copper	ug/l	5	3	2	**8**	2	**30**	**6.6**
Iron	ug/l	300	**380**	**660**	**1480**	**380**	**13200**	**1500**
Lead	ug/l	– [14]	<1	<1	5	<1	30	0.89
Magnesium	ug/l	--	31000	30000	34000	26000	31000	36000
Manganese	ug/l	–	280	430	370	200	570	670
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	17000	14000	14000	14000	10000	15000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	175000	146000	160000	184000	90000	210000
Zinc	ug/l	30 [11]	<10	<10	**40**	<10	**140**	21
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	**1.2**

Parameter	Unit	PWQO [1]	S1 22-Aug-2012 S-1	S1 29-Nov-2012 [4] S-1	S1 28-May-2013 S1	S1 15-Aug-2013 S-1	S1 21-Nov-2013 SA-1	S1 28-May-2014 S1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	360000	360000	320000	350000	370000	340000
Ammonia, unionized	ug/l	20	<2.2	0.96	0.69	1.84	<0.32	<0.75
Ammonia Nitrogen	ug/l	–	<50	110	92	50	<50	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	<2000	2000	<2000
Chemical Oxygen Demand	ug/l	--	47000	39000	38000	38000	36000	36000
Chloride	ug/l	–	240000	250000	260000	250000	200000	310000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1526	1769	1732	1739	1581	1785
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	60000	82000	71000	83000	92000	78000
Dissolved Organic Carbon	ug/l	--	86000	14000	14000	16000	13000	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	8160	13250	**3060**	**150**	10580	14290
Hardness, Calcium Carbonate	ug/l	--	520000	550000	670000	550000	580000	650000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	170	<100	<100	190	<100
Nitrite as N	ug/l	--	<10	<10	<10	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	1000	1200	810	1000	690	860
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	170	<100	<100	190	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.93	8.02	7.29	7.93	7.78	7.68
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**50**	**53**	**48**	28	24
Sulphate	ug/l	–	220000	270000	310000	230000	270000	270000
Temperature (Field)	deg c	– [10]	24.3	0.2	19.8	21.7	3.1	17.1
Total Dissolved Solids	ug/l	--	1170000	1250000	1350000	1280000	1210000	1440000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	14000	23000	8000	<1000	7000	12000
Metals								
Arsenic	ug/l	100 [11]	1	<1.0	1	<1.0	<1.0	<1.0
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	200	150	160	**210**	160	180
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	**1.8**	<0.10
Calcium	ug/l	–	160000	200000	210000	180000	180000	200000
Chromium	ug/l	– [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.63	<0.50	0.59	<0.50	<0.50	0.5
Copper	ug/l	5	3	2.7	2.6	2.6	2.5	1.9
Iron	ug/l	300	**1000**	<100	**450**	**380**	230	**320**
Lead	ug/l	– [14]	0.61	<0.50	<0.50	0.64	0.52	0.51
Magnesium	ug/l	--	31000	37000	40000	30000	40000	42000
Manganese	ug/l	–	320	120	200	83	93	120
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	18000	18000	19000	16000	15000	17000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	220000	230000	210000	200000	170000	210000
Zinc	ug/l	30 [11]	16	14	9.6	6.5	15	16
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	**1.4**	<1.0

Parameter	Unit	PWQO [1]	S1 26-Aug-2014 S1	S1 13-Nov-2014 S-1	S1 27-May-2015 S-1	S1 25-Aug-2015 S-1	S1 25-Nov-2015 S-1	S1 24-May-2016 S-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	390000	370000	373000	364000	418000	364000
Ammonia, unionized	ug/l	20	2.68	0.26	0.99	4.29	0.73	1.32
Ammonia Nitrogen	ug/l	–	120	95	190	30	100	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	5000	15000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	46000	38000	61000	29000	41000	37000
Chloride	ug/l	–	270000	210000	266000	254000	260000	344000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1992	1407	1752	1630	1824	1784
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	98000	88000	76000	79900	83800	76000
Dissolved Organic Carbon	ug/l	--	14000	13000	16400	14800	12600	13200
Dissolved Oxygen (Field)	ug/l	-- [7]	**360**	9660	7740	**4380**	11330	5570
Hardness, Calcium Carbonate	ug/l	--	590000	560000	579000	408000	838000	582000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	100	<100
Nitrite as N	ug/l	--	<10	12	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	950	1900	9800	500	900	700
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	110	--	--	--	–
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.72	7.35	7.1	**8.66**	7.93	7.88
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**57**	**88**	**1690**	**50**	**80**	30
Sulphate	ug/l	–	250000	220000	224000	211000	221000	200000
Temperature (Field)	deg c	– [10]	21.3	4.9	20.7	18.9	0.6	18.6
Total Dissolved Solids	ug/l	--	1320000	1070000	1110000	1060000	1080000	1240000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	7000	88000	266000	9000	38000	30000
Metals								
Arsenic	ug/l	100 [11]	<1.0	<1.0	2	<1	<1	<1
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	200	160	**201**	199	149	146
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	–	180000	170000	174000	120000	253000	168000
Chromium	ug/l	– [13]	<5.0	<5.0	2	<1	3	1
Cobalt	ug/l	0.9	<0.50	0.69	**1.4**	0.5	0.7	<0.5
Copper	ug/l	5	1.7	2.9	3.1	<0.5	0.9	2.4
Iron	ug/l	300	210	**460**	**3480**	234	**965**	200
Lead	ug/l	– [14]	<0.50	1.6	9	<0.1	1.1	0.3
Magnesium	ug/l	--	32000	34000	35100	26500	50000	39200
Manganese	ug/l	–	210	140	638	206	153	42
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	16000	13000	13800	12500	12200	12500
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	220000	160000	154000	148000	228000	198000
Zinc	ug/l	30 [11]	9.6	30	**33**	13	23	9
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	**1.7**	<1	**2**	<1	**8**

Parameter	Unit	PWQO [1]	S1 18-Aug-2016 S-1	S1 16-Nov-2016 S-1	S1 18-May-2017 S-1	S1 28-Aug-2017 S-1	S1 28-Nov-2017 S-1	S1 23-May-2018 S-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	332000	360000	384000	450000	464000	395000
Ammonia, unionized	ug/l	20	0.69	0.37	1.63	0.36	1.18	0.88
Ammonia Nitrogen	ug/l	–	50	60	60	30	140	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	3000	<2000	3000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	34000	33000	32000	36000	29000	35000
Chloride	ug/l	–	213000	224000	342000	443000	275000	328000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1604	1660	1921	1811	1702	1875
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	65200	63000	49000	85400	76000	80900
Dissolved Organic Carbon	ug/l	--	27400	11600	25500	14200	9600	11600
Dissolved Oxygen (Field)	ug/l	-- [7]	**4540**	9380	8480	**3010**	11590	11180
Hardness, Calcium Carbonate	ug/l	--	520000	539000	561000	652000	539000	466000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<250 [18]	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	600	800	600	600	700	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.46	7.6	7.77	7.54	8	7.88
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	20	<10	30	10	20
Sulphate	ug/l	–	305000	211000	215000	200000	202000	166000
Temperature (Field)	deg c	– [10]	22.9	7.9	22.5	18.2	0.4	20.1
Total Dissolved Solids	ug/l	--	1100000	988000	1330000	1520000	1110000	1150000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	29000	9000	2000	30000	21000	4000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	<5 [17]	<1	<1	<1
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	**250**	161	174	196	171	189
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1
Calcium	ug/l	–	148000	164000	158000	204000	154000	141000
Chromium	ug/l	– [13]	<1	<1	<5 [17]	1	<1	<1
Cobalt	ug/l	0.9	<0.5	0.8	<2.5 [17]	0.5	0.5	<0.5
Copper	ug/l	5	2.4	3.5	**5.7**	<0.5	2	2
Iron	ug/l	300	282	199	<500 [17]	**495**	**313**	101
Lead	ug/l	– [14]	0.3	2.5	<0.5 [17]	0.6	0.5	0.3
Magnesium	ug/l	--	36300	31700	40600	34800	37400	27700
Manganese	ug/l	–	160	106	170	518	308	49
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	17000	14400	14000	14900	10300	10700
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	155000	149000	176000	266000	157000	180000
Zinc	ug/l	30 [11]	7	**35**	<25 [17]	7	14	6
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	**6**	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S1 30-Aug-2018 S-1	S1 28-Nov-2018 S-1	S1 20-Jun-2019 S-1	S1 28-Aug-2019 S-1	S1 21-Nov-2019 S-1
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	466000	429000	398000	167000	409000
Ammonia, unionized	ug/l	20	1.18	0.8	1.18	0.5	1.2
Ammonia Nitrogen	ug/l	–	70	170	120	40	130
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	2000	<2000	2000	<2000
Chemical Oxygen Demand	ug/l	--	49000	56000	36000	53000	34000
Chloride	ug/l	–	442000	269000	338000	251000	383000
Conductivity	uS/cm	–	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2095	1549	1819	1232	2350
Cyanide	ug/l	5 [6]	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	87700	80400	79300	52800	<500
Dissolved Organic Carbon	ug/l	--	17400	13100	10200	14800	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	**3680**	13120	7020	6270	13560
Hardness, Calcium Carbonate	ug/l	--	599000	563000	556000	325000	660000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--
Nitrate as N	ug/l	--	<100	400	200	100	200
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2400	1300	800	700	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.71	7.72	7.51	7.53	8.03
Phosphate	ug/l	–	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**310**	**140**	10	**110**	30
Sulphate	ug/l	–	133000	157000	168000	151000	220000
Temperature (Field)	deg c	– [10]	17.7	1.1	16.5	19.2	0.6
Total Dissolved Solids	ug/l	--	1280000	1050000	1140000	794000	1180000
Total Organic Carbon	ug/l	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	91000	43000	<2000	68000	<2000
Metals							
Arsenic	ug/l	100 [11]	1	<1	<1	<1	<1
Barium	ug/l	–	--	--	--	--	--
Boron	ug/l	200 [12]	166	118	172	130	124
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	–	186000	152000	160000	104000	189000
Chromium	ug/l	– [13]	4	**12**	<1	8	1
Cobalt	ug/l	0.9	**1.4**	**2.8**	<0.5	**1.8**	0.6
Copper	ug/l	5	**5.2**	**10.7**	2.6	**6.8**	4
Iron	ug/l	300	**1960**	**3540**	201	**2690**	295
Lead	ug/l	– [14]	5.4	4.6	0.2	3.2	0.3
Magnesium	ug/l	--	32800	44700	37800	16200	45600
Manganese	ug/l	–	676	340	222	202	409
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--
Potassium	ug/l	–	16200	14100	13300	10100	14100
Selenium	ug/l	100	--	--	--	--	--
Sodium	ug/l	–	255000	195000	197000	142000	261000
Zinc	ug/l	30 [11]	18	**31**	11	25	11
Phenols							
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	<1	<1	**5**	<1

Parameter	Unit	PWQO [1]	S1 14-May-2020 S-1	S1 26-Aug-2020 S-1	S1 25-Nov-2020 S-1
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	342000	406000	404000
Ammonia, unionized	ug/l	20	2.8	3.16	2.31
Ammonia Nitrogen	ug/l	–	80	110	120
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	29000	52000	30000
Chloride	ug/l	–	445000	320000	279000
Conductivity	uS/cm	–	--	--	--
Conductivity (Field)	uS/cm	--	2038	1976	1880
Cyanide	ug/l	5 [6]	--	--	--
Dissolved Inorganic Carbon	ug/l	--	72000	79400	83700
Dissolved Organic Carbon	ug/l	--	26000	11900	10400
Dissolved Oxygen (Field)	ug/l	-- [7]	11370	9660	14170
Hardness, Calcium Carbonate	ug/l	--	611000	646000	586000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	400	600	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.12	7.76	8.29
Phosphate	ug/l	–	--	--	--
Phosphorus	ug/l	-- [9]	<10	10	10
Sulphate	ug/l	–	235000	210000	215000
Temperature (Field)	deg c	– [10]	15.1	23.6	2.4
Total Dissolved Solids	ug/l	--	1200000	1160000	1190000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	4000	4000	4000
Metals					
Arsenic	ug/l	100 [11]	<1	<1	<1
Barium	ug/l	–	--	--	--
Boron	ug/l	200 [12]	112	**216**	117
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	–	183000	192000	175000
Chromium	ug/l	– [13]	<1	<1	<1
Cobalt	ug/l	0.9	**1.1**	0.9	<0.5
Copper	ug/l	5	1.6	1.9	1.2
Iron	ug/l	300	**440**	**897**	**845**
Lead	ug/l	– [14]	0.1	0.1	<0.1
Magnesium	ug/l	--	37100	40200	36300
Manganese	ug/l	–	418	171	300
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	–	12200	15900	11400
Selenium	ug/l	100	--	--	--
Sodium	ug/l	–	194000	216000	172000
Zinc	ug/l	30 [11]	8	<5	<5
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**4**	<4 [19]

Parameter	Unit	PWQO [1]	S3 01-May-1981	S3 01-Apr-1984	S3 01-May-1987	S3 01-Oct-1987	S3 06-Sep-1992	S3 08-Jun-1993
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	–	–	–	--	–	–
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	--	122000	217000
Ammonia, unionized	ug/l	20	–	–	–	--	–	–
Ammonia Nitrogen	ug/l	–	–	80	30	610	100	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	–	–	–	–	2000	3000
Chemical Oxygen Demand	ug/l	--	24000	1600	162000	93000	129000	45000
Chloride	ug/l	–	22000	42000	123000	255300	43000	123000
Conductivity	uS/cm	–	--	--	--	--	–	--
Conductivity (Field)	uS/cm	--	330	600	761	1794	488	1004
Cyanide	ug/l	5 [6]	--	--	--	--	**15**	--
Dissolved Inorganic Carbon	ug/l	--	–	–	–	–	24900	59100
Dissolved Organic Carbon	ug/l	--	–	–	–	–	–	–
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	12800	--
Hardness, Calcium Carbonate	ug/l	--	96000	--	910000	534000	207670	328000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	840	900
Nitrite as N	ug/l	--	–	–	--	--	100	100
Nitrogen, Total Kjeldahl	ug/l	--	–	–	–	–	3920	930
Nitrogen, Nitrate-Nitrite	ug/l	--	–	–	–	–	–	–
Nitrogen, Organic	ug/l	--	--	--	--	–	3820	830
pH (Field)	-	6.5 - 8.5	7.9	--	8.15	7.82	**6.4**	8.32
Phosphate	ug/l	–	--	--	--	--	420	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	53000	--	39900	305400	41000	112000
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	170000	300000	380000	900000	328000	728000
Total Organic Carbon	ug/l	--	–	--	–	--	10100	23700
Total Suspended Solids	ug/l	--	–	–	–	–	–	–
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	1	--
Barium	ug/l	–	--	--	--	--	80	–
Boron	ug/l	200 [12]	--	--	--	--	10	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	--	--	252700	100000	50800	81000
Chromium	ug/l	– [13]	2	--	**100**	**30**	**20**	**51**
Cobalt	ug/l	0.9	--	--	--	--	–	--
Copper	ug/l	5	–	--	**100**	**10**	**10**	**6**
Iron	ug/l	300	200	--	**700**	**400**	**21330**	**1334**
Lead	ug/l	– [14]	3	--	10	10	50	7.4
Magnesium	ug/l	--	–	--	56900	56800	19600	31000
Manganese	ug/l	–	--	--	40	140	5600	36
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	–	--
Nickel	ug/l	25	1	--	10	**40**	20	20
Potassium	ug/l	–	--	--	--	--	2900	23000
Selenium	ug/l	100	--	--	--	–	--	--
Sodium	ug/l	–	--	--	--	--	20600	54000
Zinc	ug/l	30 [11]	3	--	10	**210**	**60**	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	**17**	**2**

Parameter	Unit	PWQO [1]	S3 15-Nov-1993	S3 15-Jun-1994	S3 02-Nov-1994	S3 28-Jun-1995	S3 14-Nov-1995	S3 12-Jun-1996
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	184000	326000	114000	226000	210000	235000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	100	--	140	10	120	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	1800	1900	2000	1000	2000	2000
Chemical Oxygen Demand	ug/l	--	53900	25000	45000	58000	28000	24000
Chloride	ug/l	--	301000	196000	101000	195000	172000	177000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1204	1261	739	792	1240	1060
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	50100	--	27000	68200	49200	46700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10300	8970	11460	10660	11870	7300
Hardness, Calcium Carbonate	ug/l	--	329000	285000	197000	402000	320000	299000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	6060	100	2500	100	2200	--
Nitrite as N	ug/l	--	100	100	100	100	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1770	3920	5320	630	2100	560
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	1670	1670	5180	620	1980	470
pH (Field)	-	6.5 - 8.5	7.84	8.15	7.95	7.56	7.68	7.44
Phosphate	ug/l	--	100	190	240	200	90	0.1
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	93000	56000	70000	166000	106000	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	724000	632000	371000	824000	620000	528000
Total Organic Carbon	ug/l	--	8400	18100	10600	14900	9200	10300
Total Suspended Solids	ug/l	--	--	--	--	9000	5000	8000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	100	--	--
Barium	ug/l	--	--	--	--	87	--	--
Boron	ug/l	200 [12]	--	58	48	200	10	35
Cadmium	ug/l	0.2 [11]	--	--	0.1	0.1	0.1	--
Calcium	ug/l	--	102000	76000	61000	131000	94300	90200
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	4	3	3.9	4	2	4.4
Iron	ug/l	300	**2204**	**776**	**1002**	240	210	**326**
Lead	ug/l	-- [14]	9.3	0.5	1.7	1.1	0.4	0.3
Magnesium	ug/l	--	18100	23000	11100	32100	20100	17700
Manganese	ug/l	--	294	70	129	62	130	305
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20
Potassium	ug/l	--	10100	9100	11100	27700	12400	11700
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	119000	121000	51000	65400	126000	109000
Zinc	ug/l	30 [11]	**39**	28	27	10	**50**	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	**2**	**10**	1	--	**2**

Parameter	Unit	PWQO [1]	S3 12-Oct-1996	S3 17-Jun-1997	S3 05-Nov-1997	S3 05-Jun-1998	S3 28-Aug-1998	S3 30-Oct-1998
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	239000	193000	220000	285000	240000	256000
Ammonia, unionized	ug/l	20	--	--	--	--	--	10
Ammonia Nitrogen	ug/l	--	60	10	30	30	30	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	2000	3000	1000	3000
Chemical Oxygen Demand	ug/l	--	18000	24000	14000	40000	29000	35000
Chloride	ug/l	--	188000	136000	226000	183000	229000	112000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1250	854	1375	1343	1290	1480
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	46300	36100	42600	57900	49900	61200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	8630	6970	12100	9580	8050	9390
Hardness, Calcium Carbonate	ug/l	--	347000	276000	336000	524000	513000	402000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	850	860	830	1630	1600	610
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.11	7.24	7.9	--	8.04	7.4
Phosphate	ug/l	--	100	110	50	120	90	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	630	428000	689000	673000	650000	740000
Total Organic Carbon	ug/l	--	9500	11900	9800	10700	11000	10300
Total Suspended Solids	ug/l	--	5000	1000	22000	64000	9000	1000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	50	100	80	80	100	80
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	108000	87000	105000	160000	172000	122000
Chromium	ug/l	-- [13]	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	1.8	4	**10.9**	**5.3**	2.8	2.7
Iron	ug/l	300	**380**	**340**	260	**1700**	**340**	290
Lead	ug/l	-- [14]	3	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	18500	14000	17700	30100	20000	23200
Manganese	ug/l	--	210	180	100	1070	120	100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20
Potassium	ug/l	--	12300	8400	11000	8800	10500	6800
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	112000	82200	108000	102000	127000	168000
Zinc	ug/l	30 [11]	20	10	10	30	**960**	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	**24**	1	1	**4**	1

Parameter	Unit	PWQO [1]	S3 19-Oct-1999	S3 03-May-2000	S3 25-Oct-2000	S3 13-Jun-2001	S3 27-Sep-2001	S3 21-Nov-2001
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	238000	244000	300000	272000	215000	212000
Ammonia, unionized	ug/l	20	--	10	--	<20	<20	<20
Ammonia Nitrogen	ug/l	--	30	20	--	10	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	--	1000	1000	1000
Chemical Oxygen Demand	ug/l	--	30000	21000	--	27000	9000	18000
Chloride	ug/l	--	323000	215000	244000	212000	342000	290000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1520	1290	1400	1050	1520	1200
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	62700	38200	--	46400	40900	29700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	9510	11660	8730	11200	8260	11130
Hardness, Calcium Carbonate	ug/l	--	419000	360000	525000	366000	463000	359000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	10	100	100	600
Nitrite as N	ug/l	--	--	--	200	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	680	510	6180	530	520	420
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	7.46	6.81	7.8	7.99	7.13
Phosphate	ug/l	--	40	20	2210	30	50	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	89000	53000	199000	85000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	760000	650000	772000	708000	1030000	791000
Total Organic Carbon	ug/l	--	10100	8800	--	12600	9900	11000
Total Suspended Solids	ug/l	--	14000	32000	570000	63000	1000	9000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	1	1	1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	90	50	**600**	120	90	70
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	133000	111000	143000	108000	147000	114000
Chromium	ug/l	-- [13]	--	--	**120**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	3.2	**7.3**	**62.7**	2	2.9	4.8
Iron	ug/l	300	**530**	**320**	**6240**	**320**	200	80
Lead	ug/l	-- [14]	0.2	0.2	39.6	0.5	0.2	0.2
Magnesium	ug/l	--	20700	19900	40900	23300	23400	18000
Manganese	ug/l	--	260	150	5460	150	110	30
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**80**	20	20	20
Potassium	ug/l	--	15400	8600	12000	4800	5500	8400
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	174000	126000	122000	113000	169000	154000
Zinc	ug/l	30 [11]	10	10	**410**	**70**	**50**	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	**2**	**4**	**90**	1	1

Parameter	Unit	PWQO [1]	S3 22-May-2002	S3 08-Nov-2002	S3 31-May-2003	S3 03-Jul-2003	S3 22-Oct-2003	S3 17-May-2004
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	238000	216000	209000	240000	194000	201000
Ammonia, unionized	ug/l	20	--	--	--	--	--	<10
Ammonia Nitrogen	ug/l	–	20	120	90	10	180	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	1000	2000	1000	2000
Chemical Oxygen Demand	ug/l	--	26000	44000	26000	24000	29000	38000
Chloride	ug/l	–	220000	261000	205000	283000	244000	249000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1110	1300	1220	1400	1300	1270
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	29000	60000	55000	61000	48000	37200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10030	12800	9660	6040	10400	8600
Hardness, Calcium Carbonate	ug/l	--	345000	408000	293000	393000	–	329000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	900	1400	900	100	600	300
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	400	1500	580	600	710	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.16	7	7.8	7.94	8.08	7.9
Phosphate	ug/l	–	20	400	30	70	60	70
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	77000	126000	74000	99000	86000	76000
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	696000	650000	657000	913000	710000	635000
Total Organic Carbon	ug/l	--	8000	11000	10000	16000	19000	8200
Total Suspended Solids	ug/l	--	7000	244000	6000	90000	11000	29000
Metals								
Arsenic	ug/l	100 [11]	1	1	1	1	1	1
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	70	100	50	91	52	70
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	109000	126000	93600	120000	96900	101000
Chromium	ug/l	– [13]	**10**	**10**	**10**	2	6	1
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	<1	**25.9**	4	2	**27**	3
Iron	ug/l	300	100	**5210**	290	**488**	231	**894**
Lead	ug/l	– [14]	<1	11.9	0.5	1.4	2	0.8
Magnesium	ug/l	--	17800	22600	14500	22600	14200	18400
Manganese	ug/l	–	90	420	220	139	80	368
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	10	10	10
Potassium	ug/l	–	8300	13100	8000	11500	9400	10200
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	136000	154000	132000	158000	149000	143000
Zinc	ug/l	30 [11]	20	**60**	10	18	16	21
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S3 21-Aug-2004	S3 18-Nov-2004	S3 25-May-2005	S3 09-Sep-2005 [20]	S3 09-Nov-2005	S3 24-May-2006
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	285000	--	325000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	<5000	--	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	264000	250000	234000	--	266000	233000
Ammonia, unionized	ug/l	20	<10	<10	<0.14	--	0.03	0.14
Ammonia Nitrogen	ug/l	--	10	10	<10	--	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	<3000	--	<3000	<3000
Chemical Oxygen Demand	ug/l	--	29000	26000	21000	--	24000	23000
Chloride	ug/l	--	280000	344000	267000	--	326000	212000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1320	1300	1650	--	980	725
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	29200	36000	58500	--	56500	59600
Dissolved Organic Carbon	ug/l	--	--	--	9200	--	9100	12000
Dissolved Oxygen (Field)	ug/l	-- [7]	7400	9760	9540	--	8900	9330
Hardness, Calcium Carbonate	ug/l	--	400000	374000	367000	--	405000	311000
Hydrogen Sulfide	ug/l	2 [8]	--	--	<10	--	<10	--
Nitrate as N	ug/l	--	100	600	200	--	500	500
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	420	360	550	--	460	430
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	6.9	7.6	--	7.2	7.9
Phosphate	ug/l	--	20	30	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	20	--	20	20
Sulphate	ug/l	--	83000	95000	75000	--	106000	70000
Temperature (Field)	deg c	-- [10]	--	--	18.8	--	1	9.5
Total Dissolved Solids	ug/l	--	660000	650000	799000	--	945000	686000
Total Organic Carbon	ug/l	--	9000	7200	--	--	--	--
Total Suspended Solids	ug/l	--	40000	14000	5000	--	2000000	3000
Metals								
Arsenic	ug/l	100 [11]	1	1	<1	--	<1	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	82	53	76	--	70	54
Cadmium	ug/l	0.2 [11]	--	--	<0.5	--	<0.5	<0.1
Calcium	ug/l	--	119000	114000	113000	--	126000	99300
Chromium	ug/l	-- [13]	2	2	<2	--	<2	<2
Cobalt	ug/l	0.9	--	--	**69**	--	**1**	0.5
Copper	ug/l	5	3	2	<2	--	<2	<2
Iron	ug/l	300	128	**828**	239	--	**341**	161
Lead	ug/l	-- [14]	1.3	0.7	1	--	1.5	0.9
Magnesium	ug/l	--	25000	21700	20600	--	21900	15200
Manganese	ug/l	--	210	250	233	--	153	99
Mercury, dissolved	ug/l	0.2 [15]	--	--	<0.05	--	<0.06	--
Molybdenum	ug/l	40	--	--	4	--	<5	--
Nickel	ug/l	25	10	10	<10	--	<10	--
Potassium	ug/l	--	10200	9600	10500	--	10200	7500
Selenium	ug/l	100	--	--	<1	--	<1	--
Sodium	ug/l	--	182000	183000	181000	--	203000	148000
Zinc	ug/l	30 [11]	**64**	15	**35**	--	9	8
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S3 15-Aug-2006	S3 16-Nov-2006	S3 08-May-2007	S3 22-Aug-2007 [20]	S3 20-Nov-2007	S3 23-May-2008
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	302000	171000	232000	--	170000	244000
Ammonia, unionized	ug/l	20	<0.18	--	<0.34	--	<0.12	<0.23
Ammonia Nitrogen	ug/l	--	<10	80	<10	--	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	--	<3000	<3000
Chemical Oxygen Demand	ug/l	--	30000	19000	31000	--	29000	26000
Chloride	ug/l	--	295000	88600	207000	--	194000	199000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1470	490	900	--	750	1050
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	72500	42800	58000	--	44200	57300
Dissolved Organic Carbon	ug/l	--	16200	8800	7600	--	10400	5000
Dissolved Oxygen (Field)	ug/l	-- [7]	**1600**	8270	8010	--	10890	10590
Hardness, Calcium Carbonate	ug/l	--	403000	232000	297000	--	264000	269000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	700	200	--	500	200
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	460	820	330	--	580	550
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	--	8.1	--	8.1	8
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	**140**	<10	--	**150**	30
Sulphate	ug/l	--	93000	48000	65000	--	74000	54000
Temperature (Field)	deg c	-- [10]	16	8.3	15.5	--	2.1	13.3
Total Dissolved Solids	ug/l	--	895000	407000	663000	--	594000	642000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<3000	58000	<3000	--	46000	<3000
Metals								
Arsenic	ug/l	100 [11]	1.1	<1	0.7	--	1.2	1.8
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	102	41	66	--	45	40
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	<0.1	--	<0.1	<0.1
Calcium	ug/l	--	125000	72800	92000	--	83900	87000
Chromium	ug/l	-- [13]	<2	8	<2	--	4	<2
Cobalt	ug/l	0.9	0.4	**1**	<0.5	--	**1.5**	<0.5
Copper	ug/l	5	2	**38**	**16**	--	5	<2
Iron	ug/l	300	191	**2130**	252	--	**2120**	**355**
Lead	ug/l	-- [14]	0.5	6	0.2	--	10	<0.1
Magnesium	ug/l	--	22000	12100	16300	--	13200	12400
Manganese	ug/l	--	170	238	273	--	267	258
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	10300	8800	8100	--	8000	6100
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	177000	68800	134000	--	111000	135000
Zinc	ug/l	30 [11]	10	**42**	19	--	**36**	6
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S3 12-Aug-2008 [20]	S3 06-Nov-2008	S3 13-May-2009 S-12	S3 25-Aug-2009 A-7	S3 27-Nov-2009 [28] S-10	S3 18-May-2010 S-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	276000	262000	417000	250000	343000
Ammonia, unionized	ug/l	20	--	<0.06	1.2	1.51	0.14	0.76
Ammonia Nitrogen	ug/l	--	--	<10	90	190	80	140
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	<3000	<1000	<1000	2000	2000
Chemical Oxygen Demand	ug/l	--	--	14000	25000	58000	25000	30000
Chloride	ug/l	--	--	259000	174000	211000	162000	186000
Conductivity	uS/cm	--	--	--	1170	1590	1160	1350
Conductivity (Field)	uS/cm	--	--	1200	1000	1234	1014	1452
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	66800	64900	107000	61200	73500
Dissolved Organic Carbon	ug/l	--	--	3700	10200	13300	8900	11800
Dissolved Oxygen (Field)	ug/l	-- [7]	--	8540	9390	9160	12410	11000
Hardness, Calcium Carbonate	ug/l	--	--	346000	313000	422000	326000	357000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	200	300	<100	600	<100
Nitrite as N	ug/l	--	--	--	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	--	470	560	670	380	590
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	7.5	7.6	7.37	7.13	7.37
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	30	**60**	30	**90**	20
Sulphate	ug/l	--	--	75000	53000	82000	78000	81000
Temperature (Field)	deg c	_ [10]	--	10.5	17.9	18	5.5	12.9
Total Dissolved Solids	ug/l	--	--	800000	761000	1030000	754000	878000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	3000	16000	7000	24000	8000
Metals								
Arsenic	ug/l	100 [11]	--	0.8	<1	1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	63	70	90	60	90
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	--	110000	99000	131000	104000	110000
Chromium	ug/l	_ [13]	--	<2	5	6	4	5
Cobalt	ug/l	0.9	--	0.7	0.8	**1.4**	0.7	**1.2**
Copper	ug/l	5	--	<2	2	2	2	2
Iron	ug/l	300	--	**1150**	**1310**	**3050**	**1190**	**3840**
Lead	ug/l	_ [14]	--	<0.1	<1	<1	<1	<1
Magnesium	ug/l	--	--	17100	16000	23000	16000	20000
Manganese	ug/l	--	--	420	440	1210	490	1290
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	8000	7000	8000	8000	7000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	--	163000	127000	150000	119000	143000
Zinc	ug/l	30 [11]	--	<5	<10	<10	<10	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S3 18-Aug-2010 S-8	S3 14-Oct-2010 S-12	S3 19-May-2011 W-2	S3 16-Aug-2011 [2] N-8	S3 30-Nov-2011 [22] S3	S3 30-May-2012 S 3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	363000	320000	232000	407000	228000	360000
Ammonia, unionized	ug/l	20	0.64	0.89	0.48	1.85	0.23	0.79
Ammonia Nitrogen	ug/l	–	150	70	50	280	30	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	<1000	<1000	1000	2000	<2000
Chemical Oxygen Demand	ug/l	--	35000	30000	25000	40000	20000	41000
Chloride	ug/l	–	170000	197000	112000	186000	128000	170000
Conductivity	uS/cm	–	1580	1500	914	1630	1080	–
Conductivity (Field)	uS/cm	--	1429	610	879	1313	985	1356
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	79500	89000	55100	90700	28800	91000
Dissolved Organic Carbon	ug/l	--	12400	11400	9500	14500	7800	15000
Dissolved Oxygen (Field)	ug/l	-- [7]	9000	13000	6210	6150	7780	5410
Hardness, Calcium Carbonate	ug/l	--	541000	438000	275000	518000	315000	460000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	300	<100	600	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<10
Nitrogen, Total Kjeldahl	ug/l	--	360	580	840	880	880	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.14	7.81	7.61	7.28	7.76	7.20
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	20	**40**	20	**40**	**59**
Sulphate	ug/l	–	214000	155000	71000	158000	111000	130000
Temperature (Field)	deg c	_ [10]	16.8	10.9	13.1	18.3	6.1	22.0
Total Dissolved Solids	ug/l	--	1030000	975000	594000	1060000	702000	854000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	4000	5000	4000	13000	6000	38000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	<1	<10	<50	<1.0
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	110	70	60	100	200	100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<10	<0.10
Calcium	ug/l	–	172000	139000	87000	158000	93000	150000
Chromium	ug/l	_ [13]	4	5	4	6	<50	<5.0
Cobalt	ug/l	0.9	0.8	0.6	0.4	0.8	<10	**1.1**
Copper	ug/l	5	3	3	2	2	<10	3.8
Iron	ug/l	300	**3320**	**1510**	**740**	**4660**	**1300**	**8600**
Lead	ug/l	_ [14]	<1	<1	<1	<1	<10	0.57
Magnesium	ug/l	--	27000	22000	14000	30000	20000	27000
Manganese	ug/l	–	1020	520	280	1440	370	1500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	10000	9000	6000	10000	8000	9600
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	153000	141000	81000	142000	89000	150000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<50	20
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1.0

Parameter	Unit	PWQO [1]	S3 22-Aug-2012 S-3	S3 29-Nov-2012 S3	S3 28-May-2013 S15	S3 15-Aug-2013 S3	S3 21-Nov-2013 SA-11	S3 28-May-2014 S3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	450000	340000	320000	510000	330000	340000
Ammonia, unionized	ug/l	20	2.1	0.83	0.86	3.3	0.31	1.47
Ammonia Nitrogen	ug/l	–	350	330	290	1300	63	230
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	50000	29000	27000	64000	24000	29000
Chloride	ug/l	–	200000	210000	190000	180000	210000	200000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1613	1520	1322	1695	1396	1299
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	93000	76000	73000	130000	84000	77000
Dissolved Organic Carbon	ug/l	--	<200	10000	12000	20000	10000	11000
Dissolved Oxygen (Field)	ug/l	-- [7]	5500	**1990**	9370	**210**	**2090**	**5630**
Hardness, Calcium Carbonate	ug/l	--	670000	480000	470000	580000	460000	440000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	420	400	100	840	360
Nitrite as N	ug/l	--	<10	<10	<10	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	1400	1500	1100	2100	780	1300
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	420	400	100	840	360
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.26	7.48	7.04	6.97	7.71	7.40
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**69**	**42**	**35**	**100**	19	**97**
Sulphate	ug/l	–	270000	160000	120000	140000	140000	100000
Temperature (Field)	deg c	– [10]	17.6	0.2	14.9	15.0	1.8	14.2
Total Dissolved Solids	ug/l	--	1290000	994000	832000	1130000	996000	926000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	31000	8000	8000	<5000	7000	9000
Metals								
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	160	80	77	110	97	76
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	–	220000	170000	140000	210000	150000	140000
Chromium	ug/l	– [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	**0.94**	0.53	0.61	**1.7**	<0.50	0.71
Copper	ug/l	5	3.9	2.4	2.0	1.4	2.1	1.8
Iron	ug/l	300	**7200**	**3300**	**3000**	**22000**	**1300**	**4000**
Lead	ug/l	– [14]	0.54	<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium	ug/l	--	43000	32000	26000	47000	31000	26000
Manganese	ug/l	–	1500	1300	900	4800	550	1100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	16000	9300	9300	11000	9300	9100
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	180000	180000	150000	150000	170000	140000
Zinc	ug/l	30 [11]	<5.0	<5.0	<5.0	9.7	<5.0	5.1
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Parameter	Unit	PWQO [1]	S3 26-Aug-2014 S3	S3 13-Nov-2014 S-3	S3 27-May-2015 S-3	S3 25-Aug-2015 S-3	S3 25-Nov-2015 S-3	S3 24-May-2016 S-3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	440000	330000	327000	547000	352000	367000
Ammonia, unionized	ug/l	20	2.3	0.35	5.8	**36.7**	0.67	2.91
Ammonia Nitrogen	ug/l	--	750	140	320	900	130	410
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	13000	<2000	2000
Chemical Oxygen Demand	ug/l	--	47000	25000	29000	48000	34000	37000
Chloride	ug/l	--	230000	230000	265000	240000	328000	227000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1694	1237	1501	1737	1682	1375
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	120000	79000	70500	134000	70500	74700
Dissolved Organic Carbon	ug/l	--	14000	9500	14400	15500	9800	12600
Dissolved Oxygen (Field)	ug/l	-- [7]	**1400**	**2930**	5670	**570**	**550**	5890
Hardness, Calcium Carbonate	ug/l	--	530000	430000	398000	474000	610000	592000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	130	480	200	<100	500	<100
Nitrite as N	ug/l	--	<10	18	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1600	620	900	1800	700	1000
Nitrogen, Nitrate-Nitrite	ug/l	--	130	500	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.96	7.31	7.71	8.14	7.77	7.34
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**32**	21	**60**	**80**	20	10
Sulphate	ug/l	--	100000	88000	97000	117000	127000	106000
Temperature (Field)	deg c	-- [10]	17.8	4.9	18.7	16.6	0.7	17.4
Total Dissolved Solids	ug/l	--	1040000	860000	856000	1060000	961000	872000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	22000	8000	2000	47000	8000	13000
Metals								
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	96	76	96	102	85	109
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	160000	140000	120000	132000	204000	173000
Chromium	ug/l	-- [13]	<5.0	<5.0	<1	1	<1	2
Cobalt	ug/l	0.9	**1.2**	0.57	0.6	**1.1**	<0.5	**1.6**
Copper	ug/l	5	1.4	1.6	<0.5	<0.5	<0.5	1.6
Iron	ug/l	300	**11000**	**2000**	**2990**	**12700**	**1500**	**19200**
Lead	ug/l	-- [14]	<0.50	<0.50	<0.1	0.2	<0.1	0.4
Magnesium	ug/l	--	35000	24000	23600	34600	24300	38800
Manganese	ug/l	--	2800	760	1050	2780	565	2970
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	10000	9200	9020	10800	8450	10300
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	160000	150000	147000	150000	199000	149000
Zinc	ug/l	30 [11]	13	<5.0	<5	10	5	9
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	**1.2**	<1	**2**	<1	**4**

Parameter	Unit	PWQO [1]	S3 18-Aug-2016 S-3	S3 16-Nov-2016 S-3	S3 18-May-2017 S-3	S3 28-Aug-2017 S-3	S3 28-Nov-2017 S-3	S3 23-May-2018 S-3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	595000	351000	302000	425000	317000	330000
Ammonia, unionized	ug/l	20	13.86	0.82	3.02	2.81	2.4	0.81
Ammonia Nitrogen	ug/l	-	1830	160	170	410	170	220
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	3000	<2000	4000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	59000	25000	31000	30000	23000	27000
Chloride	ug/l	-	198000	339000	198000	227000	223000	194000
Conductivity	uS/cm	-	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1743	1914	1201	1196	1241	1265
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	111000	64900	40300	77600	51300	69100
Dissolved Organic Carbon	ug/l	--	37900	9000	21900	14600	8400	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	**240**	**1140**	5960	**5350**	**4740**	**4480**
Hardness, Calcium Carbonate	ug/l	--	523000	475000	331000	445000	362000	347000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	<100	200	<100	600	100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2800	600	700	600	700	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.32	7.53	7.71	7.41	8.20	7.07
Phosphate	ug/l	-	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**110**	30	30	20	10	20
Sulphate	ug/l	-	212000	140000	81000	98000	75000	60000
Temperature (Field)	deg c	- [10]	18.9	7.5	18.4	14.8	1.1	16.9
Total Dissolved Solids	ug/l	--	1250000	1130000	742000	950000	758000	704000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	70000	6000	9000	12000	<2000	4000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	<5 [17]	<1	<1	<1
Barium	ug/l	-	--	--	--	--	--	--
Boron	ug/l	200 [12]	147	101	**444**	95	90	105
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1
Calcium	ug/l	-	145000	147000	99700	139000	110000	107000
Chromium	ug/l	- [13]	<1	<1	<5 [17]	<1	<1	<1
Cobalt	ug/l	0.9	**1.3**	0.6	<2.5 [17]	0.7	0.6	0.5
Copper	ug/l	5	2.7	1.0	4.2	<0.5	1.5	0.7
Iron	ug/l	300	**13200**	**1350**	**4320**	**4860**	**1150**	**1650**
Lead	ug/l	- [14]	<0.1	<0.1	<0.5 [17]	0.1	0.1	<0.1
Magnesium	ug/l	--	39300	26300	19800	23900	21200	19200
Manganese	ug/l	-	2220	616	520	1210	653	831
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	-	14700	10800	7920	7790	8030	7440
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	-	147000	187000	106000	138000	137000	119000
Zinc	ug/l	30 [11]	8	6	<25 [17]	<5	7	6
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	**2**	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S3 30-Aug-2018 S-3	S3 28-Nov-2018 S-3	S3 20-Jun-2019 S-3	S3 28-Aug-2019 S-3	S3 21-Nov-2019 S-3
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	784000	358000	318000	208000	311000
Ammonia, unionized	ug/l	20	5.39	0.31	2.03	2.27	0.79
Ammonia Nitrogen	ug/l	–	3490	80	170	250	170
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	68000	26000	28000	52000	24000
Chloride	ug/l	–	203000	370000	160000	234000	322000
Conductivity	uS/cm	–	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1831	1617	1213	1132	1828
Cyanide	ug/l	5 [6]	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	134000	54600	67200	70900	655
Dissolved Organic Carbon	ug/l	--	29400	24900	7400	18600	8400
Dissolved Oxygen (Field)	ug/l	-- [7]	**1400**	11190	**2070**	**1330**	**4540**
Hardness, Calcium Carbonate	ug/l	--	733000	445000	315000	322000	528000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--
Nitrate as N	ug/l	--	100	900	800	200	500
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	5400	900	700	1000	600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.73	7.56	7.61	7.46	7.71
Phosphate	ug/l	–	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	**50**	30	**70**	20
Sulphate	ug/l	–	31000	97000	146000	117000	120000
Temperature (Field)	deg c	– [10]	15.7	3.1	16.1	17	1.2
Total Dissolved Solids	ug/l	--	1100000	978000	764000	762000	926000
Total Organic Carbon	ug/l	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	116000	2000	4000	10000	2000
Metals							
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1
Barium	ug/l	–	--	--	--	--	--
Boron	ug/l	200 [12]	54	92	100	76	74
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	–	197000	128000	85500	98300	155000
Chromium	ug/l	– [13]	2	1	2	1	<1
Cobalt	ug/l	0.9	**2.6**	0.5	0.6	0.6	0.7
Copper	ug/l	5	0.9	4.3	3.0	3.5	1.9
Iron	ug/l	300	**44700**	**935**	**1870**	**2020**	**2270**
Lead	ug/l	– [14]	<0.1	0.2	0.2	0.3	0.1
Magnesium	ug/l	--	58800	30300	24700	18600	34300
Manganese	ug/l	–	6550	269	438	738	885
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--
Potassium	ug/l	–	14100	11300	9230	9830	12400
Selenium	ug/l	100	--	--	--	--	--
Sodium	ug/l	–	125000	251000	128000	126000	171000
Zinc	ug/l	30 [11]	6	11	<5	10	8
Phenols							
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	<1	<1	**5**	<1

Parameter	Unit	PWQO [1]	S3 14-May-2020 S-3	S3 26-Aug-2020 S-3	S3 25-Nov-2020 S-3
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	281000	385000	321000
Ammonia, unionized	ug/l	20	1.38	2.21	2.59
Ammonia Nitrogen	ug/l	--	240	390	240
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	27000	20000	33000
Chloride	ug/l	--	303000	336000	340000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	1457	1835	41
Cyanide	ug/l	5 [6]	--	--	--
Dissolved Inorganic Carbon	ug/l	--	59100	77200	67400
Dissolved Organic Carbon	ug/l	--	24400	11700	8600
Dissolved Oxygen (Field)	ug/l	-- [7]	**5940**	7240	11430
Hardness, Calcium Carbonate	ug/l	--	361000	493000	468000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	500	600	600
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	600	900	600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.38	7.32	8.10
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	<10	20	**70**
Sulphate	ug/l	--	103000	114000	108000
Temperature (Field)	deg c	-- [10]	13.4	15	0.6
Total Dissolved Solids	ug/l	--	780000	972000	1020000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	3000	7000	34000
Metals					
Arsenic	ug/l	100 [11]	<1	<1	<1
Barium	ug/l	--	--	--	--
Boron	ug/l	200 [12]	49	79	51
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	111000	148000	141000
Chromium	ug/l	-- [13]	<1	<1	1
Cobalt	ug/l	0.9	<0.5	0.8	0.8
Copper	ug/l	5	1.7	1.4	1.8
Iron	ug/l	300	**2160**	**2980**	**3820**
Lead	ug/l	-- [14]	0.1	<0.1	0.5
Magnesium	ug/l	--	20000	29800	28400
Manganese	ug/l	--	647	1170	964
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	7520	11100	9700
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	129000	187000	168000
Zinc	ug/l	30 [11]	<5	5	<5
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**6**	<4 [19]

Parameter	Unit	PWQO [1]	S5 19-Jun-1989	S5 24-Jul-1989	S5 17-Nov-1989	S5 27-Mar-1990	S5 16-Apr-1990	S5 18-May-1990
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	_ [5]	892000	1029000	980000	1330000	1254000	1048000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4500	1830	3460	10000	530	660
Biochemical Oxygen Demand, 5 Day	ug/l	–	7000	6000	5000	27000	14000	6000
Chemical Oxygen Demand	ug/l	–	82000	65000	105000	287000	209000	202000
Chloride	ug/l	--	136000	148000	177000	245000	239000	202000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2199	2203	2200	3207	2614	2570
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	–	4760	193000	211000	395000	302000	323000
Dissolved Organic Carbon	ug/l	–	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	_ [7]	--	--	--	<1000	500	6600
Hardness, Calcium Carbonate	ug/l	–	860000	414000	816000	1669000	1521000	1078000
Nitrate as N	ug/l	--	<100	<100	6580	4000	7300	2900
Nitrite as N	ug/l	--	<100	<100	250	<1000	<100	800
Nitrogen, Total Kjeldahl	ug/l	–	4760	1870	6470	12690	14000	12000
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--	--
Nitrogen, Organic	ug/l	–	260	40	3010	2690	13470	11340
pH (Field)	-	6.5 - 8.5	7.64	7.63	7.2	7.9	7.28	7.81
Phosphate	ug/l	--	<100	<100	250	100	930	160
Phosphorus	ug/l	_ [9]	--	--	--	--	--	--
Sulphate	ug/l	--	30000	25000	96000	156000	166000	47000
Temperature (Field)	deg c	_ [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1100000	1100000	1100000	1600000	1300000	1280000
Total Organic Carbon	ug/l	–	800	--	33900	65000	63000	44000
Total Suspended Solids	ug/l	–	--	--	--	--	--	--
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	277000	83000	238000	526000	453000	309000
Chromium	ug/l	_ [13]	**20**	**240**	<10	<50	<50	<50
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	<100	<100	**30**	<50	<50	<50
Iron	ug/l	300	**14900**	**8990**	**9900**	**16970**	**7600**	**10000**
Lead	ug/l	_ [14]	30	80	70	170	<50	<50
Magnesium	ug/l	--	41000	56000	53600	86000	84000	74000
Manganese	ug/l	–	2370	2030	2460	3120	2300	1700
Nickel	ug/l	25	<100	<100	**30**	<50	<50	<50
Potassium	ug/l	--	19000	31000	24900	51000	43000	14500
Sodium	ug/l	--	127000	176000	173000	217000	235000	192000
Zinc	ug/l	30 [11]	**260**	**120**	**40**	**270**	<50	**70**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<2	**8**	**10**	**75**	**17**	**8**

Parameter	Unit	PWQO [1]	S5 27-Jun-1990	S5 04-Oct-1990	S5 06-Nov-1990	S5 27-Nov-1990	S5 02-Nov-1991	S5 24-Nov-1991
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	_ [5]	955000	973000	1008000	718000	1296000	1256000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	6100	4100	4000	4600	29000	9290
Biochemical Oxygen Demand, 5 Day	ug/l	–	35000	2000	8000	7000	16000	6000
Chemical Oxygen Demand	ug/l	–	332000	218000	235000	141000	278000	300000
Chloride	ug/l	--	234000	199000	193000	80000	389000	244000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2213	2323	2196	2384	6500	2792
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	–	331000	238000	291000	270000	--	351000
Dissolved Organic Carbon	ug/l	–	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	_ [7]	450	3440	4650	4890	4800	6900
Hardness, Calcium Carbonate	ug/l	–	958000	1045000	1027000	915000	1068000	1194000
Nitrate as N	ug/l	--	<100	<100	<100	<100	--	7700
Nitrite as N	ug/l	--	<100	<100	30	<10	--	140
Nitrogen, Total Kjeldahl	ug/l	–	13000	6050	5590	6610	31500	13900
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	1530	--
Nitrogen, Organic	ug/l	–	6900	1950	1590	2010	2500	4610
pH (Field)	-	6.5 - 8.5	8.18	8.01	8.08	7.8	7.2	7.62
Phosphate	ug/l	--	470	130	240	<100	700	400
Phosphorus	ug/l	_ [9]	--	--	--	--	--	--
Sulphate	ug/l	--	51000	70000	45000	36000	12000	121000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1100000	1160000	1100000	1200000	3250000	1400000
Total Organic Carbon	ug/l	–	73000	41000	39000	42000	--	50000
Total Suspended Solids	ug/l	–	--	--	--	--	--	--
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	243000	281000	284000	244000	269300	341000
Chromium	ug/l	-- [13]	<50	<50	<50	<50	<10	<50
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	<50	<50	<50	<50	**20**	<50
Iron	ug/l	300	**30010**	**510**	**8430**	**14210**	**450**	**8900**
Lead	ug/l	-- [14]	90	<50	<50	<50	<1	<50
Magnesium	ug/l	--	85000	83000	77000	74000	96000	83000
Manganese	ug/l	–	1800	1930	2480	2720	1400	3300
Nickel	ug/l	25	<50	<50	<50	<50	**50**	<50
Potassium	ug/l	--	32000	46000	26000	25000	76000	49000
Sodium	ug/l	--	215000	291000	224000	241000	270000	259000
Zinc	ug/l	30 [11]	**130**	<50	<50	<50	20	<50
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<2	<2	<2	**15**	**9**	**16**

Parameter	Unit	PWQO [1]	S5 09-Jun-1992	S5 15-Nov-1993	S5 15-Jun-1994	S5 02-Nov-1994	S5 12-Jun-1996	S5 26-Aug-1998
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	_ [5]	712000	320000	468000	113000	616000	88000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	2630	100	1430	100	500	260
Biochemical Oxygen Demand, 5 Day	ug/l	–	1700	4000	1600	4200	7000	2000
Chemical Oxygen Demand	ug/l	–	148000	106000	47000	62000	51000	19000
Chloride	ug/l	--	182000	241000	83000	36000	72000	15500
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2274	2030	1711	756	1640	306
Cyanide	ug/l	5 [6]	**107**	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	–	165700	97200	--	27000	101000	17000
Dissolved Organic Carbon	ug/l	–	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	_ [7]	2500	4900	5910	12050	5880	6290
Hardness, Calcium Carbonate	ug/l	–	774150	938000	603000	247000	718000	175000
Nitrate as N	ug/l	--	600	3350	240	100	--	--
Nitrite as N	ug/l	--	<100	100	--	100	--	--
Nitrogen, Total Kjeldahl	ug/l	–	7650	3580	5040	4760	1750	820
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--	--
Nitrogen, Organic	ug/l	–	5020	3480	3610	4660	1250	--
pH (Field)	-	6.5 - 8.5	7.46	7.09	7.19	8.18	**5.92**	7.68
Phosphate	ug/l	--	<100	200	10	460	1340	960
Phosphorus	ug/l	_ [9]	--	--	--	--	--	--
Sulphate	ug/l	--	240000	796000	184000	194000	--	80
Temperature (Field)	deg c	_ [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1384000	1692000	857000	349000	820000	154000
Total Organic Carbon	ug/l	–	28200	17200	20000	9100	16300	6000
Total Suspended Solids	ug/l	–	--	--	--	--	67000	244000
Metals								
Arsenic	ug/l	100 [11]	<1	--	--	--	--	--
Barium	ug/l	--	160	--	--	--	--	--
Boron	ug/l	200 [12]	**3860**	--	**2372**	**1081**	**1630**	**350**
Cadmium	ug/l	0.2 [11]	--	--	--	**0.3**	--	--
Calcium	ug/l	--	179100	244000	150000	67000	167000	37200
Chromium	ug/l	_ [13]	<20	**10**	**11**	**10**	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	**10**	**6**	3.1	**13.6**	**5.7**	**13.2**
Iron	ug/l	300	**22000**	**19170**	**7648**	**15040**	**2740**	**18600**
Lead	ug/l	_ [14]	100	20.9	0.5	3.6	1	0.6
Magnesium	ug/l	--	79300	79900	55300	19200	72300	19600
Manganese	ug/l	–	2620	3347	1348	352	2480	240
Nickel	ug/l	25	<20	**37**	20	20	20	**50**
Potassium	ug/l	--	17100	20700	14900	11800	7420	3500
Sodium	ug/l	--	195800	194000	134000	44000	128000	19000
Zinc	ug/l	30 [11]	**230**	**2334**	**53**	**150**	19	**70**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<2	**2**	**12**	1	**163**	**5**

Parameter	Unit	PWQO [1]	S5 25-May-2005 [20]	S5 09-Sep-2005 [20]	S5 09-Nov-2005 [20]	S5 24-May-2006 [20]	S5 15-Aug-2006 [20]	S5 16-Nov-2006
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	_ [5]	--	--	--	--	--	458000
Ammonia, unionized	ug/l	20	--	--	--	--	--	0.15
Ammonia Nitrogen	ug/l	--	--	--	--	--	--	200
Biochemical Oxygen Demand, 5 Day	ug/l	–	--	--	--	--	--	6000
Chemical Oxygen Demand	ug/l	–	--	--	--	--	--	105000
Chloride	ug/l	--	--	--	--	--	--	49700
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	--	--	750
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	–	--	--	--	--	--	119000
Dissolved Organic Carbon	ug/l	–	--	--	--	--	--	31700
Dissolved Oxygen (Field)	ug/l	_ [7]	--	--	--	--	--	**4990**
Hardness, Calcium Carbonate	ug/l	–	--	--	--	--	--	491000
Nitrate as N	ug/l	--	--	--	--	--	--	200
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	–	--	--	--	--	--	3760
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--	--
Nitrogen, Organic	ug/l	–	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	--	--	--	--	6.7
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	--	--	--	--	--	**590**
Sulphate	ug/l	--	--	--	--	--	--	101000
Temperature (Field)	deg c	_ [10]	--	--	--	--	--	7.3
Total Dissolved Solids	ug/l	--	--	--	--	--	--	706000
Total Organic Carbon	ug/l	–	--	--	--	--	--	--
Total Suspended Solids	ug/l	–	--	--	--	--	--	114000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	**526**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.5
Calcium	ug/l	--	--	--	--	--	--	129000
Chromium	ug/l	_ [13]	--	--	--	--	--	**14**
Cobalt	ug/l	0.9	--	--	--	--	--	**3**
Copper	ug/l	5	--	--	--	--	--	**52**
Iron	ug/l	300	--	--	--	--	--	**3960**
Lead	ug/l	_ [14]	--	--	--	--	--	10
Magnesium	ug/l	--	--	--	--	--	--	40900
Manganese	ug/l	–	--	--	--	--	--	237
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	--	--	43000
Sodium	ug/l	--	--	--	--	--	--	62600
Zinc	ug/l	30 [11]	--	--	--	--	--	**60**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	--	<1

Parameter	Unit	PWQO [1]	S5 08-May-2007 [20]	S5 22-Aug-2007 [20]	S5 20-Nov-2007 [20]	S5 23-May-2008 [20]	S5 12-Aug-2008 [20]	S5 06-Nov-2008 [20]
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	_ [5]	--	--	--	--	--	--
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	--	--	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	–	--	--	--	--	--	--
Chemical Oxygen Demand	ug/l	–	--	--	--	--	--	--
Chloride	ug/l	--	--	--	--	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	–	--	--	--	--	--	--
Dissolved Organic Carbon	ug/l	–	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	_ [7]	--	--	--	--	--	--
Hardness, Calcium Carbonate	ug/l	–	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	–	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--	--
Nitrogen, Organic	ug/l	–	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	--	--	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--
Temperature (Field)	deg c	_ [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	--	--	--	--	--	--
Total Organic Carbon	ug/l	–	--	--	--	--	--	--
Total Suspended Solids	ug/l	–	--	--	--	--	--	--
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	--	--	--	--	--	--
Chromium	ug/l	_ [13]	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	--	--	--	--	--	--
Iron	ug/l	300	--	--	--	--	--	--
Lead	ug/l	_ [14]	--	--	--	--	--	--
Magnesium	ug/l	--	--	--	--	--	--	--
Manganese	ug/l	–	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	--	--	--
Sodium	ug/l	--	--	--	--	--	--	--
Zinc	ug/l	30 [11]	--	--	--	--	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	--	--

Parameter	Unit	PWQO [1]	S5 13-May-2009 S-4	S5 25-Aug-2009 [20] S5	S5 27-Nov-2009 S-3	S5 18-May-2010 [36] S5	S5 18-Aug-2010 [2] S-2	S5 14-Oct-2010 [2] S-10
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	_ [5]	610000	--	417000	--	220000	566000
Ammonia, unionized	ug/l	20	0.32	--	0.02	--	0.08	0.32
Ammonia Nitrogen	ug/l	--	120	--	80	--	130	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	--	4000	--	3000	2000
Chemical Oxygen Demand	ug/l	--	33000	--	75000	--	30000	35000
Chloride	ug/l	--	37000	--	53000	--	64000	40000
Conductivity	uS/cm	--	1290	--	1120	--	919	1280
Conductivity (Field)	uS/cm	--	1025	--	992	--	855	1070
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	133000	--	129000	--	50600	141000
Dissolved Organic Carbon	ug/l	--	11400	--	10100	--	15500	11300
Dissolved Oxygen (Field)	ug/l	_ [7]	**2140**	--	**4160**	--	**2920**	**5480**
Hardness, Calcium Carbonate	ug/l	--	573000	--	408000	--	305000	632000
Nitrate as N	ug/l	--	<100	--	300	--	180	<100
Nitrite as N	ug/l	--	<100	--	<100	--	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1050	--	650	--	1280	760
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.2	--	**6.33**	--	**6.27**	7.19
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	**130**	--	**340**	--	**260**	**200**
Sulphate	ug/l	--	78000	--	123000	--	159000	107000
Temperature (Field)	deg c	_ [10]	8.8	--	4.8	--	16.8	10.1
Total Dissolved Solids	ug/l	--	839000	--	728000	--	597000	832000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	6000	--	36000	--	21000	27000
Metals								
Arsenic	ug/l	100 [11]	1	--	<50	--	<1	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**880**	--	**700**	--	**300**	**560**
Cadmium	ug/l	0.2 [11]	<0.1	--	<10	--	<0.1	<0.1
Calcium	ug/l	--	142000	--	104000	--	86000	179000
Chromium	ug/l	_ [13]	6	--	<20	--	4	4
Cobalt	ug/l	0.9	**1.0**	--	<5	--	0.4	**1.5**
Copper	ug/l	5	2	--	**20**	--	5	2
Iron	ug/l	300	**770**	--	**2400**	--	260	**1300**
Lead	ug/l	_ [14]	<1	--	<10	--	<1	<1
Magnesium	ug/l	--	53000	--	36000	--	22000	45000
Manganese	ug/l	--	420	--	190	--	70	760
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	11000	--	16000	--	17000	15000
Sodium	ug/l	--	78000	--	68000	--	73000	64000
Zinc	ug/l	30 [11]	<10	--	<50	--	<10	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S5 19-May-2011 [2] W-14	S5 16-Aug-2011 [20] S-5	S5 30-Nov-2011 [20] S5	S5 30-May-2012 [20] S5	S5 22-Aug-2012 [20] S-5	S5 29-Nov-2012 [20] S5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	_ [5]	669000	--	--	--	--	--
Ammonia, unionized	ug/l	20	0.41	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	170	--	--	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	--	--	--	--	--
Chemical Oxygen Demand	ug/l	--	35000	--	--	--	--	--
Chloride	ug/l	--	24000	--	--	--	--	--
Conductivity	uS/cm	--	1260	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1181	--	--	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	166000	--	--	--	--	--
Dissolved Organic Carbon	ug/l	--	12200	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	_ [7]	**2050**	--	--	--	--	--
Hardness, Calcium Carbonate	ug/l	--	615000	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	--	--	--	--
Nitrite as N	ug/l	--	<100	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	810	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.12	--	--	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	**140**	--	--	--	--	--
Sulphate	ug/l	--	41000	--	--	--	--	--
Temperature (Field)	deg c	_ [10]	9.7	--	--	--	--	--
Total Dissolved Solids	ug/l	--	819000	--	--	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	23000	--	--	--	--	--
Metals								
Arsenic	ug/l	100 [11]	<10	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**520**	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	<0.1	--	--	--	--	--
Calcium	ug/l	--	149000	--	--	--	--	--
Chromium	ug/l	_ [13]	4	--	--	--	--	--
Cobalt	ug/l	0.9	**1.1**	--	--	--	--	--
Copper	ug/l	5	1	--	--	--	--	--
Iron	ug/l	300	**1280**	--	--	--	--	--
Lead	ug/l	_ [14]	<1	--	--	--	--	--
Magnesium	ug/l	--	59000	--	--	--	--	--
Manganese	ug/l	--	510	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	10000	--	--	--	--	--
Sodium	ug/l	--	60000	--	--	--	--	--
Zinc	ug/l	30 [11]	<10	--	--	--	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	--	--	--

Parameter	Unit	PWQO [1]	S5 28-May-2013 S5	S5 15-Aug-2013 [20] S5	S5 21-Nov-2013 [20] S-5	S5 28-May-2014 S5	S5 26-Aug-2014 [20] S5	S5 13-Nov-2014 S-5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	_ [5]	540000	--	--	470000	--	600000
Ammonia, unionized	ug/l	20	0.15	--	--	0.45	--	0.02
Ammonia Nitrogen	ug/l	--	330	--	--	290	--	78
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	--	--	<2000	--	<2000
Chemical Oxygen Demand	ug/l	--	48000	--	--	42000	--	26000
Chloride	ug/l	--	49000	--	--	32000	--	35000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1107	--	--	994	--	1150
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	110000	--	--	100000	--	140000
Dissolved Organic Carbon	ug/l	--	17000	--	--	15000	--	9500
Dissolved Oxygen (Field)	ug/l	_ [7]	**1740**	--	--	**1160**	--	**3540**
Hardness, Calcium Carbonate	ug/l	--	600000	--	--	510000	--	640000
Nitrate as N	ug/l	--	<100	--	--	<100	--	<100
Nitrite as N	ug/l	--	<10	--	--	17	--	13
Nitrogen, Total Kjeldahl	ug/l	--	2100	--	--	1700	--	910
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	--	<100	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	**6.37**	--	--	6.81	--	**6.29**
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	**530**	--	--	**230**	--	**130**
Sulphate	ug/l	--	75000	--	--	110000	--	160000
Temperature (Field)	deg c	_ [10]	10.9	--	--	13.3	--	5.7
Total Dissolved Solids	ug/l	--	748000	--	--	718000	--	836000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	12000	--	--	5000	--	5000
Metals								
Arsenic	ug/l	100 [11]	1.7	--	--	1.9	--	<1.0
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**790**	--	--	**710**	--	**870**
Cadmium	ug/l	0.2 [11]	<0.10	--	--	<0.10	--	<0.10
Calcium	ug/l	--	170000	--	--	140000	--	190000
Chromium	ug/l	_ [13]	<5.0	--	--	<5.0	--	<5.0
Cobalt	ug/l	0.9	**1.7**	--	--	**1.0**	--	**1.6**
Copper	ug/l	5	3.9	--	--	1.5	--	1.7
Iron	ug/l	300	**2300**	--	--	**710**	--	**1000**
Lead	ug/l	_ [14]	1.2	--	--	<0.50	--	<0.50
Magnesium	ug/l	--	56000	--	--	43000	--	59000
Manganese	ug/l	--	900	--	--	860	--	640
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	15000	--	--	17000	--	17000
Sodium	ug/l	--	77000	--	--	69000	--	79000
Zinc	ug/l	30 [11]	21	--	--	<5.0	--	6.1
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	--	--	<1.0	--	**3.0**

Parameter	Unit	PWQO [1]	S5 27-May-2015 [20] S-5	S5 25-Aug-2015 [20] S-5	S5 25-Nov-2015 [20] S5	S5 24-May-2016 [20] S-5	S5 18-Aug-2016 [20] S5	S5 16-Nov-2016 [20] S5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	_ [5]	--	--	--	--	--	--
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	--	--	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	–	--	--	--	--	--	--
Chemical Oxygen Demand	ug/l	–	--	--	--	--	--	--
Chloride	ug/l	--	--	--	--	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	–	--	--	--	--	--	--
Dissolved Organic Carbon	ug/l	–	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	_ [7]	--	--	--	--	--	--
Hardness, Calcium Carbonate	ug/l	–	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	–	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--	--
Nitrogen, Organic	ug/l	–	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	--	--	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--
Temperature (Field)	deg c	_ [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	--	--	--	--	--	--
Total Organic Carbon	ug/l	–	--	--	--	--	--	--
Total Suspended Solids	ug/l	–	--	--	--	--	--	--
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	--	--	--	--	--	--
Chromium	ug/l	_ [13]	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	--	--	--	--	--	--
Iron	ug/l	300	--	--	--	--	--	--
Lead	ug/l	_ [14]	--	--	--	--	--	--
Magnesium	ug/l	--	--	--	--	--	--	--
Manganese	ug/l	–	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	--	--	--
Sodium	ug/l	--	--	--	--	--	--	--
Zinc	ug/l	30 [11]	--	--	--	--	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	--	--

Parameter	Unit	PWQO [1]	S5 18-May-2017 S-5	S5 28-Aug-2017 [20] S5	S5 28-Nov-2017 S-5	S5 23-May-2018 S-5	S5 30-Aug-2018 [20] S-5	S5 28-Nov-2018 S-5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	_ [5]	557000	--	724000	823000	--	320000
Ammonia, unionized	ug/l	20	0.38	--	0.02	0.25	--	0.03
Ammonia Nitrogen	ug/l	--	60	--	50	80	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	–	2000	--	<2000	<2000	--	4000
Chemical Oxygen Demand	ug/l	–	41000	--	28000	33000	--	42000
Chloride	ug/l	--	24000	--	34000	23000	--	58000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1139	--	1036	1373	--	842
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	–	73000	--	76000	157000	--	60500
Dissolved Organic Carbon	ug/l	–	28400	--	66100	11400	--	15400
Dissolved Oxygen (Field)	ug/l	_ [7]	**3070**	--	**3620**	**2450**	--	8240
Hardness, Calcium Carbonate	ug/l	–	609000	--	730000	579000	--	423000
Nitrate as N	ug/l	--	<100	--	<100	<100	--	500
Nitrite as N	ug/l	--	<50	--	<50	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	–	900	--	600	800	--	1500
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--	--
Nitrogen, Organic	ug/l	–	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.32	--	6.66	7.16	--	7.01
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	**70**	--	**60**	**90**	--	**190**
Sulphate	ug/l	--	111000	--	163000	40000	--	153000
Temperature (Field)	deg c	_ [10]	16.4	--	0.2	12.2	--	0.4
Total Dissolved Solids	ug/l	--	740000	--	888000	818000	--	558000
Total Organic Carbon	ug/l	–	--	--	--	--	--	--
Total Suspended Solids	ug/l	–	235000	--	32000	4000	--	11000
Metals								
Arsenic	ug/l	100 [11]	<5 [17]	--	<1	<1	--	1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**774**	--	**519**	**706**	--	**399**
Cadmium	ug/l	0.2 [11]	<0.5 [17]	--	<0.1	**0.3**	--	<0.1
Calcium	ug/l	--	149000	--	183000	146000	--	118000
Chromium	ug/l	_ [13]	<5 [17]	--	6	<1	--	2
Cobalt	ug/l	0.9	<2.5 [17]	--	**1.2**	0.6	--	0.5
Copper	ug/l	5	4.2	--	2.6	<0.5	--	**8.8**
Iron	ug/l	300	<500 [17]	--	**1070**	**337**	--	284
Lead	ug/l	_ [14]	<0.5 [17]	--	0.8	0.1	--	0.5
Magnesium	ug/l	--	57600	--	66600	51900	--	31400
Manganese	ug/l	–	370	--	377	308	--	16
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	11800	--	12000	8670	--	17800
Sodium	ug/l	--	58300	--	66600	54600	--	59200
Zinc	ug/l	30 [11]	<25 [17]	--	11	7	--	13
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	--	<1

Parameter	Unit	PWQO [1]	S5 20-Jun-2019 [20] S-5	S5 28-Aug-2019 [20] S-5	S5 21-Nov-2019 [20] S-5	S5 14-May-2020 S-5	S5 26-Aug-2020 [20] S-5	S5 25-Nov-2020 [20] S-5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	_ [5]	--	--	--	518000	--	--
Ammonia, unionized	ug/l	20	--	--	--	0.87	--	--
Ammonia Nitrogen	ug/l	--	--	--	--	90	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	–	--	--	--	6000	--	--
Chemical Oxygen Demand	ug/l	–	--	--	--	122000	--	--
Chloride	ug/l	--	--	--	--	34000	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	1154	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	–	--	--	--	98100	--	--
Dissolved Organic Carbon	ug/l	–	--	--	--	39700	--	--
Dissolved Oxygen (Field)	ug/l	_ [7]	--	--	--	6600	--	--
Hardness, Calcium Carbonate	ug/l	–	--	--	--	378000	--	--
Nitrate as N	ug/l	--	--	--	--	<100	--	--
Nitrite as N	ug/l	--	--	--	--	<50	--	--
Nitrogen, Total Kjeldahl	ug/l	–	--	--	--	4200	--	--
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--	--
Nitrogen, Organic	ug/l	–	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	--	--	7.75	--	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	--	--	--	**540**	--	--
Sulphate	ug/l	--	--	--	--	131000	--	--
Temperature (Field)	deg c	_ [10]	--	--	--	9.1	--	--
Total Dissolved Solids	ug/l	--	--	--	--	712000	--	--
Total Organic Carbon	ug/l	–	--	--	--	--	--	--
Total Suspended Solids	ug/l	–	--	--	--	15000	--	--
Metals								
Arsenic	ug/l	100 [11]	--	--	--	<1	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	**298**	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	<0.1	--	--
Calcium	ug/l	--	--	--	--	98700	--	--
Chromium	ug/l	_ [13]	--	--	--	2	--	--
Cobalt	ug/l	0.9	--	--	--	0.6	--	--
Copper	ug/l	5	--	--	--	2.9	--	--
Iron	ug/l	300	--	--	--	**667**	--	--
Lead	ug/l	_ [14]	--	--	--	0.8	--	--
Magnesium	ug/l	--	--	--	--	32000	--	--
Manganese	ug/l	–	--	--	--	92	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	6990	--	--
Sodium	ug/l	--	--	--	--	39200	--	--
Zinc	ug/l	30 [11]	--	--	--	17	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	<1	--	--

Parameter	Unit	PWQO [1]	S8 18-May-1990	S8 27-Jun-1990	S8 04-Oct-1990	S8 06-Nov-1990	S8 27-Nov-1990	S8 25-Apr-1991
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	–	–	–	--	–	–
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	442000	720000	304000	235000	328000	360000
Ammonia, unionized	ug/l	20	–	–	–	--	–	–
Ammonia Nitrogen	ug/l	–	<100	<100	680	440	2000	2110
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	6000	1000	1000	2000	6000
Chemical Oxygen Demand	ug/l	--	107000	336000	137000	116000	92000	164000
Chloride	ug/l	–	200000	299000	161000	92000	50000	170000
Conductivity	uS/cm	–	--	--	--	--	–	--
Conductivity (Field)	uS/cm	--	1888	1980	1302	687	1199	1482
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	103000	255000	74000	43000	84000	95000
Dissolved Organic Carbon	ug/l	--	–	–	–	–	–	–
Dissolved Oxygen (Field)	ug/l	-- [7]	12000	9950	500	8900	10080	10000
Hardness, Calcium Carbonate	ug/l	--	565000	731000	374000	224000	344000	510000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	11000	960	1970	2730	2740	8500
Nitrite as N	ug/l	--	<100	1000	<100	50	<10	20
Nitrogen, Total Kjeldahl	ug/l	--	6700	6900	1950	1210	3820	4800
Nitrogen, Nitrate-Nitrite	ug/l	--	–	–	–	–	–	–
Nitrogen, Organic	ug/l	--	6600	6800	1270	770	1820	2690
pH (Field)	-	6.5 - 8.5	8.24	8.19	8.45	8.04	8.1	8.06
Phosphate	ug/l	–	410	300	190	160	<100	<100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	167000	133000	119000	48000	98000	173000
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	–	–	650000	340000	600000	740000
Total Organic Carbon	ug/l	--	40000	80000	22000	17000	21000	29000
Total Suspended Solids	ug/l	--	–	–	–	–	–	–
Metals								
Aluminum, dissolved	ug/l	– [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	127000	139000	95000	60000	85000	130000
Chromium	ug/l	– [13]	<50	<50	<50	<50	<50	<50
Cobalt	ug/l	0.9	--	--	--	--	–	--
Copper	ug/l	5	<50	<50	<50	<50	<50	<50
Iron	ug/l	300	**670**	**13640**	190	**910**	**2410**	**630**
Lead	ug/l	– [14]	<50	<50	<50	<50	<50	<50
Magnesium	ug/l	--	60000	93000	33000	18000	32000	46000
Manganese	ug/l	–	300	980	80	170	580	290
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	–	--
Nickel	ug/l	25	<50	<50	<50	<50	<50	<50
Potassium	ug/l	–	35500	52000	35000	15000	18000	1161000
Selenium	ug/l	100	--	--	--	–	--	--
Silver	ug/l	0.1	--	--	--	--	--	–
Sodium	ug/l	–	202000	335000	188000	76000	132000	161000
Zinc	ug/l	30 [11]	<50	**90**	<50	<50	<50	<50
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<2	<2	<2	<2	**2**	**8**

Parameter	Unit	PWQO [1]	S8 08-Jun-1992	S8 15-Nov-1993	S8 15-Jun-1994	S8 02-Nov-1994	S8 12-Jun-1996	S8 12-Oct-1996
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	760000	202000	326000	226000	260000	235000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	950	100	100	100	30	190
Biochemical Oxygen Demand, 5 Day	ug/l	--	1900	1800	1900	2100	2000	1000
Chemical Oxygen Demand	ug/l	--	230000	60100	38000	51000	31000	49000
Chloride	ug/l	--	268000	288000	129000	56000	114000	147000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2941	890	1117	973	930	960
Cyanide	ug/l	5 [6]	**143**	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	168200	56000	--	54000	52300	46600
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6900	10700	7780	12800	2000	7530
Hardness, Calcium Carbonate	ug/l	--	797630	285000	285000	240000	269000	295000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	240	3980	100	1600	--	--
Nitrite as N	ug/l	--	<100	20	--	10	--	--
Nitrogen, Total Kjeldahl	ug/l	--	5180	1030	3920	5320	960	750
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	4230	930	3820	5220	930	--
pH (Field)	-	6.5 - 8.5	7.93	7.04	7.67	7.93	7.46	7.11
Phosphate	ug/l	--	100	180	190	320	120	140
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	398000	96000	56000	156000	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1936000	584000	559000	488000	470000	480000
Total Organic Carbon	ug/l	--	28200	10200	18100	8900	15300	11800
Total Suspended Solids	ug/l	--	--	--	--	--	3000	4000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	2450	--	--
Arsenic	ug/l	100 [11]	<1	--	--	--	--	--
Barium	ug/l	--	80	--	--	--	--	--
Boron	ug/l	200 [12]	**5300**	--	58	142	136	90
Cadmium	ug/l	0.2 [11]	--	--	--	0.1	--	--
Calcium	ug/l	--	144700	80000	76000	55000	70800	81700
Chromium	ug/l	-- [13]	<20	**10**	**10**	**10**	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	<10	3	3	**13.7**	4	3.9
Iron	ug/l	300	**1500**	**1688**	**776**	**3717**	**360**	**460**
Lead	ug/l	-- [14]	70	8.2	0.5	2.5	0.2	0.5
Magnesium	ug/l	--	105900	21000	23000	24700	22100	21900
Manganese	ug/l	--	920	93	70	216	610	30
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	<20	20	20	20	20	20
Potassium	ug/l	--	35300	10100	9100	10000	10100	13500
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	**3.4**	--	--
Sodium	ug/l	--	329800	103000	121000	97000	100000	97100
Zinc	ug/l	30 [11]	<20	21	28	10	10	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<2	**2**	**2**	1	1	--

Parameter	Unit	PWQO [1]	S8 17-Jun-1997	S8 05-Nov-1997	S8 30-Oct-1998	S8 30-Jun-1999	S8 19-Oct-1999	S8 03-May-2000
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	229000	278000	358000	662000	208000	537000
Ammonia, unionized	ug/l	20	--	--	10	--	--	10
Ammonia Nitrogen	ug/l	–	50	10	20	340	30	190
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	1000	1000	7000	1000	5000
Chemical Oxygen Demand	ug/l	--	63000	34000	40000	97000	38000	38000
Chloride	ug/l	–	174000	210000	165000	109000	171000	158000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1415	2750	1390	499	1280	1590
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	46600	43500	87400	101000	83200	74500
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6090	7100	8340	8150	7480	7250
Hardness, Calcium Carbonate	ug/l	--	348000	967000	410000	387000	308000	438000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2060	1210	840	2030	830	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.26	7.04	7.1	8.2	7.5	7.28
Phosphate	ug/l	–	220	110	100	100	70	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	--	--	--	--	--	--
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	710000	1400000	693000	251000	640000	800000
Total Organic Carbon	ug/l	--	23400	14700	12600	33500	18800	11000
Total Suspended Solids	ug/l	--	42000	26000	29000	19000	10000	56000
Metals								
Aluminum, dissolved	ug/l	– [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1360**	**2800**	**1010**	**2200**	**400**	**450**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	85100	234000	99500	71400	79600	102000
Chromium	ug/l	– [13]	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	0.5	**19**	3.4	3.3	0.5	**6.2**
Iron	ug/l	300	**1690**	**410**	**2390**	**1110**	**340**	**2860**
Lead	ug/l	– [14]	0.2	0.8	0.2	0.2	0.2	0.6
Magnesium	ug/l	--	32400	91700	38800	50000	26100	43900
Manganese	ug/l	–	160	100	320	760	100	450
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	**40**	20	20	20	20
Potassium	ug/l	–	10200	20300	11700	15700	12900	10000
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	–	163000	306000	184000	284000	177000	187000
Zinc	ug/l	30 [11]	10	**40**	10	10	10	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**43**	1	1	**3**	1	**5**

Parameter	Unit	PWQO [1]	S8 25-Oct-2000	S8 13-Jun-2001	S8 27-Sep-2001	S8 21-Nov-2001	S8 22-May-2002	S8 12-Nov-2002
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	1090000	705000	375000	342000	396000	228000
Ammonia, unionized	ug/l	20	--	<20	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	120	160	400	10	30	150
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	1000	1000	1000	1000	1000
Chemical Oxygen Demand	ug/l	--	--	38000	33000	23000	23000	42000
Chloride	ug/l	--	326000	200000	259000	179000	110000	169000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2600	1650	2400	1090	970	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	69100	91000	47900	46000	57000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3040	2600	4190	7200	10770	--
Hardness, Calcium Carbonate	ug/l	--	774000	480000	852000	327000	331000	292000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	120	100	100	100	100	100
Nitrite as N	ug/l	--	100	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1520	1210	1100	490	440	750
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.51	7.4	7.39	6.84	7.04	--
Phosphate	ug/l	--	180	140	90	30	20	60
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	65000	87000	895000	140000	77000	197000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1480000	1110000	1930000	772000	642000	750000
Total Organic Carbon	ug/l	--	--	17900	14000	12000	8000	18000
Total Suspended Solids	ug/l	--	128000	53000	18000	14000	4000	4000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**2500**	**1010**	**1400**	**320**	**370**	**290**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	152000	99300	194000	76800	81900	71200
Chromium	ug/l	-- [13]	**10**	**10**	**20**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	**7.7**	2.5	**19**	2.5	<1	**5.6**
Iron	ug/l	300	**3870**	**2090**	**490**	230	90	150
Lead	ug/l	-- [14]	0.2	1.3	0.2	0.2	<1000	0.7
Magnesium	ug/l	--	95700	56400	89300	32900	30600	27700
Manganese	ug/l	--	4940	1230	310	10	20	10
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20
Potassium	ug/l	--	14200	7600	14300	8300	9600	10100
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	367000	259000	360000	200000	152000	169000
Zinc	ug/l	30 [11]	10	10	10	10	10	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**6**	**19**	1	1	1	1

Parameter	Unit	PWQO [1]	S8 31-May-2003	S8 03-Jul-2003	S8 22-Oct-2003	S8 17-May-2004	S8 21-Aug-2004	S8 18-Nov-2004
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	411000	612000	387000	470000	726000	462000
Ammonia, unionized	ug/l	20	--	--	--	<10	<10	<10
Ammonia Nitrogen	ug/l	--	100	10	20	10	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	12000	2000	2000
Chemical Oxygen Demand	ug/l	--	53000	67000	46000	86000	54000	31000
Chloride	ug/l	--	122000	145000	131000	157000	166000	207000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1250	1410	1310	1360	1430	1260
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	112000	157000	98000	114000	127800	32300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3610	940	7600	8200	3200	--
Hardness, Calcium Carbonate	ug/l	--	323000	350000	--	388000	432000	375000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	200	100	100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	960	1220	830	2800	950	590
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.7	7.55	7.99	7.4	7.4	7.1
Phosphate	ug/l	--	30	100	100	340	90	90
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	90000	71000	143000	78000	21000	61000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	750000	1020000	790000	680000	715000	630000
Total Organic Carbon	ug/l	--	22000	34000	22000	13000	17200	9700
Total Suspended Solids	ug/l	--	10000	3000	16000	112000	19000	68000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	1	1	1	1	2	1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**340**	**422**	**421**	**298**	**388**	155
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	75900	79800	68600	91800	101000	87600
Chromium	ug/l	-- [13]	**10**	2	**10**	1	4	7
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	5	2	**30**	5	**81**	**57**
Iron	ug/l	300	**320**	132	**1520**	278	**1030**	**3010**
Lead	ug/l	-- [14]	0.5	0.5	1.7	0.4	3.2	0.8
Magnesium	ug/l	--	32400	36700	34800	38500	43600	38100
Manganese	ug/l	--	30	147	161	293	62	430
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	10	10	10	**60**	10
Potassium	ug/l	--	10300	8500	13500	13100	11300	10400
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	166000	246000	178000	184000	286000	203000
Zinc	ug/l	30 [11]	10	5	13	5	**195**	**31**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S8 25-May-2005	S8 09-Sep-2005 [20]	S8 09-Nov-2005	S8 24-May-2006	S8 15-Aug-2006 [20]	S8 16-Nov-2006
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	573000	--	500000	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	<5000	--	<5000	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	470000	--	410000	436000	--	338000
Ammonia, unionized	ug/l	20	<0.05	--	0.1	0.1	--	<0.01
Ammonia Nitrogen	ug/l	--	<10	--	30	50	--	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	--	<3000	<3000	--	<3000
Chemical Oxygen Demand	ug/l	--	36000	--	25000	38000	--	32000
Chloride	ug/l	--	161000	--	283000	102000	--	39600
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1700	--	2700	625	--	600
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	122000	--	84800	93400	--	84500
Dissolved Organic Carbon	ug/l	--	13600	--	12000	19200	--	12700
Dissolved Oxygen (Field)	ug/l	-- [7]	6430	--	10100	11300	--	8300
Hardness, Calcium Carbonate	ug/l	--	354000	--	470000	371000	--	307000
Hydrogen Sulfide	ug/l	2 [8]	<10	--	**20**	--	--	--
Nitrate as N	ug/l	--	100	--	400	100	--	500
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	880	--	630	1070	--	910
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.3	--	7.6	7.2	--	6.9
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	--	**90**	**210**	--	**140**
Sulphate	ug/l	--	28000	--	119000	69000	--	98000
Temperature (Field)	deg c	-- [10]	12.9	--	0	5.5	--	7.1
Total Dissolved Solids	ug/l	--	771000	--	1060000	712000	--	554000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	11000	--	98000	122000	--	47000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	<1	<1	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**225**	--	181	**284**	--	**319**
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.5	<0.1	--	<0.5
Calcium	ug/l	--	86200	--	123000	89500	--	80000
Chromium	ug/l	-- [13]	6	--	**17**	**30**	--	**12**
Cobalt	ug/l	0.9	**14**	--	**5**	**4.9**	--	**1**
Copper	ug/l	5	5	--	**12**	**25**	--	**47**
Iron	ug/l	300	**2330**	--	**7270**	**14300**	--	**2240**
Lead	ug/l	-- [14]	0.3	--	3.5	5.7	--	2
Magnesium	ug/l	--	33800	--	39900	35800	--	26000
Manganese	ug/l	--	335	--	458	782	--	170
Mercury, dissolved	ug/l	0.2 [15]	<0.05	--	<0.06	--	--	--
Molybdenum	ug/l	40	1.1	--	<5	--	--	--
Nickel	ug/l	25	<10	--	<10	--	--	--
Potassium	ug/l	--	15100	--	18800	17900	--	13700
Selenium	ug/l	100	<1	--	<1	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	178000	--	252000	138000	--	89300
Zinc	ug/l	30 [11]	7	--	23	**52**	--	27
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	--	<1

Parameter	Unit	PWQO [1]	S8 08-May-2007	S8 22-Aug-2007 [20]	S8 20-Nov-2007	S8 23-May-2008	S8 12-Aug-2008 [20]	S8 06-Nov-2008
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	486000	--	310000	260000	--	320000
Ammonia, unionized	ug/l	20	0.24	--	<0.17	<0.12	--	<0.16
Ammonia Nitrogen	ug/l	--	20	--	<10	<10	--	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	--	3000	<3000	--	<3000
Chemical Oxygen Demand	ug/l	--	80000	--	31000	40000	--	27000
Chloride	ug/l	--	95900	--	206000	109000	--	172000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	800	--	900	800	--	925
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	122000	--	80600	61500	--	73700
Dissolved Organic Carbon	ug/l	--	11100	--	13900	8900	--	6300
Dissolved Oxygen (Field)	ug/l	-- [7]	**5760**	--	11090	8410	--	8660
Hardness, Calcium Carbonate	ug/l	--	361000	--	329000	232000	--	321000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	--	100	100	--	200
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	840	--	600	1140	--	550
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	--	8.3	7.8	--	8.1
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**810**	--	**130**	**140**	--	**70**
Sulphate	ug/l	--	37000	--	119000	46000	--	84000
Temperature (Field)	deg c	-- [10]	10.5	--	0.4	10.5	--	5.4
Total Dissolved Solids	ug/l	--	734000	--	802000	501000	--	713000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	236000	--	8000	<3000	--	10000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	2	--	1.3	1.7	--	1.2
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**218**	--	121	97	--	120
Cadmium	ug/l	0.2 [11]	0.1	--	<0.1	<0.1	--	<0.1
Calcium	ug/l	--	85300	--	82800	63500	--	87400
Chromium	ug/l	-- [13]	**22**	--	<2	<2	--	4
Cobalt	ug/l	0.9	**6.1**	--	0.9	<0.5	--	**2.2**
Copper	ug/l	5	**37**	--	**10**	4	--	5
Iron	ug/l	300	**14400**	--	**1020**	**390**	--	**1350**
Lead	ug/l	-- [14]	5.8	--	1.8	<0.1	--	0.7
Magnesium	ug/l	--	35900	--	29800	17800	--	25000
Manganese	ug/l	--	2320	--	54	21	--	39
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	14900	--	13100	7000	--	9500
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	156000	--	164000	100000	--	140000
Zinc	ug/l	30 [11]	**58**	--	19	<5	--	<5
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	--	<1

Parameter	Unit	PWQO [1]	S8 13-May-2009 S-1	S8 25-Aug-2009 [20] S8	S8 27-Nov-2009 S-1	S8 18-May-2010 [20] S8	S8 18-Aug-2010 [20] -	S8 14-Oct-2010 S-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	290000	--	333000	--	--	455000
Ammonia, unionized	ug/l	20	<0.12	--	0.2	--	--	0.03
Ammonia Nitrogen	ug/l	--	<20	--	20	--	--	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	--	<1000	--	--	1000
Chemical Oxygen Demand	ug/l	--	33000	--	28000	--	--	30000
Chloride	ug/l	--	101000	--	54000	--	--	121000
Conductivity	uS/cm	--	943	--	1040	--	--	1380
Conductivity (Field)	uS/cm	--	750	--	912	--	--	1342
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	70100	--	102000	--	--	109000
Dissolved Organic Carbon	ug/l	--	12700	--	11800	--	--	13100
Dissolved Oxygen (Field)	ug/l	-- [7]	8130	--	10100	--	--	12590
Hardness, Calcium Carbonate	ug/l	--	266000	--	235000	--	--	367000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	--	--	<100
Nitrite as N	ug/l	--	<100	--	<100	--	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	570	--	530	--	--	530
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	--	7.9	--	--	6.73
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	--	**50**	--	--	**90**
Sulphate	ug/l	--	48000	--	64000	--	--	114000
Temperature (Field)	deg c	-- [10]	10	--	5.1	--	--	8.1
Total Dissolved Solids	ug/l	--	613000	--	676000	--	--	897000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	4000	--	11000	--	--	8000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	<1	--	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	110	--	150	--	--	**220**
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.1	--	--	<0.1
Calcium	ug/l	--	72000	--	61000	--	--	96000
Chromium	ug/l	-- [13]	4	--	6	--	--	7
Cobalt	ug/l	0.9	0.3	--	0.5	--	--	0.4
Copper	ug/l	5	3	--	4	--	--	4
Iron	ug/l	300	220	--	**530**	--	--	**330**
Lead	ug/l	-- [14]	<1	--	<1	--	--	<1
Magnesium	ug/l	--	21000	--	20000	--	--	31000
Manganese	ug/l	--	10	--	80	--	--	40
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	8000	--	8000	--	--	10000
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	107000	--	109000	--	--	139000
Zinc	ug/l	30 [11]	<10	--	<10	--	--	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	--	--	<1

Parameter	Unit	PWQO [1]	S8 19-May-2011 W-3	S8 16-Aug-2011 [20] S-8	S8 30-Nov-2011 [22] S8	S8 30-May-2012 S 8	S8 22-Aug-2012 [20] S-8	S8 29-Nov-2012 [37] S8
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	422000	--	134000	460000	--	--
Ammonia, unionized	ug/l	20	<0.24	--	<0.1	<0.19	--	--
Ammonia Nitrogen	ug/l	--	<20	--	<20	<50	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	--	2000	3000	--	--
Chemical Oxygen Demand	ug/l	--	35000	--	25000	61000	--	--
Chloride	ug/l	--	62000	--	58000	83000	--	--
Conductivity	uS/cm	--	1020	--	737	--	--	--
Conductivity (Field)	uS/cm	--	982	--	722	1080	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	95800	--	27600	110000	--	--
Dissolved Organic Carbon	ug/l	--	15000	--	7800	17000	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**3000**	--	8990	**2220**	--	--
Hardness, Calcium Carbonate	ug/l	--	323000	--	210000	320000	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	890	<100	--	--
Nitrite as N	ug/l	--	<100	--	<100	<10	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1100	--	480	1800	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	<100	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.72	--	7.59	7.10	--	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	--	**80**	**300**	--	--
Sulphate	ug/l	--	47000	--	124000	54000	--	--
Temperature (Field)	deg c	-- [10]	12.8	--	5.5	16.2	--	--
Total Dissolved Solids	ug/l	--	663000	--	479000	664000	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	25000	--	24000	78000	--	--
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	<50	1.2	--	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**210**	--	100	**280**	--	--
Cadmium	ug/l	0.2 [11]	<0.1	--	<10	<0.10	--	--
Calcium	ug/l	--	80000	--	56000	87000	--	--
Chromium	ug/l	-- [13]	4	--	<50	8.1	--	--
Cobalt	ug/l	0.9	0.5	--	<10	**2.3**	--	--
Copper	ug/l	5	4	--	<10	**9.5**	--	--
Iron	ug/l	300	**440**	--	**2000**	**3300**	--	--
Lead	ug/l	-- [14]	<1	--	<10	1.3	--	--
Magnesium	ug/l	--	30000	--	17000	31000	--	--
Manganese	ug/l	--	30	--	30	1800	--	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	10000	--	10000	11000	--	--
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	107000	--	69000	150000	--	--
Zinc	ug/l	30 [11]	<10	--	<50	16	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1.0	--	--

Parameter	Unit	PWQO [1]	S8 28-May-2013 S8	S8 15-Aug-2013 [20] S8	S8 21-Nov-2013 SA-7	S8 28-May-2014 S8	S8 26-Aug-2014 [20] S8	S8 13-Nov-2014 S-8
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	360000	--	280000	410000	--	400000
Ammonia, unionized	ug/l	20	0.04	--	<0.01	<0.01	--	<0.01
Ammonia Nitrogen	ug/l	--	110	--	<50	<50	--	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	2000	<2000	--	<2000
Chemical Oxygen Demand	ug/l	--	52000	--	66000	42000	--	31000
Chloride	ug/l	--	120000	--	140000	130000	--	130000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1015	--	1254	1143	--	1222
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	81000	--	70000	95000	--	93000
Dissolved Organic Carbon	ug/l	--	13000	--	10000	13000	--	10000
Dissolved Oxygen (Field)	ug/l	-- [7]	**5500**	--	11100	**2570**	--	10220
Hardness, Calcium Carbonate	ug/l	--	290000	--	340000	320000	--	330000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	<100
Nitrite as N	ug/l	--	<10	--	<10	<10	--	<10
Nitrogen, Total Kjeldahl	ug/l	--	1600	--	2200	1700	--	720
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	<100	<100	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	**6.26**	--	**6.48**	**6.06**	--	**6.36**
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**210**	--	**290**	**210**	--	**93**
Sulphate	ug/l	--	38000	--	180000	49000	--	68000
Temperature (Field)	deg c	-- [10]	9.3	--	0.2	13.2	--	2.7
Total Dissolved Solids	ug/l	--	632000	--	818000	720000	--	698000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	500000	--	130000	9000	--	4000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	1.3	--	<1.0	<1.0	--	<1.0
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	140	--	150	**210**	--	140
Cadmium	ug/l	0.2 [11]	<0.10	--	<0.10	<0.10	--	<0.10
Calcium	ug/l	--	81000	--	94000	86000	--	87000
Chromium	ug/l	-- [13]	**11**	--	<5.0	<5.0	--	<5.0
Cobalt	ug/l	0.9	**3.6**	--	<0.50	<0.50	--	<0.50
Copper	ug/l	5	**25**	--	**5.1**	3.7	--	3.6
Iron	ug/l	300	**5800**	--	**670**	**410**	--	**590**
Lead	ug/l	-- [14]	3.1	--	<0.50	<0.50	--	<0.50
Magnesium	ug/l	--	29000	--	34000	30000	--	34000
Manganese	ug/l	--	1700	--	110	120	--	46
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	10000	--	9600	10000	--	9600
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	140000	--	150000	160000	--	150000
Zinc	ug/l	30 [11]	**33**	--	5.2	<5.0	--	6.3
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	--	<1.0	<1.0	--	**1.8**

Parameter	Unit	PWQO [1]	S8 27-May-2015 S-8	S8 25-Aug-2015 [20] S-8	S8 25-Nov-2015 [20] S8	S8 24-May-2016 S-8	S8 18-Aug-2016 [20] S8	S8 16-Nov-2016 S-8
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	455000	--	--	457000	--	304000
Ammonia, unionized	ug/l	20	2.77	--	--	0.52	--	0.54
Ammonia Nitrogen	ug/l	--	100	--	--	160	--	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	--	64000	--	7000
Chemical Oxygen Demand	ug/l	--	28000	--	--	321000	--	39000
Chloride	ug/l	--	129000	--	--	120000	--	133000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1244	--	--	1180	--	1283
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	110000	--	--	88200	--	55000
Dissolved Organic Carbon	ug/l	--	16700	--	--	23400	--	15600
Dissolved Oxygen (Field)	ug/l	-- [7]	**2950**	--	--	**2170**	--	8240
Hardness, Calcium Carbonate	ug/l	--	263000	--	--	369000	--	278000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	--	<100	--	<100
Nitrite as N	ug/l	--	<50	--	--	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	900	--	--	8100	--	800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.98	--	--	7.16	--	7.75
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	--	--	**1190**	--	**270**
Sulphate	ug/l	--	47000	--	--	62000	--	149000
Temperature (Field)	deg c	-- [10]	16.2	--	--	12.5	--	4.6
Total Dissolved Solids	ug/l	--	698000	--	--	754000	--	716000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	--	--	674000	--	112000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	--	2	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**235**	--	--	**316**	--	**208**
Cadmium	ug/l	0.2 [11]	<0.1	--	--	0.2	--	<0.1
Calcium	ug/l	--	61800	--	--	87200	--	68700
Chromium	ug/l	-- [13]	<1	--	--	**26**	--	2
Cobalt	ug/l	0.9	<0.5	--	--	**6.2**	--	<0.5
Copper	ug/l	5	<0.5	--	--	**24.9**	--	**5.6**
Iron	ug/l	300	<100	--	--	**10900**	--	**308**
Lead	ug/l	-- [14]	<0.1	--	--	5.2	--	0.2
Magnesium	ug/l	--	26400	--	--	36700	--	25900
Manganese	ug/l	--	40	--	--	3160	--	66
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	9220	--	--	11900	--	11000
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	149000	--	--	168000	--	149000
Zinc	ug/l	30 [11]	<5	--	--	**84**	--	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	**13**	--	**12**

Parameter	Unit	PWQO [1]	S8 18-May-2017 S-8	S8 28-Aug-2017 [20] S8	S8 28-Nov-2017 [38] S-8	S8 23-May-2018 S-8	S8 30-Aug-2018 [20] S-8	S8 28-Nov-2018 S-8
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	408000	--	--	482000	--	377000
Ammonia, unionized	ug/l	20	0.33	--	--	0.29	--	0.04
Ammonia Nitrogen	ug/l	--	80	--	--	40	--	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	15000	--	--	<2000	--	2000
Chemical Oxygen Demand	ug/l	--	105000	--	--	67000	--	31000
Chloride	ug/l	--	94000	--	--	85000	--	91000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1076	--	--	1048	--	955
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	53600	--	--	98000	--	72700
Dissolved Organic Carbon	ug/l	--	29000	--	--	12700	--	12100
Dissolved Oxygen (Field)	ug/l	-- [7]	**2090**	--	--	**2650**	--	14740
Hardness, Calcium Carbonate	ug/l	--	319000	--	--	286000	--	327000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	--	<100	--	400
Nitrite as N	ug/l	--	<50	--	--	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	1600	--	--	900	--	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.10	--	--	7.53	--	6.91
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**180**	--	--	**100**	--	**140**
Sulphate	ug/l	--	63000	--	--	25000	--	99000
Temperature (Field)	deg c	-- [10]	17.6	--	--	11.8	--	2.9
Total Dissolved Solids	ug/l	--	626000	--	--	598000	--	596000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	159000	--	--	27000	--	4000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<5 [17]	--	--	<1	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**357**	--	--	**261**	--	136
Cadmium	ug/l	0.2 [11]	<0.5 [17]	--	--	<0.1	--	<0.1
Calcium	ug/l	--	76400	--	--	71200	--	73700
Chromium	ug/l	-- [13]	<5 [17]	--	--	<1	--	1
Cobalt	ug/l	0.9	<2.5 [17]	--	--	<0.5	--	<0.5
Copper	ug/l	5	**6.4**	--	--	1.4	--	**5.3**
Iron	ug/l	300	**686**	--	--	109	--	248
Lead	ug/l	-- [14]	<0.5 [17]	--	--	0.1	--	0.1
Magnesium	ug/l	--	31300	--	--	26300	--	34800
Manganese	ug/l	--	168	--	--	387	--	13
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	10900	--	--	7670	--	11200
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	102000	--	--	115000	--	122000
Zinc	ug/l	30 [11]	<25 [17]	--	--	5	--	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	<1	--	<1

Parameter	Unit	PWQO [1]	S8 20-Jun-2019 S-8	S8 28-Aug-2019 [20] S-8	S8 21-Nov-2019 S-8	S8 14-May-2020 S-8	S8 26-Aug-2020 [20] S-8	S8 25-Nov-2020 S-8
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	395000	--	229000	345000	--	295000
Ammonia, unionized	ug/l	20	0.03	--	0.17	0.37	--	0.08
Ammonia Nitrogen	ug/l	--	60	--	50	70	--	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	--	<30000 [26]	5000	--	<2000
Chemical Oxygen Demand	ug/l	--	78000	--	122000	154000	--	34000
Chloride	ug/l	--	105000	--	176000	124000	--	154000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1003	--	1271	1077	--	77
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	78600	--	<500	74200	--	62500
Dissolved Organic Carbon	ug/l	--	11200	--	10500	26300	--	10000
Dissolved Oxygen (Field)	ug/l	-- [7]	**1510**	--	7540	**5690**	--	8380
Hardness, Calcium Carbonate	ug/l	--	347000	--	351000	294000	--	305000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	<100
Nitrite as N	ug/l	--	<50	--	<50	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	1600	--	1400	1600	--	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	**6.14**	--	7.33	7.6	--	7.53
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**230**	--	**240**	**160**	--	**40**
Sulphate	ug/l	--	24000	--	139000	76000	--	92000
Temperature (Field)	deg c	-- [10]	17.4	--	8.3	5.8	--	0
Total Dissolved Solids	ug/l	--	560000	--	650000	552000	--	646000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	--	245000	23000	--	15000
Metals								
Aluminum, dissolved	ug/l	-- [39]	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	<1	<1	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	143	--	93	114	--	74
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.1	<0.1	--	<0.1
Calcium	ug/l	--	88100	--	83800	72200	--	75900
Chromium	ug/l	-- [13]	<1	--	**10**	1	--	<1
Cobalt	ug/l	0.9	0.8	--	**4.0**	**1.1**	--	<0.5
Copper	ug/l	5	2.4	--	**10.5**	4.1	--	2.1
Iron	ug/l	300	108	--	**3790**	**530**	--	<100
Lead	ug/l	-- [14]	<0.1	--	1.9	0.5	--	<0.1
Magnesium	ug/l	--	30700	--	34400	27700	--	28100
Manganese	ug/l	--	3890	--	3180	1390	--	88
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	9440	--	9730	7270	--	7110
Selenium	ug/l	100	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--
Sodium	ug/l	--	122000	--	120000	108000	--	116000
Zinc	ug/l	30 [11]	<5	--	25	14	--	<5
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	--	<1

Parameter	Unit	PWQO [1]	S9 27-Mar-1990	S9 16-Apr-1990	S9 27-Jun-1990	S9 31-Jul-1990	S9 27-Aug-1990	S9 04-Oct-1990
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	–	–	–	--	–	–
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	608000	294000	532000	561000	594000	215000
Ammonia, unionized	ug/l	20	–	–	–	--	–	–
Ammonia Nitrogen	ug/l	–	4090	2200	100	4550	3130	800
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	3000	4000	3000	4000	2000
Chemical Oxygen Demand	ug/l	--	112000	62000	287000	95000	160000	67000
Chloride	ug/l	–	123000	83000	163000	204000	216000	81000
Conductivity	uS/cm	–	--	--	--	--	–	--
Conductivity (Field)	uS/cm	--	1528	951	858	1877	1699	814
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	137000	421000	199000	185000	132000	53000
Dissolved Organic Carbon	ug/l	--	–	–	–	–	–	–
Dissolved Oxygen (Field)	ug/l	-- [7]	3000	7400	5050	6150	6160	8840
Hardness, Calcium Carbonate	ug/l	--	774000	424000	626000	625000	505000	293000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	4160	11000	2000	1650	5160	3000
Nitrite as N	ug/l	--	330	100	2900	100	100	100
Nitrogen, Total Kjeldahl	ug/l	--	5030	5700	270	4720	4970	2340
Nitrogen, Nitrate-Nitrite	ug/l	--	–	–	–	–	–	–
Nitrogen, Organic	ug/l	--	940	3500	170	170	1840	1540
pH (Field)	-	6.5 - 8.5	7.9	7.47	7.92	7.93	8.05	8.2
Phosphate	ug/l	–	390	280	180	120	400	160
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	160000	86000	70000	97000	63000	72000
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	–	–	–	--	850000	400000
Total Organic Carbon	ug/l	--	28000	20000	39000	35000	31000	18000
Total Suspended Solids	ug/l	--	–	–	–	–	–	–
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	247000	135000	181000	176000	128000	86000
Chromium	ug/l	– [13]	**50**	**50**	**50**	**50**	**50**	**50**
Cobalt	ug/l	0.9	--	--	--	--	–	--
Copper	ug/l	5	**50**	**50**	**50**	**50**	**50**	**50**
Iron	ug/l	300	**1720**	**1300**	**1280**	**1340**	**3860**	**720**
Lead	ug/l	– [14]	170	50	50	70	50	50
Magnesium	ug/l	--	38000	21000	42000	45000	45000	19000
Manganese	ug/l	–	920	400	660	740	530	50
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	–	--
Nickel	ug/l	25	**50**	**50**	**50**	**50**	**50**	**50**
Potassium	ug/l	–	23000	13000	23000	24000	24000	23000
Selenium	ug/l	100	--	--	--	–	--	--
Sodium	ug/l	–	101000	60000	136000	168000	155000	97000
Zinc	ug/l	30 [11]	**130**	**50**	**50**	**50**	**50**	**50**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**20**	**2**	**2**	**14**	**2**	**2**

Parameter	Unit	PWQO [1]	S9 06-Nov-1990	S9 17-Nov-1990	S9 27-Nov-1990	S9 24-Apr-1991	S9 29-Nov-1991	S9 08-Jun-1992
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	154000	1134000	234000	420000	266000	1124000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	–	320	1380	1300	3440	300	13940
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	9000	2000	5000	6000	4800
Chemical Oxygen Demand	ug/l	--	137000	76000	56000	94000	30000	180000
Chloride	ug/l	–	43000	186000	69000	196000	224000	243000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	457	48.2	1090	1304	1145	2850
Cyanide	ug/l	5 [6]	--	--	--	--	--	**123**
Dissolved Inorganic Carbon	ug/l	--	56000	194000	62000	118000	–	259700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10300	--	--	9300	7000	6600
Hardness, Calcium Carbonate	ug/l	--	168000	7940	278000	450000	349000	853220
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	3620	16340	2200	26100	–	240
Nitrite as N	ug/l	--	50	100	10	1700	--	100
Nitrogen, Total Kjeldahl	ug/l	--	2420	7080	1960	6500	1400	19710
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	2090	--
Nitrogen, Organic	ug/l	--	2100	5700	660	3060	1100	5770
pH (Field)	-	6.5 - 8.5	7.82	7.48	8.1	7.86	7.8	7.72
Phosphate	ug/l	–	200	260	100	100	200	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	42000	115000	47000	213000	128000	130000
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	250000	--	550000	650000	–	1853000
Total Organic Carbon	ug/l	--	17000	51100	16000	25000	--	48100
Total Suspended Solids	ug/l	--	--	--	--	--	--	--
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	1
Barium	ug/l	–	--	--	--	--	--	210
Boron	ug/l	200 [12]	--	--	--	--	--	**7450**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	44000	234000	80000	147000	100400	210400
Chromium	ug/l	– [13]	**50**	**10**	**50**	**50**	**10**	**20**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	**50**	**140**	**50**	**50**	**30**	**10**
Iron	ug/l	300	**4380**	**3900**	**3930**	**1200**	**310**	**3900**
Lead	ug/l	– [14]	50	9	50	50	2	70
Magnesium	ug/l	--	14000	50800	19000	20000	23800	79500
Manganese	ug/l	–	170	1450	320	410	170	1790
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	**50**	7	**50**	**50**	**50**	20
Potassium	ug/l	–	12000	35500	12000	108000	9400	42800
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	32000	179000	129000	108000	114000	263800
Zinc	ug/l	30 [11]	**50**	**110**	**50**	**50**	10	**40**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	**9**	**2**	**33**	**2**	**17**

Parameter	Unit	PWQO [1]	S9 08-Jun-1993	S9 04-Nov-1993	S9 15-Jun-1994	S9 02-Nov-1994	S9 28-Jun-1995	S9 14-Nov-1995
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	151000	485000	861000	84000	1380000	229000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	100	3200	--	290	10	1010
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	3700	10200	4100	2000	5000
Chemical Oxygen Demand	ug/l	--	26000	108000	131000	64000	172000	50000
Chloride	ug/l	--	220000	221000	107000	43000	94500	157000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	929	1378	2440	478	792	910
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	41000	126000	--	20000	321000	6400
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10000	9500	11280	12150	10660	--
Hardness, Calcium Carbonate	ug/l	--	198000	474000	628000	141000	1070000	277000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	660	7690	340	4000	100	1500
Nitrite as N	ug/l	--	100	100	--	100	100	--
Nitrogen, Total Kjeldahl	ug/l	--	750	5690	12900	4480	17000	5500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	650	2490	12900	4190	16990	4490
pH (Field)	-	6.5 - 8.5	**8.57**	7.74	8.09	7.96	7.56	7.92
Phosphate	ug/l	--	120	180	120	500	100	200
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	55900	86000	100000	56000	64000	77600
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	560000	816000	1230000	240000	474000	460000
Total Organic Carbon	ug/l	--	11800	26200	43800	15000	70000	66200
Total Suspended Solids	ug/l	--	--	--	--	--	--	116000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	100	--
Barium	ug/l	--	--	--	--	--	43	--
Boron	ug/l	200 [12]	--	--	**4509**	**213**	11	**770**
Cadmium	ug/l	0.2 [11]	--	--	--	0.1	0.1	0.1
Calcium	ug/l	--	51000	124000	145000	37000	70000	73200
Chromium	ug/l	-- [13]	**59**	**10**	**10**	**10**	**14**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	5	**6**	**16.6**	4.8	4.2	5
Iron	ug/l	300	**2111**	**2734**	**1815**	**1211**	**659**	**2650**
Lead	ug/l	-- [14]	19	10.8	1.6	1.2	0.8	0.8
Magnesium	ug/l	--	17000	39800	64500	11500	20400	22500
Manganese	ug/l	--	76	429	242	74	36	210
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20
Potassium	ug/l	--	10000	18900	39800	9500	10800	15700
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	106000	128000	240000	29000	46000	82200
Zinc	ug/l	30 [11]	18	**49**	**44**	14	10	20
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	**3**	**2**	**10**	1	--

Parameter	Unit	PWQO [1]	S9 12-Jun-1996	S9 12-Oct-1996	S9 17-Jun-1997	S9 05-Nov-1997	S9 05-Jun-1998	S9 28-Aug-1998
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	464000	395000	187000	254000	688000	114000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	–	40	940	10	10	70	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	11000	3000	1000	3000	3000
Chemical Oxygen Demand	ug/l	--	26000	63000	28000	19000	142000	36000
Chloride	ug/l	–	99000	140000	115000	172000	362000	37300
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	780	1270	7.76	1310	2350	390
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	44000	87800	35100	51000	137000	23900
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10390	9410	8920	12360	12460	8520
Hardness, Calcium Carbonate	ug/l	--	230000	441000	236000	302000	618000	132000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	710	3980	1170	770	3950	1180
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	670	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.25	7.63	7.71	8.03	–	7.88
Phosphate	ug/l	–	120	170	260	50	120	380
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	--	--	--	--	--	--
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	390000	640000	389000	650000	1166000	200000
Total Organic Carbon	ug/l	--	12400	24200	14300	11400	39200	10000
Total Suspended Solids	ug/l	--	36000	20000	126000	24000	15000	180000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	200	**2360**	**320**	**400**	**5210**	**390**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	63600	108000	53800	80400	114000	36700
Chromium	ug/l	– [13]	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	**6.1**	2.8	0.5	**12.4**	**5.9**	4.2
Iron	ug/l	300	**1080**	**1030**	**3970**	**450**	**380**	**2450**
Lead	ug/l	– [14]	0.2	0.3	0.2	0.2	0.2	0.5
Magnesium	ug/l	--	17100	41200	18400	24300	80800	9670
Manganese	ug/l	–	54	140	150	40	40	50
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	**30**	20	**30**	20	20
Potassium	ug/l	–	11000	16000	5400	8900	19600	4900
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	78000	130000	83700	124000	305000	37800
Zinc	ug/l	30 [11]	10	10	20	10	**80**	**80**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	**4**	**3**	1	1

Parameter	Unit	PWQO [1]	S9 30-Oct-1998	S9 30-Jun-1999	S9 19-Oct-1999	S9 03-May-2000	S9 25-Oct-2000	S9 13-Jun-2001
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	254000	370000	256000	293000	370000	245000
Ammonia, unionized	ug/l	20	10	--	--	10	--	<20
Ammonia Nitrogen	ug/l	–	10	20	10	20	10	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	3000	–	1000
Chemical Oxygen Demand	ug/l	--	39000	71000	32000	32000	--	32000
Chloride	ug/l	–	114000	219000	198000	162000	248000	239000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	890	1410	1310	1100	1550	1300
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	46900	47700	68900	31300	--	31900
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	13440	11360	11620	19920	10300	13200
Hardness, Calcium Carbonate	ug/l	--	325000	354000	350000	286000	417000	334000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	10	100
Nitrite as N	ug/l	--	--	--	--	--	500	--
Nitrogen, Total Kjeldahl	ug/l	--	860	1150	580	780	740	760
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	8.1	8.2	7.98	7.81	8.4
Phosphate	ug/l	–	60	70	40	30	70	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	--	--	--	--	116000	173000
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	450000	710000	650000	650000	858000	798000
Total Organic Carbon	ug/l	--	14700	22300	10300	10000	--	13100
Total Suspended Solids	ug/l	--	5000	6000	16000	22000	49000	5000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	1
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	**760**	**2370**	**570**	**380**	**1430**	**760**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	70000	77300	92500	73300	95700	77700
Chromium	ug/l	– [13]	--	--	--	--	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	3.1	2.4	0.5	**8.2**	**11**	3
Iron	ug/l	300	**790**	220	**640**	**310**	**2340**	120
Lead	ug/l	– [14]	0.2	0.2	0.2	0.2	0.2	0.8
Magnesium	ug/l	--	36100	38700	28500	24600	43300	34100
Manganese	ug/l	–	20	40	30	130	120	20
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	10	20	20	20	20
Potassium	ug/l	–	6500	14500	13300	7800	8900	6200
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	97400	198000	162000	124000	159000	180000
Zinc	ug/l	30 [11]	10	**60**	20	10	10	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	**4**	**2**	**15**

Parameter	Unit	PWQO [1]	S9 27-Sep-2001	S9 21-Nov-2001	S9 22-May-2002	S9 08-Nov-2002	S9 31-May-2003	S9 03-Jul-2003
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	126000	179000	183000	243000	162000	237000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--
Ammonia Nitrogen	ug/l	--	40	10	40	10	200	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	1000	2000
Chemical Oxygen Demand	ug/l	--	11000	29000	34000	26000	43000	22000
Chloride	ug/l	--	82500	104000	110000	305000	77000	124000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1160	610	620	1450	660	1600
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	30200	25100	24000	64000	37000	56000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	9930	13350	10230	9200	8220	6880
Hardness, Calcium Carbonate	ug/l	--	439000	248000	261000	402000	195000	809000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	1600	700	200	300	300	100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	640	670	640	640	900	650
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.1	7.53	7.39	--	7.7	7.6
Phosphate	ug/l	--	90	40	20	90	40	40
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	435000	85000	51000	116000	64000	840000
Temperature (Field)	deg c	- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	910000	492000	416000	725000	389000	1630000
Total Organic Carbon	ug/l	--	7800	14000	9000	10000	17000	14000
Total Suspended Solids	ug/l	--	29000	17000	4000	56000	3000	8000
Metals								
Arsenic	ug/l	100 [11]	1	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**940**	80	90	80	70	**292**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	112000	71800	76500	119000	53200	229000
Chromium	ug/l	- [13]	**10**	**10**	**10**	**10**	**10**	2
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	**7**	2.9	<1	**5.7**	3	2
Iron	ug/l	300	20	**530**	200	**1910**	290	**378**
Lead	ug/l	- [14]	0.2	0.2	<1	3.1	0.5	0.5
Magnesium	ug/l	--	38700	16600	17100	25500	13800	57500
Manganese	ug/l	--	970	10	30	60	10	22
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10
Potassium	ug/l	--	10000	5200	3300	9000	5400	17600
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	123000	65900	75300	173000	61700	182000
Zinc	ug/l	30 [11]	10	10	10	20	10	5
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S9 22-Oct-2003	S9 17-May-2004	S9 21-Aug-2004	S9 18-Nov-2004	S9 25-May-2005	S9 09-Sep-2005
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	276000	343000
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	<5000	<5000
Alkalinity (Total as CaCO3)	ug/l	-- [5]	142000	241000	291000	240000	226000	281000
Ammonia, unionized	ug/l	20	--	<10	<10	<10	<0.22	<0.47
Ammonia Nitrogen	ug/l	–	30	10	10	10	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	31000	42000	30000	21000	35000	33000
Chloride	ug/l	–	84600	176000	198000	152000	128000	191000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	820	1030	1070	820	1200	860
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	34000	55500	30500	22300	54200	67400
Dissolved Organic Carbon	ug/l	--	--	--	--	--	11700	79400
Dissolved Oxygen (Field)	ug/l	-- [7]	9100	8800	10800	7200	11800	8400
Hardness, Calcium Carbonate	ug/l	--	--	299000	330000	261000	264000	354000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	<10	<10
Nitrate as N	ug/l	--	800	100	100	300	600	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1720	640	540	350	690	570
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.1	7.7	8.3	7.5	7.7	8.1
Phosphate	ug/l	–	110	30	40	30	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	**40**	20
Sulphate	ug/l	–	173000	49000	50000	95000	53000	53000
Temperature (Field)	deg c	– [10]	--	--	--	--	21.9	20
Total Dissolved Solids	ug/l	--	503000	515000	535000	410000	509000	656000
Total Organic Carbon	ug/l	--	15000	10500	9700	6800	–	–
Total Suspended Solids	ug/l	--	21000	7000	6000	4000	6000	<3000
Metals								
Arsenic	ug/l	100 [11]	1	1	1	1	<1	2
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	67	84	166	127	94	113
Cadmium	ug/l	0.2 [11]	--	--	--	--	<0.3	<0.1
Calcium	ug/l	–	77200	86100	97800	73100	74600	104000
Chromium	ug/l	– [13]	8	2	2	2	<2	<2
Cobalt	ug/l	0.9	--	--	--	--	**30**	0.5
Copper	ug/l	5	**35**	3	3	3	2	3
Iron	ug/l	300	**1190**	291	**543**	**630**	**337**	128
Lead	ug/l	– [14]	1.9	0.3	0.3	0.6	<0.6	<0.5
Magnesium	ug/l	--	18700	20400	20900	19000	18800	22900
Manganese	ug/l	–	28	63	22	48	17	4
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	<0.05	<0.06
Molybdenum	ug/l	40	--	--	--	--	20	2
Nickel	ug/l	25	10	10	10	10	<10	<10
Potassium	ug/l	–	9300	5600	6700	6500	6400	8900
Selenium	ug/l	100	--	--	--	--	<1	1
Sodium	ug/l	–	59100	115000	154000	117000	95800	117000
Zinc	ug/l	30 [11]	9	5	5	5	**33**	15
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	<1	<1

Parameter	Unit	PWQO [1]	S9 09-Nov-2005	S9 24-May-2006	S9 15-Aug-2006	S9 16-Nov-2006	S9 08-May-2007	S9 22-Aug-2007
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	339000	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	<5000	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	278000	168000	274000	130000	226000	366000
Ammonia, unionized	ug/l	20	0.04	0.42	<0.06	0.22	<0.93	3.7
Ammonia Nitrogen	ug/l	--	20	10	<10	90	<10	730
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	<3000	<3000	5000
Chemical Oxygen Demand	ug/l	--	35000	41000	34000	23000	29000	51000
Chloride	ug/l	--	140000	101000	233000	25000	140000	200000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	500	480	1270	310	800	1250
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	56500	35800	65800	32500	54200	87600
Dissolved Organic Carbon	ug/l	--	9500	16200	16500	12200	9000	19400
Dissolved Oxygen (Field)	ug/l	-- [7]	9100	11340	**1800**	9270	12680	**990**
Hardness, Calcium Carbonate	ug/l	--	448000	216000	332000	101000	273000	310000
Hydrogen Sulfide	ug/l	2 [8]	**30**	--	--	--	--	--
Nitrate as N	ug/l	--	200	500	100	1100	<100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1210	830	610	1260	600	2240
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.3	8.3	7.2	7.2	8.4	7.3
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**360**	**60**	**60**	**600**	30	**280**
Sulphate	ug/l	--	147000	58000	56000	52000	85000	40000
Temperature (Field)	deg c	- [10]	1	12	20.5	7.6	20.4	14.1
Total Dissolved Solids	ug/l	--	717000	406000	734000	246000	571000	743000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	208000	10000	14000	332000	10000	75000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	2.1	<1	0.9	3.2
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	200	51	80	63	88	181
Cadmium	ug/l	0.2 [11]	<0.5	<0.1	<0.1	<0.5	<0.1	<0.1
Calcium	ug/l	--	109000	63100	99400	24900	73100	78400
Chromium	ug/l	- [13]	**90**	2	<2	**30**	<2	7
Cobalt	ug/l	0.9	**10**	0.4	**1**	**6.6**	<0.5	**1.9**
Copper	ug/l	5	**38**	3	**45**	**56**	**17**	3
Iron	ug/l	300	**35700**	**869**	**718**	**2710**	**350**	**2880**
Lead	ug/l	- [14]	5.5	0.5	0.8	6	0.2	1
Magnesium	ug/l	--	42700	14100	20300	9330	21900	27600
Manganese	ug/l	--	710	69	113	243	74	213
Mercury, dissolved	ug/l	0.2 [15]	<0.06	--	--	--	--	--
Molybdenum	ug/l	40	<5	--	--	--	--	--
Nickel	ug/l	25	**50**	--	--	--	--	--
Potassium	ug/l	--	20600	5500	7500	8200	7200	17700
Selenium	ug/l	100	<1	--	--	--	--	--
Sodium	ug/l	--	110000	66500	160000	41100	108000	156000
Zinc	ug/l	30 [11]	**121**	11	26	**65**	**49**	22
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S9 20-Nov-2007	S9 23-May-2008	S9 12-Aug-2008	S9 06-Nov-2008	S9 13-May-2009 S-5	S9 25-Aug-2009 A-3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	250000	180000	200000	226000	197000	256000
Ammonia, unionized	ug/l	20	0.67	<0.75	<0.47	<0.13	<0.05	0.11
Ammonia Nitrogen	ug/l	–	80	<10	<10	<10	<20	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	9000	<3000	<3000	<3000	1000	<1000
Chemical Oxygen Demand	ug/l	--	25000	44000	26000	15000	38000	63000
Chloride	ug/l	–	173000	100000	156000	139000	99000	141000
Conductivity	uS/cm	–	--	--	--	--	847	1270
Conductivity (Field)	uS/cm	--	800	650	900	800	700	1088
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	168000	40100	50800	54800	46700	62800
Dissolved Organic Carbon	ug/l	--	10300	11700	8800	6100	15300	15200
Dissolved Oxygen (Field)	ug/l	-- [7]	9650	13980	5310	**6210**	17710	5900
Hardness, Calcium Carbonate	ug/l	--	304000	209000	226000	279000	242000	344000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	500	<100	200	1400	<100	<100
Nitrite as N	ug/l	--	--	--	--	--	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	850	890	470	710	810	1060
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	8.5	8.1	7.9	6.8	6.97
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**110**	**80**	**90**	**80**	**60**	**70**
Sulphate	ug/l	–	76000	59000	54000	82000	76000	163000
Temperature (Field)	deg c	– [10]	0.3	14.1	19.9	8.2	20	19.9
Total Dissolved Solids	ug/l	--	636000	420000	527000	571000	551000	825000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	19000	7000	16000	42000	8000	15000
Metals								
Arsenic	ug/l	100 [11]	1	2	1	0.5	<1	2
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	85	82	61	54	70	140
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	–	88500	59700	64900	82200	69000	103000
Chromium	ug/l	– [13]	3	<2	4	5	4	4
Cobalt	ug/l	0.9	0.7	<0.5	0.8	**1.2**	0.5	0.5
Copper	ug/l	5	2	3	3	5	4	3
Iron	ug/l	300	**1060**	**1060**	**1930**	**2230**	**550**	**440**
Lead	ug/l	– [14]	<0.1	<0.1	0.8	0.7	<1	<1
Magnesium	ug/l	--	20200	14500	15600	17800	17000	21000
Manganese	ug/l	–	152	123	57	46	50	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	9500	5900	5400	7600	7000	17000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	115000	72800	109000	97600	84000	119000
Zinc	ug/l	30 [11]	16	7	7	10	<10	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S9 27-Nov-2009 S-4	S9 18-May-2010 S-3	S9 18-Aug-2010 [29] S-4	S9 14-Oct-2010 S-3	S9 19-May-2011 [40] W-7	S9 16-Aug-2011 [2] N-3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	211000	306000	183000	265000	203000	204000
Ammonia, unionized	ug/l	20	0.1	0.17	0.15	<0.02	<0.84	0.32
Ammonia Nitrogen	ug/l	–	40	30	110	<20	<20	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	2000	4000	2000	2000	2000
Chemical Oxygen Demand	ug/l	--	33000	35000	35000	35000	45000	35000
Chloride	ug/l	–	57000	142000	43000	94000	47000	93000
Conductivity	uS/cm	–	786	1240	896	1030	665	907
Conductivity (Field)	uS/cm	--	709	1337	826	856	634	758
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	51600	63800	40000	61100	49800	46500
Dissolved Organic Carbon	ug/l	--	11500	14900	16800	13600	13700	11500
Dissolved Oxygen (Field)	ug/l	-- [7]	9730	**5080**	**610**	7970	6250	**4060**
Hardness, Calcium Carbonate	ug/l	--	231000	375000	256000	327000	219000	263000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	1040	<100	1030	480	200	<100
Nitrite as N	ug/l	--	<100	<100	330	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	760	1070	1290	600	400	570
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.31	7.40	6.58	6.82	8.20	7.41
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**200**	**110**	**310**	**120**	**120**	**170**
Sulphate	ug/l	–	100000	119000	199000	118000	69000	106000
Temperature (Field)	deg c	– [10]	5.0	12.2	18.8	9.5	15.2	20.7
Total Dissolved Solids	ug/l	--	511000	806000	582000	670000	432000	590000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	47000	24000	46000	14000	86000	78000
Metals								
Arsenic	ug/l	100 [11]	<50	2	<1	<1	<50	<10
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	<100	150	**250**	90	<100	110
Cadmium	ug/l	0.2 [11]	<10	<0.1	<0.1	<0.1	<10	<0.1
Calcium	ug/l	–	61000	104000	71000	98000	58000	79000
Chromium	ug/l	– [13]	<20	7	6	6	<50	6
Cobalt	ug/l	0.9	<5	**1.4**	**1.3**	0.9	<10	**1.1**
Copper	ug/l	5	**20**	4	**6**	4	<10	5
Iron	ug/l	300	**4800**	**1690**	**1420**	**770**	**4900**	**1250**
Lead	ug/l	– [14]	<10	<1	1	<1	<10	1
Magnesium	ug/l	--	19000	28000	19000	20000	18000	16000
Manganese	ug/l	–	110	980	210	90	160	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	8000	12000	30000	10000	8000	9000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	67000	118000	81000	80000	58000	65000
Zinc	ug/l	30 [11]	**100**	10	<10	10	<50	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	1	1	<1	<1

Parameter	Unit	PWQO [1]	S9 30-Nov-2011 [41] S9	S9 30-May-2012 S 9	S9 22-Aug-2012 S-9	S9 29-Nov-2012 S9	S9 28-May-2013 S9	S9 15-Aug-2013 S9
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	132000	260000	290000	330000	200000	220000
Ammonia, unionized	ug/l	20	0.6	<0.71	<0.25	0.26	0.37	0.52
Ammonia Nitrogen	ug/l	–	50	<50	<50	120	130	62
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	<2000	3000	6000	<2000	3000
Chemical Oxygen Demand	ug/l	--	28000	46000	41000	46000	42000	47000
Chloride	ug/l	–	33000	130000	150000	90000	83000	120000
Conductivity	uS/cm	–	594	--	--	--	--	--
Conductivity (Field)	uS/cm	--	557	969	1218	1030	670	993
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	26900	63000	66000	74000	45000	52000
Dissolved Organic Carbon	ug/l	--	7300	17000	16000	14000	17000	17000
Dissolved Oxygen (Field)	ug/l	-- [7]	9040	**2880**	**4920**	**6460**	**3400**	**5050**
Hardness, Calcium Carbonate	ug/l	--	177000	320000	460000	360000	250000	300000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	1950	<100	<100	270	<100	<100
Nitrite as N	ug/l	--	<100	<10	<10	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	790	1100	960	1800	1400	1200
Nitrogen, Nitrate-Nitrite	ug/l	--	--	<100	<100	270	<100	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.95	7.54	7.13	7.41	6.99	7.35
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**440**	**92**	**110**	**160**	**72**	**150**
Sulphate	ug/l	–	101000	84000	220000	120000	55000	130000
Temperature (Field)	deg c	_ [10]	6.2	20.7	19.4	0.1	15.8	19.4
Total Dissolved Solids	ug/l	--	386000	618000	942000	660000	426000	646000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	80000	31000	39000	83000	8000	<1000
Metals								
Arsenic	ug/l	100 [11]	<50	1.7	1.4	<1.0	1.2	<1.0
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	100	130	**240**	120	58	180
Cadmium	ug/l	0.2 [11]	<10	<0.10	<0.10	<0.10	<0.10	**0.33**
Calcium	ug/l	–	46000	92000	130000	110000	74000	87000
Chromium	ug/l	_ [13]	<50	5.4	<5.0	**11**	<5.0	<5.0
Cobalt	ug/l	0.9	<10	**1.2**	**1.4**	**2.3**	0.69	<0.50
Copper	ug/l	5	**10**	**6.4**	**7.9**	**7.0**	**6.0**	**14**
Iron	ug/l	300	**7000**	**1800**	**1800**	**4500**	**1100**	**570**
Lead	ug/l	_ [14]	<10	0.75	1.1	1.5	<0.50	<0.50
Magnesium	ug/l	--	15000	24000	37000	37000	20000	29000
Manganese	ug/l	–	140	220	95	310	110	120
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	12000	9400	16000	14000	6800	15000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	49000	100000	150000	110000	74000	110000
Zinc	ug/l	30 [11]	<50	15	12	17	8.0	<5.0
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1.0	<1.0	**24**	<1.0	<1.0

Parameter	Unit	PWQO [1]	S9 21-Nov-2013 SA-4	S9 28-May-2014 S9	S9 26-Aug-2014 S9	S9 13-Nov-2014 S-9	S9 27-May-2015 S-9	S9 25-Aug-2015 S-9
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	220000	240000	220000	240000	295000	258000
Ammonia, unionized	ug/l	20	<0.06	<0.14	1.08	<0.04	12.62	0.73
Ammonia Nitrogen	ug/l	–	<50	<50	90	<50	110	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	2000	2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	32000	38000	41000	28000	27000	63000
Chloride	ug/l	–	90000	140000	120000	81000	189000	131000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	808	885	915	803	1443	1179
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	54000	55000	57000	60000	70800	53300
Dissolved Organic Carbon	ug/l	--	11000	15000	12000	11000	11600	14300
Dissolved Oxygen (Field)	ug/l	-- [7]	12960	7060	**2950**	**5630**	**270**	**3570**
Hardness, Calcium Carbonate	ug/l	--	290000	300000	250000	300000	316000	278000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	440	<100	<100	<100	300	<100
Nitrite as N	ug/l	--	10	<10	<10	<10	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	740	1400	1100	650	500	1000
Nitrogen, Nitrate-Nitrite	ug/l	--	450	<100	<100	<100	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.13	7.00	7.40	6.84	**8.55**	7.72
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**72**	**74**	**79**	**52**	**80**	**120**
Sulphate	ug/l	–	110000	64000	79000	110000	206000	220000
Temperature (Field)	deg c	– [10]	1.1	15.2	22.8	4.2	18.9	18.4
Total Dissolved Solids	ug/l	--	562000	614000	544000	548000	858000	772000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	14000	13000	11000	12000	3000	7000
Metals								
Arsenic	ug/l	100 [11]	<1.0	1.2	1.1	<1.0	1	1
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	85	82	130	110	**255**	**423**
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Calcium	ug/l	–	84000	79000	69000	88000	67400	64800
Chromium	ug/l	– [13]	<5.0	<5.0	<5.0	<5.0	1	1
Cobalt	ug/l	0.9	0.60	0.66	<0.50	<0.50	<0.5	<0.5
Copper	ug/l	5	3.4	3.5	2.5	2.5	<0.5	<0.5
Iron	ug/l	300	**1000**	**1200**	**580**	**600**	**598**	**670**
Lead	ug/l	– [14]	0.58	<0.50	<0.50	<0.50	0.3	<0.1
Magnesium	ug/l	--	23000	22000	19000	27000	35800	28300
Manganese	ug/l	–	63	130	98	110	234	341
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	11000	7900	8500	10000	12300	11700
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	75000	110000	100000	82000	190000	111000
Zinc	ug/l	30 [11]	9.7	9.1	8.3	9.9	14	7
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	**11**	<1	**3**

Parameter	Unit	PWQO [1]	S9 25-Nov-2015 S-9	S9 24-May-2016 S-9	S9 18-Aug-2016 S-9	S9 16-Nov-2016 S-9	S9 18-May-2017 S-9	S9 28-Aug-2017 S-9
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	250000	308000	179000	236000	210000	337000
Ammonia, unionized	ug/l	20	0.21	0.86	0.1	0.26	1.48	0.43
Ammonia Nitrogen	ug/l	–	60	70	50	80	50	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	2000	3000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	45000	42000	37000	20000	42000	30000
Chloride	ug/l	–	164000	137000	135000	162000	140000	114000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	250	1062	974	1148	837	872
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	54800	64400	13900	47500	24500	66800
Dissolved Organic Carbon	ug/l	--	11900	14100	42000	6600	24600	11500
Dissolved Oxygen (Field)	ug/l	-- [7]	**7740**	**2420**	**4580**	9810	**2400**	**4510**
Hardness, Calcium Carbonate	ug/l	--	368000	335000	247000	292000	238000	331000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	<100	<100	1200	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	800	800	900	500	800	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.63	7.56	6.64	7.40	7.83	7.29
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**80**	**130**	30	**50**	**110**
Sulphate	ug/l	–	102000	115000	151000	106000	57000	126000
Temperature (Field)	deg c	– [10]	0	18.0	21.9	5.7	21.8	13.5
Total Dissolved Solids	ug/l	--	648000	680000	620000	638000	516000	712000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	31000	7000	8000	7000	14000	43000
Metals								
Arsenic	ug/l	100 [11]	<1	1	3	<1	<5 [17]	<1
Barium	ug/l	–	--	--	--	--	--	--
Boron	ug/l	200 [12]	92	144	185	109	**220**	127
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1
Calcium	ug/l	–	114000	84700	63600	86700	66100	93300
Chromium	ug/l	– [13]	4	2	2	<1	<5 [17]	2
Cobalt	ug/l	0.9	0.8	0.6	<0.5	<0.5	<2.5 [17]	<0.5
Copper	ug/l	5	0.8	2.3	1.2	0.8	4.8	0.7
Iron	ug/l	300	**1510**	**879**	**677**	298	**861**	**732**
Lead	ug/l	– [14]	0.6	0.4	0.4	0.1	<0.5 [17]	0.4
Magnesium	ug/l	--	20400	30000	21400	18300	17800	23800
Manganese	ug/l	–	88	791	164	59	177	189
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	8970	8170	9180	5270	6190	7710
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	135000	135000	110000	114000	98800	94900
Zinc	ug/l	30 [11]	16	7	8	6	<25 [17]	6
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**9**	**4**	**4**	<1	<1

Parameter	Unit	PWQO [1]	S9 28-Nov-2017 S-9	S9 23-May-2018 S-9	S9 30-Aug-2018 [20] S-9	S9 28-Nov-2018 S-9	S9 20-Jun-2019 S-9	S9 28-Aug-2019 [38] S-9
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	253000	320000	--	209000	259000	--
Ammonia, unionized	ug/l	20	0.34	**42.92**	--	0.09	0.32	--
Ammonia Nitrogen	ug/l	--	270	3700	--	120	110	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<2000	--	3000	<2000	--
Chemical Oxygen Demand	ug/l	--	41000	67000	--	34000	32000	--
Chloride	ug/l	--	101000	230000	--	141000	208000	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	140	1285	--	462	1150	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	17400	72500	--	37500	53900	--
Dissolved Organic Carbon	ug/l	--	44600	17900	--	12800	12000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	14070	9540	--	**4570**	**4750**	--
Hardness, Calcium Carbonate	ug/l	--	340000	373000	--	279000	306000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	700	<100	--	900	200	--
Nitrite as N	ug/l	--	<50	<50	--	<50	<50	--
Nitrogen, Total Kjeldahl	ug/l	--	1100	4500	--	1100	1000	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.19	7.63	--	6.93	6.93	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	**50**	--	**130**	**80**	--
Sulphate	ug/l	--	74000	55000	--	105000	86000	--
Temperature (Field)	deg c	-- [10]	0	15.1	--	0.2	18.2	--
Total Dissolved Solids	ug/l	--	514000	756000	--	544000	692000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	16000	<2000	--	8000	2000	--
Metals								
Arsenic	ug/l	100 [11]	<1	1	--	<1	1	--
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**231**	13	--	118	**391**	--
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	--	<0.1	<0.1	--
Calcium	ug/l	--	93600	102000	--	76700	82100	--
Chromium	ug/l	-- [13]	3	2	--	4	2	--
Cobalt	ug/l	0.9	**1.2**	**1.2**	--	0.9	0.7	--
Copper	ug/l	5	3.3	1.4	--	**6.3**	3.2	--
Iron	ug/l	300	**1070**	**909**	--	**1020**	**781**	--
Lead	ug/l	-- [14]	0.5	0.2	--	0.6	0.3	--
Magnesium	ug/l	--	25700	29000	--	21400	24400	--
Manganese	ug/l	--	155	292	--	91	294	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	8390	11600	--	10700	8520	--
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	84300	155000	--	116000	133000	--
Zinc	ug/l	30 [11]	12	5	--	15	7	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	--	<1	<1	--

Parameter	Unit	PWQO [1]	S9 21-Nov-2019 S-9	S9 14-May-2020 S-9	S9 26-Aug-2020 S-9	S9 25-Nov-2020 S-9
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	252000	225000	250000	283000
Ammonia, unionized	ug/l	20	0.17	0.28	0.72	0.17
Ammonia Nitrogen	ug/l	--	40	20	50	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	41000	41000	37000	31000
Chloride	ug/l	--	185000	171000	199000	192000
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1405	1011	1253	13
Cyanide	ug/l	5 [6]	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	<500	47500	51800	65300
Dissolved Organic Carbon	ug/l	--	9100	22100	12600	11700
Dissolved Oxygen (Field)	ug/l	-- [7]	14560	11710	8110	13440
Hardness, Calcium Carbonate	ug/l	--	386000	270000	362000	355000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	100
Nitrite as N	ug/l	--	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	800	500	700	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.71	7.90	7.74	7.83
Phosphate	ug/l	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	20	**50**	**40**
Sulphate	ug/l	--	159000	97000	164000	134000
Temperature (Field)	deg c	-- [10]	0	9.4	14.7	0
Total Dissolved Solids	ug/l	--	690000	542000	670000	732000
Total Organic Carbon	ug/l	--	--	--	--	--
Total Suspended Solids	ug/l	--	12000	<2000	3000	6000
Metals						
Arsenic	ug/l	100 [11]	<1	<1	<1	<1
Barium	ug/l	--	--	--	--	--
Boron	ug/l	200 [12]	200	54	**220**	88
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	103000	75600	87800	97800
Chromium	ug/l	-- [13]	2	<1	1	1
Cobalt	ug/l	0.9	0.5	<0.5	<0.5	<0.5
Copper	ug/l	5	3.3	2.0	2.0	1.9
Iron	ug/l	300	**511**	187	**305**	**315**
Lead	ug/l	-- [14]	0.2	0.1	0.1	0.2
Magnesium	ug/l	--	31100	19600	34600	26900
Manganese	ug/l	--	88	86	73	44
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--
Nickel	ug/l	25	--	--	--	--
Potassium	ug/l	--	10900	4820	11100	8050
Selenium	ug/l	100	--	--	--	--
Sodium	ug/l	--	129000	87500	149000	122000
Zinc	ug/l	30 [11]	8	<5	7	<5
Phenols						
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**4**	**3**	<1

Parameter	Unit	PWQO [1]	S10 28-Jun-1995	S10 14-Nov-1995	S10 13-Jun-1996	S10 12-Oct-1996	S10 17-Jun-1997	S10 05-Nov-1997
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	237000	312000	212000	193000	145000	8000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	10	60	20	130	10	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	7000	2000	1000	10000	1000
Chemical Oxygen Demand	ug/l	--	291000	120000	75000	67000	51000	43000
Chloride	ug/l	--	121000	118000	43000	68000	19400	58000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1026	1230	520	640	431	950
Dissolved Inorganic Carbon	ug/l	--	87700	18200	46300	39400	31000	1000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3950	--	4780	3840	2800	6390
Hardness, Calcium Carbonate	ug/l	--	200000	257000	148000	178000	112000	287000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1250	12000	980	830	2050	1280
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	1240	11940	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.79	7.08	7.55	6.56	6.85	6.89
Phosphate	ug/l	--	900	540	380	150	180	90
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	13000	91200	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	636000	620000	260000	320000	216000	480000
Total Organic Carbon	ug/l	--	31500	92400	24100	21200	37800	16600
Total Suspended Solids	ug/l	--	39000	165000	11000	4000	18000	14000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Boron	ug/l	200 [12]	**2000**	**1630**	**1060**	**1300**	**1360**	**1120**
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--
Calcium	ug/l	--	66800	50900	35200	37500	27400	76800
Chromium	ug/l	-- [13]	**11**	**10**	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	1.7	3.2	1.9	1.5	0.5	**10.6**
Iron	ug/l	300	**570**	**5840**	**503**	**2890**	**660**	**600**
Lead	ug/l	-- [14]	1.3	1.8	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	28100	31100	14300	20100	10500	22700
Manganese	ug/l	--	740	680	217	580	310	780
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20
Potassium	ug/l	--	15200	16600	7730	1300	800	10800
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	87100	182000	64800	94000	53300	47700
Zinc	ug/l	30 [11]	10	20	10	10	10	**120**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**2**	**2**

Parameter	Unit	PWQO [1]	S10 05-Jun-1998	S10 26-Aug-1998	S10 30-Oct-1998	S10 30-Jun-1999	S10 19-Oct-1999	S10 03-May-2000
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	100000	67000	202000	94000	38000	98000
Ammonia, unionized	ug/l	20	--	--	10	--	--	10
Ammonia Nitrogen	ug/l	-	70	60	20	410	40	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	14000	4000	1000	24000	5000	3000
Chemical Oxygen Demand	ug/l	--	232000	106000	100000	280000	80000	43000
Chloride	ug/l	-	25400	33800	87900	86000	57500	24100
Conductivity	uS/cm	-	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	360	371	659	199.1	650	383
Dissolved Inorganic Carbon	ug/l	--	32600	16700	52000	23100	61000	18100
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6220	6250	8070	4910	6880	6600
Hardness, Calcium Carbonate	ug/l	--	87000	157000	193000	105000	200000	99000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	4370	1600	1320	10500	1510	250
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	7.33	7.2	**6.1**	7.2	6.62
Phosphate	ug/l	-	590	180	100	1440	110	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	-	--	--	--	--	--	--
Temperature (Field)	deg c	- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	183000	191000	331000	98900	320000	190000
Total Organic Carbon	ug/l	--	41600	20000	31400	50100	19200	16300
Total Suspended Solids	ug/l	--	234000	30000	16000	22000	14000	22000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Boron	ug/l	200 [12]	**790**	**1120**	**800**	**750**	**1240**	**460**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	-	22300	46800	46000	30100	51600	25000
Chromium	ug/l	- [13]	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	4.2	1.5	0.6	**13.4**	3.1	0.5
Iron	ug/l	300	**5330**	**2160**	**1050**	**13600**	**4790**	300
Lead	ug/l	- [14]	0.2	0.2	0.2	6.6	0.2	0.2
Magnesium	ug/l	--	7710	9590	18700	7130	17100	8700
Manganese	ug/l	-	850	120	110	740	450	40
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	**30**	20	20	20	20
Potassium	ug/l	-	400	1500	14500	800	3400	4600
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	-	36100	43400	78400	18300	69000	39700
Zinc	ug/l	30 [11]	30	**460**	10	30	10	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	**19**	1	1	1	**9**

Parameter	Unit	PWQO [1]	S10 25-Oct-2000	S10 13-Jun-2001	S10 27-Sep-2001	S10 21-Nov-2001	S10 22-May-2002	S10 12-Nov-2002
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	151000	166000	54000	78000	181000	29000
Ammonia, unionized	ug/l	20	--	<20	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	1	20	40	10	40	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	5000	1000	1000	1000	7000
Chemical Oxygen Demand	ug/l	--	--	84000	71000	84000	55000	190000
Chloride	ug/l	--	112000	59000	87300	93400	29300	26700
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	667	500	680	650	370	--
Dissolved Inorganic Carbon	ug/l	--	--	28900	10100	10900	2000	4000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	2100	3400	5060	2030	6370	--
Hardness, Calcium Carbonate	ug/l	--	179000	142000	160000	155000	149000	180000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	100	100	100	100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	17700	1720	2020	1550	2470	5960
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.4	7	6.66	**5.94**	7.02	--
Phosphate	ug/l	--	--	270	260	260	300	720
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	42000	12000	188000	188000	60000	180000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	414000	326000	540000	538000	276000	360000
Total Organic Carbon	ug/l	--	--	28100	25500	27000	13000	23000
Total Suspended Solids	ug/l	--	352000	198000	7000	90000	14000	251000
Metals								
Arsenic	ug/l	100 [11]	--	1	1	1	1	1
Boron	ug/l	200 [12]	**1230**	**590**	**1330**	**1450**	**620**	**510**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	45800	35900	42000	34000	36400	49400
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	**11**	1.5	4.4	3.8	<1	5
Iron	ug/l	300	**26200**	**3330**	**3060**	**12100**	**390**	**3560**
Lead	ug/l	-- [14]	2.2	1.1	0.2	0.6	<1	4.3
Magnesium	ug/l	--	15600	12600	13500	17000	14000	13700
Manganese	ug/l	--	2700	420	670	240	40	500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20
Potassium	ug/l	--	9700	4700	4500	5500	7500	4900
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	69800	61100	93400	120000	54200	35500
Zinc	ug/l	30 [11]	30	10	10	10	10	**60**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**15**	**35**	1	1	1	1

Parameter	Unit	PWQO [1]	S10 31-May-2003	S10 03-Jul-2003	S10 22-Oct-2003	S10 17-May-2004	S10 21-Aug-2004	S10 18-Nov-2004
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	104000	136000	47000	175000	156000	180000
Ammonia, unionized	ug/l	20	--	--	--	<10	<10	<10
Ammonia Nitrogen	ug/l	--	240	110	40	20	30	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	9000	7000	7000	8000	20000
Chemical Oxygen Demand	ug/l	--	75000	138000	245000	132000	230000	891000
Chloride	ug/l	--	97000	25500	56000	48100	40400	69000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	500	400	820	470	380	550
Dissolved Inorganic Carbon	ug/l	--	24000	35000	12000	39300	37200	36500
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	7400	1930	9100	2400	1800	--
Hardness, Calcium Carbonate	ug/l	--	125000	85000	--	148000	133000	166000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	200	100	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1700	5880	6040	3930	4970	7090
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	6.69	8.1	7.2	6.7	7
Phosphate	ug/l	--	160	1320	880	770	900	1440
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	92000	28000	106000	31000	15000	54000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	297000	315000	289000	235000	190000	275000
Total Organic Carbon	ug/l	--	27000	46000	25000	21100	24800	17300
Total Suspended Solids	ug/l	--	25000	224000	294000	84000	156000	1630000
Metals								
Arsenic	ug/l	100 [11]	1	1	1	1	1	3
Boron	ug/l	200 [12]	**580**	**645**	**631**	**248**	**413**	**374**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	29800	19600	33800	39500	33900	41700
Chromium	ug/l	-- [13]	**10**	5	**9**	1	3	**48**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	3	2	**20**	**17**	**58**	**103**
Iron	ug/l	300	**1280**	**6170**	270	**2050**	**502**	**593**
Lead	ug/l	-- [14]	0.5	3.7	0.5	0.6	3	2.6
Magnesium	ug/l	--	12200	8860	10800	12000	11700	15000
Manganese	ug/l	--	70	1030	4	258	1750	4710
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	10	10	20	**50**	**40**
Potassium	ug/l	--	5600	1100	8000	7800	3200	4800
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	54300	55300	53100	62300	50200	76500
Zinc	ug/l	30 [11]	10	12	**45**	**46**	**153**	**154**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	**3**

Parameter	Unit	PWQO [1]	S10 25-May-2005	S10 09-Sep-2005 [20]	S10 09-Nov-2005	S10 24-May-2006	S10 15-Aug-2006	S10 16-Nov-2006
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	168000	--	77000	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	<5000	--	<5000	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	140000	--	63000	123000	127000	158000
Ammonia, unionized	ug/l	20	<0.03	--	0.03	<0.07	0.01	<0.01
Ammonia Nitrogen	ug/l	--	<10	--	40	<10	30	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	--	9000	3000	21000	<3000
Chemical Oxygen Demand	ug/l	--	77000	--	227000	52000	361000	52000
Chloride	ug/l	--	41900	--	52600	28200	22000	29400
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	400	--	380	280	520	320
Dissolved Inorganic Carbon	ug/l	--	43400	--	20600	23900	39400	41100
Dissolved Organic Carbon	ug/l	--	23200	--	26000	20700	35800	20700
Dissolved Oxygen (Field)	ug/l	-- [7]	**4200**	--	**3950**	11450	**2200**	**6290**
Hardness, Calcium Carbonate	ug/l	--	121000	--	142000	129000	106000	168000
Hydrogen Sulfide	ug/l	2 [8]	**20**	--	**400**	--	--	--
Nitrate as N	ug/l	--	300	--	100	<100	100	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1200	--	5500	960	7980	1450
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.2	--	6.9	7.8	**5.9**	6.6
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**100**	--	**810**	**80**	**1470**	**100**
Sulphate	ug/l	--	13000	--	152000	42000	17000	37000
Temperature (Field)	deg c	-- [10]	10	--	1	4.5	16	6.5
Total Dissolved Solids	ug/l	--	225000	--	371000	225000	189000	279000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	13000	--	320000	34000	345000	11000
Metals								
Arsenic	ug/l	100 [11]	<1	--	1	<1	0.9	<1
Boron	ug/l	200 [12]	**237**	--	**513**	192	**232**	**223**
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.5	<0.1	<0.1	<0.5
Calcium	ug/l	--	31200	--	35200	35300	21600	45100
Chromium	ug/l	-- [13]	<2	--	**11**	<2	**21**	8
Cobalt	ug/l	0.9	**4**	--	**3**	0.4	**3.3**	<0.5
Copper	ug/l	5	<2	--	**17**	2	**46**	**44**
Iron	ug/l	300	**816**	--	**2610**	**1360**	**1190**	**793**
Lead	ug/l	-- [14]	0.2	--	6	0.8	4.5	0.9
Magnesium	ug/l	--	10500	--	13100	9930	12600	13400
Manganese	ug/l	--	39	--	1080	392	1470	27
Mercury, dissolved	ug/l	0.2 [15]	<0.05	--	<0.06	--	--	--
Molybdenum	ug/l	40	<0.5	--	<5	--	--	--
Nickel	ug/l	25	<10	--	<10	--	--	--
Potassium	ug/l	--	7400	--	4100	5000	4800	16300
Selenium	ug/l	100	<1	--	<1	--	--	--
Sodium	ug/l	--	43900	--	79200	33500	36700	42200
Zinc	ug/l	30 [11]	<5	--	**64**	7	**76**	26
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S10 08-May-2007	S10 22-Aug-2007	S10 20-Nov-2007	S10 23-May-2008	S10 12-Aug-2008	S10 06-Nov-2008
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	107000	56000	103000	174000	160000	140000
Ammonia, unionized	ug/l	20	<0.25	0.37	0.63	<0.03	<0.03	<0.04
Ammonia Nitrogen	ug/l	–	<10	90	60	<10	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	13000	13000	4000	3000	<3000
Chemical Oxygen Demand	ug/l	--	66000	342000	308000	88000	71000	98000
Chloride	ug/l	–	20000	8200	60200	45700	64800	80600
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	300	425	390	480	500	500
Dissolved Inorganic Carbon	ug/l	--	26800	15100	26800	38400	42200	35600
Dissolved Organic Carbon	ug/l	--	14300	28100	19400	20300	21700	13000
Dissolved Oxygen (Field)	ug/l	-- [7]	--	**2340**	**2950**	**3840**	**960**	**6240**
Hardness, Calcium Carbonate	ug/l	--	96000	33000	156000	150000	167000	169000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	<100	200	<100	200	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1650	11200	6620	1620	1610	1280
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.3	7.3	8.1	7.3	7	7.5
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**180**	**310**	**1120**	**150**	**320**	**130**
Sulphate	ug/l	–	8000	9000	72000	20000	12000	69000
Temperature (Field)	deg c	– [10]	5.4	11.3	0.2	9.1	15.6	5
Total Dissolved Solids	ug/l	--	161000	84600	316000	277000	308000	367000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	32000	476000	320000	20000	45000	9000
Metals								
Arsenic	ug/l	100 [11]	0.6	2.7	1.6	1.2	0.7	0.5
Boron	ug/l	200 [12]	105	76	162	200	124	113
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	–	25400	8370	40800	40500	48500	45600
Chromium	ug/l	– [13]	<2	**26**	8	<2	<2	<2
Cobalt	ug/l	0.9	0.6	**6.5**	**2.5**	<0.5	<0.5	<0.5
Copper	ug/l	5	**11**	**17**	**8**	<2	**6**	<2
Iron	ug/l	300	**1630**	**2310**	**7560**	**658**	**4390**	192
Lead	ug/l	– [14]	1.4	8	3.4	<0.1	1	<0.1
Magnesium	ug/l	--	7980	2820	13100	11900	11200	13400
Manganese	ug/l	–	141	725	704	184	441	22
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	5200	1000	7200	5900	4100	8800
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	28000	18700	51900	47200	64600	65000
Zinc	ug/l	30 [11]	23	**103**	**36**	8	**38**	<5
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S10 13-May-2009 S-6	S10 25-Aug-2009 A-1	S10 27-Nov-2009 S-2	S10 18-May-2010 S-7	S10 18-Aug-2010 [2] S-1	S10 14-Oct-2010 S-2
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	176000	230000	158000	266000	135000	178000
Ammonia, unionized	ug/l	20	<0.12	0.03	0.02	0.03	<0.01	<0.02
Ammonia Nitrogen	ug/l	–	<20	30	20	20	<20	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	3000	1000	3000	2000	1000
Chemical Oxygen Demand	ug/l	--	48000	99000	53000	60000	70000	40000
Chloride	ug/l	–	54000	61000	57000	41000	36000	42000
Conductivity	uS/cm	–	587	635	610	622	568	605
Conductivity (Field)	uS/cm	--	500	510	550	702	528	530
Dissolved Inorganic Carbon	ug/l	--	44600	60400	39800	57000	29100	43900
Dissolved Organic Carbon	ug/l	--	18800	26900	13800	25900	27500	14900
Dissolved Oxygen (Field)	ug/l	-- [7]	**3480**	**5770**	**5820**	**5420**	**1610**	9070
Hardness, Calcium Carbonate	ug/l	--	173000	191000	158000	193000	175000	183000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	110	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1050	1370	160	2620	1310	1020
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	6.59	6.84	6.93	**6.26**	6.86
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	**970**	30	**750**	**80**	**170**
Sulphate	ug/l	–	36000	2000	63000	<1000	90000	61000
Temperature (Field)	deg c	– [10]	10	15.6	4.3	11.0	15.5	7.2
Total Dissolved Solids	ug/l	--	382000	413000	397000	404000	369000	393000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	38000	4000	43000	8000	12000
Metals								
Arsenic	ug/l	100 [11]	<1	2	<1	2	<1	<1
Boron	ug/l	200 [12]	130	90	110	170	**330**	110
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	–	46000	55000	42000	51000	47000	50000
Chromium	ug/l	– [13]	2	3	3	3	3	3
Cobalt	ug/l	0.9	<0.2	0.7	<0.2	**1.1**	0.4	0.5
Copper	ug/l	5	<1	<1	1	1	1	1
Iron	ug/l	300	170	**4660**	220	**8840**	**930**	**1610**
Lead	ug/l	– [14]	<1	<1	<1	<1	<1	<1
Magnesium	ug/l	--	14000	13000	13000	16000	14000	14000
Manganese	ug/l	–	40	780	50	2080	470	580
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	6000	9000	8000	8000	7000	10000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	57000	53000	50000	59000	50000	45000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<10	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	**2**	<1	<1

Parameter	Unit	PWQO [1]	S10 19-May-2011 W-1	S10 16-Aug-2011 [21] N-2	S10 30-Nov-2011 [22] S10	S10 30-May-2012 S 10	S10 22-Aug-2012 S-10	S10 29-Nov-2012 S10
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	167000	145000	90000	230000	44000	250000
Ammonia, unionized	ug/l	20	0.18	0.05	<0.09	<0.12	<0.01	0.07
Ammonia Nitrogen	ug/l	–	30	30	<20	<50	<50	180
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	3000	2000	7000	<2000	4000
Chemical Oxygen Demand	ug/l	--	50000	95000	40000	130000	160000	600000
Chloride	ug/l	–	30000	19000	39000	33000	43000	83000
Conductivity	uS/cm	–	477	354	432	--	--	--
Conductivity (Field)	uS/cm	--	464	349	428	518	759	894
Dissolved Inorganic Carbon	ug/l	--	41600	37900	17800	56000	9200	52000
Dissolved Organic Carbon	ug/l	--	18500	33600	14700	35000	27000	22000
Dissolved Oxygen (Field)	ug/l	-- [7]	**2260**	**4250**	**5740**	**2250**	**560**	**1410**
Hardness, Calcium Carbonate	ug/l	--	165000	127000	116000	200000	280000	280000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<100	<100	<100	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	1060	1820	590	2400	4000	16000
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	<100	<100	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.37	6.66	7.54	6.91	**5.87**	6.66
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**70**	**80**	<10	**330**	**390**	**1900**
Sulphate	ug/l	–	31000	12000	56000	<1000	280000	100000
Temperature (Field)	deg c	– [10]	14.0	18.3	5.3	16.4	15.2	0
Total Dissolved Solids	ug/l	--	310000	230000	281000	328000	628000	560000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	52000	18000	<2000	62000	57000	380000
Metals								
Arsenic	ug/l	100 [11]	<1	<50	<50	2.0	2.3	5.2
Boron	ug/l	200 [12]	100	100	200	130	**340**	160
Cadmium	ug/l	0.2 [11]	<0.1	<10	<10	<0.10	<0.10	0.12
Calcium	ug/l	–	43000	36000	30000	58000	82000	87000
Chromium	ug/l	– [13]	2	<50	<50	<5.0	<5.0	**17**
Cobalt	ug/l	0.9	<0.2	<10	<10	**1.1**	**2.0**	**4.5**
Copper	ug/l	5	<1	<10	<10	2.6	2.9	**17**
Iron	ug/l	300	200	**1600**	100	**5100**	**12000**	**43000**
Lead	ug/l	– [14]	<1	<10	<10	<0.50	0.66	6.6
Magnesium	ug/l	--	14000	9000	10000	15000	23000	29000
Manganese	ug/l	–	40	320	30	1900	730	1500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	5000	<1000	5000	5300	4100	7400
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	39000	26000	38000	46000	73000	87000
Zinc	ug/l	30 [11]	<10	<50	<50	7.9	12	**51**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	**3.0**	<1.0	<1.0

Parameter	Unit	PWQO [1]	S10 28-May-2013 S10	S10 15-Aug-2013 S10	S10 21-Nov-2013 SA-6	S10 28-May-2014 [23] S10 (SW-W)	S10 26-Aug-2014 [24] S10	S10 13-Nov-2014 S-10
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	150000	200000	160000	210000	200000	180000
Ammonia, unionized	ug/l	20	0.04	0.09	<0.03	<0.09	0.2	<0.02
Ammonia Nitrogen	ug/l	--	97	210	<50	<50	160	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	5000	<2000	2000	4000	6000
Chemical Oxygen Demand	ug/l	--	79000	690000	150000	190000	410000	180000
Chloride	ug/l	--	48000	42000	78000	55000	58000	62000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	524	548	725	571	603	558
Dissolved Inorganic Carbon	ug/l	--	33000	57000	43000	48000	52000	43000
Dissolved Organic Carbon	ug/l	--	23000	31000	18000	22000	23000	21000
Dissolved Oxygen (Field)	ug/l	-- [7]	**2770**	**1050**	**7580**	**680**	**600**	**3660**
Hardness, Calcium Carbonate	ug/l	--	160000	170000	200000	200000	180000	160000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<500	<500	<100
Nitrite as N	ug/l	--	<10	<10	<10	<50	<50	<10
Nitrogen, Total Kjeldahl	ug/l	--	2300	16000	2400	11000	12000	7400
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	<100	<100	<500	<500	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	**6.41**	**6.23**	6.86	6.87	6.57	6.61
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**270**	**4200**	**240**	**1100**	**1200**	**680**
Sulphate	ug/l	--	41000	<1000	100000	29000	31000	21000
Temperature (Field)	deg c	-- [10]	9.0	14	0.2	13.1	17.9	2.1
Total Dissolved Solids	ug/l	--	352000	378000	476000	408000	440000	334000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	160000	380000	120000	120000	280000	93000
Metals								
Arsenic	ug/l	100 [11]	<1.0	5.9	<1.0	2.6	3.0	1.3
Boron	ug/l	200 [12]	170	190	190	160	170	160
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	44000	63000	60000	60000	56000	47000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	8.0	<5.0
Cobalt	ug/l	0.9	<0.50	**2.3**	0.55	**1.2**	**2.6**	**1.3**
Copper	ug/l	5	<1.0	**7.2**	3.3	3.0	**7.3**	2.8
Iron	ug/l	300	**1900**	**59000**	**4400**	**10000**	**23000**	**7500**
Lead	ug/l	-- [14]	<0.50	6.3	2.2	2.4	4.8	1.3
Magnesium	ug/l	--	14000	17000	20000	16000	16000	15000
Manganese	ug/l	--	280	1100	220	1100	1300	1100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	6600	2900	8700	11000	4300	9000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	62000	59000	76000	59000	57000	60000
Zinc	ug/l	30 [11]	<5.0	**42**	11	25	30	19
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	**1.6**	**11**

Parameter	Unit	PWQO [1]	S10 27-May-2015 S-10	S10 25-Aug-2015 S-10	S10 25-Nov-2015 S-10	S10 24-May-2016 S-10	S10 18-Aug-2016 S-10	S10 16-Nov-2016 S-10
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	204000	199000	183000	163000	21000	147000
Ammonia, unionized	ug/l	20	1.34	0.11	0.01	0.71	0.07	0.4
Ammonia Nitrogen	ug/l	–	100	30	30	150	80	70
Biochemical Oxygen Demand, 5 Day	ug/l	--	<20000 [25]	<30000 [25]	6000	74000	12000	4000
Chemical Oxygen Demand	ug/l	--	115000	171000	126000	671000	100000	52000
Chloride	ug/l	–	77000	75000	108000	43000	33000	117000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	619	602	39	458	864	942
Dissolved Inorganic Carbon	ug/l	--	45900	38300	43300	20200	900	29800
Dissolved Organic Carbon	ug/l	--	38100	38900	19900	50500	25400	12800
Dissolved Oxygen (Field)	ug/l	-- [7]	**930**	**1380**	**1940**	**1700**	**1310**	9270
Hardness, Calcium Carbonate	ug/l	--	43000	137000	232000	193000	332000	229000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2400	2300	2900	17400	4100	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.63	7.13	6.56	7.38	**6.43**	7.71
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**390**	**420**	**420**	**2500**	**650**	**120**
Sulphate	ug/l	–	12000	3000	87000	10000	398000	130000
Temperature (Field)	deg c	– [10]	17.0	15.5	0	10.8	17.9	3.7
Total Dissolved Solids	ug/l	--	358000	397000	488000	324000	668000	518000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	97000	46000	129000	1160000	96000	36000
Metals								
Arsenic	ug/l	100 [11]	<1	1	<1	6	4	<1
Boron	ug/l	200 [12]	32	199	174	182	**489**	124
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Calcium	ug/l	–	13000	34300	71000	56300	91300	61900
Chromium	ug/l	– [13]	<1	1	2	**9**	2	<1
Cobalt	ug/l	0.9	<0.5	0.6	<0.5	**6.3**	**3.4**	<0.5
Copper	ug/l	5	<0.5	<0.5	<0.5	**8.7**	3.3	<0.5
Iron	ug/l	300	**801**	**9020**	**3000**	**43300**	**4450**	**2580**
Lead	ug/l	– [14]	0.2	0.1	0.8	11.7	1.9	0.2
Magnesium	ug/l	--	2560	12500	18900	12800	25200	18000
Manganese	ug/l	–	179	683	179	7530	1080	52
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	1180	3050	4830	8370	9080	5850
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	13000	61700	106000	52200	57000	88700
Zinc	ug/l	30 [11]	<5	10	13	**86**	**82**	18
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**5**	<1	**29**	**10**	**7**

Parameter	Unit	PWQO [1]	S10 18-May-2017 S-10	S10 28-Aug-2017 S-10	S10 28-Nov-2017 S-10	S10 23-May-2018 S-10	S10 30-Aug-2018 S-10	S10 28-Nov-2018 S-10
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	192000	179000	189000	243000	267000	175000
Ammonia, unionized	ug/l	20	0.3	0.06	0.02	0.11	0.05	0.02
Ammonia Nitrogen	ug/l	--	30	40	90	30	40	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	35000	<100000 [26]	8000	18000	4000
Chemical Oxygen Demand	ug/l	--	64000	153000	526000	106000	280000	66000
Chloride	ug/l	--	75000	63000	64000	32000	118000	89000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	673	520	656	510	799	649
Dissolved Inorganic Carbon	ug/l	--	11000	36300	8800	50800	43000	32000
Dissolved Organic Carbon	ug/l	--	42000	21400	43800	21500	37600	22400
Dissolved Oxygen (Field)	ug/l	-- [7]	**1660**	**2850**	**5580**	**1920**	**1170**	13250
Hardness, Calcium Carbonate	ug/l	--	208000	202000	237000	177000	230000	212000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2300	4500	1700	2300	9900	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.52	6.83	6.51	7.20	6.60	6.9
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**260**	**540**	**480**	**1190**	**1220**	**90**
Sulphate	ug/l	--	51000	37000	67000	4000	3000	73000
Temperature (Field)	deg c	-- [10]	16.3	12.3	0.4	12.3	17.3	0.9
Total Dissolved Solids	ug/l	--	408000	360000	390000	314000	484000	424000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	49000	410000	1000000	47000	346000	13000
Metals								
Arsenic	ug/l	100 [11]	<5 [17]	<1	2	1	2	<1
Boron	ug/l	200 [12]	**255**	161	162	141	**222**	124
Cadmium	ug/l	0.2 [11]	<0.5 [17]	<0.1	**0.3**	<0.1	<0.1	<0.1
Calcium	ug/l	--	55400	57600	66300	47200	64700	55300
Chromium	ug/l	-- [13]	<5 [17]	2	**11**	<1	3	<1
Cobalt	ug/l	0.9	<2.5 [17]	0.6	**3.6**	0.8	**1.2**	<0.5
Copper	ug/l	5	<2.5 [17]	0.7	**13.1**	<0.5	3.8	1.1
Iron	ug/l	300	**1880**	**4090**	**17900**	**11200**	**15500**	**2070**
Lead	ug/l	-- [14]	0.5	1.0	4.9	0.6	2.0	0.3
Magnesium	ug/l	--	16900	14200	17500	14400	16600	17800
Manganese	ug/l	--	984	400	648	1400	773	476
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	8190	3670	6080	5600	3290	6910
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	66000	57500	52400	42500	86700	79100
Zinc	ug/l	30 [11]	<25 [17]	14	**70**	9	19	11
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	**6**	<1

Parameter	Unit	PWQO [1]	S10 20-Jun-2019 S-10	S10 28-Aug-2019 [20] S-10	S10 21-Nov-2019 S-10	S10 14-May-2020 S-10	S10 26-Aug-2020 [20] S-10	S10 25-Nov-2020 S-10
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	218000	--	89000	138000	--	191000
Ammonia, unionized	ug/l	20	0.05	--	0.01	0.02	--	0.05
Ammonia Nitrogen	ug/l	--	30	--	30	20	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<12000 [26]	--	<20000 [26]	8000	--	<60000 [26]
Chemical Oxygen Demand	ug/l	--	91000	--	178000	89000	--	361000
Chloride	ug/l	--	62000	--	113000	59000	--	91000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	560	--	1091	505	--	23
Dissolved Inorganic Carbon	ug/l	--	47100	--	<500	31100	--	45900
Dissolved Organic Carbon	ug/l	--	23100	--	21800	31500	--	27600
Dissolved Oxygen (Field)	ug/l	-- [7]	**1010**	--	**2980**	**5970**	--	**3000**
Hardness, Calcium Carbonate	ug/l	--	217000	--	328000	120000	--	201000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	<100
Nitrite as N	ug/l	--	<50	--	<50	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	1600	--	3200	1500	--	6600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.69	--	6.51	6.95	--	7.22
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**110**	--	**430**	**210**	--	**1470**
Sulphate	ug/l	--	1000	--	243000	28000	--	40000
Temperature (Field)	deg c	-- [10]	17.6	--	0.2	6.0	--	0
Total Dissolved Solids	ug/l	--	352000	--	612000	278000	--	442000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	16000	--	106000	25000	--	428000
Metals								
Arsenic	ug/l	100 [11]	1	--	1	<1	--	<1
Boron	ug/l	200 [12]	197	--	**246**	83	--	99
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.1	<0.1	--	<0.1
Calcium	ug/l	--	59400	--	85000	31500	--	53000
Chromium	ug/l	-- [13]	1	--	2	<1	--	<1
Cobalt	ug/l	0.9	**2.3**	--	**2.1**	<0.5	--	<0.5
Copper	ug/l	5	1.4	--	2.9	0.6	--	1.0
Iron	ug/l	300	**13500**	--	**8400**	**1080**	--	**1050**
Lead	ug/l	-- [14]	2.3	--	1.3	0.1	--	<0.1
Magnesium	ug/l	--	16600	--	28200	9940	--	16600
Manganese	ug/l	--	2990	--	1600	215	--	324
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	4480	--	10700	4450	--	10800
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	65900	--	90200	43800	--	67700
Zinc	ug/l	30 [11]	18	--	20	9	--	<5
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	**5**	<1	--	**10**

Parameter	Unit	PWQO [1]	S11 28-Jun-1995	S11 14-Nov-1995	S11 13-Jun-1996	S11 12-Oct-1996	S11 17-Jun-1997	S11 05-Nov-1997
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	–	–	–	--	–	–
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	300000	57000	78000	82000	71000	32000
Ammonia, unionized	ug/l	20	–	–	–	--	–	–
Ammonia Nitrogen	ug/l	–	18000	330	50	190	10	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	15000	15000	5000	1000	3000	2000
Chemical Oxygen Demand	ug/l	--	620000	130000	94000	50000	82000	51000
Chloride	ug/l	–	75000	56500	42000	61000	68300	51000
Conductivity	uS/cm	–	--	--	--	--	–	--
Conductivity (Field)	uS/cm	--	790	500	320	710	706	770
Dissolved Inorganic Carbon	ug/l	--	96800	7300	19100	16100	37000	6000
Dissolved Organic Carbon	ug/l	--	–	–	–	–	–	–
Dissolved Oxygen (Field)	ug/l	-- [7]	4800	--	7700	4850	4700	4500
Hardness, Calcium Carbonate	ug/l	--	234000	113000	70000	224000	190000	182000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	--	–	--	–
Nitrite as N	ug/l	--	100	--	--	--	–	--
Nitrogen, Total Kjeldahl	ug/l	--	19500	25800	1720	1660	2120	1080
Nitrogen, Nitrate-Nitrite	ug/l	--	–	–	–	–	–	–
Nitrogen, Organic	ug/l	--	1500	25470	–	–	–	–
pH (Field)	-	6.5 - 8.5	6.73	6.93	**5.05**	**6.25**	**6.44**	7.27
Phosphate	ug/l	–	5920	1070	200	210	150	80
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	7000	46000	--	--	--	–
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	400000	250000	160000	350	354000	380000
Total Organic Carbon	ug/l	--	56100	36700	29700	16500	36800	19800
Total Suspended Solids	ug/l	--	–	625000	26000	16000	8000	12000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1450**	**570**	**652**	**1270**	**2350**	**1340**
Cadmium	ug/l	0.2 [11]	**1.3**	**0.4**	--	--	--	--
Calcium	ug/l	–	57590	27600	18600	56500	52000	47300
Chromium	ug/l	– [13]	**90**	**20**	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	–	--
Copper	ug/l	5	**14**	**11.1**	3.5	4.2	0.5	**10.8**
Iron	ug/l	300	**24210**	**14500**	**1860**	**2060**	**1650**	150
Lead	ug/l	– [14]	37.6	16.5	0.6	0.2	0.2	0.2
Magnesium	ug/l	--	21200	10600	5520	19800	14300	15400
Manganese	ug/l	–	650	270	111	280	100	70
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	–	--
Nickel	ug/l	25	**30**	20	22	20	20	20
Potassium	ug/l	–	10430	7500	792	2900	400	1700
Selenium	ug/l	100	--	--	--	–	--	--
Sodium	ug/l	–	74380	63200	45400	72800	81800	46400
Zinc	ug/l	30 [11]	**120**	**80**	10	20	10	20
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**2**	**6**

Parameter	Unit	PWQO [1]	S11 05-Jun-1998	S11 26-Aug-1998	S11 30-Oct-1998	S11 19-Oct-1999	S11 03-May-2000	S11 25-Oct-2000
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	72000	88000	218000	46000	67000	210000
Ammonia, unionized	ug/l	20	--	--	10	--	10	--
Ammonia Nitrogen	ug/l	--	730	90	30	70	50	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	16000	1000	4000	4000	--
Chemical Oxygen Demand	ug/l	--	69000	116000	96000	118000	72000	--
Chloride	ug/l	--	120000	63400	120000	70600	30400	149000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1347	522	830	520	339	861
Dissolved Inorganic Carbon	ug/l	--	11400	23300	65700	21300	13800	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10520	5580	7860	6400	8740	2270
Hardness, Calcium Carbonate	ug/l	--	397000	135000	223000	133000	67000	291000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1840	1640	1320	1460	1140	20800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	7.6	**6.4**	7.7	6.76	7.19
Phosphate	ug/l	--	170	360	100	200	140	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	61000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	673000	261000	410000	260000	170000	258000
Total Organic Carbon	ug/l	--	22800	23000	32700	24700	20100	--
Total Suspended Solids	ug/l	--	40000	28000	5000	29000	30000	1340000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	5
Boron	ug/l	200 [12]	**3350**	**1100**	**810**	**880**	**280**	**1430**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	102000	34400	52100	34800	17700	70400
Chromium	ug/l	-- [13]	--	--	--	--	--	**80**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	2	3.2	0.7	0.5	0.5	**53**
Iron	ug/l	300	**3040**	**1210**	**740**	**2620**	**1260**	**37200**
Lead	ug/l	-- [14]	0.2	0.2	0.2	0.3	0.2	51
Magnesium	ug/l	--	34600	11700	22300	11100	5370	28000
Manganese	ug/l	--	450	90	80	290	390	2420
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	**50**
Potassium	ug/l	--	400	7600	17000	8000	8500	9600
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	153000	57800	103000	60600	30800	95900
Zinc	ug/l	30 [11]	30	10	10	20	10	**320**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	**31**	**17**	**7**

Parameter	Unit	PWQO [1]	S11 13-Jun-2001	S11 21-Nov-2001	S11 22-May-2002	S11 12-Nov-2002	S11 31-May-2003	S11 22-Oct-2003
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	198000	80000	135000	44000	89000	42000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--
Ammonia Nitrogen	ug/l	--	30	20	30	40	120	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	2000	1000	13000	9000	3000
Chemical Oxygen Demand	ug/l	--	66000	60000	49000	355000	150000	84000
Chloride	ug/l	--	90400	79600	70700	89200	43200	80800
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	650	420	410	--	600	600
Dissolved Inorganic Carbon	ug/l	--	38300	11200	21000	9000	19000	10000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	2000	6110	6380	--	5000	5000
Hardness, Calcium Carbonate	ug/l	--	192000	166000	186000	295000	98000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	100	200	100	500
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1520	1200	740	8700	3460	1360
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.9	**6.15**	7.02	--	8.15	8.15
Phosphate	ug/l	--	410	140	40	970	530	170
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	53000	107000	36000	300000	44000	110000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	438000	380000	340000	672000	196000	333000
Total Organic Carbon	ug/l	--	22700	15000	11000	28000	35000	23000
Total Suspended Solids	ug/l	--	43000	106000	4000	427000	232000	28000
Metals								
Arsenic	ug/l	100 [11]	1	1	1	1	1	1
Boron	ug/l	200 [12]	**550**	**690**	110	**1260**	**260**	**455**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	49100	43700	48800	77400	25900	34600
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	8
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	0.5	3.5	<1	**10.9**	5	**21**
Iron	ug/l	300	**1990**	**5340**	220	**4940**	**2860**	**922**
Lead	ug/l	-- [14]	5	0.3	<1	8.3	1.3	1.9
Magnesium	ug/l	--	16900	13700	12800	24800	8010	11600
Manganese	ug/l	--	540	430	20	530	790	153
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10
Potassium	ug/l	--	2200	5700	4800	7800	4400	10600
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	85600	62300	51300	95400	44100	67700
Zinc	ug/l	30 [11]	20	10	10	**110**	**40**	18
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**43**	1	1	1	1	1

Parameter	Unit	PWQO [1]	S11 17-May-2004	S11 21-Aug-2004	S11 18-Nov-2004	S11 25-May-2005	S11 09-Sep-2005 [20]	S11 09-Nov-2005
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	149000	--	110000
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	<5000	--	<5000
Alkalinity (Total as CaCO3)	ug/l	-- [5]	155000	183000	250000	120000	--	90000
Ammonia, unionized	ug/l	20	<10	<10	<10	<0.04	--	0.07
Ammonia Nitrogen	ug/l	--	10	40	80	<10	--	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	7000	84000	10000	--	15000
Chemical Oxygen Demand	ug/l	--	76000	187000	2850000	64000	--	372000
Chloride	ug/l	--	86500	72300	109000	62700	--	61200
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	550	500	740	480	--	220
Dissolved Inorganic Carbon	ug/l	--	42300	38800	54100	38400	--	36800
Dissolved Organic Carbon	ug/l	--	--	--	--	20100	--	22800
Dissolved Oxygen (Field)	ug/l	-- [7]	3900	5800	--	**4800**	--	**7300**
Hardness, Calcium Carbonate	ug/l	--	189000	164000	273000	121000	--	203000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	**20**	--	**700**
Nitrate as N	ug/l	--	100	200	200	200	--	100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2040	4330	48400	1180	--	7720
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.2	7	7	7.2	--	7.2
Phosphate	ug/l	--	260	640	11800	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**120**	--	**1440**
Sulphate	ug/l	--	30000	28000	79000	20000	--	174000
Temperature (Field)	deg c	-- [10]	--	--	--	12.5	--	0.5
Total Dissolved Solids	ug/l	--	275000	250000	370000	252000	--	439000
Total Organic Carbon	ug/l	--	17700	19200	17200	--	--	--
Total Suspended Solids	ug/l	--	40000	172000	10400000	14000	--	1790000
Metals								
Arsenic	ug/l	100 [11]	1	1	9	<1	--	1
Boron	ug/l	200 [12]	109	**223**	**410**	181	--	**758**
Cadmium	ug/l	0.2 [11]	--	--	--	<0.1	--	<0.5
Calcium	ug/l	--	53600	44200	74500	32000	--	52600
Chromium	ug/l	-- [13]	2	7	**462**	<2	--	**45**
Cobalt	ug/l	0.9	--	--	--	**2**	--	**15**
Copper	ug/l	5	**17**	**96**	**370**	<2	--	**42**
Iron	ug/l	300	**922**	297	**1260**	**724**	--	**1390**
Lead	ug/l	-- [14]	1.8	4.9	22.5	<0.2	--	28
Magnesium	ug/l	--	13400	12900	21200	10100	--	17400
Manganese	ug/l	--	196	799	5760	69	--	1720
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	<0.05	--	<0.06
Molybdenum	ug/l	40	--	--	--	<0.5	--	<5
Nickel	ug/l	25	20	**80**	**300**	<10	--	**40**
Potassium	ug/l	--	6400	7700	9400	6200	--	5600
Selenium	ug/l	100	--	--	--	<1	--	<1
Sodium	ug/l	--	73600	81100	100000	52500	--	77400
Zinc	ug/l	30 [11]	**42**	**244**	**1080**	9	--	**145**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**7**	<1	--	<1

Parameter	Unit	PWQO [1]	S11 24-May-2006	S11 15-Aug-2006	S11 16-Nov-2006	S11 08-May-2007	S11 22-Aug-2007 [20]	S11 20-Nov-2007
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	82000	191000	63000	138000	--	182000
Ammonia, unionized	ug/l	20	<0.02	0.05	0.18	<0.12	--	0.32
Ammonia Nitrogen	ug/l	--	<10	20	30	<10	--	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	13000	6000	<3000	<3000	--	14000
Chemical Oxygen Demand	ug/l	--	264000	95000	48000	55000	--	366000
Chloride	ug/l	--	39700	99300	19200	53200	--	131000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	220	750	190	400	--	600
Dissolved Inorganic Carbon	ug/l	--	29100	47800	17000	34500	--	49100
Dissolved Organic Carbon	ug/l	--	56800	29200	18900	13100	--	18100
Dissolved Oxygen (Field)	ug/l	-- [7]	10510	**1200**	**4340**	**5150**	--	**2750**
Hardness, Calcium Carbonate	ug/l	--	40000	194000	32000	155000	--	215000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	100	100	--	100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	5460	2480	990	1500	--	7620
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.3	6.9	7.6	7.8	--	7.8
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**900**	**1180**	**130**	**180**	--	**2330**
Sulphate	ug/l	--	17000	20000	28000	25000	--	118000
Temperature (Field)	deg c	-- [10]	5	16	7.2	10.4	--	0.3
Total Dissolved Solids	ug/l	--	175000	375000	139000	271000	--	575000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	253000	248000	67000	30000	--	2020000
Metals								
Arsenic	ug/l	100 [11]	<1	1.1	<1	0.9	--	4.1
Boron	ug/l	200 [12]	164	107	104	53	--	**205**
Cadmium	ug/l	0.2 [11]	0.2	<0.1	<0.5	<0.1	--	<0.1
Calcium	ug/l	--	7280	45400	7250	41900	--	53100
Chromium	ug/l	-- [13]	7	**33**	**13**	<2	--	**86**
Cobalt	ug/l	0.9	**1.6**	**4.6**	0.9	0.8	--	**21.7**
Copper	ug/l	5	**41**	**50**	**38**	**21**	--	**42**
Iron	ug/l	300	**1670**	**1110**	**1730**	**1300**	--	**40600**
Lead	ug/l	-- [14]	4.7	5.8	1	0.8	--	14.8
Magnesium	ug/l	--	5200	19600	3490	12300	--	19900
Manganese	ug/l	--	652	736	88	136	--	1040
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	2000	7600	3600	5200	--	8000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	54900	73500	36900	48100	--	92800
Zinc	ug/l	30 [11]	**46**	**78**	**31**	21	--	**161**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	--	<1

Parameter	Unit	PWQO [1]	S11 23-May-2008	S11 12-Aug-2008	S11 06-Nov-2008	S11 13-May-2009 S-7	S11 25-Aug-2009 [27] A-2	S11 27-Nov-2009 [28] S-5
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	80000	170000	150000	181000	202000	157000
Ammonia, unionized	ug/l	20	<0.03	0.77	0.12	<0.16	0.3	3.35
Ammonia Nitrogen	ug/l	–	<10	200	20	<20	190	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	10000	<3000	<1000	14000	16000
Chemical Oxygen Demand	ug/l	--	115000	222000	42000	45000	95000	60000
Chloride	ug/l	–	56800	69200	104000	77000	79000	66000
Conductivity	uS/cm	–	--	--	--	710	734	654
Conductivity (Field)	uS/cm	--	370	500	600	600	640	–
Dissolved Inorganic Carbon	ug/l	--	20000	42600	38700	44500	53400	38600
Dissolved Organic Carbon	ug/l	--	8700	26200	13400	17200	26100	20100
Dissolved Oxygen (Field)	ug/l	-- [7]	**2330**	**460**	**2430**	6570	**4160**	**700**
Hardness, Calcium Carbonate	ug/l	--	70000	116000	181000	192000	188000	187000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	<100	<100	<100	220
Nitrite as N	ug/l	--	--	--	--	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	2150	7340	1020	860	2910	1070
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.2	7.1	7.6	7.4	6.70	**8.68**
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**210**	**2510**	**140**	**60**	**1210**	**250**
Sulphate	ug/l	–	16000	2000	71000	55000	44000	68000
Temperature (Field)	deg c	– [10]	11.3	16.5	7.8	17.5	17.1	4.9
Total Dissolved Solids	ug/l	--	201000	283000	417000	462000	477000	425000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	11000	93000	3000	5000	398000	112000
Metals								
Arsenic	ug/l	100 [11]	1.7	1.4	0.9	<1	<50	<50
Boron	ug/l	200 [12]	167	125	81	60	<100	<100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<10	<10
Calcium	ug/l	–	18200	25800	46900	54000	52000	50000
Chromium	ug/l	– [13]	<2	5	<2	3	<50	<20
Cobalt	ug/l	0.9	<0.5	**1.8**	0.9	0.3	<10	<5
Copper	ug/l	5	<2	**8**	<2	3	**20**	**10**
Iron	ug/l	300	**1020**	**979**	**676**	**470**	**18900**	**3800**
Lead	ug/l	– [14]	<0.1	2.1	<0.1	<1	<10	<10
Magnesium	ug/l	--	5950	12500	15400	14000	14000	15000
Manganese	ug/l	–	156	1110	191	40	560	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	3300	5000	9100	6000	11000	12000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	51100	64500	78200	65000	64000	56000
Zinc	ug/l	30 [11]	6	**44**	<5	<10	**60**	<50
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	**2**	**4**

Parameter	Unit	PWQO [1]	S11 18-May-2010 S-6	S11 18-Aug-2010 [29] S-3	S11 14-Oct-2010 S-6	S11 19-May-2011 [30] W-5	S11 16-Aug-2011 [2] N-6	S11 30-Nov-2011 [22] S11
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	139000	134000	140000	197000	110000
Ammonia, unionized	ug/l	20	0.12	0.18	0.03	<0.1	0.32	<0.07
Ammonia Nitrogen	ug/l	–	30	170	30	<20	50	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	8000	5000	3000	68000	3000
Chemical Oxygen Demand	ug/l	--	58000	53000	83000	60000	175000	40000
Chloride	ug/l	–	66000	46000	37000	34000	45000	44000
Conductivity	uS/cm	–	708	754	461	452	637	562
Conductivity (Field)	uS/cm	--	767	709	205	447	543	537
Dissolved Inorganic Carbon	ug/l	--	48900	31000	33900	34900	47700	22300
Dissolved Organic Carbon	ug/l	--	23800	21500	28000	18900	25300	10300
Dissolved Oxygen (Field)	ug/l	-- [7]	**3630**	**5780**	**3780**	**1990**	**1760**	6740
Hardness, Calcium Carbonate	ug/l	--	212000	201000	140000	138000	198000	146000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	100	<100	<100	1290
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1450	1870	920	1760	3300	660
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.25	6.55	6.83	7.26	7.23	7.40
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**250**	**160**	**110**	**290**	**90**
Sulphate	ug/l	–	27000	163000	37000	34000	57000	91000
Temperature (Field)	deg c	– [10]	12.9	15.88	9	15.4	19.3	6.3
Total Dissolved Solids	ug/l	--	460000	490000	300000	294000	414000	365000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	14000	69000	17000	33000	517000	65000
Metals								
Arsenic	ug/l	100 [11]	1	<1	<1	<50	<10	<50
Boron	ug/l	200 [12]	100	**270**	60	<100	190	100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<10	<0.1	<10
Calcium	ug/l	–	57000	54000	38000	37000	53000	37000
Chromium	ug/l	– [13]	3	5	7	<50	4	<50
Cobalt	ug/l	0.9	0.5	0.7	**1.4**	<10	0.6	<10
Copper	ug/l	5	1	3	5	<10	1	<10
Iron	ug/l	300	**990**	**1660**	**2540**	**2000**	**1860**	**4400**
Lead	ug/l	– [14]	<1	1	<1	<10	<1	<10
Magnesium	ug/l	--	17000	16000	11000	11000	16000	13000
Manganese	ug/l	–	170	250	80	100	370	130
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	8000	13000	7000	5000	6000	10000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	67000	67000	33000	36000	56000	55000
Zinc	ug/l	30 [11]	<10	<10	<10	<50	<10	<50
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<5	<1	<1

Parameter	Unit	PWQO [1]	S11 30-May-2012 S 11	S11 22-Aug-2012 S-11	S11 29-Nov-2012 S11	S11 28-May-2013 S11	S11 15-Aug-2013 S11	S11 21-Nov-2013 SA-5
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	190000	1400000	250000	160000	190000	180000
Ammonia, unionized	ug/l	20	0.53	<0.02	0.05	0.2	0.22	<0.04
Ammonia Nitrogen	ug/l	–	120	<50	150	98	130	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	<2000	4000	<2000	2000	5000
Chemical Oxygen Demand	ug/l	--	160000	47000	180000	50000	140000	73000
Chloride	ug/l	–	46000	62000	99000	66000	56000	82000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	498	1111	998	590	563	770
Dissolved Inorganic Carbon	ug/l	--	44000	10000	56000	35000	50000	46000
Dissolved Organic Carbon	ug/l	--	32000	13000	24000	20000	23000	15000
Dissolved Oxygen (Field)	ug/l	-- [7]	**300**	**2280**	**1550**	**3680**	**1260**	**4510**
Hardness, Calcium Carbonate	ug/l	--	150000	530000	340000	190000	170000	220000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	160	<100	<100	<100
Nitrite as N	ug/l	--	<10	<10	<10	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	3200	1300	6200	1100	2700	1500
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	<100	160	<100	<100	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.13	**6.15**	6.62	6.94	6.77	6.90
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**340**	**140**	**1600**	**58**	**900**	**270**
Sulphate	ug/l	–	<1000	480000	170000	58000	23000	110000
Temperature (Field)	deg c	– [10]	17.4	15.5	0	13.1	15.6	1.1
Total Dissolved Solids	ug/l	--	320000	990000	678000	390000	368000	544000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	60000	10000	460000	<1000	120000	40000
Metals								
Arsenic	ug/l	100 [11]	1.3	<1.0	4.5	<1.0	2.0	<1.0
Boron	ug/l	200 [12]	150	**650**	150	88	**220**	120
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	**0.24**	<0.10	0.10	<0.10
Calcium	ug/l	–	42000	150000	96000	49000	54000	63000
Chromium	ug/l	– [13]	<5.0	<5.0	**29**	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.53	<0.50	**12**	<0.50	**2.4**	<0.50
Copper	ug/l	5	2.6	1.8	**14**	1.6	5.0	2.0
Iron	ug/l	300	**2200**	**640**	**34000**	**550**	**12000**	**1200**
Lead	ug/l	– [14]	0.79	<0.50	9.3	<0.50	1.8	0.65
Magnesium	ug/l	--	13000	41000	35000	16000	17000	23000
Manganese	ug/l	–	230	110	3400	42	3400	210
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	6800	8800	10000	5900	9200	10000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	52000	88000	99000	65000	57000	88000
Zinc	ug/l	30 [11]	<5.0	9.8	**53**	<5.0	20	5.8
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1.0	<1.0	**2.6**	<1.0	<1.0	**1.8**

Parameter	Unit	PWQO [1]	S11 28-May-2014 [23] S11 (SW-C)	S11 26-Aug-2014 [24] S11	S11 13-Nov-2014 S-11	S11 27-May-2015 S-11	S11 25-Aug-2015 S-11	S11 25-Nov-2015 S-11
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	120000	150000	140000	120000	136000	186000
Ammonia, unionized	ug/l	20	<0.35	0.51	<0.06	1.88	0.12	0.2
Ammonia Nitrogen	ug/l	--	<50	96	<50	120	30	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	3000	<2000	<6000 [25]	<6000 [25]	<10000 [25]
Chemical Oxygen Demand	ug/l	--	79000	81000	50000	79000	64000	107000
Chloride	ug/l	--	59000	57000	60000	78000	100000	134000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	439	508	478	498	750	62
Dissolved Inorganic Carbon	ug/l	--	28000	40000	34000	30700	29900	42800
Dissolved Organic Carbon	ug/l	--	22000	21000	19000	27300	22300	20400
Dissolved Oxygen (Field)	ug/l	-- [7]	**2430**	**300**	**3130**	**560**	**1560**	**3080**
Hardness, Calcium Carbonate	ug/l	--	120000	130000	130000	22900	176000	270000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<500	<500	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	11	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2200	2000	880	2100	1000	1300
Nitrogen, Nitrate-Nitrite	ug/l	--	<500	<500	<100	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.44	7.13	7.00	7.61	7.12	7.49
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**310**	**300**	**55**	**240**	**100**	**160**
Sulphate	ug/l	--	23000	16000	20000	17000	117000	75000
Temperature (Field)	deg c	-- [10]	14.0	19.9	3.7	19.8	17.0	0
Total Dissolved Solids	ug/l	--	320000	330000	282000	178000	461000	510000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	90000	38000	3000	4000	8000	31000
Metals								
Arsenic	ug/l	100 [11]	1.4	1.7	<1.0	<1	<1	<1
Boron	ug/l	200 [12]	81	97	74	23	134	85
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Calcium	ug/l	--	27000	35000	32000	5910	42600	79300
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<1	1	3
Cobalt	ug/l	0.9	0.72	0.77	<0.50	<0.5	<0.5	<0.5
Copper	ug/l	5	1.7	2.0	1.0	<0.5	<0.5	<0.5
Iron	ug/l	300	**2500**	**4300**	**990**	216	**772**	**1210**
Lead	ug/l	-- [14]	1.7	1.7	<0.50	0.1	<0.1	0.7
Magnesium	ug/l	--	9700	12000	12000	1970	16800	17500
Manganese	ug/l	--	130	260	87	44	157	90
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	4600	6700	5200	859	5860	7960
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	54000	55000	55000	12900	76600	121000
Zinc	ug/l	30 [11]	<5.0	7.3	6.6	<5	6	9
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	**7.3**	<1	**2**	<1

Parameter	Unit	PWQO [1]	S11 24-May-2016 S-11	S11 18-Aug-2016 S-11	S11 16-Nov-2016 S-11	S11 18-May-2017 S-11	S11 28-Aug-2017 S-11	S11 28-Nov-2017 S-11
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	136000	32000	136000	150000	159000	110000
Ammonia, unionized	ug/l	20	0.76	0.02	0.27	0.56	0.35	0.07
Ammonia Nitrogen	ug/l	–	100	50	70	40	160	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	10000	3000	3000	2000	34000	4000
Chemical Oxygen Demand	ug/l	--	122000	45000	38000	69000	128000	49000
Chloride	ug/l	–	99000	95000	125000	97000	62000	51000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	579	1354	974	648	414	228
Dissolved Inorganic Carbon	ug/l	--	31300	6600	27900	8400	28400	8400
Dissolved Organic Carbon	ug/l	--	20600	15400	11000	34700	48700	32300
Dissolved Oxygen (Field)	ug/l	-- [7]	**3520**	**1650**	**2950**	**930**	**640**	**3090**
Hardness, Calcium Carbonate	ug/l	--	137000	510000	229000	167000	180000	89000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2500	1100	600	900	3200	2500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.47	**6.05**	7.47	7.55	7.00	6.94
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**490**	**170**	**80**	**80**	**330**	**480**
Sulphate	ug/l	–	31000	630000	147000	51000	15000	37000
Temperature (Field)	deg c	– [10]	14.3	19.3	5.6	20.1	12.0	0.3
Total Dissolved Solids	ug/l	--	382000	1090000	540000	394000	348000	268000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	159000	23000	5000	11000	208000	466000
Metals								
Arsenic	ug/l	100 [11]	2	2	<1	<5 [17]	1	<1
Boron	ug/l	200 [12]	**207**	**542**	109	**201**	**230**	92
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1
Calcium	ug/l	–	36100	139000	60100	43400	52400	22200
Chromium	ug/l	– [13]	**10**	2	<1	<5 [17]	5	6
Cobalt	ug/l	0.9	**1.5**	**1.5**	<0.5	<2.5 [17]	**1.7**	**1.1**
Copper	ug/l	5	3.2	1.3	<0.5	<2.5 [17]	**7.7**	2.8
Iron	ug/l	300	**5170**	**821**	**778**	**1310**	**3450**	**2650**
Lead	ug/l	– [14]	4.4	2.0	0.3	0.5	1.4	1.8
Magnesium	ug/l	--	11500	39800	19200	14200	12000	8250
Manganese	ug/l	–	342	1000	121	194	525	304
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	5020	9180	6630	5510	4650	3290
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	85600	106000	92400	78500	67500	50400
Zinc	ug/l	30 [11]	**33**	**33**	<5	<25 [17]	18	13
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**13**	**8**	**5**	<1	<1	<1

Parameter	Unit	PWQO [1]	S11 23-May-2018 S-11	S11 30-Aug-2018 S-11	S11 28-Nov-2018 S-11	S11 20-Jun-2019 S-11	S11 28-Aug-2019 [20] S-11	S11 21-Nov-2019 S-11
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	121000	249000	65000	117000	--	66000
Ammonia, unionized	ug/l	20	0.2	0.52	0.04	0.13	--	0.05
Ammonia Nitrogen	ug/l	--	30	140	50	50	--	180
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	<40000 [26]	7000	12000	--	<60000 [26]
Chemical Oxygen Demand	ug/l	--	76000	355000	83000	78000	--	137000
Chloride	ug/l	--	81000	112000	62000	75000	--	121000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	530	771	462	502	--	1317
Dissolved Inorganic Carbon	ug/l	--	32100	41000	7100	24700	--	<500
Dissolved Organic Carbon	ug/l	--	21200	37600	26200	19600	--	22500
Dissolved Oxygen (Field)	ug/l	-- [7]	**1800**	**1630**	**4570**	**1310**	--	**2040**
Hardness, Calcium Carbonate	ug/l	--	88000	212000	116000	111000	--	404000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	--	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	1600	12600	1600	1800	--	6500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.42	7.08	6.93	6.87	--	**6.49**
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**140**	**1570**	**160**	**130**	--	**1270**
Sulphate	ug/l	--	24000	38000	84000	19000	--	371000
Temperature (Field)	deg c	-- [10]	13.9	16.6	0.2	18.1	--	0.2
Total Dissolved Solids	ug/l	--	298000	500000	308000	282000	--	720000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	22000	138000	41000	38000	--	394000
Metals								
Arsenic	ug/l	100 [11]	<1	3	<1	<1	--	2
Boron	ug/l	200 [12]	109	**435**	115	111	--	**238**
Cadmium	ug/l	0.2 [11]	<0.1	**0.6**	<0.1	<0.1	--	0.1
Calcium	ug/l	--	21400	59900	27000	28400	--	108000
Chromium	ug/l	-- [13]	1	8	2	1	--	**13**
Cobalt	ug/l	0.9	<0.5	**2.9**	0.9	<0.5	--	**7.7**
Copper	ug/l	5	<0.5	4.7	2.3	0.8	--	**6.4**
Iron	ug/l	300	**1040**	**5120**	**1360**	**706**	--	**11800**
Lead	ug/l	-- [14]	0.2	2.8	0.7	0.1	--	4.5
Magnesium	ug/l	--	8300	15100	11900	9840	--	32600
Manganese	ug/l	--	250	2850	213	195	--	2650
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	2500	13500	5200	2650	--	10900
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	60300	70700	57200	61700	--	89900
Zinc	ug/l	30 [11]	7	17	13	6	--	**37**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**6**	<1	<1	--	**5**

Parameter	Unit	PWQO [1]	S11 14-May-2020 S-11	S11 26-Aug-2020 [20] S-11	S11 25-Nov-2020 S-11
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	96000	--	80000
Ammonia, unionized	ug/l	20	0.08	--	0.06
Ammonia Nitrogen	ug/l	--	20	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	2000
Chemical Oxygen Demand	ug/l	--	64000	--	76000
Chloride	ug/l	--	92000	--	113000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	594	--	15
Dissolved Inorganic Carbon	ug/l	--	19400	--	20000
Dissolved Organic Carbon	ug/l	--	26600	--	20700
Dissolved Oxygen (Field)	ug/l	-- [7]	**4800**	--	**4260**
Hardness, Calcium Carbonate	ug/l	--	127000	--	194000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	<100	--	<100
Nitrite as N	ug/l	--	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	900	--	1500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.31	--	7.25
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	--	**210**
Sulphate	ug/l	--	84000	--	162000
Temperature (Field)	deg c	-- [10]	10.0	--	-0.1
Total Dissolved Solids	ug/l	--	306000	--	514000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	4000	--	16000
Metals					
Arsenic	ug/l	100 [11]	<1	--	<1
Boron	ug/l	200 [12]	97	--	137
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.1
Calcium	ug/l	--	31600	--	50200
Chromium	ug/l	-- [13]	5	--	1
Cobalt	ug/l	0.9	<0.5	--	**1.4**
Copper	ug/l	5	1.2	--	1.2
Iron	ug/l	300	**621**	--	**1660**
Lead	ug/l	-- [14]	0.3	--	0.6
Magnesium	ug/l	--	11700	--	16600
Manganese	ug/l	--	68	--	594
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	3100	--	6860
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	64200	--	75700
Zinc	ug/l	30 [11]	<5	--	6
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	**9**

Parameter	Unit	PWQO [1]	S12 28-Jun-1995	S12 14-Nov-1995	S12 13-Jun-1996	S12 12-Oct-1996	S12 17-Jun-1997	S12 05-Nov-1997
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	735000	186000	67000	288000	231000	232000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	840	810	40	570	10	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	4000	3000	7000	23000	2000
Chemical Oxygen Demand	ug/l	--	167000	70000	65000	75000	90000	41000
Chloride	ug/l	--	157000	60000	37000	113000	127000	181000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1276	890	530	920	793	1350
Dissolved Inorganic Carbon	ug/l	--	166000	6600	15700	66800	43600	46300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	5750	--	9750	9580	10590	7850
Hardness, Calcium Carbonate	ug/l	--	449000	203000	133000	328000	235000	326000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	400	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	3000	10000	1910	2650	6160	1420
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	2160	9190	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.07	7.63	7.09	7.34	7.74	7.52
Phosphorus	ug/l	-- [9]	**300**	**140**	**320**	**180**	**970**	**130**
Sulphate	ug/l	--	45000	51000	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	736000	450000	270000	460000	398000	680000
Total Organic Carbon	ug/l	--	50300	64200	20100	28000	30200	17100
Total Suspended Solids	ug/l	--	38000	79000	7000	26000	116000	48000
Metals								
Arsenic	ug/l	100 [11]	100	--	--	--	--	--
Boron	ug/l	200 [12]	**2600**	**710**	**678**	**1600**	**1870**	**1180**
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--
Calcium	ug/l	--	78200	53000	32900	81100	53400	82100
Chromium	ug/l	-- [13]	**24**	**10**	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	3.6	2.4	**4300**	2.6	0.5	**10.4**
Iron	ug/l	300	**1300**	**1550**	**1240**	**1510**	**6090**	**910**
Lead	ug/l	-- [14]	1	0.3	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	35100	17000	12300	29900	24200	28900
Manganese	ug/l	--	425	150	114	110	480	160
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**34**	20	20	20
Potassium	ug/l	--	26800	17600	10100	16800	11800	12900
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	103000	66000	51900	92700	107000	131000
Zinc	ug/l	30 [11]	10	20	10	10	20	**80**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**14**	1

Parameter	Unit	PWQO [1]	S12 05-Jun-1998	S12 30-Jun-1998	S12 26-Aug-1998	S12 30-Oct-1998	S12 19-Oct-1999	S12 03-May-2000
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	576000	436000	102000	62000	24000	98000
Ammonia, unionized	ug/l	20	--	--	--	10	--	10
Ammonia Nitrogen	ug/l	–	30	70	470	40	130	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	7000	6000	6000	5000	3000
Chemical Oxygen Demand	ug/l	--	122000	170000	10000	202000	120000	84000
Chloride	ug/l	–	317000	242000	28900	45800	55000	45500
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1920	1530	341	342	410	319
Dissolved Inorganic Carbon	ug/l	--	118000	61400	23800	43200	20500	16600
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	17570	9570	6520	5080	7710	5830
Hardness, Calcium Carbonate	ug/l	--	507000	295000	150000	84000	89000	53000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	4140	2280	1220	3690	2210	620
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	7.9	7.88	6.5	7.2	6.9
Phosphorus	ug/l	-- [9]	**150**	**250**	**450**	**2850**	**770**	**50**
Sulphate	ug/l	–	--	--	--	--	--	--
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	950000	770000	171000	172000	200000	160000
Total Organic Carbon	ug/l	--	42900	38600	8000	41600	31100	23600
Total Suspended Solids	ug/l	--	22000	21000	103000	19000	13000	34000
Metals								
Arsenic	ug/l	100 [11]	--	--	--	--	--	--
Boron	ug/l	200 [12]	**4480**	**3900**	**390**	120	**260**	40
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	93800	44800	44900	18600	22500	11900
Chromium	ug/l	– [13]	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	4.6	1.8	**5.8**	2.3	0.5	**5.5**
Iron	ug/l	300	**390**	**550**	**3680**	**6860**	**1990**	**440**
Lead	ug/l	– [14]	0.2	0.2	0.6	0.2	0.8	0.2
Magnesium	ug/l	--	66100	43800	8960	8990	7960	5590
Manganese	ug/l	–	20	640	70	430	810	20
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	**30**	20	20	**30**	20	20
Potassium	ug/l	–	21100	23900	5300	12000	14100	4000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	268000	238000	33000	41000	45800	48000
Zinc	ug/l	30 [11]	20	10	**330**	**50**	30	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	**7**	1	**17**

Parameter	Unit	PWQO [1]	S12 25-Oct-2000	S12 13-Jun-2001	S12 27-Sep-2001	S12 21-Nov-2001	S12 22-May-2002	S12 12-Nov-2002
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	145000	137000	38000	112000	131000	52000
Ammonia, unionized	ug/l	20	--	<20	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	--	20	50	10	20	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	8000	1000	1000	1000	3000
Chemical Oxygen Demand	ug/l	--	--	66000	46000	38000	45000	71000
Chloride	ug/l	--	82000	61600	119000	89200	34200	78200
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	487	500	960	500	250	--
Dissolved Inorganic Carbon	ug/l	--	--	21500	5200	16000	16000	11000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	1720	4500	3570	7540	7330	--
Hardness, Calcium Carbonate	ug/l	--	192000	141000	373000	176000	109000	281000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	100	100	100	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	20800	1300	1060	770	760	1700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.15	7.3	6.9	6.56	7.03	--
Phosphorus	ug/l	-- [9]	--	**370**	**160**	**100**	**50**	**330**
Sulphate	ug/l	--	20000	33000	355000	105000	19000	225000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	318000	314000	830000	391000	212000	528000
Total Organic Carbon	ug/l	--	--	25500	17000	19000	13000	22000
Total Suspended Solids	ug/l	--	1580000	67000	5000	58000	4000	62000
Metals								
Arsenic	ug/l	100 [11]	7	1	1	1	1	1
Boron	ug/l	200 [12]	**920**	**300**	**790**	**280**	110	**450**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	49000	36400	101000	46400	30900	77400
Chromium	ug/l	-- [13]	**50**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	**39**	1	3.5	2.1	<1	4.3
Iron	ug/l	300	**97300**	**1520**	**740**	**2470**	**380**	**1890**
Lead	ug/l	-- [14]	19	0.9	0.2	0.2	<1	1.7
Magnesium	ug/l	--	16900	12200	29300	14600	7650	21200
Manganese	ug/l	--	2790	150	230	90	10	120
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20
Potassium	ug/l	--	5600	1900	13400	5300	4800	8500
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	48400	59000	95800	65200	29700	59900
Zinc	ug/l	30 [11]	**250**	10	10	10	10	**40**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**13**	**37**	1	1	1	1

Parameter	Unit	PWQO [1]	S12 31-May-2003	S12 03-Jul-2003	S12 22-Oct-2003	S12 17-May-2004	S12 21-Aug-2004	S12 18-Nov-2004
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	122000	176000	78000	137000	153000	111000
Ammonia, unionized	ug/l	20	--	--	--	<10	<10	<10
Ammonia Nitrogen	ug/l	--	160	20	20	10	40	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	3000	2000	13000	16000
Chemical Oxygen Demand	ug/l	--	52000	87000	56000	66000	253000	517000
Chloride	ug/l	--	53600	29100	70200	44500	41600	56600
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	540	450	520	350	360	330
Dissolved Inorganic Carbon	ug/l	--	26000	43000	18000	33800	48000	23300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6200	2660	5800	9400	3400	--
Hardness, Calcium Carbonate	ug/l	--	169000	138000	--	118000	121000	102000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	200	100	100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1020	1660	820	1150	5420	9630
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.4	6.79	6.8	7.4	7.5	7.1
Phosphorus	ug/l	-- [9]	**70**	**210**	**110**	**90**	**4700**	**4720**
Sulphate	ug/l	--	88000	15000	58000	12000	3000	17000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	338000	340000	275000	175000	180000	165000
Total Organic Carbon	ug/l	--	21000	38000	22000	18200	22000	16800
Total Suspended Solids	ug/l	--	5000	12000	84000	10000	346000	1660000
Metals								
Arsenic	ug/l	100 [11]	1	1	1	1	10	10
Boron	ug/l	200 [12]	130	**319**	195	121	**241**	**240**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	46600	36600	33700	32100	31900	26100
Chromium	ug/l	-- [13]	**10**	4	8	2	**9**	**100**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	2	2	**15**	**15**	**86**	**111**
Iron	ug/l	300	**540**	**2270**	**617**	**1110**	**2700**	**2480**
Lead	ug/l	-- [14]	0.5	1.2	1.3	0.2	9.6	6.7
Magnesium	ug/l	--	12800	11400	10700	9210	10100	8850
Manganese	ug/l	--	50	394	41	137	9	15800
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	10	10	20	**50**	**50**
Potassium	ug/l	--	5700	1600	13200	5600	3800	6600
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	49600	49600	54000	50200	51000	40700
Zinc	ug/l	30 [11]	10	5	11	26	**190**	**278**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	**3**

Parameter	Unit	PWQO [1]	S12 25-May-2005	S12 09-Sep-2005 [20]	S12 09-Nov-2005	S12 24-May-2006	S12 15-Aug-2006	S12 16-Nov-2006
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	134000	--	116000	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	<5000	--	<5000	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	110000	--	95000	114000	172000	65000
Ammonia, unionized	ug/l	20	<0.04	--	0.03	<0.1	0.03	0.03
Ammonia Nitrogen	ug/l	--	<10	--	40	<10	20	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	--	10000	6000	17000	<3000
Chemical Oxygen Demand	ug/l	--	74000	--	245000	72000	367000	42000
Chloride	ug/l	--	51300	--	63700	34300	35300	18000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	440	--	100	407	670	170
Dissolved Inorganic Carbon	ug/l	--	34100	--	26500	27100	43000	17600
Dissolved Organic Carbon	ug/l	--	17500	--	37400	18100	29400	14600
Dissolved Oxygen (Field)	ug/l	-- [7]	6500	--	11200	9400	**1600**	7360
Hardness, Calcium Carbonate	ug/l	--	131000	--	101000	103000	116000	35000
Hydrogen Sulfide	ug/l	2 [8]	**80**	--	<300	--	--	--
Nitrate as N	ug/l	--	200	--	100	<100	100	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1530	--	3520	2040	7190	980
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.3	--	7	7.9	6.7	6.9
Phosphorus	ug/l	-- [9]	**250**	--	**1280**	**470**	**8350**	**170**
Sulphate	ug/l	--	24000	--	51000	41000	2000	19000
Temperature (Field)	deg c	-- [10]	10	--	0	5	15.5	7
Total Dissolved Solids	ug/l	--	234000	--	270000	218000	229000	122000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	121000	--	400000	390000	645000	81000
Metals								
Arsenic	ug/l	100 [11]	<1	--	1	<1	6.9	1
Boron	ug/l	200 [12]	106	--	158	72	139	47
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.5	0.2	<0.1	<0.5
Calcium	ug/l	--	35300	--	25800	18200	27500	8550
Chromium	ug/l	-- [13]	4	--	**9**	**22**	**10**	6
Cobalt	ug/l	0.9	**2**	--	**5**	**6.7**	**5.5**	<0.5
Copper	ug/l	5	<2	--	**18**	**225**	**35**	**38**
Iron	ug/l	300	**3660**	--	**1390**	228	**2620**	**860**
Lead	ug/l	-- [14]	0.7	--	5	10.5	2.8	0.6
Magnesium	ug/l	--	10500	--	8790	13900	11600	3320
Manganese	ug/l	--	151	--	894	3550	4150	45
Mercury, dissolved	ug/l	0.2 [15]	<0.05	--	<0.06	--	--	--
Molybdenum	ug/l	40	<0.5	--	<5	--	--	--
Nickel	ug/l	25	<10	--	<10	--	--	--
Potassium	ug/l	--	4500	--	5400	7000	4000	3600
Selenium	ug/l	100	<1	--	<1	--	--	--
Sodium	ug/l	--	42000	--	62000	38400	42100	28900
Zinc	ug/l	30 [11]	16	--	**128**	**146**	**50**	20
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S12 08-May-2007	S12 22-Aug-2007 [20]	S12 20-Nov-2007	S12 23-May-2008	S12 12-Aug-2008	S12 06-Nov-2008
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	89000	--	89000	97000	110000	84000
Ammonia, unionized	ug/l	20	<0.09	--	0.1	<0.04	<0.04	0.03
Ammonia Nitrogen	ug/l	–	<10	--	20	<10	<10	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	--	5000	<3000	4000	<3000
Chemical Oxygen Demand	ug/l	--	49000	--	234000	44000	108000	67000
Chloride	ug/l	–	34900	--	48900	38600	27900	47500
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	300	--	290	335	315	385
Dissolved Inorganic Carbon	ug/l	--	22300	--	24000	24300	33300	22500
Dissolved Organic Carbon	ug/l	--	14200	--	32900	17900	32900	21700
Dissolved Oxygen (Field)	ug/l	-- [7]	**5330**	--	**7620**	6990	**110**	**2490**
Hardness, Calcium Carbonate	ug/l	--	103000	--	91000	94000	73000	103000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	1000	<100	100	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	640	--	5400	800	1870	1740
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	--	7.8	7.3	7.1	6.8
Phosphorus	ug/l	-- [9]	**50**	--	**1160**	**70**	**1750**	**380**
Sulphate	ug/l	–	18000	--	28000	16000	1000	28000
Temperature (Field)	deg c	– [10]	12.6	--	0	10.9	17	7
Total Dissolved Solids	ug/l	--	185000	--	216000	183000	170000	207000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	4000	--	196000	<3000	55000	23000
Metals								
Arsenic	ug/l	100 [11]	0.6	--	3.4	1.3	2.7	1.2
Boron	ug/l	200 [12]	48	--	77	42	89	157
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	–	28500	--	17600	26400	16800	25800
Chromium	ug/l	– [13]	<2	--	**18**	<2	<2	2
Cobalt	ug/l	0.9	<0.5	--	**5.2**	<0.5	**1.8**	**2**
Copper	ug/l	5	**19**	--	**17**	<2	**6**	<2
Iron	ug/l	300	**800**	--	**812**	**497**	**2690**	**2500**
Lead	ug/l	– [14]	0.3	--	5.9	<0.1	0.7	<0.1
Magnesium	ug/l	--	7700	--	11400	6720	7530	9280
Manganese	ug/l	–	26	--	803	13	1200	871
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	3600	--	7800	3700	2800	2400
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	37500	--	42900	33400	42700	40300
Zinc	ug/l	30 [11]	16	--	**65**	<5	**32**	6
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	<1	**3**

Parameter	Unit	PWQO [1]	S12 13-May-2009 S-9	S12 25-Aug-2009 [27] A-5	S12 27-Nov-2009 S-12	S12 18-May-2010 S-4	S12 18-Aug-2010 [31] S-6	S12 14-Oct-2010 S-5
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	108000	146000	81000	117000	107000	94000
Ammonia, unionized	ug/l	20	<0.68	0.24	0.01	0.11	0.07	0.07
Ammonia Nitrogen	ug/l	–	<20	150	20	30	30	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	12000	2000	3000	4000	6000
Chemical Oxygen Demand	ug/l	--	50000	133000	118000	58000	88000	450000
Chloride	ug/l	–	41000	28000	37000	28000	28000	24000
Conductivity	uS/cm	–	373	373	324	316	336	274
Conductivity (Field)	uS/cm	--	340	405	246	355	318	530
Dissolved Inorganic Carbon	ug/l	--	27300	43300	20900	26600	24000	19600
Dissolved Organic Carbon	ug/l	--	19800	35900	17900	21400	38000	21100
Dissolved Oxygen (Field)	ug/l	-- [7]	**4870**	**330**	**4660**	**4330**	**2680**	8740
Hardness, Calcium Carbonate	ug/l	--	100000	105000	72000	91000	96000	80000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	870	2740	1700	2710	2700	5620
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.1	6.64	6.76	7.27	6.92	7.13
Phosphorus	ug/l	-- [9]	**160**	**1720**	**690**	**840**	**600**	**4210**
Sulphate	ug/l	–	12000	1000	16000	1000	16000	4000
Temperature (Field)	deg c	– [10]	15.3	18.9	4.7	11.1	16.1	8.5
Total Dissolved Solids	ug/l	--	242000	242000	211000	205000	218000	178000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	50000	69000	111000	62000	54000	408000
Metals								
Arsenic	ug/l	100 [11]	1	<50	<50	<1	<50	<50
Boron	ug/l	200 [12]	50	100	<100	70	200	100
Cadmium	ug/l	0.2 [11]	<0.1	<10	<10	<0.1	<10	<10
Calcium	ug/l	–	27000	29000	19000	25000	27000	22000
Chromium	ug/l	– [13]	2	<50	**20**	2	<50	<50
Cobalt	ug/l	0.9	0.7	<10	<5	0.6	<10	<10
Copper	ug/l	5	3	<10	**20**	1	<10	<10
Iron	ug/l	300	**1260**	**22000**	**9300**	**3380**	**15200**	**30900**
Lead	ug/l	– [14]	4	<10	<10	<1	<10	<10
Magnesium	ug/l	--	8000	8000	6000	7000	7000	6000
Manganese	ug/l	–	80	890	220	240	400	1090
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	5000	6000	5000	5000	4000	4000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	38000	31000	29000	29000	31000	21000
Zinc	ug/l	30 [11]	**40**	<50	**60**	<10	**800**	<50
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	1

Parameter	Unit	PWQO [1]	S12 19-May-2011 [32] W-9	S12 16-Aug-2011 [20] S-12	S12 30-Nov-2011 [22] S12	S12 30-May-2012 S12	S12 22-Aug-2012 [20] S-12	S12 29-Nov-2012 [20] S12
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	105000	--	81000	140000	--	--
Ammonia, unionized	ug/l	20	<0.11	--	<0.07	<0.16	--	--
Ammonia Nitrogen	ug/l	--	<20	--	<20	<50	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	--	2000	10000	--	--
Chemical Oxygen Demand	ug/l	--	50000	--	63000	270000	--	--
Chloride	ug/l	--	21000	--	33000	22000	--	--
Conductivity	uS/cm	--	269	--	330	--	--	--
Conductivity (Field)	uS/cm	--	285	--	325	328	--	--
Dissolved Inorganic Carbon	ug/l	--	26300	--	14500	30000	--	--
Dissolved Organic Carbon	ug/l	--	21900	--	17400	42000	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**2990**	--	**6790**	**3910**	--	--
Hardness, Calcium Carbonate	ug/l	--	86000	--	86000	120000	--	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	--
Nitrite as N	ug/l	--	<100	--	<100	<10	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1180	--	710	5000	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	<100	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.33	--	7.40	6.92	--	--
Phosphorus	ug/l	-- [9]	**60**	--	**40**	**1500**	--	--
Sulphate	ug/l	--	2000	--	26000	<1000	--	--
Temperature (Field)	deg c	-- [10]	14.8	--	6.0	19.3	--	--
Total Dissolved Solids	ug/l	--	175000	--	214000	272000	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	--	72000	120000	--	--
Metals								
Arsenic	ug/l	100 [11]	<1	--	<50	3.7	--	--
Boron	ug/l	200 [12]	50	--	<100	96	--	--
Cadmium	ug/l	0.2 [11]	<0.1	--	<10	<0.10	--	--
Calcium	ug/l	--	23000	--	23000	36000	--	--
Chromium	ug/l	-- [13]	2	--	<50	5.6	--	--
Cobalt	ug/l	0.9	<0.2	--	<10	**5.3**	--	--
Copper	ug/l	5	<1	--	<10	4.1	--	--
Iron	ug/l	300	**530**	--	**2600**	**22000**	--	--
Lead	ug/l	-- [14]	<1	--	<10	1.7	--	--
Magnesium	ug/l	--	7000	--	7000	9300	--	--
Manganese	ug/l	--	30	--	80	2200	--	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	4000	--	4000	3500	--	--
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	23000	--	29000	29000	--	--
Zinc	ug/l	30 [11]	<10	--	<50	15	--	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<5	--	<1	**1.6**	--	--

Parameter	Unit	PWQO [1]	S12 28-May-2013 S12	S12 15-Aug-2013 [20] S12	S12 21-Nov-2013 SA-9	S12 28-May-2014 [23] S12 (SW-E)	S12 26-Aug-2014 [24] S12	S12 13-Nov-2014 [24] S-12
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	90000	--	73000	120000	140000	61000
Ammonia, unionized	ug/l	20	0.43	--	<0.12	0.28	0.53	<0.13
Ammonia Nitrogen	ug/l	-	100	--	<50	62	150	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	2000	2000	6000	<2000
Chemical Oxygen Demand	ug/l	--	74000	--	210000	130000	200000	91000
Chloride	ug/l	-	29000	--	31000	46000	32000	27000
Conductivity	uS/cm	-	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	274	--	295	393	396	240
Dissolved Inorganic Carbon	ug/l	--	20000	--	21000	29000	39000	14000
Dissolved Organic Carbon	ug/l	--	22000	--	31000	20000	29000	30000
Dissolved Oxygen (Field)	ug/l	-- [7]	**3510**	--	**5240**	**4180**	**1080**	9290
Hardness, Calcium Carbonate	ug/l	--	87000	--	80000	110000	120000	63000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<500	<500	<500
Nitrite as N	ug/l	--	<10	--	<10	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2000	--	5200	13000	3800	920
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	<100	<500	<500	<500
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.27	--	7.45	7.29	7.02	7.39
Phosphorus	ug/l	-- [9]	**360**	--	**480**	**780**	**2400**	**520**
Sulphate	ug/l	-	<1000	--	13000	<1000	<1000	<1000
Temperature (Field)	deg c	- [10]	12.9	--	0.3	13.0	18.0	2.9
Total Dissolved Solids	ug/l	--	166000	--	244000	284000	262000	148000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	44000	--	150000	23000	250000	33000
Metals								
Arsenic	ug/l	100 [11]	1.3	--	1.4	1.2	3.0	<1.0
Boron	ug/l	200 [12]	62	--	56	52	65	46
Cadmium	ug/l	0.2 [11]	<0.10	--	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	-	23000	--	25000	32000	35000	18000
Chromium	ug/l	- [13]	<5.0	--	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	**1.3**	--	**1.7**	**1.3**	**5.1**	0.77
Copper	ug/l	5	1.4	--	2.9	1.5	1.9	1.1
Iron	ug/l	300	**4500**	--	**6000**	**3800**	**19000**	**4300**
Lead	ug/l	- [14]	<0.50	--	1.4	0.56	0.97	<0.50
Magnesium	ug/l	--	7100	--	8400	9400	10000	6100
Manganese	ug/l	-	500	--	320	460	2600	260
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	-	4100	--	4600	5000	1700	2900
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	-	30000	--	29000	43000	36000	23000
Zinc	ug/l	30 [11]	7.4	--	12	11	13	5.6
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	--	**2.2**	<1.0	<1.0	**9.5**

Parameter	Unit	PWQO [1]	S12 27-May-2015 S-12	S12 25-Aug-2015 S-12	S12 25-Nov-2015 S-12	S12 24-May-2016 S-12	S12 18-Aug-2016 S-12	S12 16-Nov-2016 S-12
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	104000	116000	103000	123000	65000	158000
Ammonia, unionized	ug/l	20	1.69	0.85	0.04	0.59	0.24	0.39
Ammonia Nitrogen	ug/l	-	110	20	30	90	90	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	<20000 [25]	<75000 [25]	2000	13000	18000	4000
Chemical Oxygen Demand	ug/l	--	143000	321000	83000	192000	120000	59000
Chloride	ug/l	-	54000	52000	58000	66000	74000	100000
Conductivity	uS/cm	-	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	362	399	191	439	686	811
Dissolved Inorganic Carbon	ug/l	--	18500	4500	27100	9600	12800	31300
Dissolved Organic Carbon	ug/l	--	37500	59500	27800	46500	30400	16200
Dissolved Oxygen (Field)	ug/l	-- [7]	**2680**	**1060**	**4250**	**710**	**3500**	**3610**
Hardness, Calcium Carbonate	ug/l	--	17600	116000	289000	144000	161000	214000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2800	6200	1100	4400	3000	800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.65	8.18	7.26	7.50	6.86	7.57
Phosphorus	ug/l	-- [9]	**960**	**3130**	**90**	**2000**	**1110**	**130**
Sulphate	ug/l	-	4000	<1000	19000	5000	168000	72000
Temperature (Field)	deg c	- [10]	18.3	15.9	0	11.5	19	5.6
Total Dissolved Solids	ug/l	--	222000	275000	266000	306000	482000	458000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	114000	220000	39000	272000	49000	15000
Metals								
Arsenic	ug/l	100 [11]	<1	6	<1	3	3	<1
Boron	ug/l	200 [12]	16	95	54	63	**354**	117
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	-	4760	30400	18500	41900	42700	58300
Chromium	ug/l	- [13]	<1	8	2	5	4	2
Cobalt	ug/l	0.9	0.7	**4.4**	<0.5	**2.5**	**1.3**	<0.5
Copper	ug/l	5	<0.5	<0.5	<0.5	3.2	3.4	0.7
Iron	ug/l	300	**1610**	**59200**	**845**	**47000**	**7760**	**1050**
Lead	ug/l	- [14]	0.5	4.3	0.2	2.7	1.2	1.0
Magnesium	ug/l	--	1400	9720	8850	9620	13100	16600
Manganese	ug/l	-	278	1330	39	824	404	111
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	-	643	2070	4380	4480	8380	6040
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	-	8050	41300	49400	49400	64300	86400
Zinc	ug/l	30 [11]	5	28	6	24	**34**	27
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**6**	<1	**23**	**9**	**9**

Parameter	Unit	PWQO [1]	S12 18-May-2017 S-12	S12 28-Aug-2017 S-12	S12 28-Nov-2017 S-12	S12 23-May-2018 S-12	S12 30-Aug-2018 [20] S-12	S12 28-Nov-2018 S-12
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	139000	115000	139000	118000	--	51000
Ammonia, unionized	ug/l	20	0.61	0.04	0.08	0.15	--	0.27
Ammonia Nitrogen	ug/l	--	40	20	60	30	--	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	20000	<200000 [26]	3000	<2000	--	4000
Chemical Oxygen Demand	ug/l	--	76000	1120000	53000	52000	--	107000
Chloride	ug/l	--	48000	35000	57000	67000	--	40000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	434	264	62	446	--	161
Dissolved Inorganic Carbon	ug/l	--	2300	<500	12000	28700	--	5500
Dissolved Organic Carbon	ug/l	--	40300	94900	35700	17400	--	15700
Dissolved Oxygen (Field)	ug/l	-- [7]	**810**	**1710**	**2330**	**4900**	--	**6430**
Hardness, Calcium Carbonate	ug/l	--	138000	163000	139000	92000	--	75000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	--	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	900	7100	2100	1200	--	2200
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.67	6.90	7.23	7.37	--	7.51
Phosphorus	ug/l	-- [9]	**130**	**7620**	**750**	**140**	--	**530**
Sulphate	ug/l	--	20000	2000	38000	9000	--	13000
Temperature (Field)	deg c	-- [10]	17.5	13.1	0	11.8	--	0
Total Dissolved Solids	ug/l	--	268000	212000	306000	258000	--	144000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	62000	2020000	508000	18000	--	198000
Metals								
Arsenic	ug/l	100 [11]	<5 [17]	3	2	<1	--	1
Boron	ug/l	200 [12]	154	83	69	86	--	46
Cadmium	ug/l	0.2 [11]	<0.5 [17]	<0.1	<0.1	<0.1	--	0.2
Calcium	ug/l	--	38800	49400	37800	25900	--	21300
Chromium	ug/l	-- [13]	<5 [17]	3	4	<1	--	**20**
Cobalt	ug/l	0.9	<2.5 [17]	**4.3**	**1.9**	<0.5	--	**2.1**
Copper	ug/l	5	3.2	1.8	1.9	<0.5	--	**6.4**
Iron	ug/l	300	**2810**	**52400**	**12000**	**604**	--	**6530**
Lead	ug/l	-- [14]	0.6	1.2	1.1	<0.1	--	6.6
Magnesium	ug/l	--	10000	9560	10900	6750	--	5160
Manganese	ug/l	--	371	1860	706	30	--	165
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	4600	1240	4400	3580	--	3290
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	42800	39000	43000	43400	--	30600
Zinc	ug/l	30 [11]	<25 [17]	19	9	7	--	23
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<10 [33]	<1	<1	--	**2**

Parameter	Unit	PWQO [1]	S12 20-Jun-2019 S-12	S12 28-Aug-2019 S-12	S12 21-Nov-2019 S-12	S12 14-May-2020 S-12	S12 26-Aug-2020 S-12	S12 25-Nov-2020 S-12
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	164000	10000	85000	72000	83000	118000
Ammonia, unionized	ug/l	20	0.34	0.02	0.01	0.07	0.24	1.97
Ammonia Nitrogen	ug/l	–	130	30	30	30	200	160
Biochemical Oxygen Demand, 5 Day	ug/l	--	203000	6000	<20000 [26]	4000	16000	<400000 [26]
Chemical Oxygen Demand	ug/l	--	807000	73000	101000	82000	697000	1400000
Chloride	ug/l	–	54000	3000	92000	54000	109000	69000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	482	84	767	326	723	8
Dissolved Inorganic Carbon	ug/l	--	34400	<500	<500	17300	<500	27200
Dissolved Organic Carbon	ug/l	--	24800	9300	15400	21300	20200	19500
Dissolved Oxygen (Field)	ug/l	-- [7]	**4610**	5570	9800	**5330**	**2030**	**1420**
Hardness, Calcium Carbonate	ug/l	--	124000	30600	215000	76000	230000	298000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	10900	1100	1500	1100	14300	61700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.96	**6.22**	6.63	7.00	6.64	8.18
Phosphorus	ug/l	-- [9]	**8390**	**300**	**370**	**190**	**3360**	**19100**
Sulphate	ug/l	–	2000	17000	127000	19000	130000	44000
Temperature (Field)	deg c	– [10]	15.7	18.7	0.1	13.0	15.1	0
Total Dissolved Solids	ug/l	--	328000	50000	384000	154000	436000	330000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	1110000	113000	189000	59000	986000	7970000
Metals								
Arsenic	ug/l	100 [11]	9	<1	1	<1	5	5
Boron	ug/l	200 [12]	109	63	127	48	145	115
Cadmium	ug/l	0.2 [11]	0.2	<0.1	<0.1	<0.1	**0.3**	**0.6**
Calcium	ug/l	–	34200	8860	56600	20300	58700	89800
Chromium	ug/l	– [13]	6	**12**	3	6	**64**	**18**
Cobalt	ug/l	0.9	**9.3**	**1.2**	0.8	0.7	**10.5**	**39.8**
Copper	ug/l	5	**17.8**	4.4	2.4	2.7	**25.9**	**31.9**
Iron	ug/l	300	**132000**	**3630**	**5020**	**2840**	**26400**	**83300**
Lead	ug/l	– [14]	5.6	4.0	0.8	3.1	15.5	14.3
Magnesium	ug/l	--	9310	2070	17900	6170	20400	17800
Manganese	ug/l	–	3240	55	313	121	428	11200
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	2240	1620	5410	3170	16000	8500
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	51500	8130	75500	34100	78500	52300
Zinc	ug/l	30 [11]	**40**	22	13	8	**92**	**145**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**3**	**4**	**31**	**15**	**25**

Parameter	Unit	PWQO [1]	S15 13-Jun-2001	S15 27-Sep-2001	S15 21-Nov-2001	S15 22-May-2002	S15 08-Nov-2002	S15 31-May-2003
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	241000	189000	177000	199000	225000	168000
Ammonia, unionized	ug/l	20	<20	<20	<20	--	--	--
Ammonia Nitrogen	ug/l	--	30	30	20	20	30	240
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	1000	1000
Chemical Oxygen Demand	ug/l	--	30000	27000	26000	28000	35000	48000
Chloride	ug/l	--	200000	282000	191000	173000	275000	146000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1000	1340	910	860	1400	880
Dissolved Inorganic Carbon	ug/l	--	37800	45900	24800	7000	63000	18000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12800	9600	12190	11110	9700	9160
Hardness, Calcium Carbonate	ug/l	--	312000	428000	263000	298000	427000	228000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	300	200	1300	600	1000	700
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	810	760	610	560	1170	1090
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.96	7.23	7.22	7.1	7.9
Phosphate	ug/l	--	90	80	30	40	160	70
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	--	40000	157000	80000	56000	140000	58000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	594000	904000	600000	558000	700000	495000
Total Organic Carbon	ug/l	--	12200	11800	15000	9000	12000	42000
Total Suspended Solids	ug/l	--	40000	7000	13000	9000	75000	8000
Metals								
Arsenic	ug/l	100 [11]	1	1	1	1	1	1
Boron	ug/l	200 [12]	100	90	60	60	90	40
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	--	90500	131000	81200	91800	130000	70200
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--
Copper	ug/l	5	3.5	3.5	2	<1	**6.4**	4
Iron	ug/l	300	**1600**	250	200	**380**	**1690**	**400**
Lead	ug/l	-- [14]	1.2	0.2	0.2	<1	3.9	0.5
Magnesium	ug/l	--	21000	24400	14700	16700	24800	12900
Manganese	ug/l	--	160	160	90	140	380	100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20
Potassium	ug/l	--	8400	19700	9500	12000	18300	11200
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	107000	145000	96000	107000	152000	85300
Zinc	ug/l	30 [11]	10	10	10	20	30	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**50**	1	1	1	1	1

Parameter	Unit	PWQO [1]	S15 03-Jul-2003	S15 22-Oct-2003	S15 17-May-2004	S15 21-Aug-2004	S15 18-Nov-2004	S15 25-May-2005
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	332000
Alkalinity, Carbonate as CaCO3	ug/l	_ [5]	--	--	--	--	--	<5000
Alkalinity (Total as CaCO3)	ug/l	_ [5]	253000	189000	214000	336000	250000	272000
Ammonia, unionized	ug/l	20	--	--	<10	<10	<10	**25.03**
Ammonia Nitrogen	ug/l	–	10	250	10	60	60	2160
Biochemical Oxygen Demand, 5 Day	ug/l	–	2000	1000	2000	1000	1000	21000
Chemical Oxygen Demand	ug/l	–	27000	58000	37000	32000	32000	94000
Chloride	ug/l	--	232000	221000	203000	207000	252000	194000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1240	1280	1140	1160	1070	1550
Dissolved Inorganic Carbon	ug/l	–	63000	45000	33700	28500	25400	73400
Dissolved Organic Carbon	ug/l	–	--	--	--	--	--	19800
Dissolved Oxygen (Field)	ug/l	_ [7]	6630	10400	9800	8700	8270	**4690**
Hardness, Calcium Carbonate	ug/l	–	362000	--	308000	410000	337000	363000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	<10
Nitrate as N	ug/l	--	200	1300	300	200	700	100
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	–	620	1740	700	830	730	5380
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.92	7.98	7.9	8	7.2	7.5
Phosphate	ug/l	--	30	220	30	20	40	--
Phosphorus	ug/l	_ [9]	--	--	--	--	--	**710**
Sulphate	ug/l	--	68000	75000	56000	67000	80000	45000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	19.1
Total Dissolved Solids	ug/l	--	810000	672000	570000	580000	535000	665000
Total Organic Carbon	ug/l	--	18000	24000	10100	10000	9800	--
Total Suspended Solids	ug/l	–	3000	40000	18000	5000	13000	10000
Metals								
Arsenic	ug/l	100 [11]	1	1	1	1	1	<1
Boron	ug/l	200 [12]	71	54	53	78	48	65
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.1
Calcium	ug/l	--	108000	92500	92300	119000	99800	110000
Chromium	ug/l	-- [13]	2	**10**	1	1	3	<2
Cobalt	ug/l	0.9	--	--	--	--	--	**24**
Copper	ug/l	5	2	**15**	3	3	3	<2
Iron	ug/l	300	147	**1810**	**344**	283	**1070**	**1730**
Lead	ug/l	-- [14]	0.5	2.3	0.3	1.6	0.6	0.3
Magnesium	ug/l	--	22500	15900	18800	27200	21200	21300
Manganese	ug/l	--	161	194	199	402	271	734
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	<0.05
Molybdenum	ug/l	40	--	--	--	--	--	5.1
Nickel	ug/l	25	10	10	10	10	10	<10
Potassium	ug/l	--	14400	24200	11200	11100	14000	28200
Selenium	ug/l	100	--	--	--	--	--	<1
Sodium	ug/l	--	138000	146000	125000	146000	144000	125000
Zinc	ug/l	30 [11]	5	25	5	12	8	**127**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	**14**

Parameter	Unit	PWQO [1]	S15 09-Sep-2005	S15 09-Nov-2005	S15 24-May-2006	S15 15-Aug-2006	S15 16-Nov-2006	S15 08-May-2007
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	913000	366000	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	_ [5]	<5000	<5000	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	_ [5]	748000	300000	95000	354000	121000	236000
Ammonia, unionized	ug/l	20	**222.59**	0.12	0.38	<0.1	--	<0.62
Ammonia Nitrogen	ug/l	–	8300	150	30	<10	80	<10
Biochemical Oxygen Demand, 5 Day	ug/l	–	9000	<3000	<3000	<3000	<3000	<3000
Chemical Oxygen Demand	ug/l	–	212000	25000	44000	29000	41000	30000
Chloride	ug/l	--	171000	341000	61000	281000	48300	181000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1800	970	290	1550	320	800
Dissolved Inorganic Carbon	ug/l	–	180000	61400	25400	85000	30300	56600
Dissolved Organic Carbon	ug/l	–	99200	10600	21800	18600	15100	10100
Dissolved Oxygen (Field)	ug/l	_ [7]	**2700**	10100	8900	**1800**	9600	9990
Hardness, Calcium Carbonate	ug/l	–	604000	453000	129000	410000	93000	290000
Hydrogen Sulfide	ug/l	2 [8]	<300	**10**	--	--	--	--
Nitrate as N	ug/l	--	3400	800	300	300	500	400
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	–	15600	760	870	580	1020	560
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.9	7	7.8	7.5	--	8.3
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	**1130**	30	**60**	30	**180**	10
Sulphate	ug/l	--	45000	101000	31000	80000	34000	57000
Temperature (Field)	deg c	-- [10]	18.2	0	11	17	8	17.6
Total Dissolved Solids	ug/l	--	1050000	1020000	234000	904000	244000	614000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	–	12000	16000	3000	9000	58000	3000
Metals								
Arsenic	ug/l	100 [11]	2	<1	<1	1.1	1	0.9
Boron	ug/l	200 [12]	109	65	27	73	32	52
Cadmium	ug/l	0.2 [11]	0.2	<0.5	0.2	<0.1	<0.5	<0.1
Calcium	ug/l	--	154000	136000	38800	120000	26800	84700
Chromium	ug/l	-- [13]	3	<2	<2	<2	8	<2
Cobalt	ug/l	0.9	**4.3**	**1**	0.5	0.4	**1**	0.5
Copper	ug/l	5	**13**	<2	<2	2	**40**	**20**
Iron	ug/l	300	**5190**	**525**	**790**	200	**1270**	**362**
Lead	ug/l	-- [14]	1.8	0.5	0.8	0.5	5	0.2
Magnesium	ug/l	--	53300	27400	7770	26800	6390	19000
Manganese	ug/l	--	2120	517	102	246	185	336
Mercury, dissolved	ug/l	0.2 [15]	<0.06	<0.06	--	--	--	--
Molybdenum	ug/l	40	0.9	<5	--	--	--	--
Nickel	ug/l	25	<10	<10	--	--	--	--
Potassium	ug/l	--	151000	15800	4100	11600	7000	8900
Selenium	ug/l	100	<1	<1	--	--	--	--
Sodium	ug/l	--	143000	231000	36800	183000	44900	120000
Zinc	ug/l	30 [11]	**49**	<5	8	<5	**48**	13
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S15 22-Aug-2007 [20]	S15 20-Nov-2007	S15 23-May-2008	S15 12-Aug-2008	S15 06-Nov-2008	S15 13-May-2009 S-2
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	_ [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	_ [5]	--	202000	180000	339000	252000	212000
Ammonia, unionized	ug/l	20	--	0.29	<0.31	<1.31	1.56	1.43
Ammonia Nitrogen	ug/l	–	--	50	<10	<10	70	50
Biochemical Oxygen Demand, 5 Day	ug/l	–	--	3000	<3000	<3000	<3000	2000
Chemical Oxygen Demand	ug/l	–	--	21000	38000	42000	23000	40000
Chloride	ug/l	--	--	201000	111000	262000	193000	139000
Conductivity	uS/cm	--	--	--	--	--	--	930
Conductivity (Field)	uS/cm	--	--	750	625	1500	1000	800
Dissolved Inorganic Carbon	ug/l	–	--	56600	42500	82000	60900	51300
Dissolved Organic Carbon	ug/l	–	--	12400	11300	14000	6400	14500
Dissolved Oxygen (Field)	ug/l	_ [7]	--	10820	11190	8730	6920	11130
Hardness, Calcium Carbonate	ug/l	–	--	281000	193000	346000	306000	257000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	600	200	200	400	480
Nitrite as N	ug/l	--	--	--	--	--	--	<100
Nitrogen, Total Kjeldahl	ug/l	–	--	710	800	710	740	720
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	7.8	8.1	8.5	8.1	7.9
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	--	**150**	**40**	10	20	**40**
Sulphate	ug/l	--	--	75000	33000	49000	66000	40000
Temperature (Field)	deg c	-- [10]	--	1.5	14.2	22.6	9.7	19.1
Total Dissolved Solids	ug/l	--	--	635000	396000	819000	660000	605000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	–	--	58000	<3000	9000	4000	2000
Metals								
Arsenic	ug/l	100 [11]	--	1.3	1.3	0.8	<0.5	<1
Boron	ug/l	200 [12]	--	44	29	66	61	50
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	--	85100	58500	96300	94300	78000
Chromium	ug/l	-- [13]	--	8	<2	<2	<2	4
Cobalt	ug/l	0.9	--	**2.1**	<0.5	<0.5	0.9	0.5
Copper	ug/l	5	--	**6**	<2	<2	2	2
Iron	ug/l	300	--	**3420**	**664**	263	**381**	**690**
Lead	ug/l	-- [14]	--	7.8	<0.1	<0.1	<0.1	<1
Magnesium	ug/l	--	--	16500	11400	25500	17100	15000
Manganese	ug/l	--	--	506	234	73	476	330
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	--	9500	6100	9800	8500	7000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	--	120000	68900	172000	127000	96000
Zinc	ug/l	30 [11]	--	28	<5	<5	<5	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	<1	2	<1

Parameter	Unit	PWQO [1]	S15 25-Aug-2009 A-6	S15 27-Nov-2009 S-8	S15 18-May-2010 S-2	S15 18-Aug-2010 S-7	S15 14-Oct-2010 S-11	S15 19-May-2011 W-13
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	_ [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	_ [5]	437000	177000	378000	422000	332000	189000
Ammonia, unionized	ug/l	20	1.2	1.43	1	0.11	0.57	0.82
Ammonia Nitrogen	ug/l	_	50	80	100	40	70	70
Biochemical Oxygen Demand, 5 Day	ug/l	_	<1000	2000	<1000	2000	<1000	2000
Chemical Oxygen Demand	ug/l	_	60000	38000	30000	40000	33000	55000
Chloride	ug/l	--	199000	85000	209000	169000	186000	80000
Conductivity	uS/cm	--	1520	719	1430	1560	1430	700
Conductivity (Field)	uS/cm	--	1226	697	1515	1401	1174	672
Dissolved Inorganic Carbon	ug/l	_	108000	42800	77900	93200	78200	45200
Dissolved Organic Carbon	ug/l	_	15600	12600	13700	16100	12500	16000
Dissolved Oxygen (Field)	ug/l	_ [7]	9150	13530	12740	8830	14430	7180
Hardness, Calcium Carbonate	ug/l	_	417000	192000	393000	527000	417000	223000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	290	290	240	260	290	220
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	_	580	680	680	520	630	760
Nitrogen, Nitrate-Nitrite	ug/l	_	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.83	8.16	7.60	6.93	7.62	7.68
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	30	**130**	<10	20	20	**60**
Sulphate	ug/l	--	58000	49000	52000	157000	124000	40000
Temperature (Field)	deg c	-- [10]	18.8	5.1	14.1	16.9	10.7	13.7
Total Dissolved Solids	ug/l	--	988000	467000	930000	1010000	930000	455000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	_	5000	31000	9000	<2000	3000	7000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1
Boron	ug/l	200 [12]	80	50	80	100	60	40
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	124000	57000	116000	160000	129000	68000
Chromium	ug/l	-- [13]	6	6	5	5	6	3
Cobalt	ug/l	0.9	0.9	0.7	**1.0**	0.8	0.6	0.5
Copper	ug/l	5	2	2	2	3	2	2
Iron	ug/l	300	**420**	**1730**	**410**	210	**310**	**740**
Lead	ug/l	-- [14]	<1	<1	<1	<1	<1	<1
Magnesium	ug/l	--	26000	12000	25000	31000	23000	13000
Manganese	ug/l	--	1490	510	1460	1340	710	280
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	10000	7000	9000	12000	10000	9000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	145000	57000	152000	143000	135000	62000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<10	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S15 16-Aug-2011 [2] N-7	S15 30-Nov-2011 [22] S15	S15 30-May-2012 S 15	S15 22-Aug-2012 S-15	S15 29-Nov-2012 S15	S15 28-May-2013 S3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	_ [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	_ [5]	413000	213000	370000	520000	420000	330000
Ammonia, unionized	ug/l	20	1.5	0.75	<1.44	<0.74	1.38	0.63
Ammonia Nitrogen	ug/l	–	60	80	<50	<50	360	200
Biochemical Oxygen Demand, 5 Day	ug/l	–	1000	3000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	–	50000	28000	54000	55000	33000	36000
Chloride	ug/l	--	158000	114000	190000	190000	200000	220000
Conductivity	uS/cm	--	1370	968	--	--	--	--
Conductivity (Field)	uS/cm	--	1114	890	1358	1515	1506	1294
Dissolved Inorganic Carbon	ug/l	–	95200	37400	94000	110000	95000	74000
Dissolved Organic Carbon	ug/l	–	18000	9400	18000	21000	13000	14000
Dissolved Oxygen (Field)	ug/l	_ [7]	6970	11190	10160	**4640**	11760	**530**
Hardness, Calcium Carbonate	ug/l	–	438000	283000	440000	650000	500000	440000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	230	630	150	270	660	430
Nitrite as N	ug/l	--	<100	<100	16	12	<10	15
Nitrogen, Total Kjeldahl	ug/l	–	1030	870	1200	900	1600	1600
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	160	280	660	450
pH (Field)	-	6.5 - 8.5	7.85	7.86	7.82	7.62	7.67	7.07
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	30	**80**	**64**	19	25	**42**
Sulphate	ug/l	--	91000	88000	89000	160000	120000	81000
Temperature (Field)	deg c	-- [10]	18.8	5.6	21.7	18.8	0	14.9
Total Dissolved Solids	ug/l	--	890000	629000	872000	1130000	986000	820000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	–	26000	23000	5000	21000	6000	2000
Metals								
Arsenic	ug/l	100 [11]	<10	<50	<1.0	<1.0	<1.0	<1.0
Boron	ug/l	200 [12]	70	100	84	110	73	55
Cadmium	ug/l	0.2 [11]	<0.1	<10	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	126000	82000	140000	180000	170000	130000
Chromium	ug/l	-- [13]	7	<50	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.7	<10	0.53	0.79	0.68	0.55
Copper	ug/l	5	2	<10	3.1	2.4	2.6	2.4
Iron	ug/l	300	**600**	**2300**	**790**	**630**	**550**	**650**
Lead	ug/l	-- [14]	<1	<10	<0.50	<0.50	<0.50	<0.50
Magnesium	ug/l	--	30000	19000	30000	48000	39000	28000
Manganese	ug/l	--	710	570	800	1500	1800	850
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	11000	11000	15000	17000	11000	12000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	122000	81000	170000	160000	170000	160000
Zinc	ug/l	30 [11]	<10	<50	<5.0	<5.0	<5.0	<5.0
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1.0	<1.0	<1.0	<1.0

Parameter	Unit	PWQO [1]	S15 15-Aug-2013 S15	S15 21-Nov-2013 SA-12	S15 28-May-2014 S15	S15 26-Aug-2014 S15	S15 13-Nov-2014 S-15	S15 27-May-2015 S-15
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	_ [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	_ [5]	540000	360000	360000	480000	270000	353000
Ammonia, unionized	ug/l	20	1.34	0.31	<0.31	2.43	0.28	1.06
Ammonia Nitrogen	ug/l	–	67	77	<50	100	110	120
Biochemical Oxygen Demand, 5 Day	ug/l	–	<2000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	–	54000	34000	38000	52000	32000	33000
Chloride	ug/l	--	200000	190000	260000	220000	150000	325000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1648	1370	1419	1674	945	1704
Dissolved Inorganic Carbon	ug/l	–	130000	89000	78000	120000	64000	83600
Dissolved Organic Carbon	ug/l	–	22000	12000	14000	18000	14000	16600
Dissolved Oxygen (Field)	ug/l	_ [7]	**5150**	**3130**	11320	6830	11400	10240
Hardness, Calcium Carbonate	ug/l	–	570000	480000	440000	540000	320000	416000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	320	720	410	200	300	200
Nitrite as N	ug/l	--	<10	<10	<10	<10	23	<50
Nitrogen, Total Kjeldahl	ug/l	–	1000	840	860	1000	730	700
Nitrogen, Nitrate-Nitrite	ug/l	–	320	720	410	200	320	--
pH (Field)	-	6.5 - 8.5	7.75	7.65	7.36	7.76	7.34	7.34
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	14	**33**	20	21	**32**	<10
Sulphate	ug/l	--	58000	120000	74000	79000	57000	71000
Temperature (Field)	deg c	-- [10]	18.8	1.1	15.0	21.2	4.3	20.4
Total Dissolved Solids	ug/l	--	1030000	908000	1010000	978000	636000	994000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	–	<1000	31000	2000	6000	4000	<2000
Metals								
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	<1
Boron	ug/l	200 [12]	82	91	80	100	57	84
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Calcium	ug/l	--	170000	140000	130000	150000	99000	117000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<1
Cobalt	ug/l	0.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5
Copper	ug/l	5	1.4	2.2	2.1	1.4	1.6	<0.5
Iron	ug/l	300	<100	**650**	290	180	**860**	262
Lead	ug/l	-- [14]	<0.50	1.1	<0.50	<0.50	<0.50	<0.1
Magnesium	ug/l	--	45000	35000	30000	38000	23000	29800
Manganese	ug/l	--	360	470	790	370	560	520
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	14000	12000	13000	13000	10000	11400
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	160000	150000	180000	170000	110000	169000
Zinc	ug/l	30 [11]	<5.0	<5.0	<5.0	5.5	<5.0	<5
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	**3.8**	<1

Parameter	Unit	PWQO [1]	S15 25-Aug-2015 S-15	S15 25-Nov-2015 S-15	S15 24-May-2016 S-15	S15 18-Aug-2016 S-15	S15 16-Nov-2016 S-15	S15 18-May-2017 S-15
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	_ [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	_ [5]	538000	411000	408000	508000	417000	331000
Ammonia, unionized	ug/l	20	4.22	1.55	2.74	4.73	0.92	4.01
Ammonia Nitrogen	ug/l	–	30	290	80	190	180	100
Biochemical Oxygen Demand, 5 Day	ug/l	–	18000	<2000	<2000	5000	3000	<2000
Chemical Oxygen Demand	ug/l	–	45000	40000	38000	67000	32000	39000
Chloride	ug/l	--	335000	280000	207000	258000	346000	159000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1888	1769	1364	1792	1981	1140
Dissolved Inorganic Carbon	ug/l	–	115000	81900	82100	84600	75500	42500
Dissolved Organic Carbon	ug/l	–	19700	13100	15300	45500	12100	25100
Dissolved Oxygen (Field)	ug/l	_ [7]	**4570**	13590	10400	6340	11590	9890
Hardness, Calcium Carbonate	ug/l	–	504000	620000	490000	580000	518000	324000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	200	200	200	100	200
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	–	900	1100	900	1600	700	800
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	**8.69**	7.81	7.87	7.79	7.53	7.96
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	20	30	<10	**90**	20	30
Sulphate	ug/l	--	77000	106000	101000	204000	120000	80000
Temperature (Field)	deg c	-- [10]	17.7	0.1	22.6	20.6	7.5	22.0
Total Dissolved Solids	ug/l	--	1160000	987000	868000	1210000	1140000	708000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	–	3000	21000	2000	5000	7000	7000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<5 [17]
Boron	ug/l	200 [12]	91	80	110	134	94	**252**
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]
Calcium	ug/l	--	133000	191000	129000	147000	150000	87600
Chromium	ug/l	-- [13]	<1	1	<1	<1	<1	<5 [17]
Cobalt	ug/l	0.9	0.5	0.6	<0.5	<0.5	0.6	<2.5 [17]
Copper	ug/l	5	<0.5	<0.5	1.5	0.7	0.8	**5.5**
Iron	ug/l	300	197	**527**	254	223	**328**	**647**
Lead	ug/l	-- [14]	<0.1	0.1	<0.1	<0.1	<0.1	<0.5 [17]
Magnesium	ug/l	--	41100	34900	40500	51600	34600	25600
Manganese	ug/l	--	1370	1220	614	488	1250	554
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	12900	10900	12300	24200	14400	10300
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	176000	205000	161000	185000	186000	115000
Zinc	ug/l	30 [11]	5	8	<5	<5	<5	<25 [17]
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	<1	**6**	**5**	**5**	<1

Parameter	Unit	PWQO [1]	S15 28-Aug-2017 S-15	S15 28-Nov-2017 S-15	S15 23-May-2018 S-15	S15 30-Aug-2018 S-15	S15 28-Nov-2018 S-15	S15 20-Jun-2019 S-15
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	_ [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	_ [5]	520000	324000	343000	664000	323000	344000
Ammonia, unionized	ug/l	20	1.23	5.37	2.79	2.05	0.41	3.21
Ammonia Nitrogen	ug/l	_	60	280	160	70	120	210
Biochemical Oxygen Demand, 5 Day	ug/l	_	6000	<2000	<2000	2000	3000	<2000
Chemical Oxygen Demand	ug/l	_	44000	24000	37000	75000	35000	43000
Chloride	ug/l	--	250000	171000	162000	253000	214000	154000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1288	1141	1124	1724	1213	1177
Dissolved Inorganic Carbon	ug/l	_	97400	15300	70400	115000	62000	72300
Dissolved Organic Carbon	ug/l	_	17000	53000	13400	29300	11800	10400
Dissolved Oxygen (Field)	ug/l	_ [7]	7240	13660	10480	**2020**	14410	8880
Hardness, Calcium Carbonate	ug/l	_	683000	341000	312000	647000	385000	345000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	500	200	400	1000	400
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	_	900	900	800	2400	1200	900
Nitrogen, Nitrate-Nitrite	ug/l	_	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.85	8.35	7.70	7.94	7.55	7.69
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	20	10	20	**40**	**90**	**50**
Sulphate	ug/l	--	63000	70000	45000	13000	117000	113000
Temperature (Field)	deg c	-- [10]	16.0	0.7	18.5	18.2	2	17
Total Dissolved Solids	ug/l	--	1010000	670000	666000	1040000	764000	712000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	_	3000	7000	4000	17000	6000	21000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1
Boron	ug/l	200 [12]	87	76	76	61	83	100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	211000	96600	92500	168000	102000	90700
Chromium	ug/l	-- [13]	1	<1	<1	2	4	1
Cobalt	ug/l	0.9	0.6	0.6	<0.5	**1.1**	**1.0**	0.7
Copper	ug/l	5	<0.5	1.7	<0.5	1.4	**5.1**	2.2
Iron	ug/l	300	**325**	**894**	**634**	**1170**	**938**	**1730**
Lead	ug/l	-- [14]	0.1	0.2	<0.1	0.4	0.4	0.5
Magnesium	ug/l	--	38100	24100	19700	55200	31400	28700
Manganese	ug/l	--	1100	956	503	1800	388	830
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	15300	9660	8070	21800	14400	11000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	171000	110000	94200	152000	161000	119000
Zinc	ug/l	30 [11]	12	5	<5	6	8	<5
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	**5**	<1	<1

Parameter	Unit	PWQO [1]	S15 28-Aug-2019 S-15	S15 21-Nov-2019 S-15	S15 14-May-2020 S-15	S15 26-Aug-2020 S-15	S15 25-Nov-2020 S-15
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	_ [5]	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	_ [5]	371000	377000	323000	526000	387000
Ammonia, unionized	ug/l	20	1.77	3.01	2.54	2.95	2.05
Ammonia Nitrogen	ug/l	–	150	350	130	120	260
Biochemical Oxygen Demand, 5 Day	ug/l	–	<2000	<2000	4000	<2000	<2000
Chemical Oxygen Demand	ug/l	–	54000	32000	45000	57000	30000
Chloride	ug/l	--	168000	308000	271000	259000	246000
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1149	1883	1382	1715	54
Dissolved Inorganic Carbon	ug/l	–	125000	<500	65800	102000	80600
Dissolved Organic Carbon	ug/l	–	27400	11000	29900	21000	11800
Dissolved Oxygen (Field)	ug/l	_ [7]	7230	14600	10890	7640	12760
Hardness, Calcium Carbonate	ug/l	–	385000	544000	374000	537000	454000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--
Nitrate as N	ug/l	--	200	300	400	700	300
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	–	1000	900	600	1100	700
Nitrogen, Nitrate-Nitrite	ug/l	–	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.55	8.00	7.86	7.92	7.98
Phosphate	ug/l	--	--	--	--	--	--
Phosphorus	ug/l	_ [9]	**60**	20	10	20	20
Sulphate	ug/l	--	59000	92000	84000	47000	91000
Temperature (Field)	deg c	-- [10]	17.8	0.6	15.1	16.4	-0.1
Total Dissolved Solids	ug/l	--	724000	976000	780000	948000	942000
Total Organic Carbon	ug/l	--	--	--	--	--	--
Total Suspended Solids	ug/l	–	4000	5000	2000	2000	5000
Metals							
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1
Boron	ug/l	200 [12]	64	69	45	59	62
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	101000	150000	110000	145000	125000
Chromium	ug/l	-- [13]	1	1	<1	1	<1
Cobalt	ug/l	0.9	0.8	**1.0**	0.5	0.8	<0.5
Copper	ug/l	5	2.1	1.5	1.6	1.0	0.8
Iron	ug/l	300	**1070**	**1260**	**882**	**373**	**502**
Lead	ug/l	-- [14]	0.3	0.1	0.1	0.2	<0.1
Magnesium	ug/l	--	31900	41000	24400	42600	34500
Manganese	ug/l	--	1240	1670	775	1090	895
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--
Potassium	ug/l	--	12900	15800	10700	21800	12600
Selenium	ug/l	100	--	--	--	--	--
Sodium	ug/l	--	96300	164000	127000	148000	144000
Zinc	ug/l	30 [11]	5	5	<5	<5	<5
Phenols							
Phenolics, Total Recoverable	ug/l	1 [16]	**6**	**10**	<1	**9**	<4 [19]

Parameter	Unit	PWQO [1]	S16 27-Sep-2001	S16 21-Nov-2001	S16 22-May-2002	S16 08-Nov-2002	S16 31-May-2003	S16 03-Jul-2003
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	–	–	–	--	–	–
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	153000	86000	176000	156000	103000	210000
Ammonia, unionized	ug/l	20	<20	<20	–	–	–	–
Ammonia Nitrogen	ug/l	–	670	30	30	1070	180	240
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	4000	1000	2000
Chemical Oxygen Demand	ug/l	--	70000	29000	36000	31000	63000	44000
Chloride	ug/l	–	394000	63300	83000	300000	56000	340000
Conductivity	uS/cm	–	--	--	--	--	–	--
Conductivity (Field)	uS/cm	--	1580	450	490	1400	480	1490
Dissolved Inorganic Carbon	ug/l	--	39700	12000	20000	39000	25000	57000
Dissolved Organic Carbon	ug/l	--	–	–	–	–	–	–
Dissolved Oxygen (Field)	ug/l	-- [7]	2920	7410	8200	3000	3860	2000
Hardness, Calcium Carbonate	ug/l	--	386000	191000	211000	303000	161000	292000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	2600	600	200	600	200
Nitrite as N	ug/l	--	–	–	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2460	920	640	1980	1220	1500
Nitrogen, Nitrate-Nitrite	ug/l	--	–	–	–	–	–	–
pH (Field)	-	6.5 - 8.5	7.37	**6.4**	**6.15**	7.4	7.5	7.03
Phosphate	ug/l	–	280	70	40	130	60	150
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	154000	76000	37000	134000	42000	37000
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1050000	328000	340000	700000	266000	937000
Total Organic Carbon	ug/l	--	9600	15000	11000	10000	23000	15000
Total Suspended Solids	ug/l	--	186000	22000	2000	34000	3000	77000
Metals								
Arsenic	ug/l	100 [11]	2	1	1	1	1	2
Boron	ug/l	200 [12]	50	30	40	70	20	46
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	131000	57000	64700	104000	48300	96700
Chromium	ug/l	– [13]	**10**	**10**	**10**	**10**	**10**	3
Cobalt	ug/l	0.9	--	--	--	--	–	--
Copper	ug/l	5	**8.2**	2.1	<1	2.9	3	2
Iron	ug/l	300	**2400**	**410**	**650**	**1150**	**870**	**2970**
Lead	ug/l	– [14]	8	0.2	<1	3.9	0.5	3.6
Magnesium	ug/l	--	14400	11700	11800	10600	9740	12300
Manganese	ug/l	–	390	40	240	860	160	1060
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	–	--
Nickel	ug/l	25	20	20	20	20	20	10
Potassium	ug/l	–	7100	9000	7000	9100	5500	5600
Selenium	ug/l	100	--	--	--	–	--	--
Sodium	ug/l	–	208000	30300	50900	176000	38800	209000
Zinc	ug/l	30 [11]	30	**500**	20	20	10	13
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S16 22-Oct-2003	S16 17-May-2004	S16 21-Aug-2004 [20]	S16 18-Nov-2004	S16 25-May-2005	S16 09-Sep-2005 [20]
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	215000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	93000	194000	--	150000	180000	--
Ammonia, unionized	ug/l	20	--	<10	--	<10	<0.05	--
Ammonia Nitrogen	ug/l	--	30	50	--	10	<10	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	7000	--	2000	<3000	--
Chemical Oxygen Demand	ug/l	--	40000	55000	--	36000	52000	--
Chloride	ug/l	--	92500	158000	--	68500	73000	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	680	910	--	480	595	--
Dissolved Inorganic Carbon	ug/l	--	24000	37200	--	19700	50400	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	17700	--
Dissolved Oxygen (Field)	ug/l	-- [7]	8400	7000	--	6600	**4600**	--
Hardness, Calcium Carbonate	ug/l	--	--	250000	--	196000	212000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	<10	--
Nitrate as N	ug/l	--	1600	300	--	300	200	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	850	1310	--	680	1040	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	7.1	--	6.8	7.2	--
Phosphate	ug/l	--	130	160	--	60	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	**70**	--
Sulphate	ug/l	--	75000	24000	--	56000	23000	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	16.8	--
Total Dissolved Solids	ug/l	--	347000	455000	--	240000	327000	--
Total Organic Carbon	ug/l	--	13000	12800	--	9500	--	--
Total Suspended Solids	ug/l	--	6000	31000	--	13000	5000	--
Metals								
Arsenic	ug/l	100 [11]	1	1	--	1	<1	--
Boron	ug/l	200 [12]	34	25	--	23	38	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	<0.3	--
Calcium	ug/l	--	56300	76000	--	57900	60800	--
Chromium	ug/l	-- [13]	7	1	--	2	<2	--
Cobalt	ug/l	0.9	--	--	--	--	<3	--
Copper	ug/l	5	**11**	5	--	2	<2	--
Iron	ug/l	300	**437**	**4610**	--	**1400**	**1610**	--
Lead	ug/l	-- [14]	1.8	1.1	--	1.2	<0.6	--
Magnesium	ug/l	--	10300	14600	--	12400	14500	--
Manganese	ug/l	--	60	1270	--	167	268	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	<0.05	--
Molybdenum	ug/l	40	--	--	--	--	4.5	--
Nickel	ug/l	25	10	10	--	10	<10	--
Potassium	ug/l	--	11300	4800	--	5900	6100	--
Selenium	ug/l	100	--	--	--	--	<1	--
Sodium	ug/l	--	49500	101000	--	40000	47900	--
Zinc	ug/l	30 [11]	16	15	--	9	21	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	--	1	<1	--

Parameter	Unit	PWQO [1]	S16 09-Nov-2005	S16 24-May-2006	S16 15-Aug-2006 [20]	S16 16-Nov-2006	S16 08-May-2007 [20]	S16 22-Aug-2007
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	327000	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	<5000	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	268000	183000	--	72000	--	452000
Ammonia, unionized	ug/l	20	1.9	0.32	--	--	--	0.58
Ammonia Nitrogen	ug/l	--	570	60	--	20	--	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	3000	--	<3000	--	9000
Chemical Oxygen Demand	ug/l	--	45000	48000	--	38000	--	200000
Chloride	ug/l	--	666000	147000	--	12800	--	1140000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1600	550	--	160	--	3300
Dissolved Inorganic Carbon	ug/l	--	60000	40200	--	20200	--	108000
Dissolved Organic Carbon	ug/l	--	11700	19200	--	18800	--	11900
Dissolved Oxygen (Field)	ug/l	-- [7]	**6700**	11050	--	7550	--	**4480**
Hardness, Calcium Carbonate	ug/l	--	395000	230000	--	49000	--	645000
Hydrogen Sulfide	ug/l	2 [8]	<10	--	--	--	--	--
Nitrate as N	ug/l	--	400	600	--	300	--	200
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1200	970	--	900	--	7360
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	7.5	--	--	--	7.3
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**50**	**60**	--	**160**	--	**3130**
Sulphate	ug/l	--	133000	52000	--	23000	--	158000
Temperature (Field)	deg c	-- [10]	3	9	--	8.1	--	14.7
Total Dissolved Solids	ug/l	--	1550000	489000	--	123000	--	2540000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	13000	6000	--	94000	--	1160000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	--	1	--	6
Boron	ug/l	200 [12]	39	39	--	22	--	49
Cadmium	ug/l	0.2 [11]	<0.5	<0.1	--	<0.5	--	<0.1
Calcium	ug/l	--	125000	70300	--	13900	--	195000
Chromium	ug/l	-- [13]	<2	<2	--	6	--	**12**
Cobalt	ug/l	0.9	0.7	0.7	--	0.6	--	**3.9**
Copper	ug/l	5	<2	3	--	**28**	--	**11**
Iron	ug/l	300	**5060**	**748**	--	**894**	--	**10200**
Lead	ug/l	-- [14]	1	0.8	--	2	--	17.7
Magnesium	ug/l	--	19800	13300	--	3580	--	38100
Manganese	ug/l	--	1710	212	--	68	--	1730
Mercury, dissolved	ug/l	0.2 [15]	<0.06	--	--	--	--	--
Molybdenum	ug/l	40	<5	--	--	--	--	--
Nickel	ug/l	25	<10	--	--	--	--	--
Potassium	ug/l	--	5000	8400	--	4600	--	6600
Selenium	ug/l	100	<1	--	--	--	--	--
Sodium	ug/l	--	442000	92600	--	19800	--	726000
Zinc	ug/l	30 [11]	<5	7	--	**37**	--	**237**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	--	<1	--	<1

Parameter	Unit	PWQO [1]	S16 20-Nov-2007	S16 23-May-2008	S16 12-Aug-2008	S16 06-Nov-2008	S16 13-May-2009 S-10	S16 25-Aug-2009 [34] A-10
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	99000	435000	120000	128000	458000
Ammonia, unionized	ug/l	20	0.62	<0.07	4.1	<0.07	0.44	2.15
Ammonia Nitrogen	ug/l	–	60	<10	180	<10	50	340
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	<3000	<3000	<3000	<1000	3000
Chemical Oxygen Demand	ug/l	--	173000	55000	40000	33000	43000	73000
Chloride	ug/l	–	222000	38600	790000	93900	79000	486000
Conductivity	uS/cm	–	--	--	--	--	566	2520
Conductivity (Field)	uS/cm	--	875	320	3500	525	470	2018
Dissolved Inorganic Carbon	ug/l	--	54000	22300	107000	30100	31600	115000
Dissolved Organic Carbon	ug/l	--	13200	18200	9400	13000	18400	16400
Dissolved Oxygen (Field)	ug/l	-- [7]	8520	8220	**1070**	7230	**2780**	**180**
Hardness, Calcium Carbonate	ug/l	--	271000	112000	432000	160000	164000	358000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	1000	200	100	600	250	<100
Nitrite as N	ug/l	--	--	--	--	--	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	5120	1040	980	750	780	1940
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.4	7.7	7.6	7.4	7.19
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**2450**	**80**	**40**	**40**	**90**	**400**
Sulphate	ug/l	–	97000	18000	84000	57000	25000	51000
Temperature (Field)	deg c	– [10]	2.8	15	22.2	8.7	18.3	20.5
Total Dissolved Solids	ug/l	--	713000	188000	1780000	357000	368000	1640000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	432000	<3000	25000	5000	4000	43000
Metals								
Arsenic	ug/l	100 [11]	1.6	1.5	2.2	<0.5	<1	<50
Boron	ug/l	200 [12]	56	20	48	34	30	<100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<10
Calcium	ug/l	–	86500	32700	134000	49900	49000	112000
Chromium	ug/l	– [13]	5	<2	<2	<2	3	<50
Cobalt	ug/l	0.9	**1.5**	<0.5	<0.5	<0.5	0.6	<10
Copper	ug/l	5	**10**	<2	<2	3	1	<10
Iron	ug/l	300	**3430**	**866**	**1760**	**491**	**1480**	**16200**
Lead	ug/l	– [14]	4.6	<0.1	<0.1	<0.1	<1	<10
Magnesium	ug/l	--	13300	7440	23900	8610	10000	19000
Manganese	ug/l	–	438	78	1840	187	220	3240
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	7100	4300	4400	4900	4000	6000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	159000	25800	477000	66800	52000	365000
Zinc	ug/l	30 [11]	**138**	<5	<5	5	<10	<50
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	**3**

Parameter	Unit	PWQO [1]	S16 27-Nov-2009 S-7	S16 18-May-2010 S-9	S16 18-Aug-2010 [2] S-11	S16 14-Oct-2010 S-14	S16 19-May-2011 [2] W-12	S16 16-Aug-2011 [2] N-10
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	93000	338000	415000	234000	151000	411000
Ammonia, unionized	ug/l	20	<0.07	0.85	0.71	0.77	0.39	1.19
Ammonia Nitrogen	ug/l	–	<20	180	90	70	30	130
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	4000	2000	2000	1000	1000
Chemical Oxygen Demand	ug/l	--	45000	28000	33000	38000	50000	45000
Chloride	ug/l	–	25000	570000	593000	225000	48000	551000
Conductivity	uS/cm	–	342	2540	2780	1350	506	2650
Conductivity (Field)	uS/cm	--	335	2555	2485	1038	496	1423
Dissolved Inorganic Carbon	ug/l	--	23600	153000	90400	55000	35900	33500
Dissolved Organic Carbon	ug/l	--	16100	11600	13200	13500	18900	10800
Dissolved Oxygen (Field)	ug/l	-- [7]	9730	**1800**	**1420**	7240	6720	**3500**
Hardness, Calcium Carbonate	ug/l	--	114000	428000	437000	261000	174000	468000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	260	640	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	540	1650	990	780	1290	750
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.47	7.16	7.34	7.72	7.64	7.24
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	**110**	**130**	**120**	**50**	30
Sulphate	ug/l	–	31000	44000	79000	75000	28000	62000
Temperature (Field)	deg c	– [10]	5.0	17.5	18.9	11.7	16.2	24.1
Total Dissolved Solids	ug/l	--	222000	1650000	1810000	878000	329000	1720000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	4000	49000	33000	25000	8000	11000
Metals								
Arsenic	ug/l	100 [11]	<1	1	<1	<1	<10	<10
Boron	ug/l	200 [12]	20	30	70	30	20	40
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	–	34000	135000	142000	83000	50000	146000
Chromium	ug/l	– [13]	3	8	<5	6	3	<5
Cobalt	ug/l	0.9	0.3	**1.9**	0.8	0.7	0.4	0.6
Copper	ug/l	5	2	2	2	2	2	1
Iron	ug/l	300	**680**	**4040**	**1690**	**1370**	**600**	**580**
Lead	ug/l	– [14]	<1	<1	<1	<1	<1	<1
Magnesium	ug/l	--	7000	22000	20000	13000	12000	25000
Manganese	ug/l	–	60	2540	1240	350	70	550
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	6000	4000	6000	5000	4000	14000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	22000	295000	408000	170000	40000	183000
Zinc	ug/l	30 [11]	10	20	<10	<10	10	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S16 30-Nov-2011 [22] S16	S16 30-May-2012 S 16	S16 22-Aug-2012 [20] S-16	S16 29-Nov-2012 S16	S16 28-May-2013 S16	S16 15-Aug-2013 [20] S16
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	97000	340000	--	370000	240000	--
Ammonia, unionized	ug/l	20	<0.16	4.56	--	0.77	1.09	--
Ammonia Nitrogen	ug/l	--	<20	230	--	530	160	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	4000	--	3000	<2000	--
Chemical Oxygen Demand	ug/l	--	25000	58000	--	86000	140000	--
Chloride	ug/l	--	58000	620000	--	480000	400000	--
Conductivity	uS/cm	--	477	--	--	--	--	--
Conductivity (Field)	uS/cm	--	482	2451	--	1903	1607	--
Dissolved Inorganic Carbon	ug/l	--	18600	85000	--	86000	53000	--
Dissolved Organic Carbon	ug/l	--	7900	17000	--	9400	14000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	9120	**1780**	--	**1200**	5330	--
Hardness, Calcium Carbonate	ug/l	--	141000	480000	--	410000	360000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	440	380	--	<100	<100	--
Nitrite as N	ug/l	--	<100	56	--	<10	<10	--
Nitrogen, Total Kjeldahl	ug/l	--	540	1300	--	1700	5600	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	430	--	<100	<100	--
pH (Field)	-	6.5 - 8.5	7.81	7.58	--	7.18	7.25	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**210**	**130**	--	**57**	**350**	--
Sulphate	ug/l	--	42000	56000	--	70000	38000	--
Temperature (Field)	deg c	-- [10]	5.0	24.1	--	1.9	19.7	--
Total Dissolved Solids	ug/l	--	310000	1580000	--	1440000	942000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	26000	73000	--	14000	120000	--
Metals								
Arsenic	ug/l	100 [11]	<50	1.8	--	<1.0	2.6	--
Boron	ug/l	200 [12]	<100	50	--	32	17	--
Cadmium	ug/l	0.2 [11]	<10	<0.10	--	<0.10	<0.10	--
Calcium	ug/l	--	45000	170000	--	160000	110000	--
Chromium	ug/l	-- [13]	<50	<5.0	--	<5.0	7.0	--
Cobalt	ug/l	0.9	<10	**1.9**	--	0.65	**2.8**	--
Copper	ug/l	5	<10	4.3	--	1.2	5.0	--
Iron	ug/l	300	**6100**	**5000**	--	**8100**	**14000**	--
Lead	ug/l	-- [14]	<10	3.0	--	<0.50	5.2	--
Magnesium	ug/l	--	7000	24000	--	29000	19000	--
Manganese	ug/l	--	160	1700	--	2700	1300	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	6000	5300	--	4100	5000	--
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	38000	440000	--	440000	250000	--
Zinc	ug/l	30 [11]	<50	26	--	10	**39**	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1.0	--	<1.0	<1.0	--

Parameter	Unit	PWQO [1]	S16 21-Nov-2013 SA-3	S16 28-May-2014 S16	S16 26-Aug-2014 S16	S16 13-Nov-2014 S-16	S16 27-May-2015 S-16	S16 25-Aug-2015 S-16
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	330000	280000	390000	140000	255000	446000
Ammonia, unionized	ug/l	20	0.56	1.2	14.2	0.29	0.35	**30.59**
Ammonia Nitrogen	ug/l	–	90	130	1500	62	120	440
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	<2000	9000	17000
Chemical Oxygen Demand	ug/l	--	150000	48000	2000000	160000	86000	74000
Chloride	ug/l	–	350000	560000	800000	88000	402000	1100000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1653	2054	3177	502	1782	3767
Dissolved Inorganic Carbon	ug/l	--	85000	64000	100000	34000	62400	77800
Dissolved Organic Carbon	ug/l	--	10000	13000	11000	18000	16600	19100
Dissolved Oxygen (Field)	ug/l	-- [7]	10510	**4300**	**300**	9690	**110**	**60**
Hardness, Calcium Carbonate	ug/l	--	330000	430000	470000	160000	67700	512000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	250	<100	<100	<100	<100
Nitrite as N	ug/l	--	<10	21	21	<10	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	3200	1600	65000	4400	2800	3100
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	270	<100	<100	--	--
pH (Field)	-	6.5 - 8.5	7.80	7.48	7.31	7.61	6.74	8.33
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1300**	**200**	**4800**	**2200**	**810**	**920**
Sulphate	ug/l	–	81000	41000	52000	25000	45000	55000
Temperature (Field)	deg c	– [10]	2.2	16.6	22.3	4.1	24.1	18.3
Total Dissolved Solids	ug/l	--	1130000	1360000	1770000	346000	982000	2220000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	1100000	410000	11000000	130000	363000	170000
Metals								
Arsenic	ug/l	100 [11]	7.8	1.5	52	2.7	<1	7
Boron	ug/l	200 [12]	36	110	110	26	12	56
Cadmium	ug/l	0.2 [11]	**0.25**	0.13	**3.1**	0.18	<0.1	**0.4**
Calcium	ug/l	–	130000	150000	290000	54000	21800	160000
Chromium	ug/l	– [13]	**27**	<5.0	**250**	**11**	1	**23**
Cobalt	ug/l	0.9	**7.6**	**2.8**	**78**	**2.7**	<0.5	**6.5**
Copper	ug/l	5	**17**	3.5	**180**	**9.4**	<0.5	**12.6**
Iron	ug/l	300	**60000**	**6700**	**430000**	**14000**	**1560**	**42500**
Lead	ug/l	– [14]	19	3.9	190	9.8	1.0	18.3
Magnesium	ug/l	--	23000	22000	63000	12000	3230	27600
Manganese	ug/l	–	1900	2200	11000	280	137	2020
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	6200	5200	22000	7600	917	7060
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	290000	310000	530000	55000	52900	584000
Zinc	ug/l	30 [11]	**130**	26	**1200**	**57**	7	**121**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**2.3**	<1.0	**4.8**	**11**	<1	**3**

Parameter	Unit	PWQO [1]	S16 25-Nov-2015 S-16	S16 24-May-2016 S-16	S16 18-Aug-2016 S-16	S16 16-Nov-2016 S-16	S16 18-May-2017 S-16	S16 28-Aug-2017 S-16
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	392000	357000	430000	369000	186000	468000
Ammonia, unionized	ug/l	20	0.5	2.1	5.22	2.3	0.76	3.34
Ammonia Nitrogen	ug/l	–	180	120	350	190	60	340
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	24000	18000	16000	3000	16000
Chemical Oxygen Demand	ug/l	--	80000	95000	90000	94000	51000	98000
Chloride	ug/l	–	288000	1010000	791000	815000	184000	802000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	3549	3437	3144	3185	880	2483
Dissolved Inorganic Carbon	ug/l	--	76200	54900	22700	66100	15100	85100
Dissolved Organic Carbon	ug/l	--	10000	32100	78500	10800	35600	14800
Dissolved Oxygen (Field)	ug/l	-- [7]	**1780**	**4630**	**2610**	**4330**	**2860**	**990**
Hardness, Calcium Carbonate	ug/l	--	733000	616000	651000	461000	205000	577000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	300	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<250 [18]	<50	<50	<250 [18]
Nitrogen, Total Kjeldahl	ug/l	--	3100	4400	1900	3400	900	2900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.51	7.40	7.51	7.84	7.42	7.46
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1400**	**1550**	**450**	**1470**	**50**	**970**
Sulphate	ug/l	–	96000	58000	252000	89000	27000	58000
Temperature (Field)	deg c	– [10]	0.6	28.2	22.3	9.4	22.9	18.1
Total Dissolved Solids	ug/l	--	1840000	2130000	2150000	1790000	550000	1780000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	203000	382000	99000	44000	12000	970000
Metals								
Arsenic	ug/l	100 [11]	3	2	6	2	<5 [17]	2
Boron	ug/l	200 [12]	34	150	132	93	166	49
Cadmium	ug/l	0.2 [11]	0.2	0.1	0.1	0.1	<0.5 [17]	0.1
Calcium	ug/l	–	243000	196000	216000	148000	61900	188000
Chromium	ug/l	– [13]	**12**	7	7	7	<5 [17]	6
Cobalt	ug/l	0.9	**2.8**	**2.4**	**2.7**	**1.9**	<2.5 [17]	**1.9**
Copper	ug/l	5	**7.7**	**5.7**	**5.3**	**5.9**	2.9	3.8
Iron	ug/l	300	**20100**	**10300**	**8310**	**10300**	**924**	**11100**
Lead	ug/l	– [14]	9.7	6.4	5.6	7.3	<0.5 [17]	6.6
Magnesium	ug/l	--	30700	30600	27200	22300	12200	26300
Manganese	ug/l	–	1430	3490	3500	1750	413	2030
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	5260	5940	6760	5630	4530	5560
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	663000	670000	503000	504000	101000	497000
Zinc	ug/l	30 [11]	**66**	**59**	**46**	**58**	<25 [17]	**42**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**16**	<2 [19]	**11**	<1	**2**

Parameter	Unit	PWQO [1]	S16 28-Nov-2017 S-16	S16 23-May-2018 S-16	S16 30-Aug-2018 S-16	S16 28-Nov-2018 S-16	S16 20-Jun-2019 S-16	S16 28-Aug-2019 S-16
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	155000	164000	429000	246000	222000	227000
Ammonia, unionized	ug/l	20	0.47	0.76	6.16	0.35	1	2.27
Ammonia Nitrogen	ug/l	–	80	70	600	160	130	300
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	<2000	<30000 [26]	<2000	<12000 [26]	4000
Chemical Oxygen Demand	ug/l	--	48000	52000	169000	56000	67000	46000
Chloride	ug/l	–	<1000	109000	995000	1410000	335000	505000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	609	717	3400	>3999	1322	1893
Dissolved Inorganic Carbon	ug/l	--	10200	37300	67400	45900	45000	75700
Dissolved Organic Carbon	ug/l	--	34900	18200	25800	8700	10700	14800
Dissolved Oxygen (Field)	ug/l	-- [7]	**7660**	**730**	**630**	7770	**430**	**280**
Hardness, Calcium Carbonate	ug/l	--	145000	158000	605000	555000	310000	284000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	200	200	<100
Nitrite as N	ug/l	--	<50	<50	<250 [18]	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	1100	2400	700	1300	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.83	7.49	7.45	7.35	7.41	7.31
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**150**	**60**	**290**	**80**	**210**	**140**
Sulphate	ug/l	–	36000	12000	31000	113000	43000	36000
Temperature (Field)	deg c	– [10]	0.6	18.5	19.0	2.2	16.3	19.2
Total Dissolved Solids	ug/l	--	340000	366000	2060000	2720000	832000	1130000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	49000	11000	268000	11000	41000	62000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	3	<1	<1	<1
Boron	ug/l	200 [12]	24	34	34	27	36	24
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	**0.3**	<0.1	<0.1	<0.1
Calcium	ug/l	–	43300	47700	189000	176000	99100	92900
Chromium	ug/l	– [13]	1	<1	**27**	**9**	3	5
Cobalt	ug/l	0.9	<0.5	<0.5	**7.0**	**2.2**	**2.0**	**1.4**
Copper	ug/l	5	1.9	<0.5	**17.0**	**6.0**	**6.1**	4.8
Iron	ug/l	300	**1260**	**943**	**28800**	**3180**	**2670**	**3640**
Lead	ug/l	– [14]	0.6	0.3	20.1	1.7	4.3	2.9
Magnesium	ug/l	--	9010	9460	32200	27900	15200	12700
Manganese	ug/l	–	190	233	2930	626	1020	843
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	4530	3980	8500	9200	3390	3750
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	38400	58700	440000	883000	147000	268000
Zinc	ug/l	30 [11]	12	11	**103**	24	22	22
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	**4**	<1	<1	**5**

Parameter	Unit	PWQO [1]	S16 21-Nov-2019 S-16	S16 14-May-2020 S-16	S16 26-Aug-2020 S-16	S16 25-Nov-2020 S-16
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	352000	182000	350000	354000
Ammonia, unionized	ug/l	20	0.52	0.13	2.41	0.41
Ammonia Nitrogen	ug/l	--	300	40	550	130
Biochemical Oxygen Demand, 5 Day	ug/l	--	<30000 [26]	5000	9000	<40000 [26]
Chemical Oxygen Demand	ug/l	--	70000	67000	213000	44000
Chloride	ug/l	--	1030000	260000	758000	1070000
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	4110	1104	2924	2
Dissolved Inorganic Carbon	ug/l	--	<500	39400	69300	73600
Dissolved Organic Carbon	ug/l	--	11300	22300	10900	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	**4420**	**1060**	**120**	**4200**
Hardness, Calcium Carbonate	ug/l	--	673000	271000	521000	556000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<250 [18]
Nitrogen, Total Kjeldahl	ug/l	--	6600	2000	4200	1200
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.31	7.03	7.10	7.58
Phosphate	ug/l	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**3660**	**640**	**1620**	**440**
Sulphate	ug/l	--	114000	41000	23000	116000
Temperature (Field)	deg c	-- [10]	0.3	16.2	18.3	0
Total Dissolved Solids	ug/l	--	2080000	588000	828000	2380000
Total Organic Carbon	ug/l	--	--	--	--	--
Total Suspended Solids	ug/l	--	208000	171000	454000	292000
Metals						
Arsenic	ug/l	100 [11]	4	1	2	<1
Boron	ug/l	200 [12]	30	16	31	18
Cadmium	ug/l	0.2 [11]	0.2	<0.1	<0.1	<0.1
Calcium	ug/l	--	198000	82100	169000	167000
Chromium	ug/l	-- [13]	**28**	5	7	2
Cobalt	ug/l	0.9	**6.2**	**1.5**	**2.5**	**1.1**
Copper	ug/l	5	**18.3**	5.0	**5.2**	2.8
Iron	ug/l	300	**31700**	**3770**	**14400**	**3190**
Lead	ug/l	-- [14]	12.8	4.0	4.7	2.6
Magnesium	ug/l	--	43200	16100	24000	33500
Manganese	ug/l	--	2450	418	2430	1440
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--
Nickel	ug/l	25	--	--	--	--
Potassium	ug/l	--	10300	4480	6340	5980
Selenium	ug/l	100	--	--	--	--
Sodium	ug/l	--	544000	121000	479000	601000
Zinc	ug/l	30 [11]	**82**	23	26	15
Phenols						
Phenolics, Total Recoverable	ug/l	1 [16]	**12**	**6**	**9**	<10 [19]

Parameter	Unit	PWQO [1]	S17 27-Sep-2001	S17 21-Nov-2001	S17 22-May-2002	S17 08-Nov-2002	S17 31-May-2003	S17 03-Jul-2003
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	–	–	–	--	–	–
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	240000	151000	158000	186000	151000	234000
Ammonia, unionized	ug/l	20	<20	<20	–	–	–	–
Ammonia Nitrogen	ug/l	–	150	30	60	450	170	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	2000	1000	2000
Chemical Oxygen Demand	ug/l	--	29000	25000	44000	23000	59000	45000
Chloride	ug/l	–	83600	83300	90000	406000	75500	371000
Conductivity	uS/cm	–	--	--	--	--	–	--
Conductivity (Field)	uS/cm	--	1230	510	580	1600	425	1320
Dissolved Inorganic Carbon	ug/l	--	59400	21100	17000	46000	39000	59000
Dissolved Organic Carbon	ug/l	--	–	–	–	–	–	–
Dissolved Oxygen (Field)	ug/l	-- [7]	3550	10270	8350	9300	6020	3390
Hardness, Calcium Carbonate	ug/l	--	367000	226000	221000	277000	187000	304000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	1600	900	600	1600	900	1100
Nitrite as N	ug/l	--	–	–	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1720	630	890	1070	1260	1210
Nitrogen, Nitrate-Nitrite	ug/l	--	–	–	–	–	–	–
pH (Field)	-	6.5 - 8.5	7.18	6.81	7.1	7.9	7.7	6.8
Phosphate	ug/l	–	190	40	50	60	50	190
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--
Sulphate	ug/l	–	430000	70000	37000	69000	38000	57000
Temperature (Field)	deg c	– [10]	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	842000	394000	362000	800000	334000	997000
Total Organic Carbon	ug/l	--	10600	15000	12000	11000	22000	15000
Total Suspended Solids	ug/l	--	11000	7000	14000	31000	3000	82000
Metals								
Arsenic	ug/l	100 [11]	1	1	1	1	1	1
Boron	ug/l	200 [12]	100	40	30	160	30	61
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--
Calcium	ug/l	–	124000	65200	65600	92300	54700	100000
Chromium	ug/l	– [13]	**10**	**10**	**10**	**10**	**10**	3
Cobalt	ug/l	0.9	--	--	--	--	–	--
Copper	ug/l	5	3.2	1.9	<1	**39.7**	2	4
Iron	ug/l	300	**500**	220	**380**	**1370**	**460**	**1360**
Lead	ug/l	– [14]	0.2	0.2	<1	34.1	0.5	3.2
Magnesium	ug/l	--	13900	15300	14000	11400	12300	13200
Manganese	ug/l	–	140	20	90	290	40	344
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	–	--
Nickel	ug/l	25	20	20	20	20	20	10
Potassium	ug/l	–	9300	5900	4800	9200	4800	7700
Selenium	ug/l	100	--	--	--	–	--	--
Sodium	ug/l	–	162000	56300	37200	240000	49700	230000
Zinc	ug/l	30 [11]	20	10	20	**50**	20	26
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	0.1

Parameter	Unit	PWQO [1]	S17 22-Oct-2003	S17 17-May-2004	S17 21-Aug-2004	S17 18-Nov-2004	S17 25-May-2005	S17 09-Sep-2005 [20]
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	264000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	106000	196000	264000	200000	216000	--
Ammonia, unionized	ug/l	20	--	<10	<10	<10	0.29	--
Ammonia Nitrogen	ug/l	--	90	120	360	170	40	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	5000	6000	2000	6000	--
Chemical Oxygen Demand	ug/l	--	58000	59000	92000	35000	50000	--
Chloride	ug/l	--	66900	192000	337000	122000	139000	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	640	1050	1410	790	845	--
Dissolved Inorganic Carbon	ug/l	--	26000	47200	42300	25300	56100	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	14000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	11800	4000	2700	7200	7110	--
Hardness, Calcium Carbonate	ug/l	--	--	260000	297000	245000	259000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	<10	--
Nitrate as N	ug/l	--	1100	1200	900	1600	400	--
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1400	1450	3120	880	1160	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.32	7.3	7.2	6.7	7.3	--
Phosphate	ug/l	--	350	100	740	60	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	**80**	--
Sulphate	ug/l	--	56000	42000	63000	68000	31000	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	18.8	--
Total Dissolved Solids	ug/l	--	294000	525000	705000	395000	485000	--
Total Organic Carbon	ug/l	--	16000	12300	9200	9800	--	--
Total Suspended Solids	ug/l	--	20000	32000	148000	6000	4000	--
Metals								
Arsenic	ug/l	100 [11]	1	1	3	1	<1	--
Boron	ug/l	200 [12]	36	51	78	39	39	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	<0.5	--
Calcium	ug/l	--	47100	81800	98000	73700	75200	--
Chromium	ug/l	-- [13]	**9**	2	6	2	<2	--
Cobalt	ug/l	0.9	--	--	--	--	**83**	--
Copper	ug/l	5	**25**	**16**	**84**	2	<2	--
Iron	ug/l	300	**1540**	**1110**	129	**519**	**436**	--
Lead	ug/l	-- [14]	3.4	0.8	5.8	1.2	<1	--
Magnesium	ug/l	--	9500	13600	12600	14900	17200	--
Manganese	ug/l	--	70	341	528	95	85	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	<0.05	--
Molybdenum	ug/l	40	--	--	--	--	8	--
Nickel	ug/l	25	10	10	**90**	10	<10	--
Potassium	ug/l	--	7600	6400	6800	7100	5300	--
Selenium	ug/l	100	--	--	--	--	<1	--
Sodium	ug/l	--	44500	146000	254000	80600	90800	--
Zinc	ug/l	30 [11]	29	**34**	**164**	14	14	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	<1	--

Parameter	Unit	PWQO [1]	S17 09-Nov-2005	S17 24-May-2006	S17 15-Aug-2006	S17 16-Nov-2006	S17 08-May-2007	S17 22-Aug-2007
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	237000	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	<5000	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	190000	150000	260000	90000	212000	302000
Ammonia, unionized	ug/l	20	0.15	0.25	0.54	--	<0.26	0.63
Ammonia Nitrogen	ug/l	--	50	20	40	100	<10	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	<3000	<3000	3000
Chemical Oxygen Demand	ug/l	--	60000	63000	28000	38000	38000	37000
Chloride	ug/l	--	174000	102000	434000	21200	252000	494000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	610	430	1700	210	1000	1450
Dissolved Inorganic Carbon	ug/l	--	40800	39700	62400	24300	50900	72300
Dissolved Organic Carbon	ug/l	--	10500	20900	13800	15700	10100	10000
Dissolved Oxygen (Field)	ug/l	-- [7]	12500	8620	**800**	7880	8020	**1890**
Hardness, Calcium Carbonate	ug/l	--	290000	196000	314000	69000	279000	351000
Hydrogen Sulfide	ug/l	2 [8]	<10	--	--	--	--	--
Nitrate as N	ug/l	--	1800	900	1000	1100	1200	200
Nitrite as N	ug/l	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	730	860	640	1190	2110	1790
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	7.8	7.6	--	7.9	7.4
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**40**	**50**	**230**	**70**	**310**
Sulphate	ug/l	--	79000	40000	63000	24000	47000	46000
Temperature (Field)	deg c	-- [10]	2	11	18	8.1	18	14
Total Dissolved Solids	ug/l	--	598000	370000	1030000	158000	700000	1190000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	16000	3000	<3000	45000	4000	30000
Metals								
Arsenic	ug/l	100 [11]	<1	<1	1.6	2	1.4	3.3
Boron	ug/l	200 [12]	34	23	47	24	41	41
Cadmium	ug/l	0.2 [11]	<0.5	<0.1	<0.1	<0.5	**0.7**	<0.1
Calcium	ug/l	--	89800	59200	103000	18400	88400	115000
Chromium	ug/l	-- [13]	<2	<2	<2	8	<2	<2
Cobalt	ug/l	0.9	0.6	0.2	0.4	0.5	0.5	**1.1**
Copper	ug/l	5	<2	<2	<2	**39**	**20**	4
Iron	ug/l	300	**453**	**303**	**355**	**399**	**858**	**1740**
Lead	ug/l	-- [14]	2.5	<0.5	0.5	2	0.7	1
Magnesium	ug/l	--	15900	11800	13800	5570	14000	15200
Manganese	ug/l	--	56	40	342	80	204	772
Mercury, dissolved	ug/l	0.2 [15]	<0.06	--	--	--	--	--
Molybdenum	ug/l	40	<5	--	--	--	--	--
Nickel	ug/l	25	<10	--	--	--	--	--
Potassium	ug/l	--	8400	4700	6900	4300	6600	8700
Selenium	ug/l	100	<1	--	--	--	--	--
Sodium	ug/l	--	115000	62700	256000	25000	158000	323000
Zinc	ug/l	30 [11]	**56**	14	25	28	19	**49**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S17 20-Nov-2007	S17 23-May-2008	S17 12-Aug-2008	S17 06-Nov-2008	S17 13-May-2009 S-11	S17 25-Aug-2009 A-9
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	180000	142000	280000	190000	165000	285000
Ammonia, unionized	ug/l	20	3.64	<0.16	3.06	0.28	1.72	3.39
Ammonia Nitrogen	ug/l	–	380	<10	110	20	60	500
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	<3000	<3000	<3000	<1000	<1000
Chemical Oxygen Demand	ug/l	--	30000	19000	42000	22000	50000	50000
Chloride	ug/l	–	193000	108000	455000	123000	113000	296000
Conductivity	uS/cm	–	--	--	--	--	757	1620
Conductivity (Field)	uS/cm	--	750	550	1800	750	600	1291
Dissolved Inorganic Carbon	ug/l	--	48600	34900	70400	46500	40900	69600
Dissolved Organic Carbon	ug/l	--	13200	15400	9800	8300	20000	12100
Dissolved Oxygen (Field)	ug/l	-- [7]	9250	10540	**1780**	8710	8490	**2190**
Hardness, Calcium Carbonate	ug/l	--	248000	148000	290000	252000	194000	260000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	1500	300	900	1100	750	880
Nitrite as N	ug/l	--	--	--	--	--	<100	130
Nitrogen, Total Kjeldahl	ug/l	--	1310	1130	1100	650	1300	1180
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.8	7.9	7.9	7.8	7.22
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**100**	**100**	**130**	**40**	**50**	**50**
Sulphate	ug/l	–	80000	21000	57000	74000	27000	45000
Temperature (Field)	deg c	– [10]	1.9	14.6	18.7	9.4	22.3	20.5
Total Dissolved Solids	ug/l	--	620000	341000	1070000	494000	492000	1050000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	40000	45000	4000	3000	11000
Metals								
Arsenic	ug/l	100 [11]	1.6	1.9	1.1	0.9	1	1
Boron	ug/l	200 [12]	34	17	55	29	30	50
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	–	83300	42900	90600	76200	58000	86000
Chromium	ug/l	– [13]	3	<2	<2	<2	3	7
Cobalt	ug/l	0.9	**1.6**	<0.5	<0.5	0.8	0.4	0.6
Copper	ug/l	5	5	<2	<2	2	3	1
Iron	ug/l	300	**1260**	**726**	145	279	**430**	**1140**
Lead	ug/l	– [14]	3.2	<0.1	<0.1	<0.1	<1	<1
Magnesium	ug/l	--	9720	9900	15400	14900	12000	11000
Manganese	ug/l	–	179	72	107	70	90	640
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	8800	3200	7600	6900	4000	8000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	126000	68900	277000	80400	81000	211000
Zinc	ug/l	30 [11]	**50**	5	15	<5	10	<10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S17 27-Nov-2009 S-9	S17 18-May-2010 S-10	S17 18-Aug-2010 S-10	S17 14-Oct-2010 S-13	S17 19-May-2011 W-10	S17 16-Aug-2011 [2] N-11
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	152000	223000	283000	208000	107000	148000
Ammonia, unionized	ug/l	20	1.08	1.17	1.06	0.42	<0.1	8.79
Ammonia Nitrogen	ug/l	--	100	60	110	30	<20	420
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	10000	4000	<1000	<1000	6000
Chemical Oxygen Demand	ug/l	--	45000	53000	40000	35000	55000	48000
Chloride	ug/l	--	80000	262000	277000	102000	36000	97000
Conductivity	uS/cm	--	660	1400	1630	864	362	716
Conductivity (Field)	uS/cm	--	795	1475	1487	650	363	617
Dissolved Inorganic Carbon	ug/l	--	37400	53700	63200	52000	25800	35400
Dissolved Organic Carbon	ug/l	--	13900	18500	15600	13000	20800	11500
Dissolved Oxygen (Field)	ug/l	-- [7]	10560	8840	**4010**	11690	**3070**	**3610**
Hardness, Calcium Carbonate	ug/l	--	189000	267000	298000	228000	128000	174000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	950	1860	3710	2210	<100	1010
Nitrite as N	ug/l	--	<100	<100	170	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	880	2600	1050	820	1270	1800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.93	7.80	7.38	7.84	7.26	7.61
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	**110**	**60**	**80**	**80**	**190**
Sulphate	ug/l	--	51000	51000	75000	52000	15000	50000
Temperature (Field)	deg c	-- [10]	5.3	16.9	20.3	11.3	14.7	23.9
Total Dissolved Solids	ug/l	--	429000	910000	1060000	562000	235000	465000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	17000	67000	15000	9000	3000	31000
Metals								
Arsenic	ug/l	100 [11]	<1	1	<1	<1	<1	<10
Boron	ug/l	200 [12]	30	140	180	30	20	60
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	61000	87000	103000	70000	38000	58000
Chromium	ug/l	-- [13]	4	7	**9**	4	2	7
Cobalt	ug/l	0.9	0.8	0.7	0.6	0.4	0.5	0.8
Copper	ug/l	5	3	5	4	2	1	4
Iron	ug/l	300	**780**	**830**	**770**	260	**1280**	**1370**
Lead	ug/l	-- [14]	2	1	<1	<1	<1	4
Magnesium	ug/l	--	9000	12000	10000	13000	8000	7000
Manganese	ug/l	--	130	340	70	70	110	470
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	6000	8000	10000	7000	4000	11000
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	69000	195000	212000	63000	25000	70000
Zinc	ug/l	30 [11]	**40**	**60**	**70**	20	<10	20
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**2**	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S17 30-Nov-2011 [22] S17	S17 30-May-2012 S17	S17 22-Aug-2012 S-17	S17 29-Nov-2012 S17	S17 28-May-2013 S17	S17 15-Aug-2013 [20] S17
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	97000	190000	250000	250000	180000	--
Ammonia, unionized	ug/l	20	0.5	<5.18	2.31	0.52	2.57	--
Ammonia Nitrogen	ug/l	--	60	<50	93	180	140	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	2000	3000	6000	4000	--
Chemical Oxygen Demand	ug/l	--	30000	64000	40000	43000	44000	--
Chloride	ug/l	--	41000	160000	290000	240000	140000	--
Conductivity	uS/cm	--	442	--	--	--	--	--
Conductivity (Field)	uS/cm	--	439	927	1357	1272	771	--
Dissolved Inorganic Carbon	ug/l	--	18700	45000	55000	54000	40000	--
Dissolved Organic Carbon	ug/l	--	8500	18000	12000	9500	17000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**4550**	6030	**3520**	**6940**	11360	--
Hardness, Calcium Carbonate	ug/l	--	138000	230000	310000	300000	250000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	1210	980	480	4400	900	--
Nitrite as N	ug/l	--	<100	28	80	48	<10	--
Nitrogen, Total Kjeldahl	ug/l	--	1190	2400	1500	2700	1000	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	1000	560	4500	900	--
pH (Field)	-	6.5 - 8.5	7.83	8.26	7.72	7.51	7.77	--
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**200**	**320**	**160**	**280**	**56**	--
Sulphate	ug/l	--	50000	43000	59000	65000	36000	--
Temperature (Field)	deg c	-- [10]	5.0	26.6	22.8	0.9	17.0	--
Total Dissolved Solids	ug/l	--	287000	556000	852000	722000	462000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	13000	4000	12000	24000	<1000	--
Metals								
Arsenic	ug/l	100 [11]	<50	1.6	1.3	<1.0	<1.0	--
Boron	ug/l	200 [12]	<100	50	71	45	19	--
Cadmium	ug/l	0.2 [11]	<10	<0.10	<0.10	<0.10	<0.10	--
Calcium	ug/l	--	42000	78000	110000	110000	74000	--
Chromium	ug/l	-- [13]	<50	<5.0	<5.0	<5.0	<5.0	--
Cobalt	ug/l	0.9	<10	0.68	0.65	0.51	<0.50	--
Copper	ug/l	5	<10	4.4	3.1	4.4	1.8	--
Iron	ug/l	300	**900**	**920**	**990**	**620**	**410**	--
Lead	ug/l	-- [14]	<10	1.1	1.2	0.83	<0.50	--
Magnesium	ug/l	--	8000	13000	12000	16000	13000	--
Manganese	ug/l	--	40	170	150	220	150	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	8000	6400	9700	8400	4900	--
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	--	29000	120000	230000	190000	85000	--
Zinc	ug/l	30 [11]	<50	30	15	**73**	21	--
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**2.2**	<1.0	<1.0	<1.0	--

Parameter	Unit	PWQO [1]	S17 21-Nov-2013 SA-2	S17 28-May-2014 S17	S17 26-Aug-2014 [20] S17	S17 13-Nov-2014 S-17	S17 27-May-2015 S-17	S17 25-Aug-2015 S-17
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	230000	210000	--	190000	244000	257000
Ammonia, unionized	ug/l	20	<0.47	1.45	--	<0.31	0.3	19.16
Ammonia Nitrogen	ug/l	–	<50	69	--	<50	170	440
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<2000	--	<2000	3000	14000
Chemical Oxygen Demand	ug/l	--	32000	45000	--	42000	60000	88000
Chloride	ug/l	–	100000	240000	--	75000	654000	347000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	862	1122	--	584	2387	1513
Dissolved Inorganic Carbon	ug/l	--	57000	48000	--	44000	58700	62000
Dissolved Organic Carbon	ug/l	--	10000	16000	--	16000	22500	16000
Dissolved Oxygen (Field)	ug/l	-- [7]	10550	8150	--	**6620**	**4980**	**730**
Hardness, Calcium Carbonate	ug/l	--	300000	290000	--	230000	375000	224000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	1800	580	--	770	<100	200
Nitrite as N	ug/l	--	16	34	--	13	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	940	1000	--	960	1600	3000
Nitrogen, Nitrate-Nitrite	ug/l	--	1800	620	--	780	--	--
pH (Field)	-	6.5 - 8.5	7.98	7.85	–	7.74	6.62	8.07
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**140**	**66**	--	**86**	**150**	**650**
Sulphate	ug/l	–	78000	37000	--	56000	20000	43000
Temperature (Field)	deg c	– [10]	2.2	16.4	--	3.8	20.9	19.7
Total Dissolved Solids	ug/l	--	554000	744000	--	394000	1410000	872000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	10000	12000	--	230000	8000	61000
Metals								
Arsenic	ug/l	100 [11]	1.4	1.1	--	<1.0	2	2
Boron	ug/l	200 [12]	40	32	--	25	33	53
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	--	<0.10	<0.1	<0.1
Calcium	ug/l	–	100000	97000	--	68000	108000	72300
Chromium	ug/l	– [13]	<5.0	<5.0	--	<5.0	2	6
Cobalt	ug/l	0.9	0.80	<0.50	--	<0.50	0.7	**1.6**
Copper	ug/l	5	4.7	1.5	--	2.3	<0.5	0.7
Iron	ug/l	300	**1700**	**620**	--	**880**	**1110**	**4140**
Lead	ug/l	– [14]	3.2	<0.50	–	0.85	0.5	5.4
Magnesium	ug/l	--	20000	16000	--	18000	25800	10600
Manganese	ug/l	–	74	320	--	110	753	542
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	7300	5700	--	5400	7530	8850
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	70000	160000	--	52000	306000	183000
Zinc	ug/l	30 [11]	**47**	19	--	24	8	**48**
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	**1.2**	<1.0	--	**5.7**	<1	**2**

Parameter	Unit	PWQO [1]	S17 25-Nov-2015 S-17	S17 24-May-2016 S-17	S17 18-Aug-2016 S-17	S17 16-Nov-2016 S-17	S17 18-May-2017 S-17	S17 28-Aug-2017 S-17
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	245000	201000	119000	200000	163000	246000
Ammonia, unionized	ug/l	20	0.51	4.47	1.86	2.93	3.96	3.73
Ammonia Nitrogen	ug/l	–	80	280	60	80	60	370
Biochemical Oxygen Demand, 5 Day	ug/l	--	16000	3000	4000	2000	<2000	25000
Chemical Oxygen Demand	ug/l	--	63000	45000	47000	28000	49000	38000
Chloride	ug/l	–	246000	317000	154000	183000	199000	273000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1272	1286	933	1104	907	1000
Dissolved Inorganic Carbon	ug/l	--	52600	43600	4700	39200	16000	50700
Dissolved Organic Carbon	ug/l	--	15900	15500	36800	9300	30300	12200
Dissolved Oxygen (Field)	ug/l	-- [7]	**6900**	**110**	7180	8560	10440	**1690**
Hardness, Calcium Carbonate	ug/l	--	363000	297000	191000	275000	193000	294000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	<100	200	900	<100	400
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1200	1300	1100	600	900	2400
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.83	7.38	7.75	8.38	8.08	7.42
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**150**	**60**	**150**	**90**	**50**	**490**
Sulphate	ug/l	–	55000	28000	144000	68000	30000	43000
Temperature (Field)	deg c	– [10]	1.8	27.5	25	8.0	25.5	19.7
Total Dissolved Solids	ug/l	--	667000	776000	592000	598000	552000	738000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	6000	11000	18000	51000	10000	76000
Metals								
Arsenic	ug/l	100 [11]	<1	1	3	<1	<5 [17]	1
Boron	ug/l	200 [12]	33	34	43	125	141	158
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1
Calcium	ug/l	–	119000	98700	61700	88900	58600	97200
Chromium	ug/l	– [13]	3	1	1	2	<5 [17]	2
Cobalt	ug/l	0.9	0.7	0.6	<0.5	0.6	<2.5 [17]	0.6
Copper	ug/l	5	0.8	1.7	1.6	3.0	4.5	0.6
Iron	ug/l	300	**1330**	**970**	**864**	**1130**	**811**	**2200**
Lead	ug/l	– [14]	2.6	0.5	1.4	1.5	<0.5 [17]	1.3
Magnesium	ug/l	--	16100	12300	8850	13000	11300	12400
Manganese	ug/l	–	137	641	109	149	160	751
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	6440	6310	5840	8600	4450	7590
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	159000	199000	87000	121000	113000	181000
Zinc	ug/l	30 [11]	**39**	9	13	**42**	<25 [17]	18
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**9**	**7**	**6**	<1	<1

Parameter	Unit	PWQO [1]	S17 28-Nov-2017 S-17	S17 23-May-2018 S-17	S17 30-Aug-2018 S-17	S17 28-Nov-2018 S-17	S17 20-Jun-2019 S-17	S17 28-Aug-2019 S-17
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	185000	183000	334000	133000	211000	86000
Ammonia, unionized	ug/l	20	0.73	1.89	11.14	0.06	2.28	0.97
Ammonia Nitrogen	ug/l	–	100	60	930	50	160	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	20000	<2000	3000	2000	<2000	4000
Chemical Oxygen Demand	ug/l	--	79000	53000	56000	34000	65000	44000
Chloride	ug/l	–	106000	274000	488000	151000	300000	192000
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	705	1225	1931	351	1256	884
Dissolved Inorganic Carbon	ug/l	--	14800	41400	63000	23800	44800	27300
Dissolved Organic Carbon	ug/l	--	43100	18600	13900	11900	13000	12900
Dissolved Oxygen (Field)	ug/l	-- [7]	8240	11540	**1360**	12320	9810	**2950**
Hardness, Calcium Carbonate	ug/l	--	216000	216000	400000	192000	285000	153000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--
Nitrate as N	ug/l	--	1100	100	<100	1200	300	500
Nitrite as N	ug/l	--	<50	<50	<250 [18]	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1300	1100	2800	1000	1400	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.93	7.86	7.55	7.13	7.64	7.49
Phosphate	ug/l	–	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**220**	**60**	**510**	**150**	**70**	**150**
Sulphate	ug/l	–	48000	19000	24000	54000	31000	101000
Temperature (Field)	deg c	– [10]	0.6	21.7	18.0	1.0	17.6	20.1
Total Dissolved Solids	ug/l	--	428000	710000	1090000	438000	770000	548000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	63000	<2000	85000	3000	<2000	43000
Metals								
Arsenic	ug/l	100 [11]	<1	1	2	<1	1	<1
Boron	ug/l	200 [12]	29	33	32	26	32	34
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	–	64200	66100	131000	57100	86600	51700
Chromium	ug/l	– [13]	3	<1	5	2	<1	4
Cobalt	ug/l	0.9	0.7	<0.5	**1.3**	0.6	0.7	**1.0**
Copper	ug/l	5	3.2	0.9	3.8	3.4	2.1	**6.8**
Iron	ug/l	300	**1330**	**738**	**5700**	**489**	**821**	**1550**
Lead	ug/l	– [14]	2.0	0.3	3.8	0.5	0.2	2.5
Magnesium	ug/l	--	13600	12500	17500	11900	16600	5720
Manganese	ug/l	–	120	208	1380	125	484	140
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	–	4760	4340	11500	6310	5900	6120
Selenium	ug/l	100	--	--	--	--	--	--
Sodium	ug/l	–	57600	145000	241000	86500	165000	101000
Zinc	ug/l	30 [11]	24	10	27	21	13	27
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	**4**

Parameter	Unit	PWQO [1]	S17 21-Nov-2019 S-17	S17 14-May-2020 S-17	S17 26-Aug-2020 S-17	S17 25-Nov-2020 S-17
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	143000	224000	246000
Ammonia, unionized	ug/l	20	0.21	2.35	1.62	0.31
Ammonia Nitrogen	ug/l	--	50	30	130	70
Biochemical Oxygen Demand, 5 Day	ug/l	--	28000	<2000	4000	<2000
Chemical Oxygen Demand	ug/l	--	76000	33000	39000	38000
Chloride	ug/l	--	275000	183000	339000	208000
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1499	836	1557	10
Dissolved Inorganic Carbon	ug/l	--	1380	33100	46400	56300
Dissolved Organic Carbon	ug/l	--	17600	16800	10600	12500
Dissolved Oxygen (Field)	ug/l	-- [7]	10230	14450	**0** [35]	10070
Hardness, Calcium Carbonate	ug/l	--	352000	194000	280000	293000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--
Nitrate as N	ug/l	--	600	<100	<100	600
Nitrite as N	ug/l	--	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	800	500	1300	600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.67	8.35	7.56	7.72
Phosphate	ug/l	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	30	**300**	**70**
Sulphate	ug/l	--	104000	48000	106000	69000
Temperature (Field)	deg c	-- [10]	0.9	19.4	18.2	0.3
Total Dissolved Solids	ug/l	--	772000	426000	866000	688000
Total Organic Carbon	ug/l	--	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	3000	47000	11000
Metals						
Arsenic	ug/l	100 [11]	<1	<1	1	<1
Boron	ug/l	200 [12]	37	17	73	24
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	104000	59800	89100	88600
Chromium	ug/l	-- [13]	1	1	2	1
Cobalt	ug/l	0.9	0.6	<0.5	**1.0**	<0.5
Copper	ug/l	5	2.9	1.7	2.3	2.0
Iron	ug/l	300	**391**	**515**	**1660**	**575**
Lead	ug/l	-- [14]	0.3	0.3	1.3	0.7
Magnesium	ug/l	--	22400	10900	14000	17400
Manganese	ug/l	--	169	158	292	88
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--
Nickel	ug/l	25	--	--	--	--
Potassium	ug/l	--	8110	3620	9020	6720
Selenium	ug/l	100	--	--	--	--
Sodium	ug/l	--	152000	88000	201000	119000
Zinc	ug/l	30 [11]	29	8	13	7
Phenols						
Phenolics, Total Recoverable	ug/l	1 [16]	**9**	<1	**6**	<4 [19]

Parameter	Unit	PWQO [1]	S18 16-Nov-2006
General Chemistry			
Alkalinity (Total as CaCO3)	ug/l	-- [5]	145000
Ammonia, unionized	ug/l	20	<0.01
Ammonia Nitrogen	ug/l	--	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000
Chemical Oxygen Demand	ug/l	--	28000
Chloride	ug/l	--	33400
Conductivity (Field)	uS/cm	--	300
Dissolved Inorganic Carbon	ug/l	--	37700
Dissolved Organic Carbon	ug/l	--	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	6800
Hardness, Calcium Carbonate	ug/l	--	147000
Nitrate as N	ug/l	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	780
pH (Field)	-	6.5 - 8.5	6.9
Phosphorus	ug/l	-- [9]	**40**
Sulphate	ug/l	--	35000
Temperature (Field)	deg c	-- [10]	6.2
Total Dissolved Solids	ug/l	--	262000
Total Suspended Solids	ug/l	--	13000
Metals			
Arsenic	ug/l	100 [11]	<1
Boron	ug/l	200 [12]	177
Cadmium	ug/l	0.2 [11]	<0.5
Calcium	ug/l	--	39000
Chromium	ug/l	-- [13]	**10**
Cobalt	ug/l	0.9	<0.5
Copper	ug/l	5	**37**
Iron	ug/l	300	**880**
Lead	ug/l	-- [14]	0.6
Magnesium	ug/l	--	12000
Manganese	ug/l	--	38
Potassium	ug/l	--	5300
Sodium	ug/l	--	49700
Zinc	ug/l	30 [11]	26
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	<1

Parameter	Unit	PWQO [1]	S19 16-Nov-2006
General Chemistry			
Alkalinity (Total as CaCO3)	ug/l	-- [5]	170000
Ammonia, unionized	ug/l	20	<10
Ammonia Nitrogen	ug/l	--	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000
Chemical Oxygen Demand	ug/l	--	34000
Chloride	ug/l	--	82600
Conductivity (Field)	uS/cm	--	450
Dissolved Inorganic Carbon	ug/l	--	42500
Dissolved Organic Carbon	ug/l	--	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	7930
Hardness, Calcium Carbonate	ug/l	--	197000
Nitrate as N	ug/l	--	1200
Nitrogen, Total Kjeldahl	ug/l	--	960
Phosphorus	ug/l	-- [9]	**200**
Sulphate	ug/l	--	38000
Temperature (Field)	deg c	-- [10]	8.6
Total Dissolved Solids	ug/l	--	379000
Total Suspended Solids	ug/l	--	82000
Metals			
Arsenic	ug/l	100 [11]	<1
Boron	ug/l	200 [12]	38
Cadmium	ug/l	0.2 [11]	<0.5
Calcium	ug/l	--	57100
Chromium	ug/l	-- [13]	8
Cobalt	ug/l	0.9	**1**
Copper	ug/l	5	**42**
Iron	ug/l	300	**1850**
Lead	ug/l	-- [14]	4
Magnesium	ug/l	--	13300
Manganese	ug/l	--	88
Potassium	ug/l	--	4900
Sodium	ug/l	--	73900
Zinc	ug/l	30 [11]	**40**
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	<1

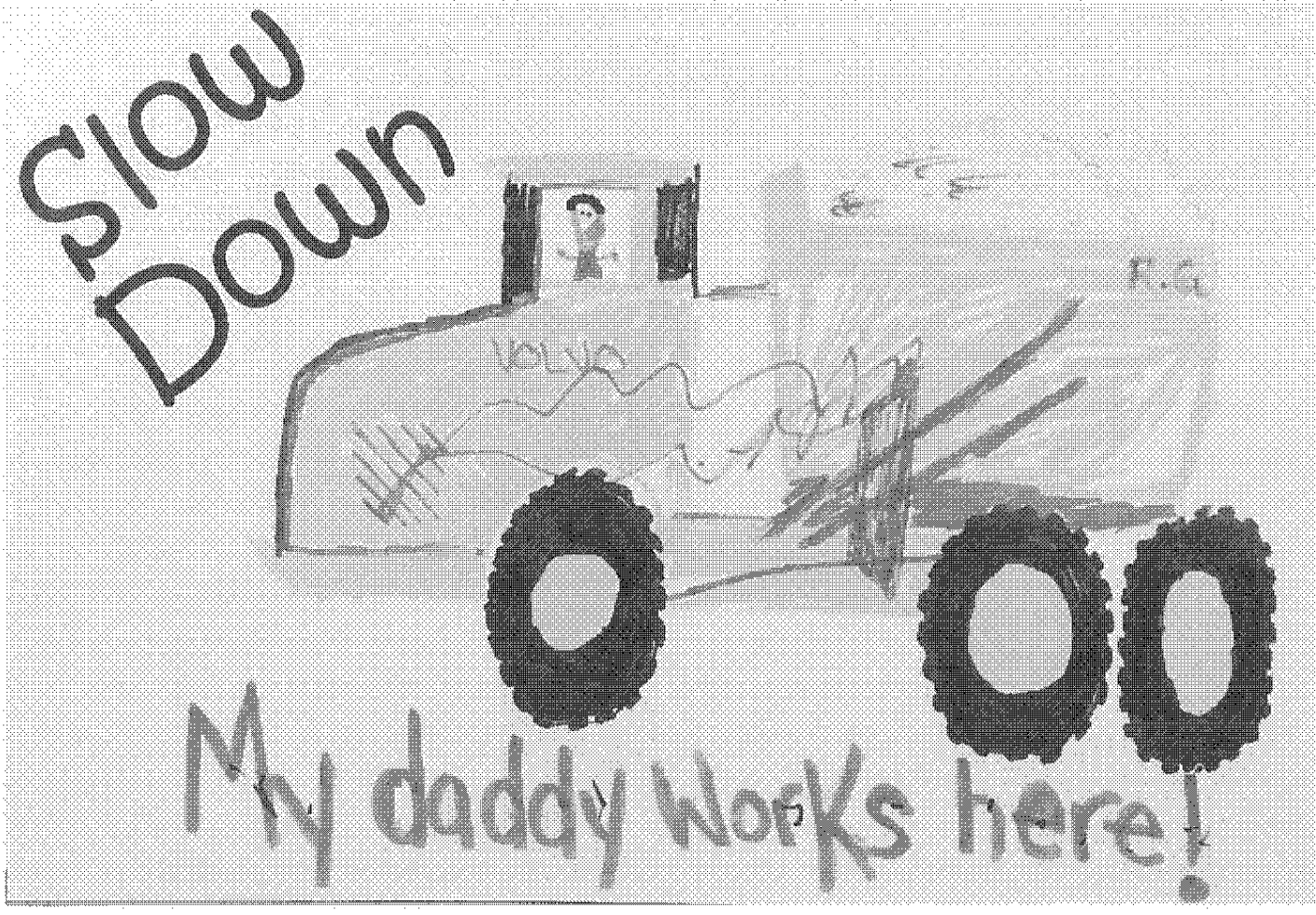
Footnotes:	
	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than PWQO
(1)	Provincial Water Quality Objectives (July 1994, reprinted February 1999)
(2)	Arsenic MRL elevated due to matrix interference.
(3)	TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.
(4)	Sampling location was slightly moved due to ditch alterations.
(5)	Alkalinity should not be decreased by more than 25% of the natural concentration.
(6)	PWQO is for free cyanide in an unfiltered water sample.
(7)	Objective depends on water temperature and biota. Dissolved oxygen concentrations should not be less than the values specified in the PWQO document for cold water biota (e.g. salmonid fish communities) and warm water biota (e.g. centrarchid fish communities).
(8)	Undissociated hydrogen sulphide.
(9)	Current scientific evidence is insufficient to develop a firm Objective at this time. Accordingly, the following phosphorus concentrations should be considered as general guidelines which should be supplemented by site-specific studies: To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L; A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to all lakes naturally below this value; Excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L.
(10)	(1) General: The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed. (2) Waste Heat Discharge: (a) Ambient Temperature Changes: The temperature at the edge of a mixing zone shall not exceed the natural ambient water temperature at a representative control location by more than 10°C (18°F). However, in special circumstances, local conditions may require a significantly lower temperature difference than 10°C (18°F). Potential dischargers are to apply to the MOEE for guidance as to the allowable temperature rise for each thermal discharge. This ministry will also specify the nature of the mixing zone and the procedure for the establishment of a representative control location for temperature recording on a case-by-case basis. (b) Discharge Temperature Permitted: The maximum temperature of the receiving body of water, at any point in the thermal plume outside a mixing zone, shall not exceed 30°C (86°F) or the temperature of a representative control location plus 10°C (18°F) or the allowed temperature difference, which ever is the lesser temperature. These maximum temperatures are to be measured on a mean daily basis from continuous records. (c) Taking and Discharging of Cooling Water: Users of cooling water shall meet both the Objectives for temperature outlined above and the "Procedures for the Taking and Discharge of Cooling Water" as outlined in the MOEE publication Deriving Receiving-Water Based, Point-Source Effluent Requirements for Ontario Waters(1994).
(11)	An Interim PWQO also exists for this parameter. See Section 1.10 of the PWQO - Where both a PWQO and an Interim PWQO exist.
(12)	See Section 1.2.3. of PWQO. This Interim PWQO was set for emergency purposes based on the best information readily available. Employ due caution when applying this value.
(13)	PWQO values exist for Cr(III) and Cr(VI)
(14)	If alkalinity as CaCO3 < 20 mg/L, PWQO = 5 µg/L; if alkalinity as CaCO3 from 20 to 40 mg/L, PWQO = 10 µg/L; if alkalinity as CaCO3 from 40 to 80 mg/L, PWQO = 20 µg/L; if alkalinity as CaCO3 > 80 mg/L, PWQO = 25 ug/L. An Interim PWQO also exists for this parameter. See Section 1.10 of the PWQO - Where both a PWQO and an Interim PWQO exist.
(15)	In a filtered water sample.
(16)	Determined by the total reactive phenols test - the 4-AAP (4-amino-antipyrine) test. This objective should be used primarily as a screening tool. The isomer specific PWQOs for various phenolics should be employed where possible.
(17)	INOG12 Water sample required digestion for Total metals analysis, which resulted in elevated detection limits.
(18)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(19)	GEN02 Elevated Reporting Limit due to matrix interference.
(20)	Monitoring location was dry during this sampling event. No sample was collected.
(21)	Metals analysis performed on aqua-regia digest of sample material excpet for Boron.
(22)	Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.
(23)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(24)	Nitrite/Nitrate: Due to the colour interferences, some sample required dilution. Detection limits were adjusted accordingly.
(25)	Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

(26)	BOD01 Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(27)	Metals analysis performed on aqua-regia digest of sample material.
(28)	TP MRL elevated due to matrix interference.
(29)	Arsenic and TP MRL elevated due to matrix interference.
(30)	Metals analysis performed on aqua-regia digest of sample material, except for Boron. Phenols MRL elevated due to matrix interference.
(31)	Metals analysis performed on aqua-regia digest of sample material except for Boron.
(32)	Phenols MRL elevated due to matrix interference.
(33)	GEN09 Elevated detection limits due to the nature of the sample matrix.
(34)	TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material.
(35)	Parameter was not measured.
(36)	Monitoring location was stagnant during sampling event. No sample was collected.
(37)	Monitoring location was frozen during this sampling event. No sample was collected.
(38)	Insufficient sample volume was collected for analysis.
(39)	At pH 4.5 to 5.5 the Interim PWQO is 15 µg/L based on inorganic monomeric aluminum measure in clay-free samples; At pH > 5.5 to 6.5, no condition should be permitted which would increase the acid soluble inorganic aluminum concentration in clay-free samples to more than 10% above natural background concentrations for waters representative of that geological area of the Province that are unaffected by man-made inputs. At pH > 6.5 to 9.0, the Interim PWQO is 75 µg/L based on total aluminum measured in clay-free samples. If natural background aluminum concentrations in water bodies unaffected by man-made inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level. Note: pH values of < 6.5 and > 8.5 are outside the range considered acceptable by the PWQO for pH. See the Scientific Criteria Document for Development of Provincial Water Quality Objectives and Guidelines - Aluminum for a discussion of analytical procedures.
(40)	Metals analysis performed on aqua-regia digest of sample material, except for Boron.
(41)	TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.

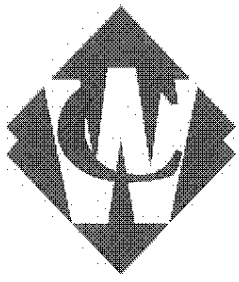
WASTE CONNECTIONS OF CANADA

NAVAN WASTE RECYCLING AND DISPOSAL FACILITY

3354 NAVAN ROAD, OTAWA, ON K4B 1H9



OPERATIONS AND MONITORING REPORT 2021



WASTE CONNECTIONS OF CANADA

3354 NAVAN ROAD, OTAWA, ON K4B 1H9
Tel: 613-824-7289 Fax: 613-824-6730

2021
OPERATIONS AND MONITORING REPORT

Waste Connections of Canada Inc.
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 Navan Road, Ottawa, Ontario

March, 2022

EXECUTIVE SUMMARY

The Navan Waste Recycling and Disposal Facility is a 91.87 ha waste management facility that includes a 40 ha landfill as well as processing (recycling) operations. The Site is located in the east end of the City of Ottawa (formerly in the City of Gloucester) and is owned and operated by Waste Connections of Canada Inc. (WCC).

The site currently operates under amended Environmental Compliance Approval (ECA) for a waste disposal site (ECA # A460702) re-issued April 16th, 2009 with subsequent amendments (Notices 1 through 13) as well as an ECA for Industrial Sewage Works, ECA # 5616-86NKNW amendment dated June 29th, 2010 and ECA Air # 3536-8APNZD amendment dated November 24th, 2010 and ECA # 4024-9WFQE5 dated June 8th, 2015 and ECA # 2427-AETKQ5 dated November 14, 2016. The waste ECA also incorporates and makes reference to the Design and Operations (D&O) Report for the Site prepared by Golder Associates and dated January 2008.

An emergency amendment under Notice No. 13 dated September 29, 2021 was received which stipulated the following: Emergency Notice for Soils was issued permitting up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021 and contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1.

The Facility is approved to receive solid non-hazardous and asbestos waste, excluding putrescible waste. Landfilling is restricted to waste generated within the Province of Ontario, excluding the City of Toronto. The site includes a processing facility for the recycling of waste materials and treatment of hydrocarbon impacted soils. The processing site is approved to receive solid non-hazardous waste, excluding putrescible waste, generated within the Outaouais Region of the Province of Quebec and within the Province of Ontario, excluding the City of Toronto. The site is also approved to host household hazardous waste (HHW) day events, whereby, the waste is received by a carrier approved through valid certificates of approval to receive, temporarily store and transport HHW to an approved waste disposal site. Other than during HHW events, no hazardous or liquid industrial wastes, as defined in O. Reg. 347, R.R.O. 1990, are permitted at the site. Most of the waste handled at the Site is generated within the City of Ottawa and neighbouring municipalities.

In 2021, a total of 513,078 tonnes of materials entered the site. Of this total, 190,415 tonnes (37.11%) were received as landfill material; 5,074.24 tonnes (1.0%) were recycled and removed from the site; and an estimated 36 tonnes (0.01%) were waste materials rejected and removed from the site by WCC for alternative disposal at another licensed facility. Other materials received for re-use on site included 40,041 tonnes (7.8%) of rock, brick, shingles, concrete and rubble re-used as aggregate for road construction and staging area pads; 8,120 tonnes (1.58%) of clean fill, topsoil, and asphalt re-used on site for final grading, road/pad construction and engineered fill; 95,846 tonnes (18.68%) of treated soils or soils re-used on site; and 173,546 tonnes (33.82%) of special materials such as storm sewer screenings and impacted non-hazardous soils received at the site for re-use as daily cover material.

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Golder Associates Ltd. estimated the air space used by measuring the volumetric changes between topographic mapping generated from aerial photography obtained on May 1st, 2021 and the previous year on April 28th 2020. The net estimated air space used (ASU) between the last two aerial survey dates was reported to be 319,316 m^3. Records indicate that the ASU during that period of time was consumed by approximately 380,715 tonnes of waste, daily cover material and other materials resulting in a density calculation of 1.19 tonnes/m^3 and a five year average density of 1.42 tonnes/m^3. Air space used was also calculated based on assigning assumed waste densities to the various waste streams received and landfilled, cover material and re-used materials placed within the air space from May 1st to December 31st, 2021. Using this approach, it is estimated that approximately 244,244 m^3 of remaining air space was used and excludes materials diverted off site for recycling and some materials re-used outside the air space. Based on this approach, the weighted average of the in-place density for all of the materials used in the air space calculation was estimated to be 1.34 tonnes/m^3. The variance in density calculations could be attributed to factors such as cell excavation and settlement which influence the year over year volume calculations. The air space remaining as of January 1st, 2022 was estimated to be 1,252,969 m^3.

Under the present Environmental Compliance Approval (ECA), the life expectancy remaining for the Navan Waste Recycling and Disposal Facility as of January 1st, 2022 is estimated to be 5.1 – 5.2 yrs (2027) based on future projected maximum annual waste receipts for landfilling including daily cover of 344,750 tonnes and a 5 year average waste density of 1.42 tonnes/m^3. The actual life of the landfill will vary based on annual fill rates, in-place waste densities, waste diversion and recycling initiatives at the Facility, and the rate of air space development.

Diversion through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the Navan Facility. For example, all daily and intermediate cover needs are met by substituting the use of virgin soils with the re-use of significant quantities of impacted soils. Brick, concrete, asphalt and rubble are also recovered for re-use each year in the construction of access roads. Roofing shingles free of paper and other debris are also re-used on site as a sub-base for roads and pads over which a base of aggregate or recycled asphalt is placed. In addition, steel, aluminum, wood, tires and white goods are recovered daily from the active face for recycling. Recycling of E-waste and drywall was continued in 2021 as a service to the local community. Hydrocarbon contaminated soils treated in 2021 were re-used at the site as final cover material and structural fill within the east buffer area.

Materials received by the Navan Waste Recycling and Disposal Facility are those which IC&I generators have generally deemed to be waste and of no further value (i.e., post diversion at the source). Many of the waste generators, serviced by waste collection contractors who bring waste to the Site, also divert materials from landfill at their place of business prior to collection. Recycling within the IC&I sector is regulated by the Ministry of the Environment, Conservation and Parks under Regulations 101, 103 and 104. While the Site receives post-diversion waste materials from the IC&I sector, WCC has procedures in place to screen the incoming waste for recyclable material in what is known as a "last chance harvest" which is a "positive" sort where the recyclable item must be removed from the mixed waste mass. In this case, the majority of the material is not recyclable (i.e. it is waste). This is very different than recycling from "source separated" material, which results in a "negative" sort, where the waste components are removed from what is predominantly recyclable material. WCC also encourages and receives "clean" recyclable materials such as drywall, metal, electronics and glass where such materials can be shipped to market in bulk in efforts to make the recycling of such materials more economically viable.

The Navan Waste Recycling and Disposal Facility diverted over 149,081 tonnes of material from disposal in 2021, and over 440,508 tonnes during the past 5 years. For 2021, this represents a "last chance harvest" diversion rate of 43.9% and excludes the re-use of impacted soils for daily cover material. This is in addition to the diversion rate for IC&I waste considered to occur at the source. WCC will continue to improve waste diversion and recycling initiatives at the Navan Facility and pursue economically viable waste diversion opportunities to help the local community and WCC clients achieve a better IC&I recycling rate.

Significant activities and capital works undertaken between January 1st and December 31st, 2021 included active landfilling in Phase 6 (refer to Figure 2.4); excavation of clay cover material in the N-E quadrant of Phase 8; continued recycling operations at the facility with treatment of hydrocarbon impacted soils; screening of coarse granular soils to separate rock from soil for re-use; pre-treatment and disposal of collected leachate to ROPEC for off-site treatment; retained Dillon Consulting Limited to undertake Airborne Contaminant Discharge Monitoring and Reporting requirements for the landfill site as well as the National Pollutants Release Inventory and Green House Gas reporting; retained Golder Associates to carry out surface water, groundwater, leachate, gas and noise monitoring and reporting programs; added clay cover to completed fill areas of the landfill; constructed a new perimeter access road on the east side of the waste footprint; retained Base Mapping to undertake aerial photos and prepare topographic mapping of the site; retained Les Entreprises Forlam Inc. to construct the perimeter 300 mm diameter landfill gas collection pipe line along the north, west and east limits of the waste footprint; retained Farrell & Sons to construct the concrete pads for the permanent enclosed gas flare and abstraction plant; and, retained Perennial Energy, LLC to manufacture, assemble, package, check, test, and deliver a Landfill Gas Extraction Plant and Enclosed Flaring System.

Leachate generated by the landfill is collected by a drainage system consisting of three separate components that gravity flow to a leachate treatment and pumping station located at the southeast corner of the waste pile and a fourth located in the east cell that is pumped to the on-site treatment station. Presently, the disposal method of choice for the pre-treated leachate is direct discharge to the City of Ottawa sewer system via approximately 2 km of forcemain. In 2021, a total of 88,591 m^3 of pre-treated leachate was discharged to the City of Ottawa wastewater system, a 33.3% reduction over 2020. The decrease is attributed to efforts to reduce the infiltration of surface water runoff into the waste. There were no issues reported with the operation of the leachate treatment and pumping system in 2021.

The WCC Facility is ideally situated on a thick deposit of Champlain Sea Clay (Leda Clay). The clay deposit at this site ranges from 22 metres to greater than 33 metres in depth. A clay ridge that cuts across the site rises approximately 18 m above the floor of an abandoned Ottawa River Channel. This results in surface water and shallow groundwater flowing in a southward direction. The Site is located on the northern fringe of the Mer Bleue Bog, a well-known salt water bog that is an Area of National Scientific Interest (ANSI). These natural features are ideal for the control and monitoring of leachate at the site.

Environmental control systems and operational activities that include the operation and maintenance of an elaborate perimeter leachate collection system (LCS) and surface water diversion works are monitored in accordance with the conditions of the ECA. Monitoring carried out to identify areas of environmental concern includes measuring water quality parameters in surface water and in groundwater at the site's boundary as well as in the leachate generated by the landfill. Monitoring for the presence of landfill gas was also carried out. In addition, sediment quality monitoring at three locations within the Mer Bleue Bog that was started in 2000 at the request of the National Capital Commission (NCC) was continued.

The monitoring program carried out in 2021 was a continuation of the monitoring program already in place for this site.

Based on the groundwater levels obtained during the 2021 monitoring program, no significant change in groundwater flow patterns has been observed.

Groundwater at the Navan Waste Recycling and Disposal Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (unweathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present in each of these units up-gradient, at the down-gradient edge of the waste pile (used to assess compliance) and further down-gradient of the landfill within the buffer zone.

The objectives of the 2021 Environmental Monitoring Program were to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702; to assess any potential impacts on water quality at the site resulting from landfill operations; to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the Facility; to document the chemical composition of groundwater and surface water in the vicinity of the Facility; to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate; and to document the chemical composition of sediment at three locations in the Mer Bleue Bog.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2020 background range.

Leachate quality monitoring results for 2021 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Trigger concentration exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

WCC's efforts were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented.

In 2021, there were two confirmed exceedances (continued increase in concentration beyond the background range), manganese concentration in the weathered clay at OW-92-10 in November 2021 and the ammonia concentration in the intact clay at MW-07-1B in November 2021. These two confirmed exceedances were reported by Golder to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in the 2021 Landfill Monitoring report and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions.

The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

In 2002/2003, an assessment of the WCC Navan Facility operations was undertaken in support of a WCC-NCC (WSI-NCC) exchange of land parcels located south of the Navan Facility along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

A Monitoring and Screening Checklist prepared and signed by a Competent Environmental Practitioner (CEP) is included with the Golder 2021 Landfill Monitoring report attached as Appendix '1'.

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program and sediment monitoring which is proposed to be discontinued. As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to

collect a sample during a dry period (i.e., in the summer or the fall depending on site conditions) as has been done between 2014 and 2021.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the November 2021 monitoring session and will be monitored again in the spring of 2023.

In 2021, Golder Associates Ltd. (GAL) was retained to carry out the landfill gas monitoring program. The monitoring program undertaken was a continuation of the monitoring program already in place for this site and the results of the monitoring events undertaken are presented in more detail in the GAL report provided in Appendix '2'.

LFG monitoring was undertaken in May, August and December 2021. At most locations monitored, methane gas was detected at concentrations lower than 1.25% by volume. Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 1.25% by volume at MH-2 (G18-a), MH-3 (G13-a), MH-4 (G-12a) and MH-5 (G11-a) in August 2021, MH-7 (G5-a), MH-9 (G3-a), and MH-10 (G2-a) in December 2021.

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the WCC Navan Facility based on the 2021 monitoring results. Although no monitoring locations are available below surface at the property boundary, it is anticipated that the WCC Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events, with the exception of MH-6 (G6-a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), in May 2021 which reported relatively low detection (1 part per million or 1 ppm).

It is noted that an interim LFG odour control system was installed in 2011 and commissioned in April 2012. Extensions to the LFG odour control system were installed in 2016, in 2017 and in 2019. The additional wells installed in 2017 and 2019 are intended to be part of the future permanent LFG collection system. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells. In 2021, construction of the permanent landfill gas collection system was started consisting of the construction of the 300 mm diameter HDPE landfill gas header pipe along the north, west and south perimeters of the waste footprint and construction of the concrete pads for the enclosed flare and abstraction plant.

out. In 2022, landfilling will continue in the last completed cell identified as Phase 6 and north part of Phase 1. Closure work will be carried out on the north side of Phase 6 and the east sides of Phase 6 and Phase 1 where final waste grades will have been reached.

The development of the remaining landfill capacity in the area of Phase 6 and Phase 1 (east cell expansion) requires the filling and compaction of material along the east waste limit. Soil management practices will include the following:

- Treated soils will be placed and compacted in the east buffer area;
- Excavation of clay from the Phase 8 area will occur in the first three quarters of 2022;
- Sediment control measures will be taken so that inactive areas such as soil stockpile side slopes are seeded; silt fences are installed as required around the perimeter of disturbed areas; and surface runoff from the stockpile areas will be channeled to the internal ditch system which will drain to the site's stormwater retention ponds.

Along with landfilling operations, other site operations expected to be carried out in 2022 will consist of the following:

- Provide additional landscaping to completed final cover areas on the north surfaces of Phase 4.
- Re-align surface runoff away from fill areas and cell construction areas.
- Raise grades at the east waste limit and grade to direct surface runoff away from waste.
- "Last Chance Harvest" of recyclable waste will continue in the active face using specialized heavy equipment as per present practice.
- Increase efforts to sort and divert waste from small vehicles at the small vehicle drop-off area and provide incentives to clients to sort materials at source, prior to arrival at the Site.
- Establish markets for new recyclable materials and increase the types of materials to be recycled at the site.
- Enhance treatment of hydrocarbon impacted soils.
- Construct a working pad in the area of Phase 1 for recycling activities.
- Expand the east end of the existing recycling pad north into Phase 8.
- Continue the screening of rock out of contaminated soils received at the site.
- Add additional wells (horizontal and/or vertical) to the landfill gas flaring system, if required, to enhance and control fugitive gas in fill areas and odours from the landfill.
- Construct the perimeter landfill gas forcemain along the east waste perimeter as designed by Golder Associates and connect to the existing landfill gas collection system.
- Install and commission the permanent enclosed flare and abstraction plant.
- Extend and complete the east access road onto the top of Phase 1.

The 30 m buffer at the northern, eastern and western perimeter of the landfill and the 10m buffer at the southern perimeter will continue to be maintained as required by the ECA. Aesthetic improvements at the site will continue to be an on-going objective.

In August 2007, WCC (WSI) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Approval under the Ontario Environmental Protection Act (EPA) as well as other legislation were also received which culminated in the issuance of the above noted Certificates of Approval for the Site. Condition 4 of the EAA approval required that WCC (WSI) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WCC's compliance monitoring program (EAAB File # is EA 02 08 02). In accordance with Condition 3 of the EA approval, WCC has previously submitted a separate document proposing an EA Compliance Monitoring Program. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of follow up EACMRs with submission of the Annual Operations and Monitoring Report. Accordingly, this EACMR is submitted as Appendix 5 to this Annual Report and covers the period January 1st to Dec. 31st, 2021. No non-compliance issues were identified during the reporting period.

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1. INTRODUCTION

The Waste Connections of Canada Inc. (WCC) Navan Waste Recycling and Disposal Facility operates under the Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) for a Waste Disposal Site number A460702 as amended. The site is approved to receive solid non-hazardous and asbestos waste, excluding putrescible waste. Landfilling is restricted to waste generated within the Province of Ontario, excluding the City of Toronto. The processing site is approved to receive solid non-hazardous waste, excluding putrescible waste, generated within the Outaouais Region of the Province of Quebec and within the Province of Ontario, excluding the City of Toronto. The site is also approved to host household hazardous waste (HHW) day events whereby the waste is received by a carrier approved through valid certificates of approval to receive, temporarily store and transport HHW to an approved waste disposal site. Other than during HHW events, no hazardous or liquid industrial wastes, as defined in O.Reg 347, R.R.O. 1990, are permitted at the site. Most of the waste handled at the site is generated within the City of Ottawa and neighbouring municipalities. The site is also approved to treat contaminated soils.

This report presents the annual operating and monitoring conditions for the site to the Ministry of the Environment , Conservation and Parks (MECP) pursuant to Conditions 135 and 136 of the ECA No. A460702. The site is located in the eastern portion of Ottawa, Ontario on Part of West Half of Lot 2, Part of Lots 3 and 4, Concession IV, Ottawa Front (Parts 1, 2 and 3 on Plan 4R-19707, Parts 1 and 2 on Plan 5R-13200, Parts 1, 2, 3, 5 and 6 on Plan 5R-11073, Parts 1 and 2 on Plan 5R-11716 also referred as Parts 1, 2 and 3 on Plan 4R-21920), 3354 Navan Road, Township of Gloucester, now in the City of Ottawa, UTM Easting: 460570, UTM Northing: 5030570 at the front entrance to the site (see Key Plan, Figure 1.1 and Survey Plan, Figures 1.2 and 1.3).

1.1 BACKGROUND

The site was formerly owned and operated by Huneault Waste Management Ltd., and has undergone a series of name changes beginning with Waste Services Inc. (WSI) in 2000. In 2002, Capital Environmental Services Inc. (CERI) acquired WSI and kept the operating name of WSI. Later, in July 2010, WSI merged with BFI Canada Inc. BFI Canada Inc. changed name to Progressive Waste Solutions Canada Inc. and later merged with Waste Connections Inc. now operating in Canada as Waste Connections of Canada Inc. (WCC). The Site started operations in the early 1960s, and has operated under the Environmental Compliance Approval (ECA) No. A460702 first issued in 1971 by the Ministry of the Environment, Conservation and Parks (MECP) and numerous amendments since. The current ECA approval officially revoked and replaced the previous approval dated May 12, 2006 due to the site's expansion in 2009. The following summarizes the notices that have amended the current ECA No. 460702:

- Notice No. 1 dated October 9, 2009: Permitted construction of base liner and leachate collection system for the east cell expansion.
- Notice No. 2 dated August 4, 2010: Widening of Navan Road.
- Notice No. 3 dated November 1, 2010: Landfill Gas Odour Control System.

- Notice No. 4 dated April 29, 2011: Financial assurance update (processing site)
- Notice No. 5 dated June 13, 2012: Financial assurance update (processing site)
- Notice No. 6 dated April 19, 2013: Financial Assurance update (processing site)
- Notice No. 7 dated February 25, 2014: Financial assurance update (landfill)
- Notice No. 8 dated June 8, 2015: Soil Treatment Pad
- Notice No. 9 dated February 1, 2016: Financial assurance update (landfill)
- Notice No. 10 dated March 14, 2017: Landfill and Processing Facility Financial Assurance
- Notice No. 11 dated June 19, 2018: Landfill and Processing Facility Financial Assurance
- Notice No. 12
- Notice No. 13 dated September 29, 2021: Temporary Tonnage Exemption for Contaminated Soil

The site also operates under an ECA for Industrial Sewage Works, ECA # 5616-86NKNW amendment dated June 29th, 2010 and ECA Air # 3536-8APNZD amendment dated November 24th, 2010, ECA # 4024-9WFQE5 dated June 8, 2015 and ECA # 2427-AETKQ5 dated November 14, 2016. The waste ECA also incorporates and makes reference to the Design and Operations (D&O) Report for the site prepared by Golder Associates and dated January 2008.

The site occupies a 91.87 hectare (ha) property (blue and green areas on Fig. 1.2) that includes a 40 ha area currently approved for recycling and disposal (red area on Fig. 1.2). Figure 1.2 depicts the existing approved waste boundaries at the site including the total land area currently owned by WCC. The site receives solid, non-hazardous industrial, commercial and institutional (IC&I) waste including construction and demolition (C&D) waste, asbestos waste, dry non-putrescible (i.e., non-organic) domestic waste and impacted soil. The approved service area for the receipt of waste for disposal is the Province of Ontario excluding the City of Toronto. The approved service area for processing/recycling and transfer includes the Province of Ontario (excluding the City of Toronto) and the Outaouais Region of the Province of Quebec (consisting of Quebec Region 7 including La Vallée-de-la-Gatineau, Pontiac, les Collines-de-l'Outaouais, Papineau and the City of Gatineau). Solid non-hazardous industrial and commercial waste including C&D waste and dry domestic recyclable waste may be received for processing. In 2015 the site was approved for the treatment of contaminated soils (ECA Amendment Notice 8) as part of its processing operations.

The remaining operating life for the landfill disposal site is influenced significantly by a number of factors such as the waste mix, the annual waste receipts, materials recycled and re-used, and the density of the in-place waste to name a few. Consequently, the remaining life can only be estimated to extend to the year 2027 based on current site approvals and projected annual waste receipts (refer to Section 5).

The last expansion of the Navan Waste Recycling and Disposal Facility received approval under the Ontario Environmental Assessment Act (EAA) in 2007 and approval under the Ontario Environmental Protection Act (EPA) as well as other legislation in 2009. Major amendments to the Environmental Compliance Approval for a waste disposal site (ECA # A460702) were issued as listed above. An Environmental Compliance Approval for Industrial Sewage Works, ECA # 4816-7C7M6C issued on April 16th, 2009 was amended by ECA # 5616-86NKNW on June 29th, 2010. An Environmental Compliance Approval Air, ECA # 6733-7BYS9A issued on April 16th, 2009 was amended by ECA # 3536-8APNZD on November 24th,

2010 and by ECA # 4024-9WFQE5 on June 8th, 2015 and by ECA # 2427-AETKQ5 dated November 14, 2016.

The site is situated on a thick deposit of Leda clay and is located immediately north of a large bog (Mer Bleue). The underlying clay deposit serves as a natural liner system. Leachate management activities include the operation of a leachate collection system that consists of a perimeter collector and underdrain systems. A leachate pre-treatment/pumping station and forcemain connection to the City of Ottawa sanitary sewer system was completed in 2007 and commissioned in early 2008. It continues to be used for the management of leachate generated by the facility. Surface water is diverted around the landfill footprint through a series of berms, swales and ditches. Landfill gas generated by the facility continues to be monitored and an interim landfill gas odour control system approved by the Technical Standards and Safety Authority (TSSA) was constructed and commissioned in early 2012. Design details for a permanent landfill gas collection and enclosed flaring system was completed by Golder Associates Ltd. and construction was started in 2021.

1.2 PURPOSE AND ORGANIZATION OF REPORT

This document is referred to as the Operation and Monitoring (O&M) Report. The O&M components specifically described in this document include the following:

- Zoning and surrounding land uses;
- Existing facilities and utilities;
- Geology;
- Hydrogeology;
- Surface water flow system;
- Mer Bleue Bog;
- Description of operations (2021);
- Waste quantities and characteristics;
- Site capacity and life expectancy;
- Surface water management;
- Leachate management;
- Landfill gas management;
- Groundwater quality assessment;
- Leachate water quality assessment;
- Surface water quality assessment;
- Sediment quality assessment;
- Landfill gas monitoring results;
- Diversion of waste and other materials from disposal; and
- Proposed 2022 operations.

All O&M components described in this report have been prepared to address the Conditions of the ECA for the Navan Waste Recycling and Disposal Facility, ECA No. A460702.

1.3 *WASTE QUANTITIES*

The maximum total amount of waste that can be received at the site for disposal is controlled by the site's approved final waste contour plan. Base on the final waste contour plan approved, the estimated total air space for the site was approximately 7.6 million cubic metres. Under the current ECA (#A460702), the maximum annual amount at which the site can receive waste for disposal (excluding daily and interim cover material) is 234,750 tonnes per year. The maximum daily rate, averaged over a year, at which the site can receive waste (including daily and interim cover material), is 1500 tonnes per day. The maximum amount of unprocessed material and residuals from the processing operation that may be stored on site at any one time is 225 tonnes. In 2021, an Emergency Notice for Soils was issued permitting up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021 and contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1.

Diversion, through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the Navan Waste Recycling and Disposal Facility. Management is constantly searching for on-site and off-site diversion or re-use opportunities to ensure that approved disposal capacity is preserved and used for the disposal of waste material of least commercial value. Given the provincial policy and regulations concerning waste diversion from landfill, the site will continue to provide critical support to the City and Province in their efforts to meet diversion targets while at the same time ensuring essential disposal capacity is available locally.

1.4 *ECA AMENDMENTS (2021)*

The site currently operates under amended Environmental Compliance Approval (ECA) for a waste disposal site (ECA # A460702) re-issued April 16th, 2009 with subsequent amendments (Notices 1 through 13). An emergency amendment under Notice No. 13 dated September 29, 2021 was received which stipulated the following: Emergency Notice for Soils was issued permitting up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021 and contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1. A copy of the MECP amendment Notice No. 13 is provide in Appendix 4, Schedule 'D'.

1.5 *ENVIRONMENTAL ASSESSMENT COMPLIANCE MONITORING REPORT (EACMR)*

In August 2007, WCC (formerly WSI) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Approval under the Ontario Environmental Protection Act (EPA) as well as other legislation were also received which culminated in the issuance of the above noted Environmental Compliance Approval for the site. Condition 4 of the EAA approval required that WCC (WSI) prepare an annual compliance report describing the

extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WCC's compliance monitoring program. In accordance with Condition 3 of the EA approval, WCC had previously submitted a separate document proposing an EA Compliance Monitoring Program. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of follow up EACMRs with the submission of the annual Operations and Monitoring Report. Accordingly, this EACMR is submitted as Appendix 5 to this annual report and covers the period January 1st to Dec. 31st, 2021.

No non-compliance issues were identified during the 2021 reporting period.

The Ministry's EAAB File # is EA 02 08 02.

1.6 *HISTORY OF THE FACILITY*

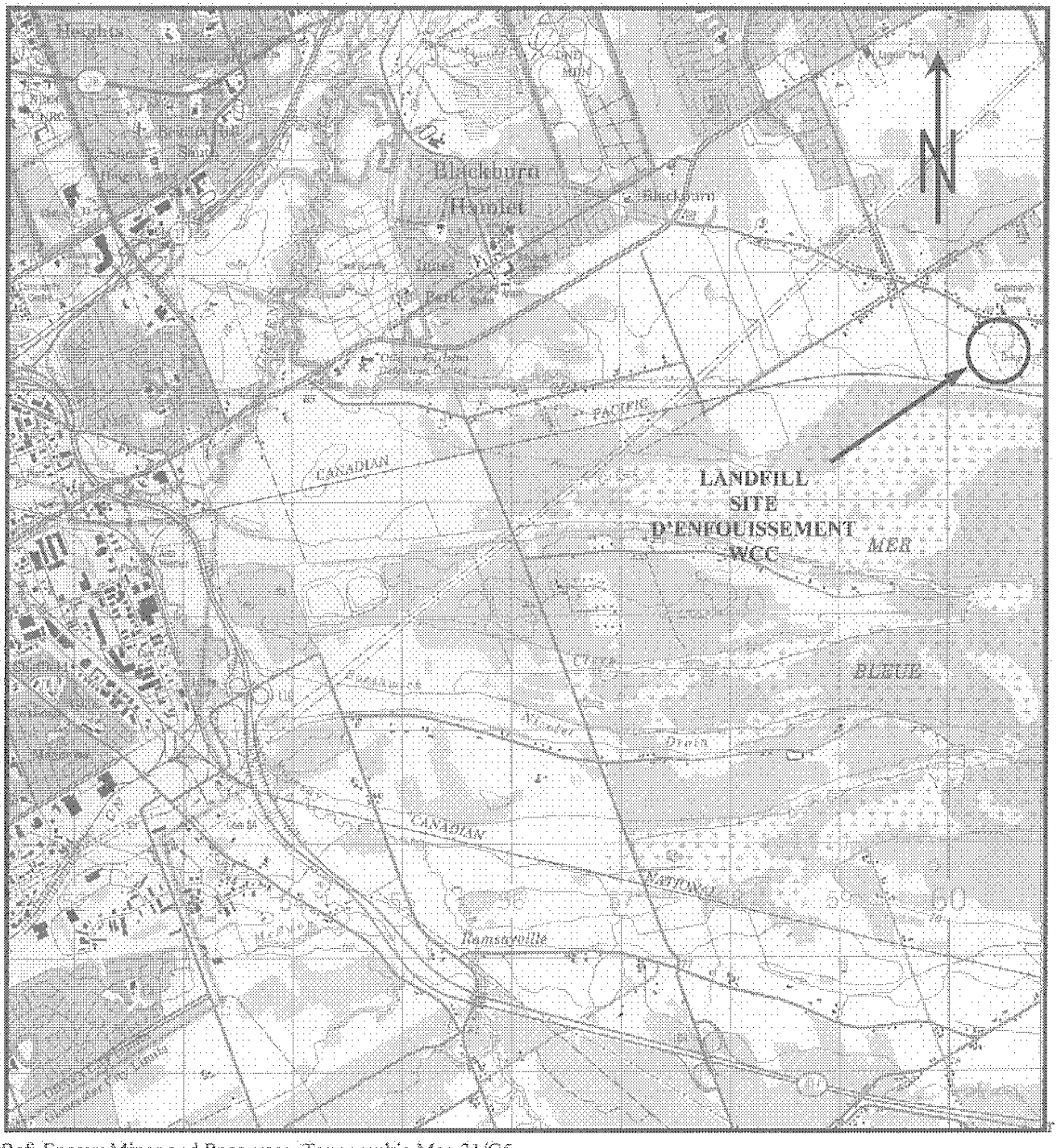
Landfilling at the site started in the early 1960s and served, at the time, as a rural dump operation for local residents. In 1971, the Ministry of the Environment (MOE) issued an Environmental Compliance Approval (CofA No. 460702) to Mr. D. J. Huneault for disposal of industrial waste including construction and demolition waste. Currently the site receives all types of solid, non-hazardous waste for disposal excluding putrescible waste. In 1995, the CofA was amended for the operation of waste processing and composting facilities at the site. Composting operations were later suspended with the issuance of the ECA amendments in April 2009 for the landfill expansion.

Annual monitoring of groundwater and surface water was initiated in 1987 and has evolved into a comprehensive monitoring program that is reported to the MECP on an annual basis. In 1992, a leachate collection system was constructed along the down-gradient toe of the landfill and surface water diversion ditches were constructed up-gradient within the north buffer zone. Leachate was initially collected in retention ponds and re-circulated onto and into the landfill following treatment through a peat filter and constructed wetland system. Transport of leachate by tanker truck to the municipal wastewater treatment plant was initiated in 1997 following odour issues related to leachate storage ponds. Presently, leachate is pre-treated on site and discharged to the City of Ottawa sewer system for treatment at the Robert O. Pickard Environmental Centre (ROPEC). Construction of the existing leachate pre-treatment/pumping station and forcemain connection to the sanitary sewer system was completed in 2007 and commissioned in early 2008.

In 2011, a landfill gas collection and flaring system was constructed as an interim odour control system. This system was commissioned and approved in April of 2012 by the Technical Standards and Safety Authority (TSSA) and has since remained operational. Permanent vertical gas wells were last added in the Phase 4 area of the landfill in 2019. In 2020, one horizontal gas well was added to the landfill gas collection system in the northwest corner of Phase 1. In 2021, construction of the permanent landfill gas forcemain and abstraction plant was started.

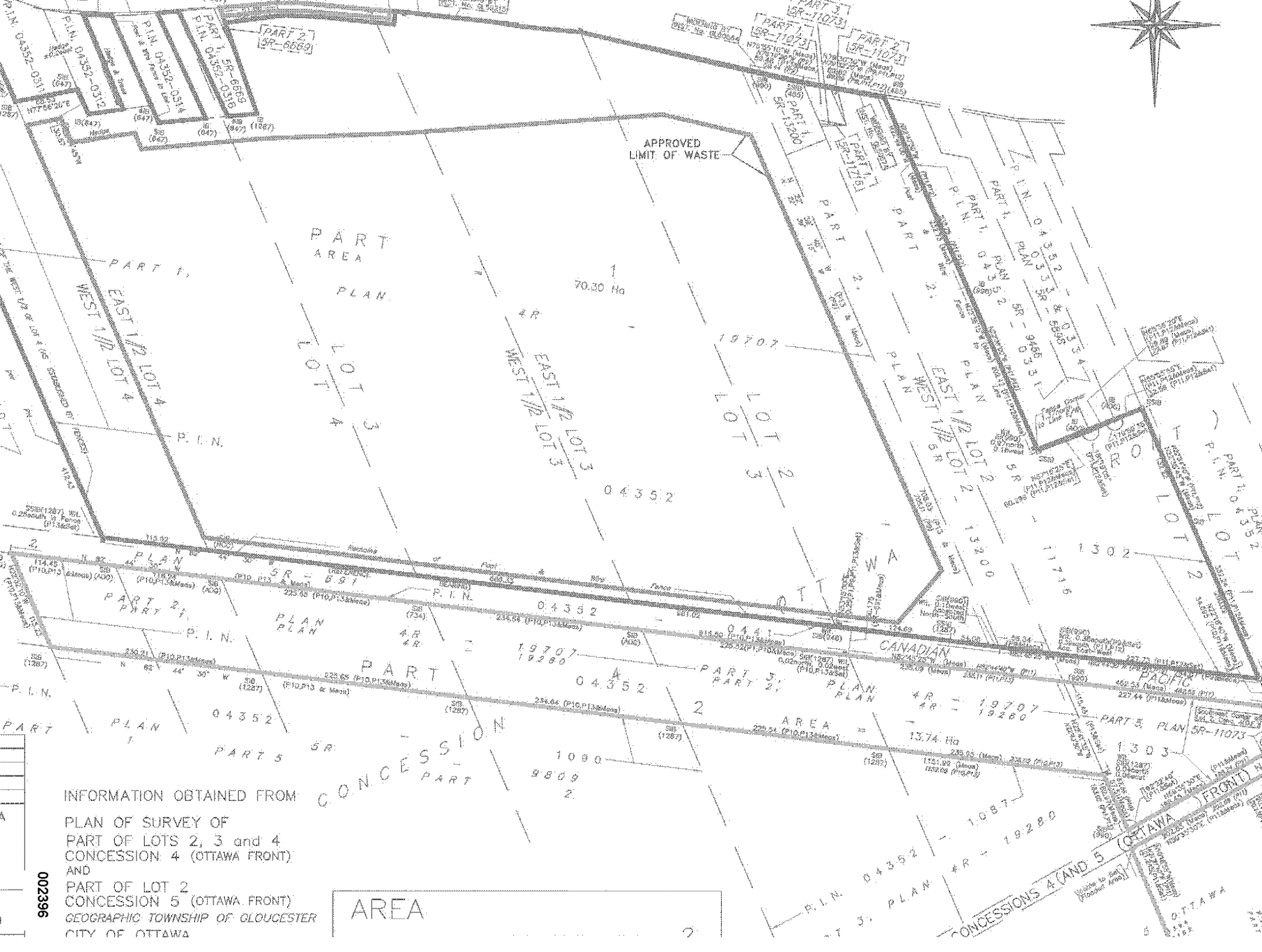
In June of 2015, the site was approved for the treatment of contaminated soils as part of the site's processing operations. Treatment of hydrocarbon impacted soils has since been on-going.

A more detailed record of milestones in the site's history is presented in Appendix 4 – Schedule 'C'.



Ref: Energy Mines and Resources, Topographic Map 31/G5

FIGURE 1.1	**KEY PLAN**	WASTE CONNECTIONS OF CANADA


APPROVED
LIMIT OF WASTE
PART 1, 5R-6669
PART 2, 5R-6669
PART 1, 5R-11073
PART 2, 5R-11073
PART 3, 5R-11073
PART 1, 5R-13200
PART 1, 5R-11716
P.I.N. 04352-0312
P.I.N. 04352-0314
P.I.N. 04352-0318
P.I.N. 04352-0319
P.I.N. 04352-0331
P.I.N. 04352-0333
P.I.N. 04352-0334
P.I.N. 04352-0335
P.I.N. 04352-0336
P.I.N. 04352-0337
P.I.N. 04352-0338
P.I.N. 04352-0339
P.I.N. 04352-0340
P.I.N. 04352-0341
P.I.N. 04352-0342
P.I.N. 04352-0343
P.I.N. 04352-0344
P.I.N. 04352-0345
P.I.N. 04352-0346
P.I.N. 04352-0347
P.I.N. 04352-0348
P.I.N. 04352-0349
P.I.N. 04352-0350
P.I.N. 04352-0351
P.I.N. 04352-0352
P.I.N.

OF

(A FRONT)
GLOUCESTER

SURVEYING LTD.

SCALE = 1:500

0 5 10 20 30 40 50

BEARING NOTE

BEARINGS ARE GRID AND ARE DERIVED FROM THE EASTERLY LIMIT OF PART 2, PLAN 5R-6003, SHOWN ON PLAN 04-21920 AS HAVING A BEARING OF N16°36'15"W.

LEGEND

⊕	SURVEY MONUMENT FOUND
⊡	SURVEY MONUMENT SET
SIB	STANDARD IRON BAR
SSIB	9.5mm STANDARD IRON BAR
IB	IRON BAR
m	(MEASURED)
CU	CROWN LAND UNKNOWN
Acc.	ACCEPTED
WIT	WITNESS
---x---	FENCE
990/00F	J.G. FAYETTE, O.L.S.
1287/FSD /1882	FARLEY, SMITH & DENIS SURVEYING LTD.

NOTE: ALL BEARINGS, DISTANCES AND MONUMENTS ARE PER PLAN 4R-21920, UNLESS NOTED OTHERWISE.

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE: AUGUST 18, 2009

RONALD A. DENIS
ONTARIO LAND SURVEYOR

SCHEDULE

Part	Lot	Concession	P.I.N.
1	Part of Lot 3	A (O.F.)	PART of P.I.N. 04352-1302

PLAN 4R-23883

RECEIVED AND DEPOSITED

DATE: August 18, 2009

Asst. Dep. C. Holloway

LAND REGISTRAR FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON No.4

REGIONAL ROAD No. 22

ROAD

NAVAN

(AS WIDENED BY BY-LAW No. 1750, INST. No. GL73185)

CENTRELINE

P. I. N. 04352

P. I. N. 04343

EXISTING

WIDENING BY INST. No. GL59239

WIDENING BY INST. No. GL59244

ROAD ASSUMPTION BY BY-LAW 16-87 INST. No. N376812

PART 1

AREA = 983.0m²

PART 1, PLAN 4R-21920

P. I. N. 04352-1302

EAST 1/2 LOT 3

WEST 1/2 LOT 3

LOT 3 CONCESSION 4 (OTTAWA FRONT)

Southeast Corner of Lot 3, Conc. 4(O.F.)

Part 3, Plan 5R-6003

ROAD ALLOWANCE BETWEEN CONCESSIONS A AND B (O.F.)

SURVEYOR'S CERTIFICATE

I certify that:
1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act, and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 12th day of August, 2009.

Date: AUGUST 18, 2009

RONALD A. DENIS
Ontario Land Surveyor

FARLEY, SMITH & DENIS SURVEYORS LTD.
ONTARIO LAND SURVEYORS
CANADA LANDS SURVEYORS
150 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J6
(613) 727-8228 FAX (613) 727-1833

METRIC NOTE:
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

FILE No. : 249-09 | BOOK : 3080

AUGUST 18, 2009 CAD FILE: M:\PENNY\PLANS\2009\P249-09_ORLEANS-NAVAN ROAD_4R-xxxxx.dwg

002397

2. SITE SETTING

2.1 *Site Location and Legal Description*

The Navan Waste Recycling and Disposal Facility is located in the eastern portion of Ottawa, Ontario on Part of West Half of Lot 2, Part of Lots 3 and 4, Concession IV, Ottawa Front at 3354 Navan Road, City of Ottawa (formerly the Township of Gloucester), UTM Easting: 460570, UTM Northing: 5030570 at the front entrance to the site. The location is indicated on the Key Plan, Figure 1.1. The latest legal survey plan for the site was registered on April 13th, 2008 as Plan 4R-21920. Parts 1, 2 and 3 of this Plan are lands owned by WCC (refer to Fig. 1.2). A narrow section of land bordering Navan Road, west of the site entrance and having an area of 963 m^2 referred to as Part 1 on Plan 4R-23883 dated August 18th, 2009 was severed from WCC property as part of a Site Plan Agreement for the development of the new site facilities (refer to Fig. 1.2 and 1.3) and transferred to the City of Ottawa for the future widening of Navan Road.

2.2 *Location, Zoning, and Surrounding Land Uses*

According to the City of Ottawa's Official Plan (City of Ottawa, 2003) (Schedule B), the site is designated as Solid Waste Disposal site and is located within the Developing Community designation of the Urban Area. The East Urban Community is the southeast portion of the Orléans Community bounded by Mer Bleue Road to the east, a former Canadian Pacific Railway line (VIA Rail ROW) bordering the Mer Bleue Bog and WCC Site to the south, the National Capital Commission (NCC) Greenbelt to the west and a hydro corridor to the north. Generally, it is Urban Area (Developing Community) to the north, west and east, and Significant Wetland to the south (refer to Fig. 2.1, 2.2 and 2.3). Designations in the vicinity of the Site include: General Urban Area, including Mixed Use and Employment Areas to the north, Significant Wetland Area to the south, Residential to the immediate west and General Rural Area further to the east.

The Developing Communities designation is used by the City to identify those areas where the detail for the development of the lands requires additional study. The planning process for the Phase 1 lands was completed when City Council approved the Phase 1 Community Development Plan (CDP) document July 2005. The Landfill Site is located within the Phase 2 study area of the East Urban Community as shown on Figures 2.1 and 2.2. The landfill site was clearly identified during the work on each of these studies. The adopted CDP includes policies to protect the landfill site from sensitive land uses being established within 500 metres without a specific study to ensure compatibility. The CDP confirmed the Official Plan policies for road widening along Navan Road and also identified the need for future linkages that would be necessary to create the municipal infrastructure (water, sanitary and storm sewers) to complete the development of the community.

In 2006 a study of a 500 m buffer area around the WCC landfill site was initiated by the city. The purpose of the study was to fulfill the Official Plan requirements and to determine whether any land would be temporarily or permanently undevelopable due to its proximity to the WCC site. The peer reviewed buffer study was completed in the late spring of 2008. It determined that the landfill posed no constraints to

development of any Phase 2 lands. However, the peer review noted that where development occurs within the buffer zone, warning clauses should be placed in the purchase and sale agreements and on title. The clause should state that there is a possibility of occasional dust and odour episodes from the landfill operations.

The City of Ottawa has now adopted a Comprehensive Zoning By-law for the entire Amalgamated City (2001). By-law 250-2008 was adopted by Council in June of 2008 and was subject to numerous appeals, none related to the landfill. In November 2008 the Ontario Municipal Board provided an Order that brought the vast majority of the Zoning By-law into effect. All of the lands in the area of the site are now subject to the provisions of this By-law.

The existing adjacent lands are predominantly residential and rural residential with some scattered non-residential uses. The land is primarily open pasture, wooded areas and the Mer Bleue Bog. Existing land uses adjacent to the site boundaries are as follows:

- **To the North:** Navan Road, formerly known as Regional Road 28, residential and light commercial developments, and a former school now used as a senior's center, medical center and pharmacy.

  The north side of Navan Road is zoned Development Reserve in the Comprehensive Zoning By-law for the City of Ottawa. A Plan of Subdivision Proposal has been approved for approximately 23 hectares of largely undeveloped land, situated north of Navan Road and extending to Renaud Road (refer to Figure 2.2). These lands owned by Ashcroft Homes are presently under development. The eastern limit of the proposed development abuts the properties of the White Street residential enclave and other undeveloped lands. The lands to the west, known as Eastboro, continue to be under development for residential purposes and include two schools.

  The senior's center property directly across from the WCC Site is in a special Development Reserve Zone (DR) that identifies the community center as an additionally permitted use. A medical center and pharmacy also occupies this property presently.

- **To the East:** woodlots, a small scrap yard, and a small recycling business (abandoned and partially remediated). The lands to the east are also in the DR Zone.

  There was a rezoning for 3628 Navan Road to permit a recycling business to be recognized as a Temporary Use so that an Environmental Compliance Approval could be issued for the use of a portable wood chipper. This exception to the By-law is identified as DR [1616] and it is a Temporary Use permission which expired on December 7th, 2011. This property has been identified by the City of Ottawa as the preferred location for a large storm water management pond to service the Phase 2 CDP. The design for this pond has been approved by the City of Ottawa and is presently under construction by Ashcroft Homes.

  The balance of the lands to the east is in the same Development Reserve Zone (DR) which replaces the former Future Growth zone;

- **To the South:** VIA Rail right-of-way (ROW) is currently used as a recreational trail, however, railway traffic may resume in the future. This ROW is used as the zoning boundary in the comprehensive by-law. A 100 m strip of land south of the ROW is owned by WCC.

The lands south of the ROW that are within the Provincially Significant Wetland are identified as Environmental Protection (EP) in the zoning by-law. The remaining lands south of the ROW are zoned Rural in the By-law;

- **To the West:** Immediately west was a former composting and soil blending operation recently shut down which is zoned DR, while beyond that point are lands re-zoned and being developed by Claridge Homes for urban residential (R3VV[1286]), including Open Space (O1) and a portion that remains as a DR Exception [459]-h Zone.

Figure 2.3 summarizes the current zoning that is found in the area as shown in the Comprehensive Zoning By-law for the City of Ottawa.

The lands owned by WCC are within two defined zoning areas. The actual landfill being zoned as Heavy Industrial Exception [2] (IH[2]H(11)) and the buffer area being a separate Exception Zone to recognize its function as a buffer (IH[1483]H(11)). These are the zones found in the Comprehensive Zoning By-law. The WCC lands that lie south of the VIA Rail corridor are zoned as Environmental Protection and Rural as shown on Figure 2.3.

2.3 *Existing Site Design and Facilities*

The existing approved design and operation of the site is described in the Design and Operations report prepared by Golder Associates Ltd. for the site expansion (Golder, January 2008) and the approved Quality Assurance/Quality Control Plan and Specifications for the WSI Landfill Leachate Collection and Management System – Lateral Expansion Area (Golder, June 2009 and MOE reference Number 1851-7SUSJ9). The following sections summarize some of the current facilities and systems described therein.

2.3.1 Existing Facilities

A gated entrance from Navan Road at the north end of the site presently serves as the only access point into the landfill. The gate is locked after operating hours and monitored by security personnel. Access during operating hours is controlled by an attendant at the scales, operating from a scale house. The scale house is in close proximity to the equipment maintenance garage and administrative office building.

Internal roads are constructed and relocated as necessary to provide access to the active landfill areas and other site facilities. The internal roads are generally constructed using recycled asphalt, re-used screened rock, brick or crushed concrete over a sub-base of re-used shingles. The current approximate road network is illustrated in plan view on Figure 2.4.

A waste processing area has been built on interim-covered waste in the south-central part of the waste footprint to facilitate stockpiles of recycled and processed materials (refer to Figure 2.4). A small vehicle pad consisting of reinforced concrete retaining walls was constructed south of the scale house for the unloading and sorting of waste from small vehicles. Concrete block bunkers are available for the separation of larger volumes of recyclable materials such as shingles, aggregates, clean fill, windshield glass, etc.

A minimum buffer width of 30 metres is maintained around the west, north and east sides of the approved waste disposal area. A 10 metre buffer is maintained between the southern limit of the waste footprint and the VIA rail corridor. Additional buffer lands owned by WCC exist to the east and west with a minimum 100 metres wide strip of land extending the full width of the site south of the VIA right-of-way (see Figure 2.4).

2.3.2 Leachate Management and Groundwater Protection System

The existing leachate management system at the Navan Waste Recycling and Disposal Facility includes an underdrain system in the northwest corner of the existing waste footprint north of Grid Line I and between Grid Lines 3 and 6 (refer to drawing 6.2). This area is connected via perforated HDPE pipe to a perimeter leachate collection trench. It consists of a granular-filled trench and perforated drainage pipe which runs along the west edge of the waste mound (Grid Line 1) and the south toe of the waste mound (between Grid Lines Q & R).

An underdrain leachate collection system also exists in the southeast corner of Phase 8 consisting of a combination of perforated collection pipes, French drains and sand drainage blanket. This drainage layer extends from Grid Line N to the south toe of the waste mound and between Grid Lines 14 and 16.

An underdrain leachate collection system also exists in the north central area of the waste footprint in the Phase 4 and 5 area of the site (refer to Fig. 2.4) consisting of a combination of perforated collection pipes, French drains and sand drainage blanket. This large drainage system extends from the north toe of the waste mound to Grid Line L and between Grid Lines 6 and 16.

The leachate drainage system in the east expansion cell (Phase 1) was constructed in 2014/2015 and consists of a network of perforated HDPE pipe, separation and filter geotextiles, a clear drainage stone layer and a sand protective layer. A similar system was constructed in 2018/19 for the cell to the north in Phase 6. A pump station was constructed at the northwest corner of Phase 1 to assist with the drainage of the east cells.

The existing leachate collection systems are illustrated in Figure 6.2 and discussed in greater detail in Section 6.3.

All leachate collected in the existing leachate collection system is designed to gravity drain or be pumped to a wet well and a pre-treatment/pump station located in the south buffer near Grid Lines R-16. Pre-treatment of leachate consists of air stripping hydrogen sulphide (H_2S) and Volatile Organic Carbons (VOCs) with the use of activated carbon filters prior to discharge. During 2021, all leachate was pre-treated and pumped via forcemain to the City of Ottawa sewer system for final treatment at the City's municipal sewage treatment plant. The leachate forcemain was flushed and cleaned twice during 2021. No operational issues with the treatment and pumping station were reported in 2021.

A vertical manhole, connected to the leachate collection system in the centre of the existing waste footprint (referred to as "the central manhole"), provides an alternative point of access to evacuate leachate from this part of the leachate collection system in the event that positive drainage to the wet well and pump station cannot be maintained due to sub-grade settlement. This manhole has been raised to an elevation of 101 metres and will require that it be raised with additional MH sections in 2022.

Access to the leachate collection pipes in the Phase 4 and 5 area (refer to Fig. 2.4) is provided via a series of cleanouts along the north side of the existing waste footprint. Cleanouts are also provided along the east perimeter for leachate collection pipe access in the east cell expansion. Access to the west and south perimeter leachate collection system is provided via a series of manholes. The system was checked for drainage to ensure proper performance of the drainage/collection system. Low permeability cover soils are currently used to minimize infiltration of precipitation into the waste column. At present, clay soil cover is located on the north, west and south facing slopes as well as the surface of completed fill areas in Phase 3, the north part of Phase 4 and parts of Phase 1. Leachate containment is currently provided by a thick deposit of natural low-permeability clay soil which underlies the entire site and a constructed final clay cover.

2.3.3 Landfill Gas and Odour Management System

The Certificate of Approval (Air), ECA # 6733-7BYS9A issued on April 16th, 2009 was amended by ECA (Air) # 3536-8APNZD on November 24th, 2010 to add one (1) candlestick flare, used to combust a maximum of 0.24 actual cubic metres per second (500 scfm) of landfill gas (LFG) collected from three (3) vertical landfill gas wells and gas collected from the Leachate Collection System (refer to Fig. 8.1). Construction of the approved candlestick flare was completed at the end of 2011 and was commissioned and approved by the Technical Standards and Safety Authority (TSSA) in April of 2012. Horizontal and vertical wells were later added in the area of Phase 4, Phase 3 and Phase 1 to enhance the odour control system. Details are provided in Section 8.

A fixed line misting system powered by a portable generator was added at the end of 2017 to be on hand ready to be implemented as an emergency response system to assist in addressing odour issues.

2.3.4 Surface Water Management System

The regional surface water flow system in the area of the landfill is discussed in sub-section 2.7 and existing surface water control features are shown on Figures 2.4 and 6.1. Existing controls can be summarized as follows:

a) Upstream flows originate north and northwest of the site. This flow is diverted around the landfill by ditches that exist along the north perimeter of the site buffer zones.

b) A diversion ditch has been constructed along the northern limits of the landfill that discharges into the east perimeter ditch at the northeast corner of the landfill. The east perimeter ditch conveys flows southward to storm water management ponds located at the south-east corner of the site. These ponds discharge into a perimeter ditch that flows south under the VIA ROW onto and through WCC property and drains to the Mer Bleue drainage basin.

c) Another diversion ditch has been constructed northwest of the site in the north buffer area. This ditch discharges further west into a natural drainage channel termed the west perimeter ditch which is not well defined. Surface water from the completed west parts of the site is controlled and discharges into a storm water pond located at the northwest corner. This pond discharges into a ditch located on WCC property which drains into the west perimeter ditch. The west perimeter

ditch conveys flows southward and then westward north of the VIA ROW to the Mud Creek drainage basin.

d) An east diversion ditch was constructed in accordance with South Nation Conservation Authority requirements for a fish habitat and was commissioned following approval in the fall of 2009.

e) Interim clay cover has been placed over inactive portions of the existing waste mound. Finished slopes are covered with clay soil and topsoil, graded and seeded. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control. To protect the perimeter clay slopes against erosion, clay diversion dikes and drainage swales have been constructed to collect surface run-off above the slope. Storm water collected by the swales is directed down the landfill side slopes via rip-rap lined drainage chutes. Culverts exist at the top of each drainage chute to provide surface runoff across the perimeter access road, with the access road itself serving as a berm.

2.4 *Climatic Setting*

The landfill is located 17 km northeast of the meteorological station located at the Ottawa International Airport (OTAWA INTL. A, climate ID 6106001). Climatic conditions at the site are presented on Figures 2.5 and 2.6 and summarized as follows:

a) The average monthly temperatures in 2021, obtained from Environment Canada Atmospheric Environment Service, varied from an average low of about -8.3°C in February to an average high of 22.3°C in August with an annual average temperature of 7.6°C. The 60 year average ranges from a low of -10.4°C to a high of 20.9°C and an annual average of 6.2°C.

b) The average (1961 to 2021) annual precipitation at the Ottawa International Airport station is 920.1 millimetres. The driest month is generally February at an average of 55.4 mm and the wettest month being July at an average of 91.2 mm. Total precipitation for 2021 was 836.8 mm and ranged from a low of 30.2 mm in January to a high of 139.9 mm in October.

c) The average annual water surplus (i.e. precipitation minus evaporation) for the Ottawa vicinity is in the order of 320mm (12.5 in.). The water surplus provides an estimate of the amount of water available for infiltration into the site and for surface run-off during a 12-month period.

2.5 *Geology*

Regionally, the site is located within the Ottawa Valley clay plain at the western edge of the Prescott and Russell sand plains. The lowland region is composed of unconsolidated glacial deposits of till, varved clays and marine beds of clay and sand from the post-glacial Champlain Sea. The region is bound to the north by Precambrian formations of the Canadian Shield and underlain by interbedded Paleozoic bedrock that outcrops in ridges and scattered exposures due to faulting and downdrop fault blocks. The WCC Facility is situated on the banks of the Ottawa River Channel. The post-glacial Ottawa River Channels, east of Ottawa, are from 3 kilometres to 10 kilometres wide and up to 18 metres deep. They are floored with clay and silt and bordered by sand deltas. Figure 2.7 shows the surficial geology of the area.

Sand deposits cover the escarpment that runs through the site. Sands are found to be 0.6 metres to 2 metres deep in the area of the Facility above the escarpment. For the most part, the sand below the escarpment has been eroded, leaving behind only a thin sand blanket. A thick (20 to 35 m) marine clay deposit underlies the entire area and has been exposed by the deep erosion channels that have cut through the escarpment and wherever the thin sand deposit has been eroded. The bedrock beneath the site is shown to consist of shale of the Billings Formation (Figure 2.8). A review of MECP water well records within the site vicinity study area indicated that the Site is underlain by limestone or shale.

2.6 *Hydrogeology*

The regional groundwater flow direction in the deep bedrock is east (Charron, 1978). In the general area of the site, groundwater flows from a north to south direction, toward the Mer Bleue bog located south of the site. Figure 2.9 indicates the groundwater flow direction and the interpreted groundwater recharge, transitional and discharge areas as described in studies undertaken for this area (A.J. Robinson and Associates Inc., 1987, Gore & Storrie Limited, 1992).

The thick clay deposit which underlies the site and surrounding area acts as an acquitard, such that lateral flow is directed through the surface sand unit and the upper weathered clay (total thickness of a few metres). Shallow groundwater flow is strongly influenced by topography, the depth of the surficial sand layer, the underlying weathered clay, the natural drainage systems and recently constructed drainage systems. Shallow groundwater flow occurs at the site generally in a north to south direction, as shown schematically on Figure 2.10.

The results of water levels measured at the site at up-gradient wells indicate the shallow water table to be typically located approximately 1 to 2 metres below ground surface with only small fluctuations in water levels indicated for recent years. A downward hydraulic gradient has been profiled up-gradient to the site. The only variation in the direction of the hydraulic gradient is indicated in the upper 5.6 metres to 10.4 metres below ground surface, from a downward gradient to an upward gradient in the weathered clay. These results may be attributed to a perched water table at the interface of the weathered clay and the intact clay. The relatively weak downward gradient from the sand to the weathered clay suggests a hydraulic interconnection between these units. The downward gradient is quite pronounced from the weathered clay down to the lower reaches of the intact clay deposit. It is interpreted that the intact clay deposit at depth beneath the landfill site acts as a barrier to groundwater flow.

The results of the water levels measured at the down-gradient wells at the site indicate the shallow groundwater table lies within the sand deposit close to the original ground surface ranging in elevation from about 68.8 metres to 70.2 metres. Seasonal variations of nearly 1 metre have been observed. The high water levels generally occur during the wet spring whereas the lower water levels are recorded during the dry summer months and fall. Unlike the up-gradient groundwater level profiles, the down-gradient profiles generally indicate a slight upward vertical gradient, although a localized weak downward gradient is observed at times between the upper 6.3 metres to 7.6 metres within the weathered clay. The upper sand and fractured clay layers appear to be hydraulically connected with near vertical or hydrostatic water level profiles. A slight upward gradient at the down-gradient boundary of the landfill suggests there is upward vertical flow of shallow groundwater at this location which would retard the potential for leachate migration into the deeper groundwater system.

Water levels obtained further down-gradient of the landfill indicate the shallow groundwater table is close to the ground surface within the upper sand or organic deposit with artesian conditions within the clay. Hydraulic head profiles illustrate an upward gradient through most of the profile with a weak downward gradient from the sand to the weathered clay. Historically, there has been an upward gradient through the entire profile. The presence of an upward gradient suggests upward groundwater flow is occurring south of the landfill. These results may also suggest upward leaching of pore water from the Champlain Sea clay, a brackish water deposit, may be occurring at the southern boundary of the landfill. North of the landfill, downward leaching of the clay pore water is indicated.

The horizontal hydraulic gradient in the shallow sand deposit and weathered clay at this site is consistent with the relief of the property which changes in elevation by approximately 15 metres to 18 metres between the up-gradient and down-gradient boundaries of the landfill. Since the shallow water table appears to be a reflection of the original surface topography, horizontal hydraulic gradients are expected to vary between 0.7% in the plateau above the escarpment and 1.4% in the valley below. Water levels measured south of the landfill indicate shallow groundwater is flowing in a south to southwest direction with a small hydraulic gradient ranging between 0.5% and 2%. The horizontal gradients in the bog area are influenced by seasonal fluctuations in the surface water levels. Hydraulic gradients could also be influenced by the leachate collection system (LCS) located along the south toe of the landfill. Keeping the LCS drained could result in a lowering of the water table by more than 3 metres below the original grade at the southeast corner of the landfill and by 2 metres at the southwest corner. This water table lowering could significantly influence the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient side of the LCS was constructed to alleviate any potential problems related to lowering of the groundwater table south of the landfill.

Water levels measured within the glacial till/upper bedrock up-gradient and down-gradient of the site indicate a difference in water levels of about 6 metres, which represents a hydraulic gradient of approximately 1% across the site within the glacial till/upper bedrock.

Many factors, such as mounding within the waste pile, the installation of the leachate collection system and the construction of waste cells with under drainage will influence the rate of groundwater flow across the site.

Within the study area MECP water well records indicate that former groundwater users obtained their groundwater from the overburden and bedrock interface. This interface is considered the main aquifer in the study area. Down-gradient of the landfill, in the direction of groundwater flow, there are no potential groundwater users and the marine clays present in the Mer Bleue bog area produce saline water.

2.7 Surface Water Flow System

The Navan Landfill is located on a watershed divide between two major drainage watersheds - the Rideau River watershed to the west and the South Nation River watershed to the east (see Figure 2.11). Surface runoff drains to both the east and west of the site. The east side of the site drains to the Bear Brook drainage basin, which is part of the South Nation River watershed. The west side drains into the Mud Creek drainage basin which in turn drains into Green's Creek; part of the Rideau River watershed. The Mer Bleue bog, a

unique and internationally recognized ecological feature, is located to the south of the landfill as seen on Figure 1.1.

2.8 *Mer Bleue Bog*

The Mer Bleue bog, located south of the site, is an important ecological and hydrologic feature in the Ottawa area. This 4,106 ha area was formed approximately 9,500 years ago, following the last ice age, (Frasier et al., 2001) when the Champlain Sea occupied the Ottawa Valley and laid down deep marine clay deposits. As the glaciers began to melt, a spillway channel formed south of the present day Ottawa River. Melt water flowing through the southern channel eroded the floor of the Champlain Sea. As the melt waters receded and isostatic rebound forced sea water eastward to the Atlantic Ocean, the southern channel ceased flowing and a lake formed in the present location of the Mer Bleue bog. Plant growth progressively filled in the lake, forming a raised peat dome Sphagnum bog. The peat thickness is reported to be about 6 to 7 m.

The Mer Bleue is underlain by Ordovician limestone and shale, deposited as marine sediments 445 million years ago (Brunton, 1984). The bedrock layer is deeply buried by organic deposits over the central portion of the Mer Bleue with marginal deposits of marine clay, and sand deposits along two prominent ridges. The marine clay deposits are very thick, ranging from 12 to 45 m in depth (Hobson et al., 1969). There are also sandy shoreline deposits located on the northern and southern margins of the Mer Bleue bog (Brunton, 1984).

The hydrologic features of the bog are very unusual. Being a domed bog, surface water drainage in the bog flows radially outwards from the centre towards the edges of the bog and then flows in the "lagg" along the perimeter of the bog. The elevation at the centre of the bog is approximately 70 m above sea level, sloping gradually down to about 67 m at the perimeter of the bog. Groundwater flow into the bog is very small given the low permeability of the underlying clay soils. Surface water inflow to the bog is also very limited because the contributing drainage watersheds are quite small; consequently the bog receives most of its water and nutrients in the form of atmospheric precipitation (for this reason the Mer Bleue is referred to as an "ombrotrophic bog").

Surface water flowing radially outwards from the centre of the bog enters the lagg around the perimeter of the bog which is basically a channel of standing or very slowly flowing water flowing along the perimeter of the bog. The lagg receives water from the bog and distributes it through the surrounding lands. On the western portion of the bog, drainage channels drain bog waters westward to Greens Creek. On the eastern portion of the bog, drainage from the bog ultimately discharges to Bear Brook Drain to the southwest.

Attempts were made in the late 1800's to drain portions of the bog for agricultural purposes; however, these drainage ditches no longer function because of the many beaver ponds which started up in the late 1950's. Now the water level in the Mer Bleue is at or near the surface of the bog for most of the year. The Savage Drain is an example of an agricultural drain which is quite visible in aerial photographs of the bog as a prominent linear feature on the eastern side of the bog. Flow in the drain in the northern part of the bog (nearest the landfill) is northward and then eastward along the lagg on the perimeter of the bog. There are a number of agricultural drains along the northern and eastern parts of the bog which receive surface water from the bog.

Shoreline erosion is not a concern as the surface water flow rates are nil to minimal. Flooding in the bog is also not a concern as water levels are controlled naturally through beaver dams and the ability of sphagnum to absorb large amounts of water.

In addition to its hydrologic function, the lagg is also a transition zone for plant communities and water quality, where the water regime changes from acid dominated waters in the bog to increasing calcium and basic waters.

Fraser et al., (2001) studied flow patterns and geochemistry in the peat in the Mer Bleue bog. The researchers found that vertical groundwater flow patterns in the bog alternated annually between periods of recharge and discharge in accordance with changes in precipitation, evapotranspiration and the differential head response of the lower peat layer to changes in water table. A sustained moisture deficit during the summer maintained a flow reversal for about a month until a significant rainfall raised the water table. One of the reasons that the researchers selected the Mer Bleue for their study of flow reversals was that the large peatland was isolated from the regional groundwater flow (Fraser, et al., 2001).

The surface vegetation in the Mer Bleue bog has, to some extent, become a shrub-rich bog as a result of the extensive drainage activities and peat mining of the 19th and early 20th centuries. These disturbances reduced the wetland size by 20%, accelerated the maturation of the peatland and accelerated the rate of tree establishment. The re-establishment of beaver populations along the margins of the peatland have helped restore pre-disturbance water levels, however many bog species have already been reduced (Brunton, 1992).

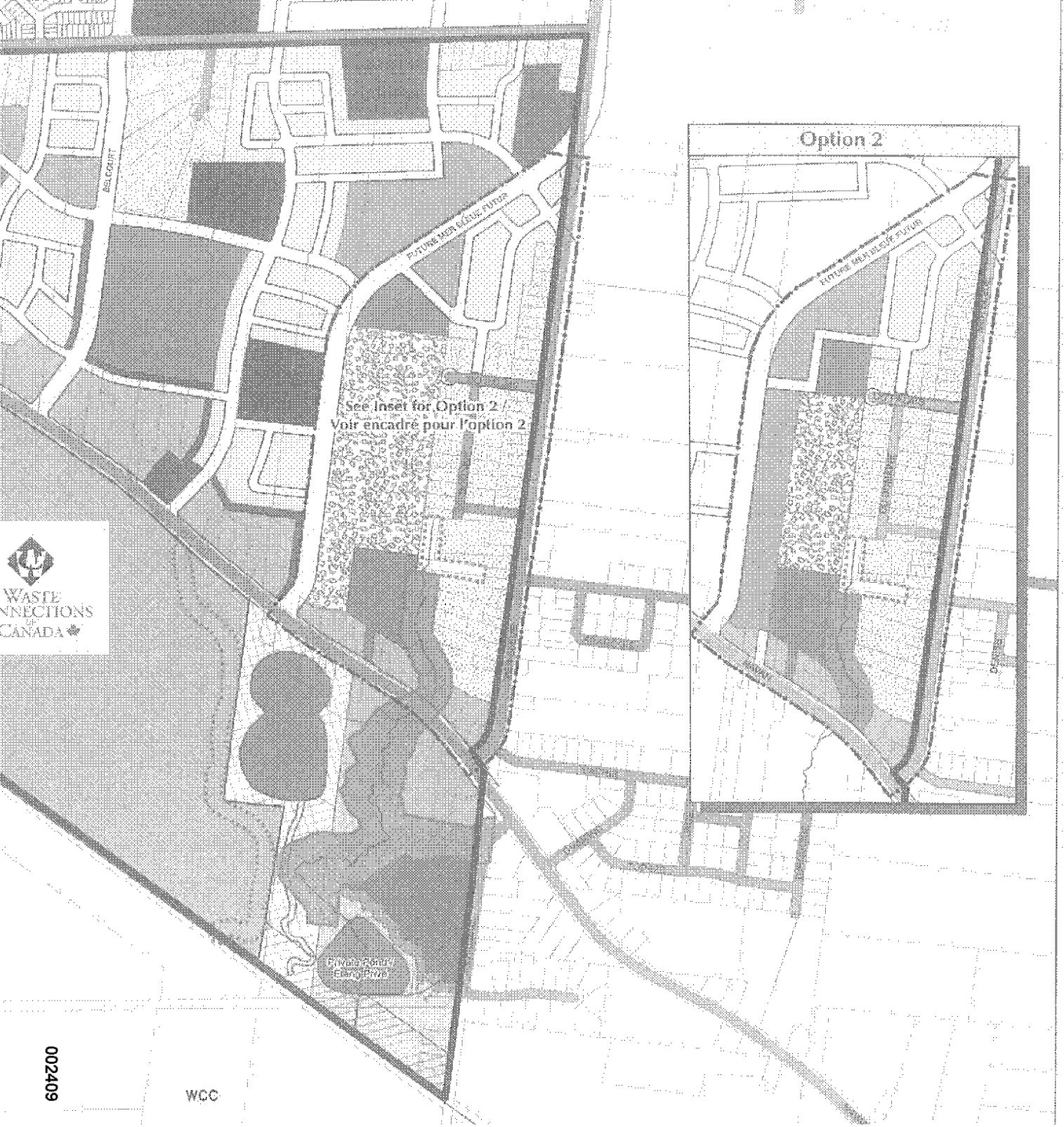
Ponding due to beaver activity has the potential to convert the bog vegetation to marsh communities. There is a concern about the spread of invasive and/or non-native plant species; in particular, purple loosestrife, grey birch, glossy buckthorn and European frog-bit (Wetlands International, 2001).

East Urban Community
COMMUNITY DESIGN PLAN

Communauté urbaine de l
PLAN DE CONCEPTION COMMUNAUTAIRE

- Proposed School / Ecole proposé
- Future Institutional Site / Futur emplacement
- 15m Overland Flow Corridor / Couloir d'éco
- Existing and Proposed Parks / Parc existant e
- Wooded Area / Zone boisée
- BFI Waste Disposal Site / Décharge de BFI
- Storm Water Management Pond / Bassin de
- Slope Stability Setback / Marge de reculeme
- Aquatic Habitat Setbacks from top of Bank / Marge de reculement des habitats aquatique à partir du haut de la rive
- Buffer to Mer Bleue Bog / Zone tampon de la tourbière de la Mer Bleu
- Proposed Street / Rue proposé
- Future Mixed Use Area /
- Phase 2 Area /

002408



Communauté urbaine G

PLAN DE CONCEPTION COMMUNAUTAIRE

LAND USE / UTILISATION DU SO

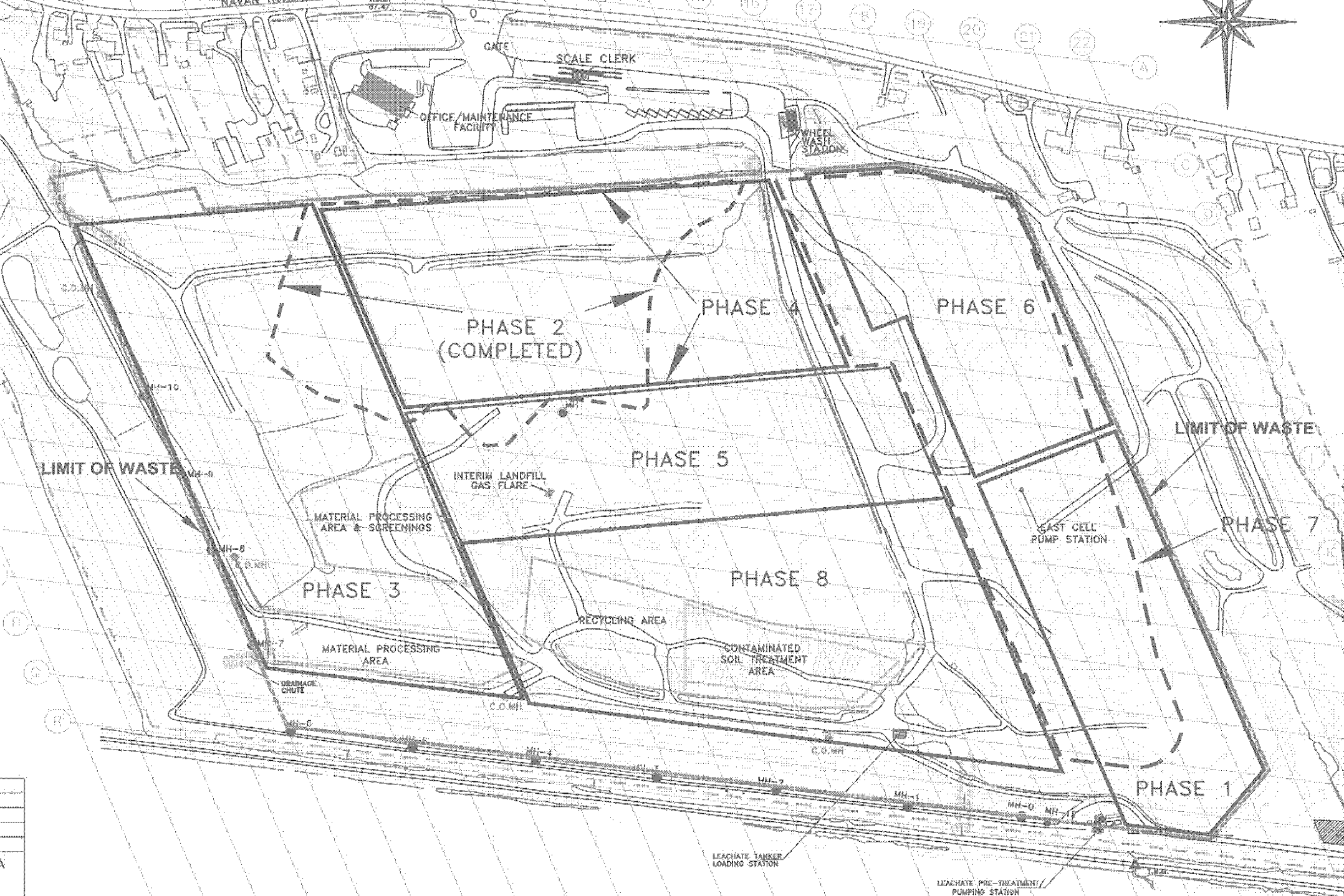
- School / Ecole
- Institutional / Institutionnel
- 15m Overland Flow Corridor / Couloir d'
- Park / Parc
- Wooded Area / Zone boisée
- BFI Waste Disposal Site / Décharge BFI
- Storm Water Management Pond Area / Zone de retention des eaux pluviales
- Slope Stability Setback / Marge de reculem
- Aquatic Habitat Setbacks from top of Ban Marge de reculement des habitats aquatic de la rive
- Existing Residential – Potential for long ter redevelopment to low/medium density re Résidentiel existant – Potentiel, à long ter en résidentiel de densité faible à moyenne
- Future Residential – low/medium density Résidentiel futur – faible/moyenne densité
- Future Residential – medium/high density Résidentiel future – moyenne/haute densi
- Mixed Use – institutional, office, commerc Secteur polyvalent – institutionnel, bureau
- Leisure/ recreational uses - Significant acce servicing constraints limit development po Utilisations de loisir et récréatives - Les co conduites pluviales et domestiques limitén
- Future development potential to low dens and sanitary servicing constraints can be o Potentiel d'aménagement futur en lotissem densité, uniquement si les contraintes de domestiques peuvent être résolues
- Buffer zone from the rail corridor / Zone t
- Proposed Street / Rue proposé

Stantec

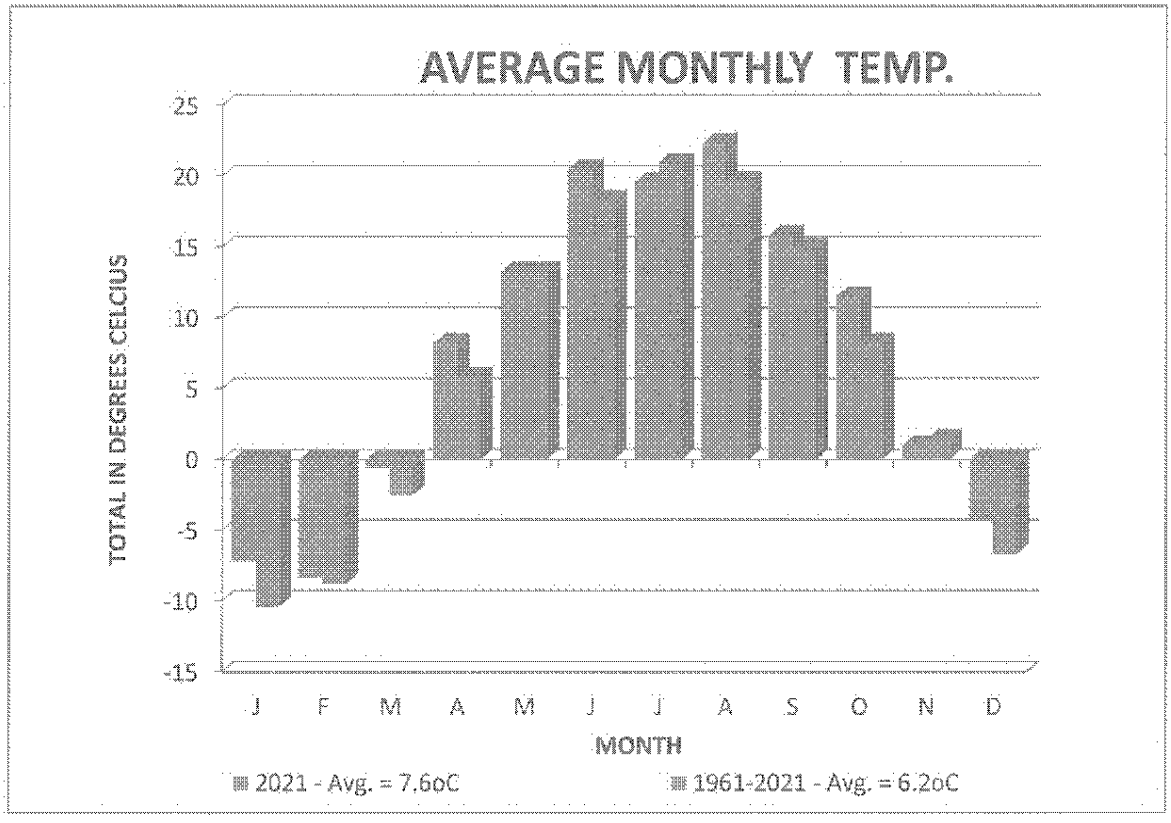
FIGURE 2.3

CURRENT ZONING OF SITE AND SURROUNDING AREA

WASTE CONNECTIONS OF CANADA


GATE
SCALE CLERK
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
PHASE 2 (COMPLETED)
PHASE 4
PHASE 6
PHASE 5
PHASE 7
PHASE 8
PHASE 3
PHASE 1
LIMIT OF WASTE
LIMIT OF WASTE
INTERIM LANDFILL GAS FLARE
MATERIAL PROCESSING AREA & SCREENINGS
EAST CELL PUMP STATION
RECYCLING AREA
MATERIAL PROCESSING AREA
CONTAMINATED SOIL TREATMENT AREA
DRAINAGE CHUTE
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT PUMPING STATION
MH-10
MH-9
MH-8
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-11
C.O. MH

002411



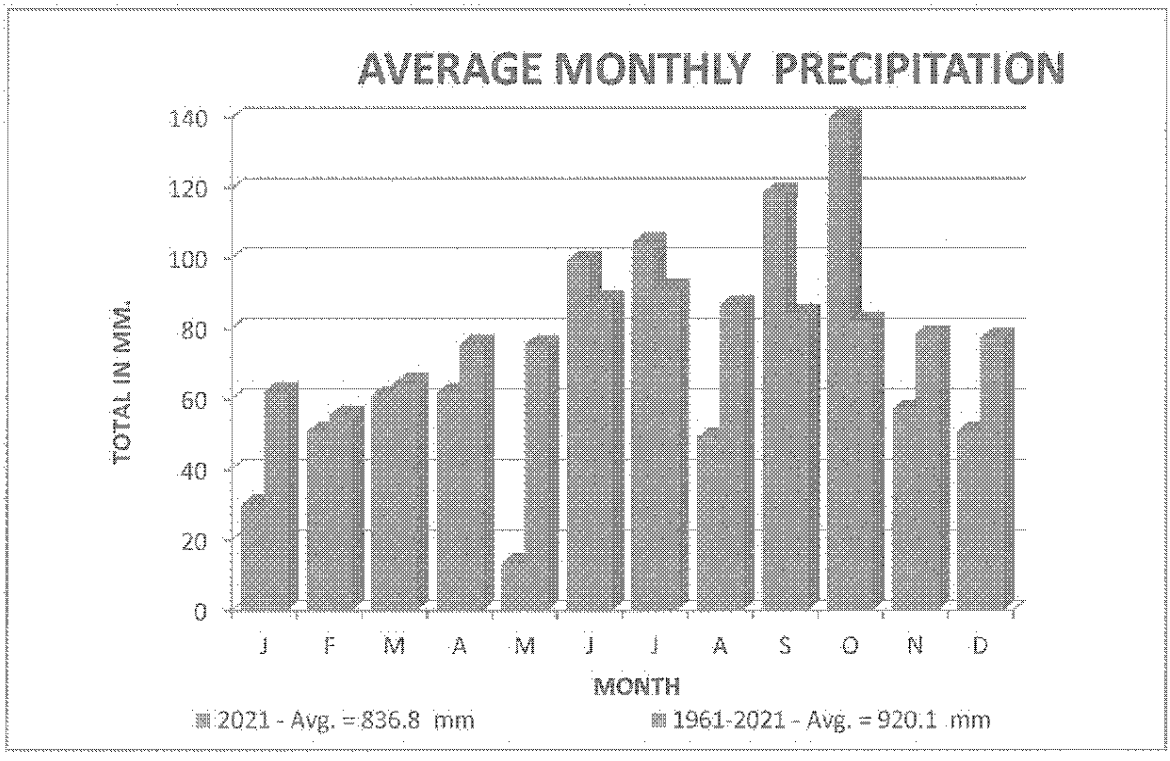
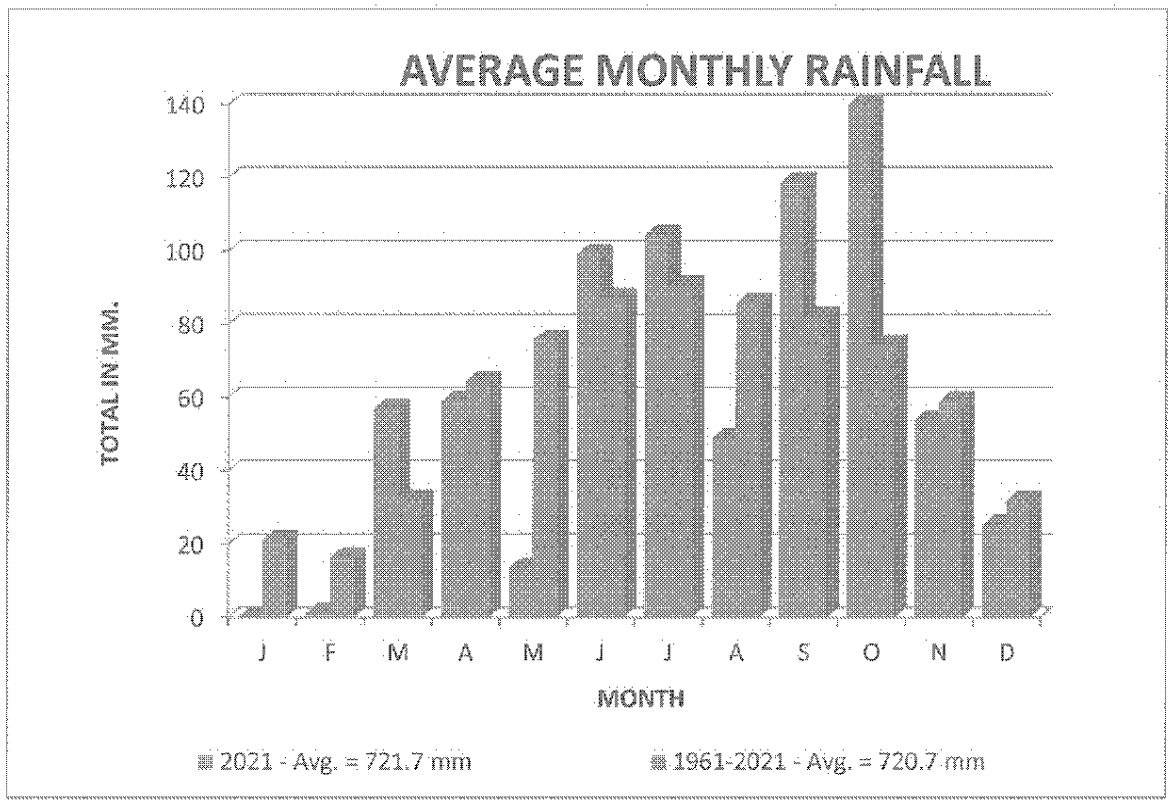


Figure 2.5: Average MonthlyTemperature and Precipitation for 2021



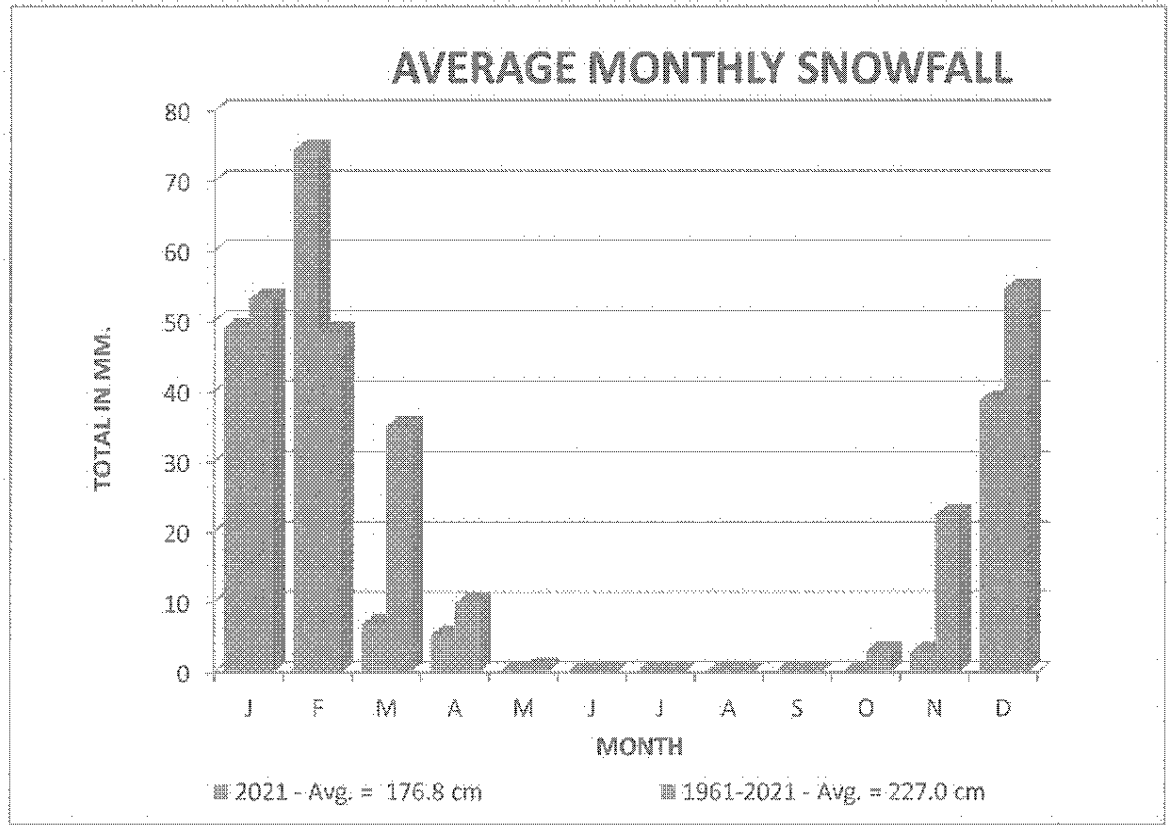
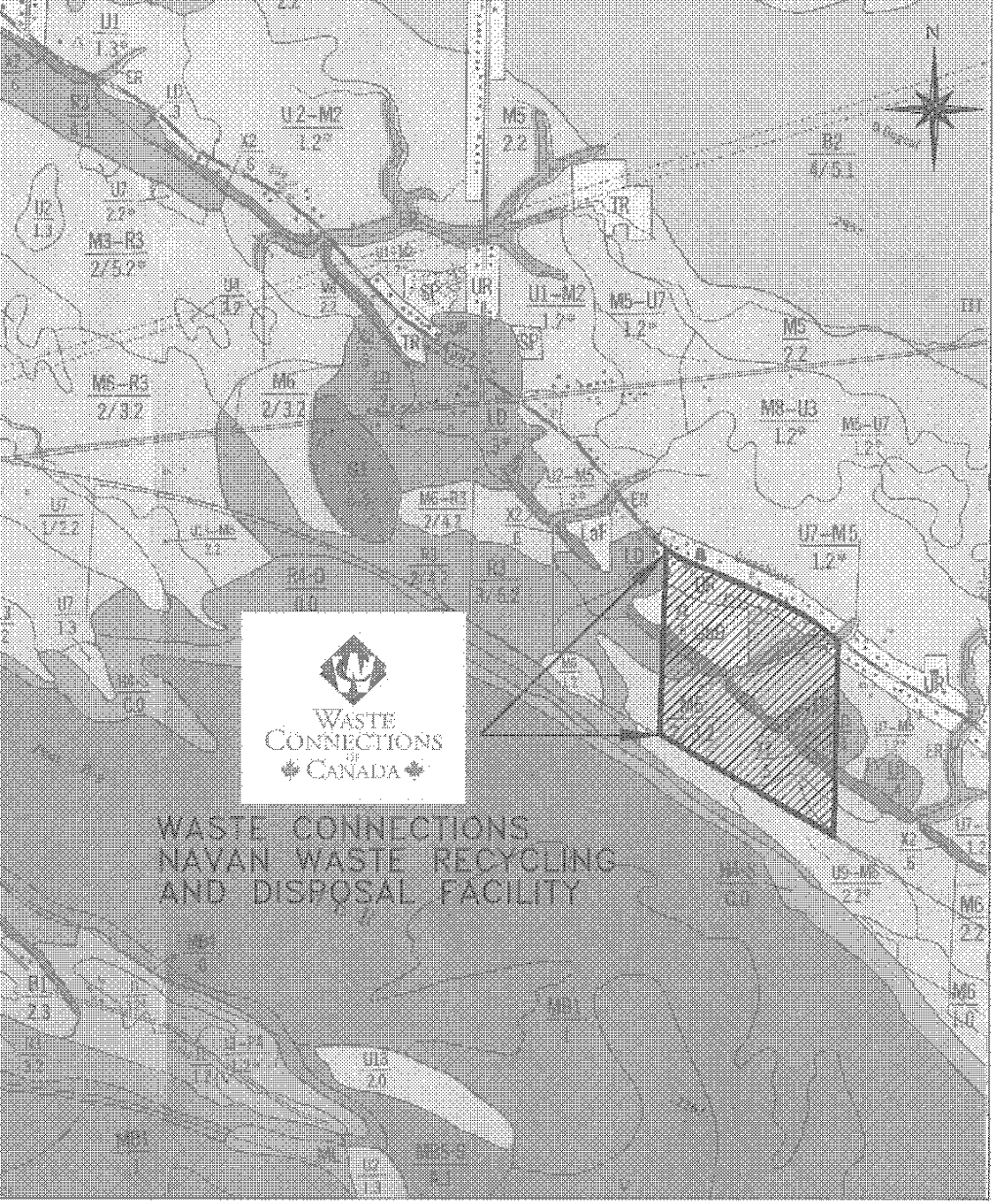


Figure 2.6: Average Monthly Rainfall and Snowfall for 2021


N
U1
1.3*
U2-M2
1.2*
M5
2.2
B2
4/5.1
M3-R3
2/5.2*
M5-U7
1.2*
M6-R3
2/3.2
M6
2/3.2
M8-U3
1.2*
M5-U7
1.2*
U7-M5
1.2*
R4-3
1.0
M6
2.2
U7-M5
2.2*
M6
2.2
U1-M5
2.2*
U3-M5
2.2*
U3-M6
2.2*
U1-M6
2.2*
U1-M2
1.2*
M5-U7
1.2*
U7
1.2.2
U7
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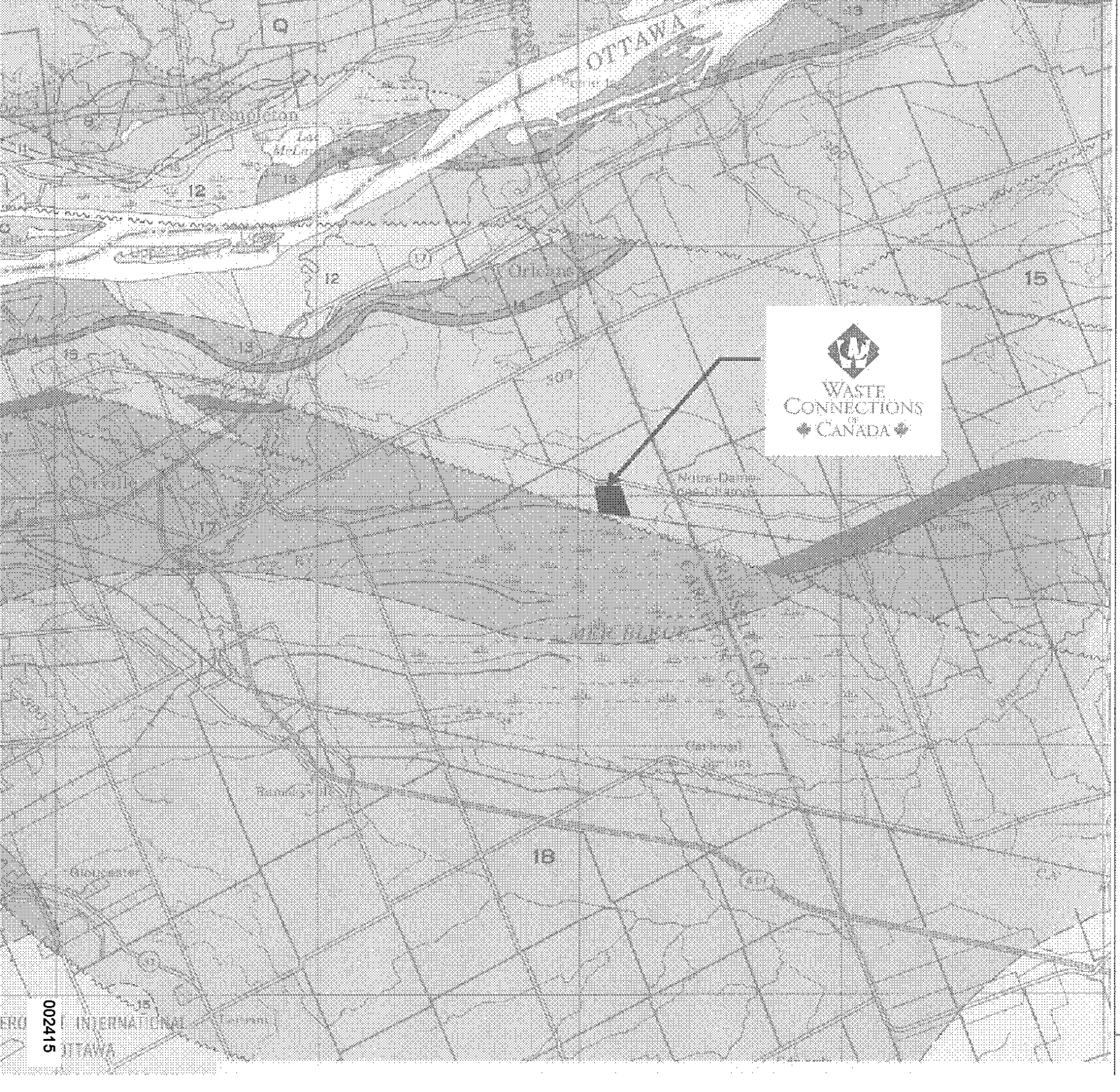
M6
2.2



LEGEND

Q — No information is available on t
Newa Dictionary deposits

PALEOZOIC

ORDOVICIAN

10 — QUEENSTON FORMATION:

9 — CARLSBAD FORMATION: gra
layers

8 — BILLINGS FORMATION: blac

7b — PASTVIEW FORMATION: dark

7a — OTTAWA FORMATION: limest
sandstone in basal part

6 — ST. MARTIN FORMATION: sha
dolomite

5 — ROCKCLIFFE FORMATION: sh

4 — OXFORD FORMATION: volcan

3 — MARCH FORMATION: interbed

ORDOVICIAN OR CAMBRIAN

1a — NEPEAN FORMATION: sandst

PRECAMBRIAN

Granite, quartz monzonite, gra
and syenite) and associated mig

Syenite, monzonite, massive and

Pegmatite, white pegmatite and

Diorite, gabbro, diabase, meta

Marble, lime silicate rocks, biotit

Amphibolite, greenstone, quartz
garnetiferous (includes probably

Paragneiss, pelitic and psammop
(includes some layered amphibo

Quartzite, interlayered paragneiss

Undifferentiated Precambrian

Geological boundary (approximate, assumed)

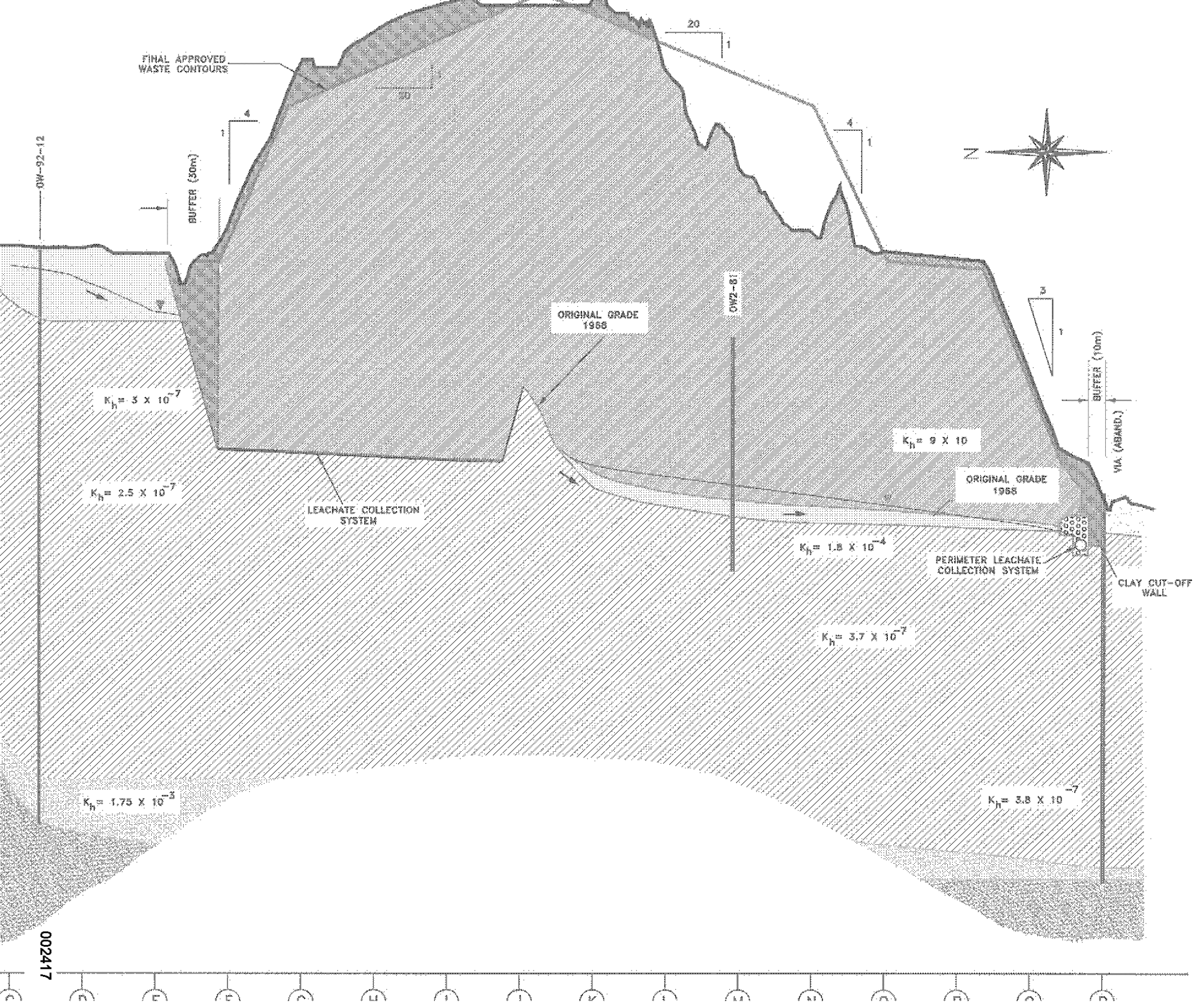
Fault (defined, approximate)

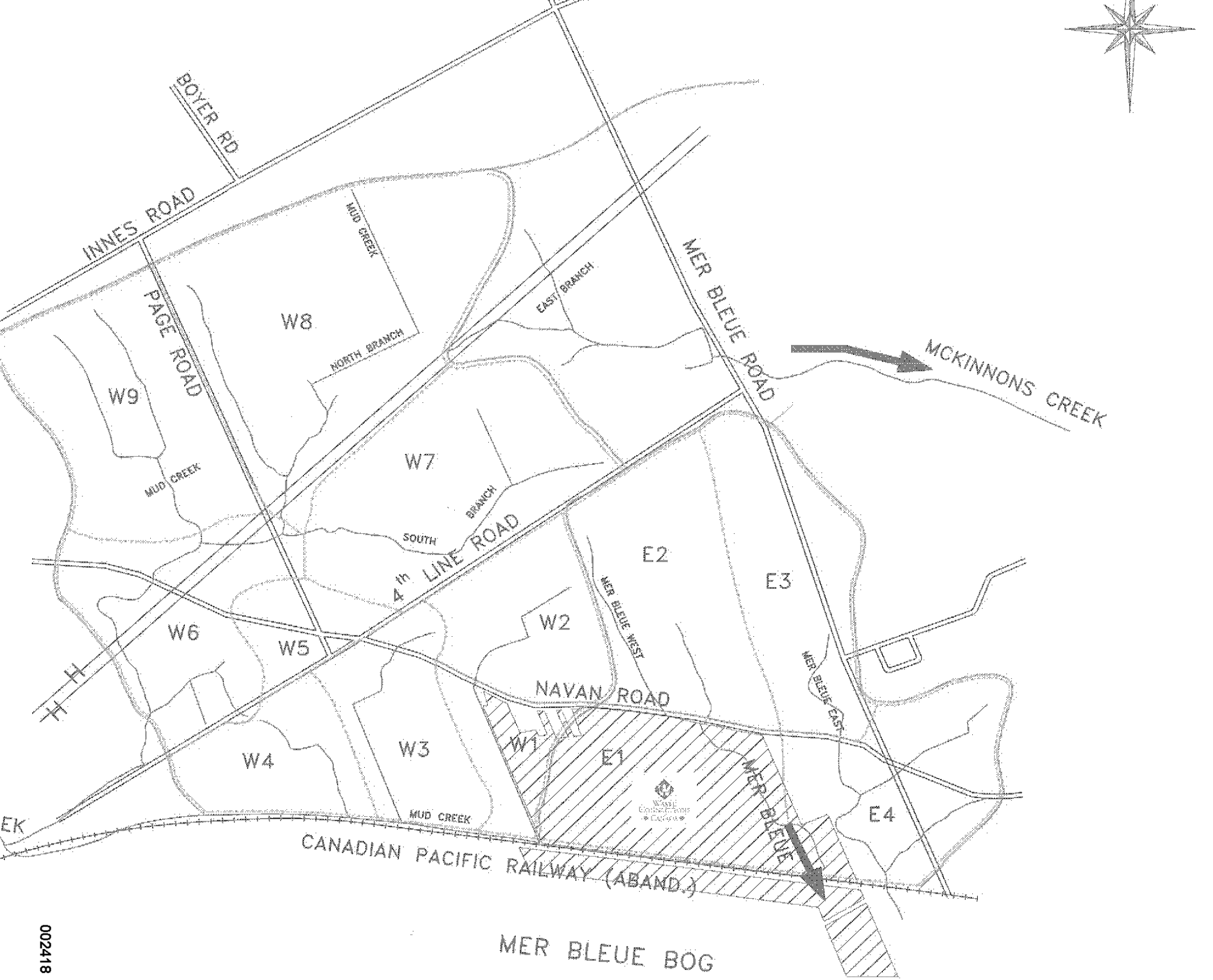
PROGRESSIVE WASTE SOLUTIONS LANDFILL SITE – 33

002415

MCKINNONS CREEK
ONTARIO HYDRO
R.O.W.
MER BLEUE ROAD
NAVAN ROAD
Renaud Road
VIA (Abandoned Railway)
MER BLEUE BOG
BOYER ROAD
PAGE ROAD
INNES ROAD
60
65
70
WATTS
CONSULTING
ENGINEERS
OTTAWA

002416


FINAL APPROVED WASTE CONTOURS
20
1
4
1
BUFFER (30m)
OW-92-12
ORIGINAL GRADE 1958
OW2-81
3
1
BUFFER (10m)
VIA. (ABAND.)
K_h= 3 X 10^{-7}
K_h= 2.5 X 10^{-7}
LEACHATE COLLECTION SYSTEM
K_h= 9 X 10
ORIGINAL GRADE 1958
K_h= 1.8 X 10^{-4}
PERIMETER LEACHATE COLLECTION SYSTEM
CLAY CUT-OFF WALL
K_h= 3.7 X 10^{-7}
K_h= 1.75 X 10^{-3}
K_h= 3.8 X 10^{-7}
002417


BOYER RD
INNES ROAD
PAGE ROAD
MUD CREEK
W8
NORTH BRANCH
EAST BRANCH
MER BLEUE ROAD
MCKINNONS CREEK
W9
MUD CREEK
W7
SOUTH BRANCH
4th LINE ROAD
E2
E3
MER BLEUE WEST
MER BLEUE EAST
W6
W5
W2
NAVAN ROAD
W1
E1
W4
W3
MUD CREEK
MER BLEUE
E4
CANADIAN PACIFIC RAILWAY (ABAND.)
MER BLEUE BOG

002418

3. OPERATIONS - 2021

3.1 *Description of Operations*

The Navan Waste Recycling and Disposal Facility has evolved over the years from being simply a disposal site into an integrated waste management facility with increased focus on re-use and recycling.

Prior to 1981, landfilling was carried out by end-dumping over an existing east-west oriented ridge with minimal base preparation. Following an ownership change in 1981, the site was operated using an area method with waste being placed in the southern half of the landfill (i.e., below the escarpment). As-built survey information collected during the construction of the perimeter leachate collection system indicated the base elevation of the waste varied between 68 and 70 m ASL below the escarpment along the perimeter of the waste footprint. The landfill expansion approvals received in 2009 added 3,600,000 m^3 of air space bringing the total estimated waste capacity for the site to 7.6 million m^3, which included the previously approved capacity of 4 million m^3.

Prior to expansion, cell development in the north central part of the landfill footprint (Phases 4&5 on Drawing 2.4) consisted of stripping topsoil and excavating native sand and clay soils to the required elevations for the construction of a leachate collection system. These base grades varied from 69.5 m ASL at the low point of the system along the east edge of Phase 8 at Grid Point M-16 to approximately 73.2 m ASL at the high point of the system in the N-W corner of Phase 4 at Grid Point F-7. The base grades were sloped downward at 0.5% draining in a south-easterly direction to the S-E corner of the cell (Grid Point M-16). The cell construction maintained gravity flow of leachate to the pump station located southeast of the waste footprint (Grid Q/R-16) entering the pump station at about elevation 67 m. Construction of the east cell expansion (Phase 1) was completed in 2015 with a leachate collection system overlying a clay floor ranging in elevation from 70.1 m to 72.1 m. Construction of the east cell expansion (Phase 6) was completed in 2019. Both cells in Phase 1 and Phase 6 drain to a pump station near Grid J/K-17. The design of the leachate collection system is summarized in Section 6.3.

The landfill will continue to be developed until the upper approved final waste contours are achieved. Figure 3.1 presents the current approved top of waste grades. The final cover, which at a minimum will have a 1.0 m thickness, will be superimposed on top of the final grades. Generally, an interim clay cover is constructed immediately upon reaching the approved fill heights in an effort to reduce water infiltration and the volume of leachate generated at the site. Clay cover has been placed in areas such as the north, west, south and southeast slopes and the top of waste where final waste grades have been reached in the area of Phase 3 and the north half of Phase 4.

Active landfilling continued from January through December of 2021 in the Phase 6 east cell area. Significant activities and capital works undertaken between January 1st and December 31st, 2021 included the following:

1. Active landfilling in the east cell (Phase 6);
2. Excavation of clay cover in the N-E quadrant of Phase 8;
3. On-going recycling operations at the facility;
4. Treatment of hydrocarbon contaminated soils in the material processing area of the site;
5. Screening of coarse granular soils to separate rock from soil for re-use;
6. Continued pre-treatment of collected leachate and disposal to ROPEC for off-site treatment;
7. Retained Dillon Consulting Limited to complete the reporting requirements under the National Pollutants Release Inventory (NPRI) for the 2020 calendar year; to assess the Greenhouse Gas Reduction Reporting as required under Ontario Regulation 347; to determine the reporting requirements under Ontario Regulation 390/18 – Greenhouse Gas Emissions Reporting and the Federal Government Greenhouse Gas Reporting Program;
8. Retained Golder Associates to carry out surface water, groundwater, leachate, gas and noise monitoring and reporting programs;
9. Added clay cover to completed fill areas of the landfill;
10. Constructed a new perimeter access road on the east side of the waste footprint;
11. Retained Base Mapping Ltd. to undertake aerial photography and produce an updated topographic map of the site;
12. Retained Les Entreprises Forlam Inc. to construct the perimeter 300mm diameter landfill gas collection pipe line along the north, west and south limits of the waste footprint;
13. Retained Farrell & Sons to construct the concrete pads for the enclosed landfill gas flare and abstraction plant; and
14. Retained Perennial Energy, LLC to manufacture, assemble, package, check, test, and deliver a Landfill Gas Extraction Plant and Enclosed Flaring System.

A brief description of the major activities and capital works follows.

3.1.1 Active Landfilling

From January through to the end of December of 2021, active landfilling was carried out in the east cell in Phase 6. Operations in this area focused on constructing an access road and a receiving pad for haul trucks and placing lifts over the drainage layer. Construction of the east buffer wall against which waste could be

placed was achieved with the use of treated soils placed along the east waste limit in Phase 6. Access to the active fill area was provided by a north-south access road along the west edge of the cell area running along the east side of grid line 14 then turning east at Grid Line J and into the cell then exiting at the N-W corner of Phase 6 near Grid Point E-15.

3.1.2 Cell Development

On-going cell wall construction of the east cell defined as Phase 6 was carried out concurrently as other landfilling operations progressed. Excavated clay from the N-E quadrant of Phase 8 was used to construct the cell walls along Grid Line D from Grid Lines 16-19 and along Grid Line 19 from Grid Lines D-G. Construction of the leachate collection system on the constructed sloped walls of the cell was completed by WCC personnel.

3.1.3 Processing (recycling)

Recycling operations continued throughout 2021 making use of an excavator equipped with a grappler and magnet for the removal of metals, wood and bulky items from the waste stream received at the active face. Wood and metals recovered were moved to a recycling area located on site within the waste footprint where metals and wood are stored for further processing and/or bulk removal. A resident mobile wood grinder is used on site to reduce the wood into chips suitable for use as bio-fuel at a local mill or re-used at a local organic waste composting facility. A Duratech EJ100 Wood Grinder was used for the grinding of recycled wood into wood chips. On occasion a wood grinding contractor was retained to assist with wood grinding operations. A refrigerant recovery program established at the site continued to assist clients wanting to properly dispose of their appliances containing refrigerants. Materials such as brick, concrete, rubble, clean roofing shingles and asphalt continued to be separated for beneficial re-use in the construction of access roads, turn areas at the active face and storage pads. Other materials recycled and/or re-used at the site consist of cardboard, drywall, glass, tires, electronic waste, batteries and propane cylinders found within the waste. Further details on recycling and material volumes are provided in Section 9.

3.1.4 Contaminated Soil Treatment

The treatment of hydrocarbon contaminated soils was on-going throughout 2021 in the soil processing area of the landfill along Grid Line O between Grid Lines 9 and 13 (refer to Dwg 2.4). A total of 38,593 tonnes of hydrocarbon impacted soils meeting the target parameters were received at the treatment area and re-used as a construction fill material in the east buffer along Grid Line 19 between Grid Lines D and P in accordance with ECA conditions for the site. A total of 30,769 tonnes of impacted soils were re-used as construction material within the waste footprint of the landfill.

3.1.5 Soil Screening Plant

A METSO rock screening plant was used for the screening of rock and rubble greater than 50 mm. This plant separates materials 150 – 600 mm and 50 – 150 mm. The rock was re-used as general fill and as construction materials such as rip-rap for drainage chutes and erosion control. Material finer than 50 mm was landfilled or re-used as cover material. A total of 26,484 tonnes of rock was re-directed from landfill airspace.

3.1.6 Leachate Management

Leachate generated by the landfill continued to be collected through a leachate collection system and directed to an on-site leachate pre-treatment/pumping station. In 2021, a total of 88,591 m^3 of leachate was pre-treated and pumped via force main to the City of Ottawa sewer system for final treatment at the Robert. O. Pickard Environmental Centre (ROPEC), the City of Ottawa wastewater treatment plant. The forcemain conducting leachate to the sewer system was flushed and cleaned twice in 2021. No operational problems with the leachate discharge operations at the landfill were reported for 2021.

3.1.7 Stormwater Management

Stormwater and snow melt water at the site is managed to direct surface runoff to the east and west watersheds using a series of natural and constructed ditches, swales, chutes, culverts and stormwater ponds. In 2019, a 237 m long culvert was constructed at the north and northeast corner of the cell in Phase 6. The culvert consists of a 900 mm diameter corrugated smooth interior HDPE pipe joined with bell and spigot c/w gasket and pre-fabricated concrete headwalls at both ends. A sediment trap was also constructed in front of the inlet structure. Construction of the north and north-east clay walls over the culvert in the Phase 6 cell was completed in 2020 and vertical extension of the clay wall continued in 2021.

3.1.8 Landfill Gas Monitoring

Monitoring of methane gas at the landfill site was performed by Golder Associates Ltd. on three separate occasions in 2021. Results of the monitoring programs and interpretation of the data are presented in Section 8 and Appendix '2' of this report. Construction of the candlestick flaring system for the Interim Odour Control System designed by Golder and approved by the MECP was completed in late 2011. In early 2012 the flaring system was commissioned and approved by the Technical Standards and Safety Authority (TSSA) and has since been in continuous operation.

In 2014, the landfill gas collection system was expanded to collect gas from the central manhole and from horizontal wells constructed at the top of the Phase 3 area in efforts to mitigate fugitive emissions from these areas. In 2016, additions to the gas collection system were required and five horizontal collectors were constructed. In 2017, seven vertical wells and one horizontal well were added. In 2019, four additional vertical wells were constructed in Phase 4. In 2020, one horizontal well was added at the north-west corner

of Phase 1. In 2021, the 300 mm diameter landfill gas collection pipe line for the permanent landfill gas collection and flaring system was constructed along the north, west and south limits of the waste footprint.

Dillon Consulting Limited was retained to complete the previous year (2020) reporting requirements under the National Pollutants Release Inventory (NPRI); to assess the Greenhouse Gas Reduction Reporting as required under Ontario Regulation 347; to determine the reporting requirements under Ontario Regulation 390/18 – Greenhouse Gas Emissions Reporting and the Federal Government Greenhouse Gas Reporting Program.

3.1.9 Noise Monitoring

Monitoring of noise levels at the WCC Navan Facility was performed by Golder Associates Ltd. at two points of reception (POR) for the period of November 1st to November 9th, 2021. Monitoring results are presented in a Technical Memorandum provided in Appendix 3. The noise levels at the two PORs are reported to be dominated by road traffic noise along Navan Road with audible noise from landfill operations of the WCC Navan Facility. The measured average hourly noise levels were equal to 48 dBA and 57 dBA at Monitoring Location 1 and Monitoring Location 2, respectively. The noise level at Monitoring Location 1 was below the applicable MECP Landfill Guidelines for landfilling operations noise limit, whereas at Monitoring Location 2 the average cumulative (i.e. ambient plus landfill) hourly noise level was 2 dB above the noise limit. Monitoring Location 2 is located on landfill property in close proximity to landfill activity. The nearest off site noise POR is some 100 m to the N-E of Monitoring Location 2 on the other side of the busy Navan Road. It is expected that the off-site noise POR would be lower due to increased distance and Navan Road traffic noise sources between the POR and landfill activities. Therefore, the Facility is expected to be able to operate within the compliance with the relevant noise limits based on the results of 2021 noise monitoring. It should be noted that the Facility is not a source of noise complaint from area residents.

3.1.10 Surface Water, Groundwater and Leachate Monitoring

Water quality monitoring programs are carried out twice annually for groundwater, and three times per year for surface water and leachate by Golder Associates Ltd. Surface water quality monitoring events were carried out on May 27th, August 24th, and November 24th of 2021. Leachate was also sampled by Golder at the pump station on May 27th, August 24th, and November 24th 2021. Groundwater quality monitoring was carried out in May and November 2021. Groundwater monitoring wells further in the Mer Bleue Bog were sampled in August of 2021 as frozen well conditions prevent winter sampling. Additional monitoring of surface water, groundwater and sediments requested by the National Capital Commission (NCC) in early 2000 was continued. Results of the monitoring programs and interpretation of the data reported by Golder Associates Ltd. are presented in Appendix '1' of this report and discussed in Section 7.

3.1.11 Closure

Closure consisting of placing clay fill material of at least 1.0m in thickness was continued where final waste grades were reached in the area of Phases 1 and 4. These areas are also used for staging excavated wet clay for drying and re-use purposes. Placing of topsoil and seeding will be carried out in these areas at a later date.

3.1.12 Aerial Photography

Base Mapping Co. Ltd. of Ottawa was again retained to undertake aerial photography of the Navan Waste Recycling and Disposal Facility. Digitized topographic maps of the site with 0.5 metre contour intervals were obtained for May 1st, 2021. The 2021 topography with 2 metre contour intervals is shown on most drawings. To date, a total of 221,100 m^2 of the waste footprint has received clay cover as shown of Figure 3.2.

3.2 *Daily Site Operations*

The site continues to be operated in accordance with the approved Design and Operations report (Golder, 2008) and the amended Certificate of Approval. Daily site operations are described in the following sub-sections.

3.2.1 Access

The site is well serviced by Regional Roads, being located on Regional Road 28, locally known as Navan Road (refer to Figure 1.1). Most of the traffic at the site is generated by commercial vehicles which access the site via Innes Road (Regional Road 30) and Navan Road. The Tenth Line Road (Regional Road 47) and Milton Road (Regional Road 31) also provide access from East Ottawa (Cumberland Township).

Access to the site is provided by one entrance located off Navan Road. The gate is kept locked after hours to restrict access. The access road is paved between Navan Road and a distance past the scale house and wheel wash station (Grid Lines C-15). A well-maintained all-weather road provides access to the designated unloading areas. Other access roads are provided throughout the site allowing access to water management systems, material stockpiles, site facilities and equipment storage areas (refer to the Site Features Plan - Figure 2.4).

3.2.2 Hours of Operation

Approved hours of operation for the receipt of waste are from 7:00 am to 6:00 pm Monday through Saturday, inclusive, however the site generally closes at 5:00 pm on week days and 1:00 pm on Saturdays and statutory holidays. The site does not receive waste prior to 7:00 am or after 6:00 pm on these days. Waste acceptance outside of these hours requires the approval of the MECP District Manager. Operating hours may vary within the approved hours. On occasion and as required, Landfill excavation and equipment/site maintenance may occur outside these hours.

The site is secured after operating hours and includes sporadic security patrols by a security services contractor. No scavenging is permitted at the site.

3.2.3 Site Staffing

WCC routinely reviews and monitors its staffing needs for the site and adjusts the staffing level accordingly. Currently 23 fulltime equivalent employees (FTE) are employed locally at the site including management, sales, administrative, clerical, and operations personnel. University and/or college students are also retained to assist with general landfill task and fulfil the work requirements of their co-op program.

The number of employees at the landfill site is variable from time to time and is based on the workload which can be seasonal and personnel turnover. Throughout the year, part time personnel or contractors are hired to perform general tasks such as grass cutting, general site clean-up, minor site maintenance work, surveying, traffic control, etc. Personnel from other WCC districts are also called upon from time to time to assist with landfill operations. When required, contractors are also hired for task specific work such as maintenance, security and landscaping.

3.2.4 Equipment

The following equipment was in use at the landfill site in 2021:

1) 1- 826G & 1- 826H CATERPILLAR WASTE COMPACTOR
   - levelling; compaction; grading of waste

2) D7R CATERPILLAR BULLDOZER (C/W LANDFILL PKG)
   - levelling; placing; grading of waste

3) D6N LGP CATERPILLAR BULLDOZER
   - Levelling; compaction; grading; earth works

4) D6T XW & D6T LGP CATERPILLAR BULLDOZER
   - Levelling; compaction; grading; earth works

5) Volvo EC340DL EXCAVATOR
   - excavating; levelling; ditching; grading; soil movement; berm construction

6) CAT 330 WH EXCAVATOR C/W GRAPPLER
   - recycling; excavating; levelling; ditching; grading; soil movement; berm construction; processing; box scrape outs

7) Volvo EC220 EL EXCAVATOR C/W GRAPPLER AND MAGNET
   - recycling; excavating; levelling; ditching; grading; soil movement; berm construction; processing; box scrape outs

8) JOHN DEERE 310J BACKHOE (C/W ATTACHMENTS)
   - excavating; recycling; levelling; ditching; grading; snow removal; box scrape outs

9) CAT 420F BACKHOE (C/W ATTACHMENTS)
   - excavating; levelling; ditching; grading; snow removal; box scrape outs; tree planting

10) 1 – 730 CAT ARTICULATED TRUCK
- 6-wheel drive truck / earthworks; daily cover

11) 2 - A25E VOLVO ARTICULATED TRUCK
- 6-wheel drive truck / earthworks; daily cover

12) 1 - CAT 950H LOADER
- material loading; snow removal; processing; road maintenance

13) 1 - CAT 950M LOADER
- material loading; snow removal; processing; road maintenance

14) DURATECH EJ100 WOOD GRINDER
- wood and drywall grinding

15) 2- MACK ROLL-OFF TRUCK
- on-site container management; dust control

16) PICK-UP TRUCKS AND ALL-TERRAIN VEHICLES
- site access; road sweeping; snow removal; magnetic sweeps; salting

17) 1 TON DUMP TRUCK (c/w SNOW PLOUGH)
- For general use and snow removal both on-site and off-site

18) 3-35 HP LEACHATE PUMPS
- available throughout the year for leachate management

19) 2- 100 MM GORMAN RUPP PUMPS AND ADDITIONAL GENERAL PURPOSE PUMPS
- available for the handling of leachate and surface water

20) TANKER 22.7 m^3 (5,000 GAL.)
- On-site water needs (dust control; clean roadways; flush leachate MHs etc.)

21) 100 KW GENERATOR, 40 KW GENERATOR AND 20KW GENERATOR
- Power supply for the candlestick flare
- Power supply for the odour misting system
- Pump Station backup power supply.

22) KUBOTA UTILITY VEHICLE
- Equipped with snow blowing and lawn mowing equipment.

23) ARGO UTILITY VEHICLE C/W TRACKS
- All terrain vehicle.

24) LIGHT TOWERS
- Landfill and recycling area lighting and power supply for equipment.

25) METSO SCREENING PLANT
- Screening of oversize materials from soil and rubble.

Vehicles are equipped with 2-way radio equipment along with hand held portable 2-way radios utilized for on-site communication between equipment operators, supervisors, spotter, weigh scale attendants, maintenance personnel and site office.

The size and type of equipment available on site handles the every day and long-term operation of this engineered facility. Additional equipment is brought on site as required to supplement or replace the WCC heavy equipment during repair programs or for special projects.

3.2.5 Equipment Maintenance

A maintenance building completed in 2009 is used for equipment repairs and storage of parts, tools and supplies. A comprehensive preventative maintenance program is in place and equipment maintenance is fully documented. A maintenance schedule is followed in a strict manner. WCC's own staff mechanics perform all lubrication and oil changes as well as most vehicle repairs. Qualified equipment dealers perform major repairs and warranty work when required. A daily pre-trip and post-trip inspection of all equipment in use is performed by equipment operators.

All machinery is equipped with fire suppressant and first aid equipment. First-aid stations are located at various locations on site.

On-site personnel are able to perform routine maintenance on all machinery and employees are trained to operate and maintain different pieces of equipment. A daily, weekly and monthly equipment inspection is carried out and documented for each piece of equipment. Daily records of fuel, lubrication consumption, and hours of operation are maintained.

3.2.6 Scale House and Small Vehicle Pad

Two full-time employees operate the scale house. Two 100 tonne Rice Lake scales installed in early 2009 are in operation to reduce traffic congestion on Navan Road. All vehicles are weighed upon entering and leaving the landfill. Drivers must exit their vehicle and sign the weigh bill at the scale house. The scale clerk records the name of the client, the origin of the waste (customer), the type of waste, driver identification, truck identification and notes using a grid system where the waste was placed within the landfill. All records from these transactions are maintained at the site office and recorded in WCC's computer records.

The scale clerk has contact with the site office, spotter and equipment operators at all times. The site cannot be opened unless the scale clerk and an operator/spotter are present. Rejected loads of waste are recorded and reported to the MECP and a record is kept on site.

A small vehicle unloading area was built southeast of the weigh scales to service small vehicles and promote recycling. The paved area is maintained and kept clean at all times. Concrete bunkers were added in 2012 west of the small vehicle pad to add capacity for small loads of aggregate, shingles, asphalt, metals, wood

and recyclable windshield glass. These bunkers are also used to accommodate small waste vehicles preventing them from entering the landfill where commercial and heavy equipment activity is occurring.

3.2.7 Site Office

Management and administrative staff work in an office/maintenance building constructed in 2009 located north of the landfill near the Navan Road site entrance. The site office is open Monday to Friday during working hours of the landfill. All records are maintained at the site office. The site office is equipped with several computers to maintain landfill records, employee information and site operation manuals. Areas of active landfilling are recorded daily and referenced to a grid system. The daily operation of the landfill is carried out from this office.

3.2.8 House Keeping and Controls

(a) Site safety

All employees have been instructed in safety procedures and a Joint Occupational Health and Safety Committee meets monthly to discuss health and safety issues at the site. Managers have been tasked as Site Safety Leaders dedicating time to safety related programs, training and safety awareness. On-site employees have completed waste handling safety courses, GHS training (Global Harmonized System of Classification and Labelling of Chemicals), confined space entry, and CPR & basic first aid training courses. On-site first-aid stations are available on the equipment, maintenance facility, scale house, pump station and site office. On-site communication allows for quick response. Emergency spill kits are available at the maintenance garage and site office. All workers have been provided with personal protective equipment (PPE) and must wear hard hats, safety boots, reflective clothing and safety glasses. All vehicles have back-up alarms. A spotter directs all traffic and machinery at the working face of the landfill.

Employees have been instructed in the handling of special materials, in particular impacted soils and asbestos, a designated waste. All employees and haulers follow a documented protocol for the handling of these materials. In brief, the procedure is as follows:

No hauler is allowed to enter the site with these materials without prior approval. All haulers of these materials must give advance warning of their coming to the site. A time slot is then assigned for receipt of the material. A designated spot for the placement of the materials is prepared. Asbestos waste is landfilled and covered without any equipment coming into contact with the waste. Disposable safety coveralls, head covers and respirators are also available on site for the handling of special wastes.

Employees have been instructed as to the types of waste allowed and materials not allowed to be received at the site. All containers must be open and void of any liquid material before they can enter the site. Closed containers are refused. Waste that is inadvertently dumped at the site is either placed back in the hauler vehicle or stored in one of WCC's boxes for later removal. Hauled materials are inspected for any banned waste and the above procedure followed. Materials rejected from the landfill are reported to the MECP district office. Records of rejected waste and materials removed from the site are kept at the landfill site office.

(b) Scavenging control

No scavenging is permitted at the site. The spotter and equipment operators working at the active face strictly enforce this. On-site personnel carry out recycling of wood, metals and white goods in a controlled and manageable manner at the active face using heavy equipment specially equipped with a grappler and magnet. A small vehicle receiving pad is provided where waste from small vehicles can be received safely and materials can be sorted for recycling by the vehicle operator. Concrete bunkers were added to this area to further assist with the recycling of materials such as asphalt, aggregates, shingles, wood, metals and windshield glass. A program for the recovery of refrigerants is available and this service continued throughout 2021.

(c) Litter control

Litter has not been a problem at the Navan Waste Recycling and Disposal Facility because of the use of daily cover. Periodic checks are made of the finished and active areas of the site for litter. Litter fencing is maintained at the active working face and temporary fencing is maintained in areas of the landfill perimeter as a supplementary litter control measure. Fencing is cleaned of litter as required. At least twice each year WCC personnel collect litter accumulated in the ditches along Navan Road for a distance of 1 km to the east and west of the site entrance. No complaints related to litter were received in 2021.

(d) Vector and vermin control

The presence of vermin and vectors is not a problem at the site primarily due to the dry, non-putrescible nature of the waste stream. Periodic checks have proven that no problems with vermin exist at the site due to proper landfilling procedures. If vermin are detected at the site, a registered pest control company is retained to control the problem. Although some seagulls and crows do frequent the site in summer months, this is not considered a health or environmental problem because of the small numbers present. A bird scare permit has been obtained from the Ministry of Natural Resources. When required, pellet whistlers are shot into the air to control birds during business hours. Abell Pest Control was hired in 2018 to set up bait control stations at various locations throughout the landfill to monitor activity on site and continued their work throughout 2021. No complaints were received in 2021.

(e) Dust management plan

The landfill has the potential to generate fugitive dust emissions. Fugitive dust sources have been assessed in accordance with MECP guidelines. In order to minimize the potential for off-property impacts due to fugitive dust, the following practices are implemented at the site:

- Aggregate (e.g., gravel, crushed limestone) is spread over unpaved roads to reduce silt loading. Repeat applications of aggregate are done on an as-needed basis, dependent on the condition of the roads.
- Watering of unpaved roads is carried out to increase the moisture content of the surface material and reduce the potential for fugitive dust generation. Dust suppressants (e.g., calcium chloride,

wood chips) are also used, depending on the ability of watering to appropriately control dust. The frequency of application of water or dust suppressants to roadways is adjusted based on road conditions, weather conditions and traffic loadings. In 2021, watering of access roads for dust suppressant with the use of an on-site water truck was carried out on 142 separate occasions throughout the dry weather months. The company also owns a backhoe equipped with a road brush for sweeping asphalted surfaces. In addition to the use of on-site equipment, mud and dirt was removed from Navan Road and on-site paved roads by a subcontractor retained to vacuum sweep/flush paved surfaces on 9 separate occasions.

- A speed limit of 15 km/h is enforced while vehicles are traveling on unpaved roads. This limit is posted on site and communicated to users of the unpaved roads.
- Where possible, travel distances to material transfers and drop points are kept as short as practical to reduce dust generation.
- A wheel wash station was constructed in 2009 east of the weigh scales and scale house to wash vehicles exiting the landfill and to reduce mud drag-out onto Navan Road. The wheel wash station is operational during the non-freezing months of the year.

The site maintains a log to record the date and time of any fugitive dust complaints and a summary is provided in Appendix '4' – Schedule 'A'. This log also describes activities related to the investigation of the complaint and also records the mitigative measures implemented to address concerns raised. In 2021, WCC received no complaints related to dust or dirty roads.

(f) Noise control

The active face of the landfill operation is sufficiently set back from Navan Road to minimize disturbance resulting from noise. Berms and soil stockpiles are located between active fill areas and nearby homes and offices to act as a sound barrier. Landscaped berms have been constructed along Navan Road east and west of the site access as well as east of the wheel wash station. No complaints related to noise were received in 2021. Noise monitoring was carried out by Golder Associates Ltd. and results are presented in Appendix 3. The results and site observations indicate that elevated background noise levels exist at surrounding receptors due to road traffic noise along Navan Road including landfill activities. Based on these results, the operations of the Navan Landfill are considered to be in compliance with the MECP's Landfill Guideline and NPC-205.

(g) Aesthetic controls

Landscaped berms have been constructed along Navan Road and a tree planting program is in place to improve site aesthetics. Each year efforts are made to further improve site aesthetics. A fish habitat ditch was completed along the east limit of the site complete with vegetation, landscaping and other ditch features. In addition to drainage, the ditch also provides an aesthetic barrier to the landfill.

(h) Fire control

Fire control is maintained by the supervision of all staff including the scale staff, the spotter and equipment operators. A number of non-smoking signs have been erected throughout the site that warns users of the

danger of fire in the landfill. Personnel have been instructed on the procedures of handling a landfill fire. The use of the landfill compactor and soil as cover material does not allow a fire to persist. The excavator, compactor, loader and the dozers are available to isolate a fire. Spare cover material, available at the working face, will be used in conjunction with the landfill compactor to smother a fire. The proximity of the Ottawa Fire Department at Blackburn Hamlet (less than 5 kilometres) will allow any superficial fire to be put out in a timely manner. On-site security and the presence of employees who live adjacent to the site will allow for quick action in the event of fire after hours. All machinery is equipped with proper fire extinguishers.

(i) Odour Control (Odour Management Plan)

To ensure the WCC Navan Facility is operated in a manner that minimizes the impact from odour on the public and the natural environment, the following program is in place at the WCC Navan Facility to deal with odour issues.

(1) Odour Monitoring

WCC has a comprehensive program for monitoring odours and for taking remedial action in the event that odours become at all problematic in the operation of the WCC Navan Facility. Any unusual odour events and any measures taken to deal with odour at the site are recorded and filed on-site.

There are no Ontario Government standards for odour. There are no agreed-upon, empirical measurement protocols or odour thresholds that may be used in the operation of a landfill or processing facility. Consequently, the ultimate test of an effective odour-control strategy for any facility can only be that it produces no odour complaints from the surrounding community over an extended period of operation. The operators of the facility need to take preventative and other control measures to ensure that odours never reach a threshold where they can generate complaints. The best odour monitoring program available is to give responsibility to all staff working at the site to use their own senses to constantly monitor for excessive levels of odour on-site. While some level of on site odour is normal and acceptable, it can become a problem when these same odours register off the property. As well, the character of the odour is significant. Many 'aerobic' odours may be very inoffensive, even at a significant concentration, while even very low levels of the types of odour associated with anaerobic activity may be deeply offensive.

It is normal practice at the site to monitor odours in the following way. Every morning, when staff first arrives on the site, a general inspection is undertaken of the facility. While the site manager is looking for anything untoward, the presence of any odours likely to extend beyond the perimeter of the site will be of special concern. In addition, whenever any material at the site is being disturbed by the equipment used at the facility, staff on site periodically stand downwind of the work that is being done, and assure themselves that any odours being created are mild, indicative of fully aerobic activity, and are not likely to be carried off the property.

In the event staff on-site believes any odours may have some potential for off-site impact, they will drive to a location off-site and downwind from the work at the facility to determine at that moment if any off-site impact can be detected. If there is a detectable off-site impact, work on the site will be stopped immediately and remedial measures will be taken (see below). If no off-site impacts are detectable, work

at the site will proceed with caution, with further periodic inspections off-site. Remedial measures will again be taken as appropriate.

The key to this approach is that all staff is constantly vigilant for even mild odours produced on-site and will take actions to deal with those odours well before they become evident off-site.

A windsock and flag is installed on the site. This provides a strong visual reminder to site staff of existing wind conditions, such that they can make judgments as to the potential for off-site odours, given that day's planned activities.

No odour monitoring program is of much value unless there is a companion program to control those same odours, once they are detected. What follows is a stepped program, capable of dealing effectively with everything from the mildest odours to the most offensive. It should be noted that all of the measures described below can and are just as likely to be applied to only sections of a site, rather than to the entire site. The source of odour problems can commonly be quite localized.

(2) Prevention

The best odour control strategy is odour prevention. If experienced staff early in the process makes the correct, preventative decisions, odour will not be an issue. Although mild odours are experienced on-site from time to time, they are mild in nature and should not be noticeable off-site.

A perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends below the water table. This drainage system has significantly reduced, if not eliminated, the potential for off-site migration of LFG.

Monitoring of methane gas at the landfill site is performed on three occasions per year generally during the spring, summer and late fall or winter. Results of the monitoring programs and interpretation of the data are presented in Section 8 of this report.

A leachate pumping station has been constructed in the southeast corner of the landfill site and a forcemain connection to the municipal sewage treatment plant commenced in 2007. Presently, the disposal method of choice for leachate generated by the WCC Navan Facility is treatment at the Robert O. Pickard Environmental Centre, a waste water treatment plant. The use of leachate retention ponds has been discontinued. This eliminates the possibility of odours emanating from on-site treatment and leachate retention ponds.

As discussed an interim LFG odour control system was installed in 2011 and commissioned in April 2012. The purpose of the interim LFG odour control system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells as well as a series of horizontal extraction wells.

(3) Masking the Odour

Principally, these additional measures will consist of using physical, biological and/or chemical methods to mask the odours on the surface of the odour source, so that none of the odours contained within are

released to the environment. A number of proven masking techniques are available and can be used at the discretion of the site manager:

- Physically covering the surface of the odour source with a 15 centimetre layer of bulking material is often enough to block the release of most odours for a period of a day or more while remedial work is done;

- A number of biological inoculants are available commercially. These substances, when applied to the surface in a water solution, are felt to effectively reinforce aggressive aerobic activity on the surface by out competing any anaerobic colonies that may be present in the near surface area. In effect, this creates a bio-filter, and biologically processes anaerobic gases as they are released; and/or

- A number of chemical/nutrient mixtures are also available commercially. These substances, when applied to the odour source in much the same manner used with the biological inoculants, can have a very similar or even stronger effect. Manufacturers of these products claim that their compounds rapidly stimulate the growth of one desirable family of microorganisms or another, again to create a bio-filter effect.

Whatever the actual mechanism, these products have been proven effective in the field. In all cases, odour control strategies used at this level can be applied within minutes of the decision to use them, and the effects will be largely felt within 10-15 minutes of that application, if not sooner.

(4) Isolating an Odour Source

The last strategy will consist of using additional measures to isolate and neutralize the offending odour source material. The offensive material may be removed from the problem area, landfilled and covered immediately. This isolation strategy will be used at the discretion of the site manager.

(j) Contingency for winter operations

The following contingency factors have been implemented in the event that very cold conditions cause operating problems:

- Snow removal equipment

A variety of equipment is available for snow removal. Two CAT 950 loaders are mainly used for this purpose. A John Deere and a CAT backhoe along with a one ton truck equipped with snow ploughing equipment are also used. A Kubota utility vehicle equipped with snow blowing equipment is available to assist with snow removal along walkways and vehicle restricted areas.

- Cover material stockpiles

Impacted soil reserved for re-use as daily cover material has been stockpiled in certain areas of the landfill. In case of frost, an excavator equipped with ripping tooth is available for ripping through the frost line. The excavator and 6-wheel drive articulated dump trucks are used to move and stockpile cover as a contingency.

(k) Complaints Procedure

In the event that an odour complaint is received, either by the City of Ottawa or the MECP, it is expected that those parties will immediately contact WCC site staff and notify them of the problem. WCC staff will take immediate steps to determine the extent of the problem and whether or not it is caused by the facility. If the source of the complaint is deemed to be originating from the WCC Navan Facility, appropriate measures as described above will be taken to mitigate the problem. Again, all such measures taken will be documented and a record kept on-site. If the identity of the complainant is made known to WCC staff, staff will contact the complainant that day, listen to their description of the problem, advise them in detail of the measures taken to rectify the problem, and invite them to visit the facility at some point to see for themselves how the site is operated. WCC will also call them back to determine whether or not they have been aware of any other site related issues.

WCC staff has found in the past that this kind of immediate and personal attention goes a long way to building community support for a facility and builds community confidence in the management of the site.

The site maintains a log to record the date and time of any complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. A summary of complaints received in 2021 is provided as Schedule 'A' in Appendix '4'. In 2021, WCC personnel received 1 odour related complaint. No other complaints were received by site personnel in 2021.

(l) Record Keeping

Record keeping is in accordance with the requirements of the ECA and as described in the D&O (Golder, 2008) as follows:

Site inspection records and daily waste records are retained at the site for a minimum period of two years. The records include the following information:

a. Type and estimated amount of waste received at the site for landfilling and processing;
b. Area of the site in which landfilling operations are taking place;
c. Type, source and amount of daily and intermediate cover used;
d. Waste types and quantities of recyclable wastes received at the site;
e. Source of their generation (e.g. customer);
f. Waste types and quantities of recyclable wastes transferred off the site;
g. Destination of recyclable wastes transferred off the site;
h. White goods tag numbers tagged at the site;
i. Types of wastes and quantity transferred from the processing area into the landfill area;
j. The calculated total quantity (including volume or weight) of waste remaining on-site at the end of each day;
k. Records of any dust suppression activities undertaken at the site;
l. Maintenance and repairs performed on the equipment used at the site;

m. Records of complaints received and actions taken to resolve them;
n. Summary of emergency situations and actions taken to address them; and
o. Any environmental and operational problems and any mitigative actions taken.

3.2.9 Waste Acceptance and Placement

The mechanics of waste placement at the active disposal face are described as follows:

1. Procedures are in place at the site to pre-screen all special waste materials prior to arrival at the site. Generators/haulers are required to provide information related to the type of waste to be delivered at the site and complete and submit a computer generated or hard copy Special Waste Approval Form which is screened prior to approval by WCC staff. Once approved, an Vehicle Code (VC) number is provided and must be presented at the scale prior to entry to the site.

2. The gate clerk registers all vehicles entering the site at the weigh scale. Vehicles are weighed and directed to the active disposal face. Light vehicles are diverted to an unloading area near the entrance to the site and do not enter the working area of the landfill. Appropriate signs are posted to indicate clearly where vehicles are to unload.

3. Vehicles reach the active face via a well-maintained gravel surfaced access road. On arrival, they wait until a ground worker screens the load and directs them to back into the active working face. The working face length is confined to as small an area as possible, but generally is wide enough so that 6 to 8 trucks can operate safely in the working face area at any one time. After dumping, the trucks move a distance of several metres from the active working face where they can be cleaned by the truck operator.

4. Waste is placed and compacted on the active working face using a "push down method" and/or a "push up method" to an average depth of approximately 60 cm.

5. A landfill D7 dozer is used to spread and level the waste as it is received. An 826 CAT compactor works on top of the refuse and compacts and shapes the waste into place. Between 3 and 5 passes with this equipment are made before the required density is obtained. Additional waste is spread evenly by repeated passes of the dozer and compactor to a total average lift depth of 2.5 to 3 metres.

6. Cover material is placed daily and as required. Generally, impacted soil hauled to the active face is used as cover material and spread into a minimum 15 cm thick layer. Areas not visited for an extended period of time are covered with a minimum of 25 cm of interim cover material.

7. All weigh tickets are kept on site along with daily and monthly summaries which are available for review. All rejected waste loads are reported to the Ministry of the Environment, Conservation and Parks (MECP) district office in Ottawa and a record of the report is kept on site.

8. Asbestos waste is landfilled in accordance with Section 17 of Ont. Reg. 347. These procedures consist of the following:

    a. Personnel involved in the disposal of asbestos are trained to recognize the related hazards.

b. Asbestos is accepted only in containers/bags and not in a loose form. Care is taken to ensure that staff and equipment do not come into contact with the asbestos.
c. Asbestos is accepted only with 24 hour pre-notification.
d. Personal protective equipment including disposable coveralls, head covers and respirators are available for the handling of special wastes.
e. Prior to the arrival of asbestos on-site, a trench is excavated to receive the material.
f. Other operations in the immediate vicinity of the trench are temporarily suspended while the containers are emptied in the trench.
g. The trench is immediately covered over with at least 1.25 metres of waste or cover soil.

9. Refrigerant containing appliances are received and handled in accordance with the following procedures:

a. When refrigerant containing appliances are identified in the waste load, the client will be notified and given the opportunity to reclaim the unit(s) and remove it from the site and a rejected waste form shall be completed by scale personnel if the unit is reclaimed for removal;

b. Should the client/driver not reclaim the refrigerant containing unit(s), scale personnel shall be notified immediately and the unit(s) shall be recorded on the weigh ticket and the unit(s) shall be removed by landfill or recycling personnel and taken to a designated area on the recycling pad taking all necessary precautions not to damage the refrigerant containing unit;

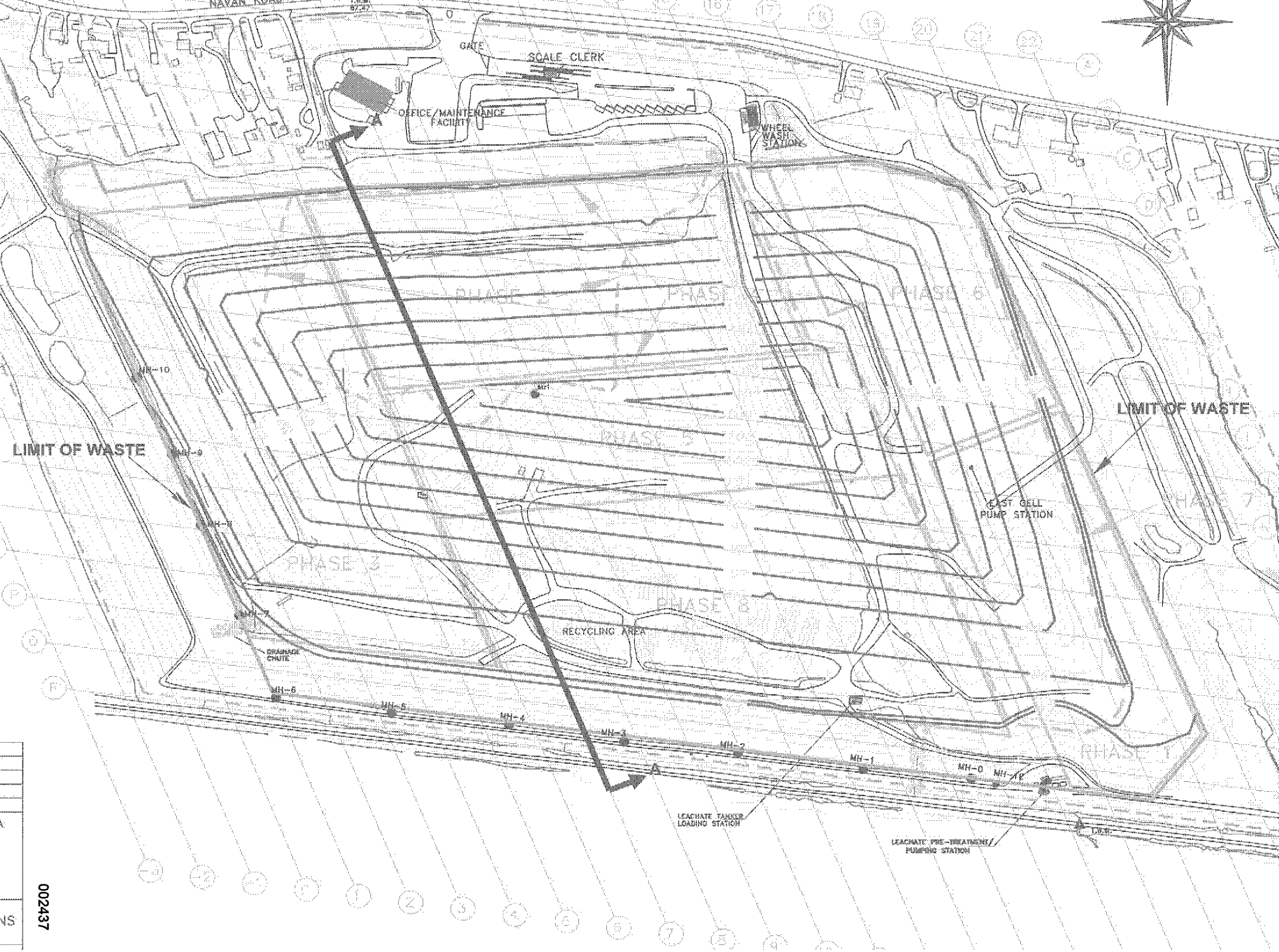
c. Every effort shall be taken by personnel to store the refrigerant containing unit in the designated area on the recycling pad in an orderly manner that is accessible to the refrigerant removal technician and in an up-right position or, if not possible due to damage, in a manner to prevent damage to the refrigerant containing unit.

d. Once a sufficient number of units have been stored for removal of refrigerants, or once quarterly, a certified technician shall be retained to safely remove all refrigerants and certify them as completed and a record of the certification shall be kept on file;

e. Once the unit has been certified it shall be available for removal as scrap metal;

f. The procedures noted above shall apply for all units received at the site that do not contain a refrigerant removal certificate, including those claimed to no longer contain refrigerant materials.

No waste is accepted, deposited or removed from the site unless the site supervisory personnel is present.


GATE
SCALE CLERK
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
LIMIT OF WASTE
LIMIT OF WASTE
MH-10
MH-9
MH-8
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH
EAST CELL PUMP STATION
RECYCLING AREA
DRAINAGE CHUTE
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT PUMPING STATION
PHASE 5
PHASE 6
PHASE 7

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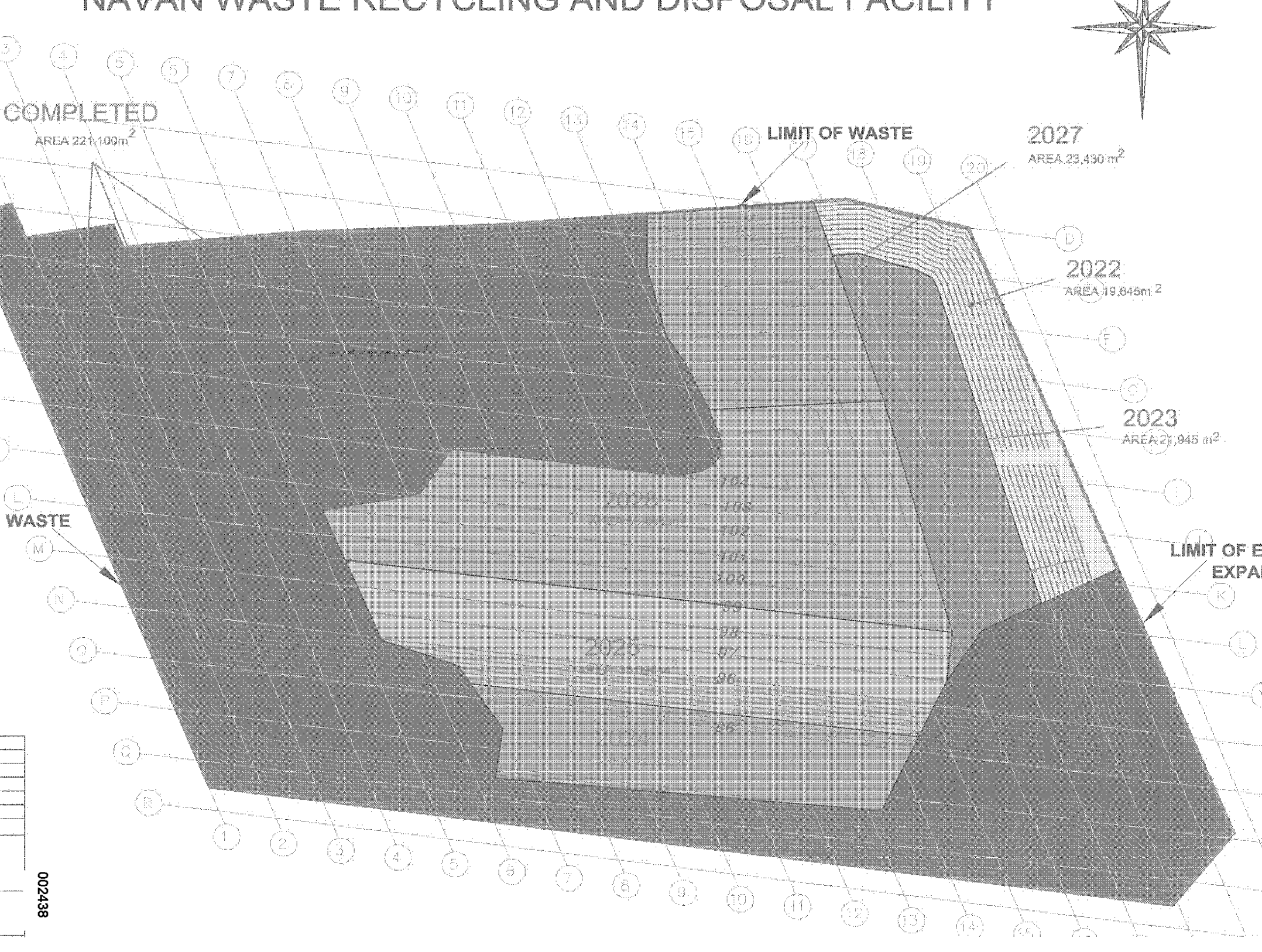
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY



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4. WASTE QUANTITIES AND CHARACTERISTICS

Major private haulers as well as small haulers serving all segments of the Ottawa community, Eastern Ontario and the Outaouais are served by the Navan Waste Recycling and Disposal Facility. Materials processed at the site in 2021 consisted mainly of contaminated soils, construction and demolition waste, IC&I waste including asbestos waste as well as general dry waste and recyclable materials. Materials received at the site for re-use included brick, rubble and small concrete as aggregate, asphalt, granular materials and clean roofing shingles for road/pad construction material. Impacted non-hazardous soils were also received for re-use as cover material or treated for re-use outside the designated air space in accordance with approvals received for the site. Materials such as metals, wood, glass, drywall, cardboard, white goods, tires and electronics were also recycled and removed from the site.

All materials received at the site are weighed upon arrival on one of two scales located at the entrance to the facility. During 2021 a total of 513,078 tonnes of waste and other materials were received at the site of which 190,415 tonnes were landfilled. The total tonnage and number of loads are summarized in Table 4.1 below.

Table 4.1: WCC Material Tonnage, Jan.1 – Dec. 31, 2021

	Tonnage	No. of Loads
Total:	513,078	67,219
Total Landfilled:	190,415	N/A
Total Reused/recycled:	322,663	N/A
Monthly Average:	42,757	5,602
Daily Average:	1,650	216

The above material tonnage received in 2021 includes waste landfilled, recycled waste materials, treated contaminated soils, rejected waste removed from the site and other materials received for re-use at the site.

The material distribution is as follows:

- Tonnage landfilled totalled 190,415 tonnes (37.11%) and included IC&I waste, C&D waste and other materials that were received and directed to the active working face for landfilling;
- Recyclable materials such as cardboard, tires, glass, drywall, e-waste, wood, metals and white goods taken off-site to market totalled 5,074.24 tonnes (1.0 %);

- Waste materials rejected and removed from the site by WCC for alternative disposal at a licensed facility totalled an estimated 36 tonnes (0.01%).

- Special materials such as storm sewer screenings and impacted non-hazardous soil received at the site for re-use as cover material totalled 173,546 tonnes (33.82%).

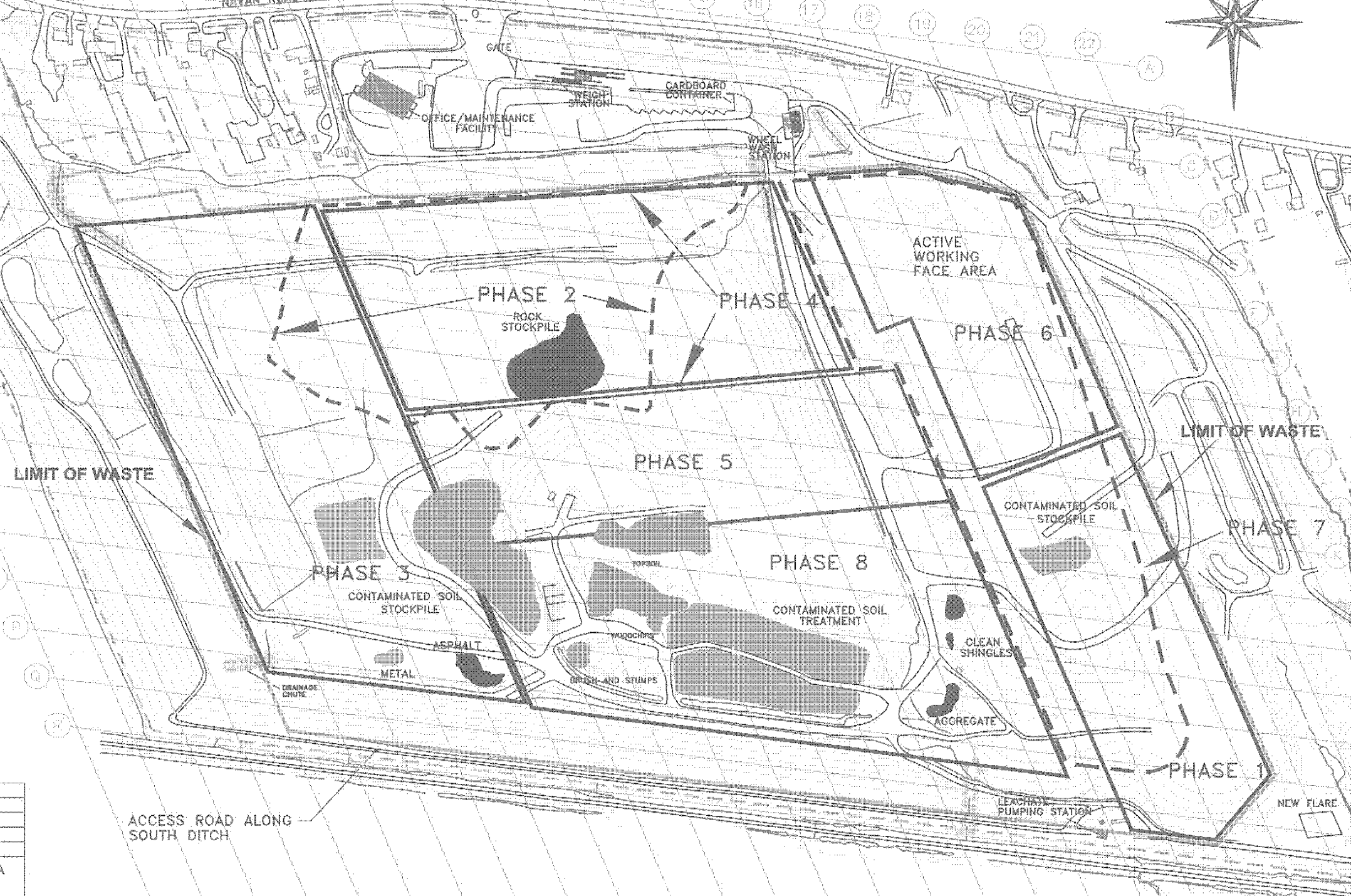
- Impacted soils treated or re-used on site totalled 95,846 tonnes (18.68%).

- Rock, brick, concrete, aggregate, shingles and rubble received and re-used on site as aggregate totalled 40,041 tonnes (7.8%); and

- Clean fill, topsoil and asphalt re-used on site for final grading, road/pad construction and engineered fill totalled 8,120 tonnes (1.58%).

Additional materials were recovered from on-site excavation such as soil, concrete, boulders, stumps and metals and re-used on site or recycled. These materials however, were already on site and were not part of the inbound receipts.

All weigh tickets are kept on site along with daily and monthly summaries, which are available for review. All rejected waste loads are reported to the MECP district office in Ottawa and a record of the report is kept on site. A monthly summary of material tonnage received in 2021 is provided as Schedule 'B' in Appendix '4'. The location of materials stockpiled on site is shown on Figure 4.1.


GATE
WEIGH STATION
CARDBOARD CONTAINER
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
ACTIVE WORKING FACE AREA
PHASE 2
ROCK STOCKPILE
PHASE 4
PHASE 6
LIMIT OF WASTE
PHASE 5
LIMIT OF WASTE
CONTAMINATED SOIL STOCKPILE
PHASE 7
PHASE 3
CONTAMINATED SOIL STOCKPILE
TOPSOIL
PHASE 8
CONTAMINATED SOIL TREATMENT
WOODCHIPS
ASPHALT
CLEAN SHINGLES
METAL
BRUSH AND STUMPS
DRAINAGE CHUTE
AGGREGATE
PHASE 1
ACCESS ROAD ALONG SOUTH DITCH
LEACHATE PUMPING STATION
NEW FLARE

002441

5. SITE CAPACITY AND LIFE EXPECTANCY

The capacity of the site is a measure of the amount of compacted waste that can be incorporated into the site in a series of lifts in accordance with the approved top of waste elevation contours as shown on Figure 3.1. The total site capacity includes the total volume of daily cover material used for lift and cell construction. The estimate of air space remaining does not include the final cover materials that WCC will place once the waste pile has reached the approved fill height.

Some of the factors that continue to influence the estimated life remaining at the Navan Waste Recycling and Disposal facility are as follows:

- Volume of waste permitted by the approved top of waste elevation contours;
- Annual and daily material tonnage received at the facility for landfilling;
- Characteristics (bulk density) of the waste materials being landfilled;
- Compaction energy provided during the placing of the waste;
- Volumetric cover to waste ratio;
- The degree of cell development optimisation;
- Operational factors such as recycled waste removed from the site and the exclusion of bulky, non-compactable materials that cannot be readily incorporated into the working face;
- The re-use of waste materials received as an alternative construction material for roads and unloading pads;
- The treatment of contaminated soils;
- The removal and re-use of rock and concrete from waste;
- The volume of loose non-compactable asbestos waste received at the site and cover material required to properly dispose of asbestos waste;
- Water infiltration and rate of biodegradation of the waste; and
- Settlement/consolidation of the waste pile and underlying soft clay soils.

Factors affecting the remaining life of a site are many and varied and in fact, some will change daily. Therefore, such calculations will only provide a theoretical approximation of the expected life remaining. A factor, which appears to be changing year over year, is the bulk density of waste landfilled. Increased recycling efforts at the source with the diversion of heavy materials such as concrete, rock, brick and rubble along with increased efforts to recycle and divert materials from landfill impact on the bulk density of the waste placed within the air space used. Other factors that affect the in-place density include the volume of impacted soils landfilled; the lift placement and compaction energy used to compact the waste; the volume of daily cover used; the volume of impacted soils treated rather than landfilled as a waste material and the volume of bulky asbestos waste that cannot be effectively compacted following burial of this waste.

Information related to site life expectancy is important for the proper management of landfill operations. Daily records of waste landfilled or stored at the site are therefore necessary.

5.1 *Estimate of Air Space Used (ASU) - 2021*

A simplistic approach to the calculation of air space used (ASU) consists of assigning assumed in-place compacted densities to the various types of waste materials landfilled as described below:

- 2.0 tonnes/m^3 for cover soil material;
- 0.9 tonnes/m^3 for IC&I, C&D, and general waste materials;
- 0.9 tonnes/m^3 for excavated waste materials;
- 1.2 tonnes/m^3 for roofing materials
- 1.5 tonnes/m^3 for Special Waste Materials (Industrial Waste, Screenings, etc.)
- 0.4 tonnes/m^3 for asbestos waste
- 0.4 tonnes/m^3 for wood waste; and
- 2.0 tonnes/m^3 for materials that are re-usable such as soil, concrete, brick and masonry.

Based on the assumed waste density distribution indicated above, the air space used by waste received, cover material and re-used materials placed within the air space during 2021 as presented in Table 5.1 is estimated at approximately 327,100 m^3 and excludes materials diverted off site for recycling and some materials re-used outside the air space. Based on this approach, the weighted average of the in-place density for all of the materials used in the air space calculation for 2021 is estimated to be 1.32 tonnes/m^3.

Table 5.1: ESTIMATED AIR SPACE USED (ASU), Jan.1 – Dec. 31, 2021

Material	Tonnage	Average Assumed Density, (tonnes/m^3)	Estimated Volume (m^3)
Waste Materials Landfilled	161,431	0.9	179,387.5
Special Waste Material	47,837	1.5	31,891.3
Asbestos Waste	2,306	0.4	5,764
Daily Cover Soils	173,546	2.0	86,773
Re-use materials (aggregates, asphalt)	43,021	2.0	21,510.4
Shingles used for sub base on road/turn areas	2,152.8	1.2	1,794
Estimated Air Space Used	430,294	1.32	327,100.2

Golder Associates Ltd. estimated the air space used by measuring the volumetric changes from topographic mapping generated from aerial photography obtained on May 1st, 2021 and the previous year on April 28th 2020. The net estimated air space used (ASU) between the last two aerial survey dates was reported to be 319,316 m^3 resulting in air space remaining of 1,497,213 m^3. Records indicate that the ASU during that period was consumed by approximately 380,715 tonnes of waste, daily cover material and other materials resulting in a density calculation of 1.19 tonnes/m^3 for a 5-year average of 1.42 tonnes/m^3. The variance between the density calculations could be attributed to many factors including optimization of cell excavation, settlement of the underlying soft clay soils and surcharge loading of the waste pile, which influence the year over year volume calculations.

Active landfilling of waste materials and daily cover throughout 2021 was carried out in the east cell or area outlined as Phase 6 (refer to Figure 2.4). Of the 269,391tonnes of impacted soils received in 2021, a total 95,845 tonnes were treated and re-used in the east buffer or re-used on site. 139,150 tonnes of impacted soils were re-used as daily and interim cover and as cover over asbestos waste in accordance with O. Reg. 347 (17). A balance of 34,396 tonnes received in 2021 was added to the soil stockpiled on site for re-use as cover material and located on the south side of Phase 6 as shown on Figure 4.1.

The remaining air space volume of the landfill estimated by Golder Associates Limited is 1,497,213 m^3(as of the latest Aerial Survey dated May 1st, 2021). Golder Associates Limited estimated the remaining life of the landfill to be 5.1 years as of December 31st, 2021. This estimate was based on the remaining air space calculated as of May 1st 2021, a projected 179,909 m^3 of airspace to be consumed between the May 1st, 2021 survey date and December 31st, 2021, a 5 year average density of 1.42 tonnes/m^3 and projected future annual waste receipts and daily cover soils of 344,750 tonnes/yr.

The actual tonnage landfilled and re-used within the air space between May 1st and December 31st, 2021 was 326,890 tonnes as shown in Table 5.2 consuming an estimated volume of 244,244 m^3 based on assumed waste type densities shown yielding an estimated overall density of 1.34 tonnes/m^3 and remaining air space of 1,252,969 m^3 as of December 31st, 2021. Allowing for future waste receipts and cover soils of 344,750

tonnes/year consuming 242,782 m^3/year at a 5 year average density of 1.42 tonnes/m^3, the estimated life remaining would be 5.2 years.

Table 5.2: ESTIMATED AIR SPACE USED (ASU), May 1 – Dec. 31, 2021

Material	Tonnage	Average Assumed Density, (tonnes/m^3)	Estimated Volume (m^3)
Waste Materials Landfilled	114,839	0.9	127,598.9
Special Waste Material	40,350	1.5	26,900
Asbestos Waste	1,637	0.4	4,092.5
Daily Cover Soils	139,812	2.0	69,906
Re-use materials (aggregates, asphalt)	28,391	2.0	14,195.5
Shingles used for sub base on road/turn areas	1,861	1.2	1550.8
Estimated Air Space Used	326,890	1.34	244,243.7

As of January 1st, 2022 the life expectancy remaining for the Navan Waste Recycling and Disposal Facility under the present Environmental Compliance Approval is estimated to be 5.1- 5.2 years (2027) based on future projected annual waste receipts and cover soils of 344,750 tonnes/yr and a 5 year average waste density of 1.42 tonnes/m^3 as discussed above. As indicated, the actual life of the landfill will vary significantly based on in-place waste densities and waste mix, but also on annual waste tonnage receipts, the amount of waste diversion and recycling initiatives at the landfill and settlement of the underlying soft clays.

5.2 *Financial Assurance*

In compliance with Condition 15 of the Environmental Compliance Approval #A460702, Financial Assurance for the site is currently in place with the MECP in the form of a Surety Bond in the amount of $13,566,246.00. Amendment Notice 11 to the ECA A460702 dated June 19th, 2018 requires that Financial Assurance be reviewed at intervals of three (3) years commencing on March 31, 2021 (Condition 15(b)); that commencing on March 31st, 2019 the owner shall prepare and maintain at the Site an updated re-evaluation of the amount of Financial Assurance required to implement the actions required under Condition 15(a) for each of the intervening years in which a re-evaluation is not required to be submitted to the Director under Condition 15(b). A Financial Assurance re-evaluation prepared by Golder Associates dated March 26th, 2021 was submitted to the MECP. Based on this latest Financial Assurance evaluation to be reviewed and approved by the MECP, the Financial Assurance for the site has increased to $13,724,172. The next re-evaluation report to be submitted to the MECP Director will be due on March 31, 2024.

6. ENVIRONMENTAL CONTROLS

6.1 *Overview*

The key components of the environmental controls at the site are as follows:

a) Surface Water Controls:

- Ditches have been constructed to divert external flows around the landfill. These consist of north, west, and east diversion ditches, including a 237 m long large diameter drainage culvert at the northwest corner of the site;
- Drainage water generated within the landfill that does not come into contact with waste is diverted to the perimeter ditches. Surface runoff water is directed from the top of the landfill down drainage chutes lined with erosion protection;
- The east diversion ditch was constructed as a fish habitat and was commissioned in late 2009 following the South Nation Conservation Authority approval;
- A pond exists in the southeast corner of the site which serves as a storm water retention pond. The north and east parts of the site drain to this pond prior to discharge to the east diversion ditch;
- A pond exists in the northwest corner of the site which serves as a storm water retention pond. The northwest and west parts of the site drain to this pond prior to discharge to the north diversion ditch.

b) Leachate Controls:

- The landfill is underlain with native low permeability clay soil (i.e. a natural liner);
- A perimeter leachate collection system has been constructed along the west and south perimeter of the waste pile;
- A leachate underdrain and collection system has been constructed below the waste in the north 1/3 of Phase 3; below the waste in the east part of Phase 8; below the waste in Phase 4; below the waste in the east half of Phase 5; below the waste in Phase 1; and below the waste in Phase 6;
- The landfill will be covered with low permeability final cover material to reduce water infiltration. Final cover has been completed in parts of the landfill as shown on Figure 3.2.

c) Landfill Gas Controls:

- Riser pipes for the leachate collection system along the north, east and west perimeters of the waste pile have been capped and the interim landfill gas odour control system consisting of a landfill gas collection and flaring system was approved by the TSSA and commissioned in April of 2012. This system has since been in operation on a continuous basis;

- The landfill gas collection system was extended to the top of Phase 3 below the final clay cover in late 2014 as well as a connection to the central MH to control odours generated from these areas. Additional horizontal gas collectors were added to this system in 2016 and 2017 and 2020. In 2017, 5 vertical wells were added in the Phase 3 area and 2 vertical wells were added in the south east corner of the Phase 1 area. In 2019, 4 vertical wells were added in the Phase 4 area of the waste footprint.

- The leachate collection system and maintenance holes along the west and south waste boundaries serve as a passive venting system.

- In 2017, a misting system comprising of a 300 m perforated HDPE line and blower powered by a diesel generator was constructed on the west side of the main access road that runs along Grid Line 14 as an added odour control system.

Environmental control systems for surface water, groundwater, leachate control, and erosion control systems are discussed in greater detail in the Design & Operations Report (Golder 2008). For the purpose of this report, a summary of the systems presently in use and/or proposed is provided in the following sub-sections. Surface water, groundwater, leachate and landfill gas monitoring undertaken by Golder Associates Ltd. are discussed in Sections 7 and 8 of this report.

6.2 Surface Water Management

The overall objectives for surface water management at the site are as follows:

- Divert surface run-off and shallow ground water flows originating upstream of the site around the outside perimeter of the waste footprint;

- Maintain the pre-development drainage conditions and water balance to each watershed;

- Minimize the amount of surface water that comes into contact with waste (which must then be managed as leachate); and

- Maximize the removal of suspended sediment from surface water generated on site prior to its release to the downstream drainage systems.

The regional surface water setting of the landfill is discussed in Section 2.7 and existing surface water control features are shown on Figure 6.1. Existing controls can be summarized as follows:

a) Upstream flows originate from the north and northwest of the site. These flows are diverted around the landfill via ditches located along the perimeters of the site buffer zones.

b) A diversion ditch has been constructed in the north buffer of the landfill flowing east from the office/maintenance facility. A large diameter culvert was added in 2019 at the northeast corner of the waste footprint. This northern diversion ditch and culvert discharges into the east perimeter ditch. The east perimeter ditch conveys water southward into a storm water retention pond located at the southeast corner of the site. This pond discharges into an existing ditch along the landfill's south property line. The southern ditch drains under the VIA ROW near Grid Lines R-16 and flows onto WCC property and to the Mer Bleue drainage basin.

c) A diversion ditch has been constructed in the north buffer area flowing west from the office/maintenance facility. This ditch discharges into a natural drainage channel, referred to as the west perimeter ditch, flowing southward along the west perimeter of the property east of Grid Line -2. This ditch discharges at a location near the intersection of Grid Lines R and -2 and conveys flows westward to the Mud Creek drainage basin. Land through which this ditch flows is subject to a proposed residential development.

d) Clay cover has been placed on the north, west and south facing slopes of the waste pile as well as the top of Phase 3, the north edge of Phase 4 and the south half of Phase 1 where final waste grades have been reached as shown on Figure 3.2. Finished slopes are covered with clay soil, a thin layer of topsoil, graded and seeded. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control.

e) Landfill operations are carried out such that surface water is directed away from the waste to minimize water infiltration.

Surface water monitoring is discussed in Section 7.

6.3 *Leachate Management*

Leachate is generated from a combination of infiltration of precipitation into the waste pile as well as surface water and groundwater discharge into the landfill despite efforts to divert water around the waste footprint. Generation of leachate is minimized by grading the waste surface and placing low permeability cover materials over areas of the landfill that have been filled with waste in efforts to reduce infiltration from precipitation and to promote surface runoff.

Leachate generated by the landfill is collected by a collection system consisting of four separate components that all drain to a leachate pumping station in the southeast corner of the site. Figure 6.2 presents the leachate collection system in plan view.

1. A perimeter leachate collection system has been constructed along the southern limit of the waste footprint extending from Grid line 15 to Grid Line 1 and then approximately 330 m north

along the west perimeter of the waste footprint along Grid Line 1 to just north of Grid Line K. The perimeter leachate collection system was designed with a slope varying between 0.4% and 0.6% to provide gravity drainage to a collection point at the southeast corner of the site. The waste in the north 1/3 area of Phase 3 (Northwest Cell) was placed on a drainage blanket that connects to the west perimeter leachate collection system. This system consists of a granular trench with a 250 mm diameter perforated HDPE (Boss 2000) drainage pipe. Along the southern perimeter, the leachate collection system has been constructed with lateral granular filled hydraulic connector trenches into the waste pile. Access to the western and southern leachate collection system is provided by a series of manholes spaced at approximately 100 m intervals for monitoring and maintenance purposes.

2. The north area of the site below Phase 4 was constructed with a grid-type drainage network within a stone drainage layer underlying the waste. The leachate collection system in this excavated cell consists of 200 mm diameter perforated HDPE (Boss 2000) drainage pipe surrounded by 50 mm clear stone and non-woven geotextile laid out in a grid pattern spaced no more than 45 m apart. A network of French drains, consisting of clear stone wrapped in non-woven geotextile, placed between the drainage pipes reduces the drainage path along the floor of the cell to approximately 15 m.

3. An underdrain leachate collection system has been constructed beneath the waste located between Grid Lines 14 and 16 and south of Grid Line N and just north of the pump station consisting of a stone drainage layer and perforated drainage piping similar to the system constructed in the Phase 4 area to the north. A clay berm was constructed along Grid Line N to separate the two leachate collection systems located on each side of Grid Line N.

4. A fourth component to the leachate collection system consists of the east lateral expansion cell (Phases 1 and 6) designed by Golder Associates Ltd. and approved by the MECP as an amendment to the ECA No. A460702 Notice 1 dated October 9th 2009. This system in Phase 1 was completed in 2015 with Phase 6 completed in 2019. QA/QC was carried out by Golder Associates Ltd. and as-built reports were prepared by Golder Associates for each of the completed cells and submitted to the MECP. A leachate sump and pump is located at the northwest corner of Phase 1 to drain leachate from both the Phase 1 and Phase 6 areas.

Presently, the disposal method of choice for leachate generated by the WCC Facility is pre-treatment using air stripping followed by direct discharge to the City sewer system via a WCC forcemain. The leachate pumping station located at the southeast corner of the landfill site and leachate forcemain connection to the municipal sewer system on Renaud Road were completed in 2007 and commissioned in early 2008. Pre-treatment of leachate to reduce the concentration of H_2S and Volatile Organic Carbons (VOCs) using an air stripping system is carried out prior to pumping leachate to the municipal system. In 2008, cleanouts were added along the leachate forcemain to provide easier access for cleaning and maintenance. In 2011, the leachate pre-treatment and pumping station was expanded with the addition of higher capacity treatment chambers and higher capacity pumps to maintain discharge flows at the approved 17L/sec. The forcemain discharging to the City of Ottawa sewer system was pressure washed on two separate occasions in 2021 to clean the line and maintain unobstructed flows.

In 2021, a total of 88,591 m^3 of pre-treated leachate was discharged to the City of Ottawa wastewater system, a 33.3 % reduction over 2020. The decrease is attributed to efforts to decrease surface water

runoff into the waste. The monthly leachate volumes discharged are summarized in Table 6.1. The monthly and cumulative volumes of leachate pumped are shown graphically on Figures 6.3, 6.4 and 6.5. The peak month was March with a volume of 12,585 m^3. The daily average for the period of operation was 242.7 m^3/day.

Table 6.1: Summary of Leachate Volumes Discharged Off-Site in 2021

Month	Leachate Volumes (m^3) Discharged to City Sewer	Cumulative Leachate Volumes (m^3)
January	7,576	7,576
February	4,493	12,069
March	12,585	24,654
April	6,254	30,908
May	3,832	34,740
June	11,937	46,677
July	11,282	57,959
August	7,155	65,114
September	6,681	71,795
October	6,856	78,651
November	8,077	86,728
December	1,863	88,591
Total:	88,591	

Leachate monitoring is discussed in Section 7.

6.4 *Landfill Gas Management*

Landfill gas generation at the site is limited although its presence can be identified in the waste pile area by signs of dying vegetation and/or localized snow melt during the winter. Landfill gas is produced when organic waste decomposes. It consists primarily of methane (50%) and carbon dioxide (50%) as well as water vapour, nitrogen, and trace amounts of other non-methane organic compounds (NMOC). Non-putrescible waste received at the landfill does not generate landfill gas and methane at the same rate as municipal solid waste (MSW). Methane, which is explosive at concentrations greater than 5%, presents a health and safety risk both on-site and off-site. As a result, monitoring of landfill gas is carried out at the property boundary and within facilities located on site. In addition, passive gas ventilation systems and an active gas collection system at the site prevent the off-site migration of landfill gas.

The perimeter leachate collection system extends below the water table and prevents off-site migration of gas. Figure 6.2 provides details of the perimeter leachate collection system along the southern limit of the landfill.

As part of a commitment to control potential odorous emissions from the site, WCC has installed an interim landfill gas odour control system which will operate until the full-scale landfill gas collection system is installed at the site, which is expected in 2022. This interim odour control system, constructed within the existing landfill footprint, includes connections to leachate collection cleanouts, existing vertical landfill gas extraction wells, and to horizontal wells. This system also includes the installation of lateral and header piping, condensate management facilities, an outdoor skid-mounted abstraction plant, and a candlestick flare. During construction, leachate collection system cleanouts were excavated and the perforated pipe replaced with solid pipe and air tight connections. Tees were installed in the header pipe to allow for expansion of the system as required.

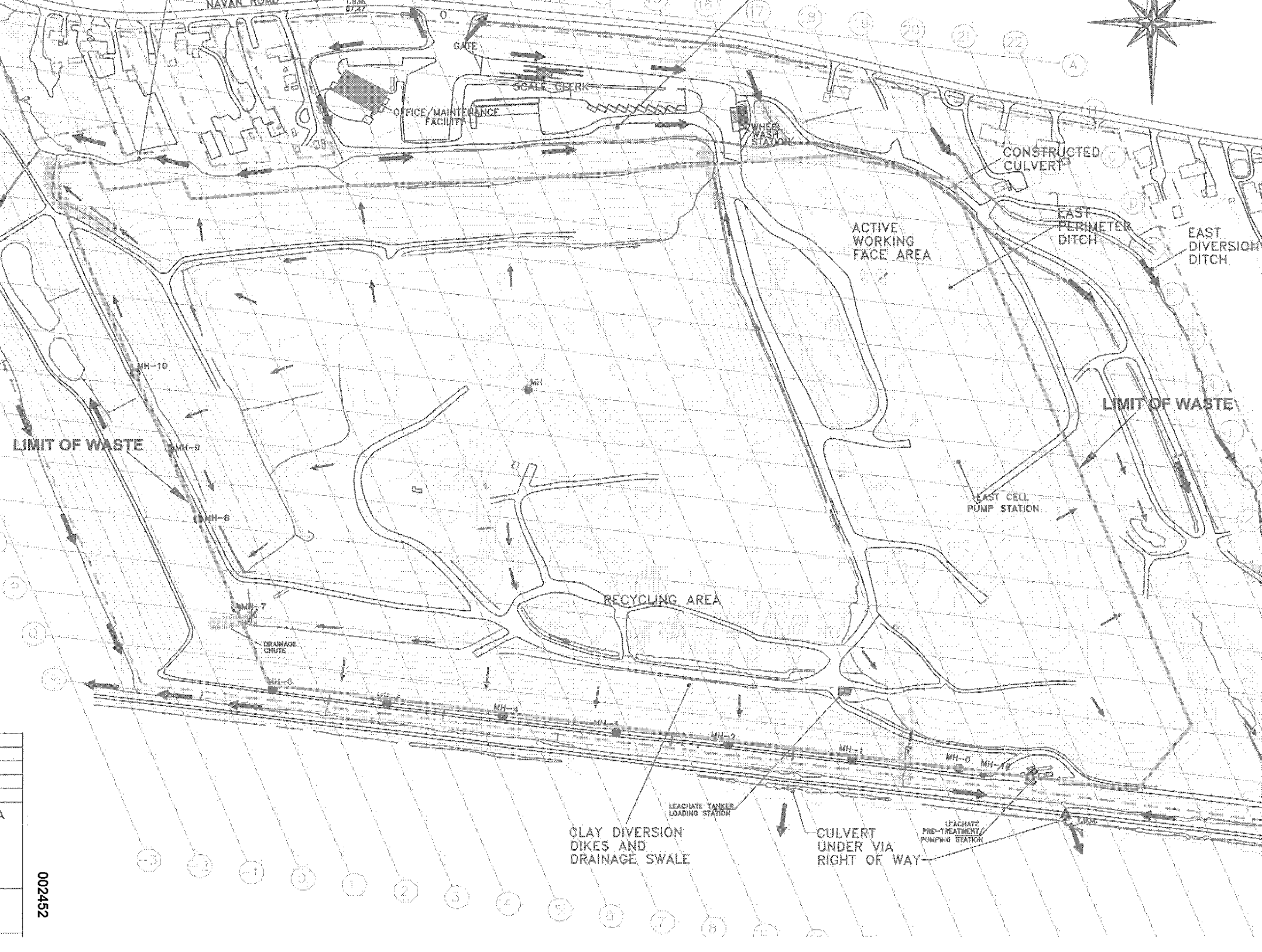
The interim landfill gas odour control system was installed in 2011 and commissioned in April of 2012. Additions to the LFG collection system which included horizontal and vertical wells were constructed in 2016, in 2017, in 2019 and in 2020. In 2021 the interim LFG system operated for 8,252 hrs at an average of 391 scfm with a totalizer reading indicating 5,801,695 m^3 of landfill gas was recovered at a methane (CH4) concentration of approximately 49.5%. A total of 2,871,839 m^3 of methane was flared using the interim landfill gas flaring system in 2021, a 1.81% increase in methane recovery from 2020 to 2021.

A monitoring program associated with the odour control system has also been implemented. Design of the full-scale landfill gas collection and flaring system has been completed by Golder Associates Ltd. and construction started in 2021.

Landfill Gas monitoring is discussed in Section 8.

6.5 *Buffer Zone*

The perimeter of the site is surrounded by a buffer zone which occupies an area of about 6.2 ha. In accordance with the ECA, a minimum buffer width of 30 m is maintained between the northern, eastern and western limits of the landfill area and the property boundary. A minimum buffer width of 10 m is maintained between the southern limit of the landfill area and a VIA Right-of-Way. WCC owns additional lands to the north, west and east of the landfill site as well as a 100m wide track of land south of the VIA ROW providing additional buffer space. No waste is deposited within the designated buffer zone. The limits of waste are illustrated on Figure 2.4.


NAVAL ROAD
GATE
SCALE HOUSE
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
CONSTRUCTED CULVERT
EAST PERIMETER DITCH
EAST DIVERSION DITCH
ACTIVE WORKING FACE AREA
LIMIT OF WASTE
LIMIT OF WASTE
MH-10
MH-9
MH-8
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-11
EAST CELL PUMP STATION
RECYCLING AREA
DRAINAGE CHUTE
LEACHATE TANKER LOADING STATION
CLAY DIVERSION DIKES AND DRAINAGE SWALE
CULVERT UNDER VIA RIGHT OF WAY
LEACHATE PRE-TREATMENT PUMPING STATION

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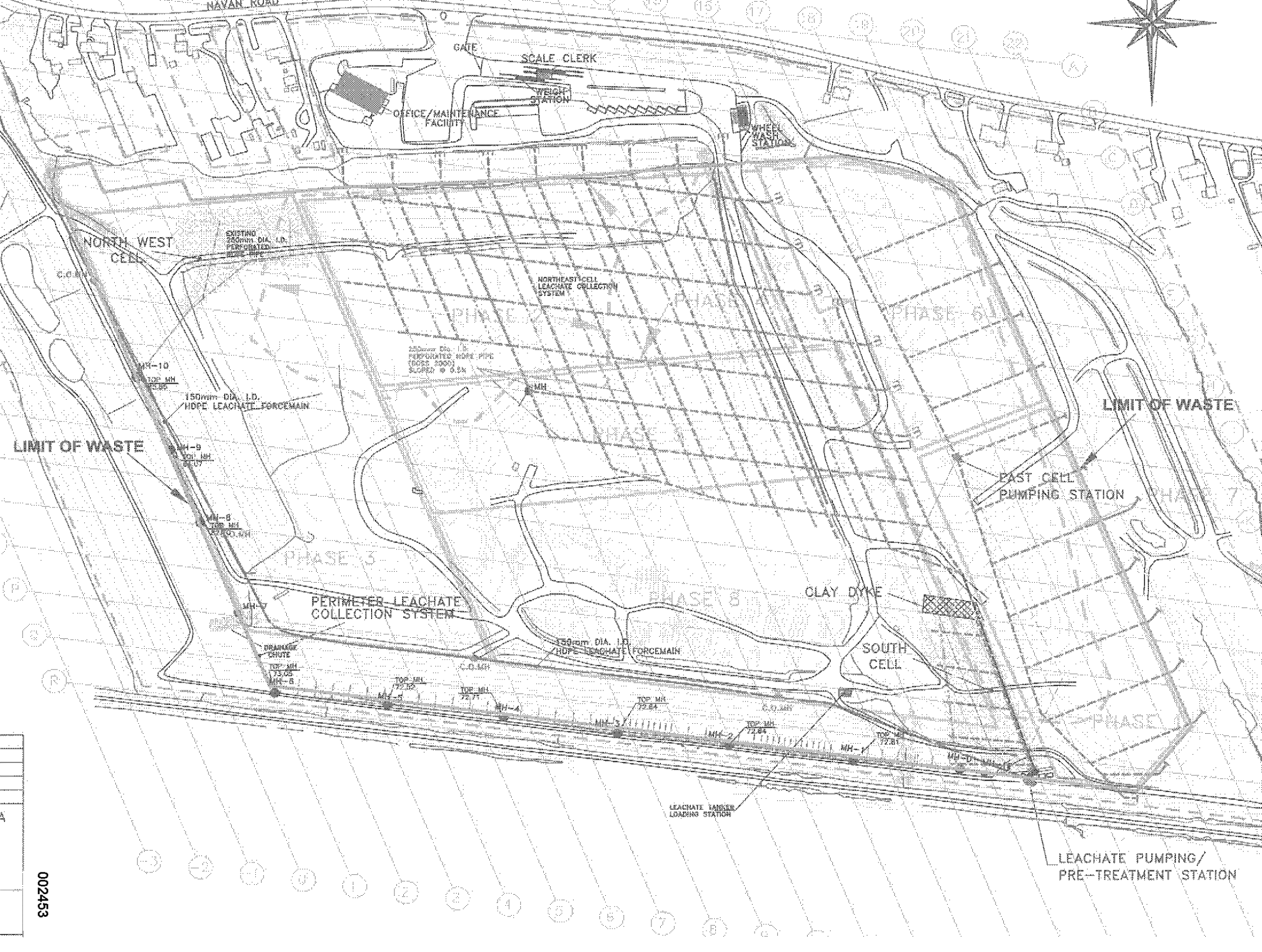

NAVAN ROAD
GATE
SCALE CLERK
WEIGH STATION
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
NORTH WEST CELL
EXISTING 250mm DIA. I.D. PERFORATED HDPE PIPE
NORTHEAST CELL LEACHATE COLLECTION SYSTEM
MH-10
TOP MH 75.06
150mm DIA. I.D. HDPE LEACHATE FORCEMAIN
MH
LIMIT OF WASTE
MH-9
TOP MH 74.10
MH-8
TOP MH 73.60 C.O.MH
LIMIT OF WASTE
EAST CELL PUMPING STATION
PERIMETER LEACHATE COLLECTION SYSTEM
CLAY DYKE
MH-7
DRAINAGE CHUTE
TOP MH 73.05
MH-6
TOP MH 72.92
MH-5
TOP MH 72.71
MH-4
150mm DIA. I.D. HDPE LEACHATE FORCEMAIN
C.O.MH
SOUTH CELL
TOP MH 72.84
MH-3
TOP MH 72.84
MH-2
TOP MH 72.81
MH-1
MH-0
MH-12
LEACHATE TANKER LOADING STATION
LEACHATE PUMPING/ PRE-TREATMENT STATION

002453

Figure 6.3: Total Monthly Volume of Pre-treated Leachate Discharged to City of Ottawa Sewer

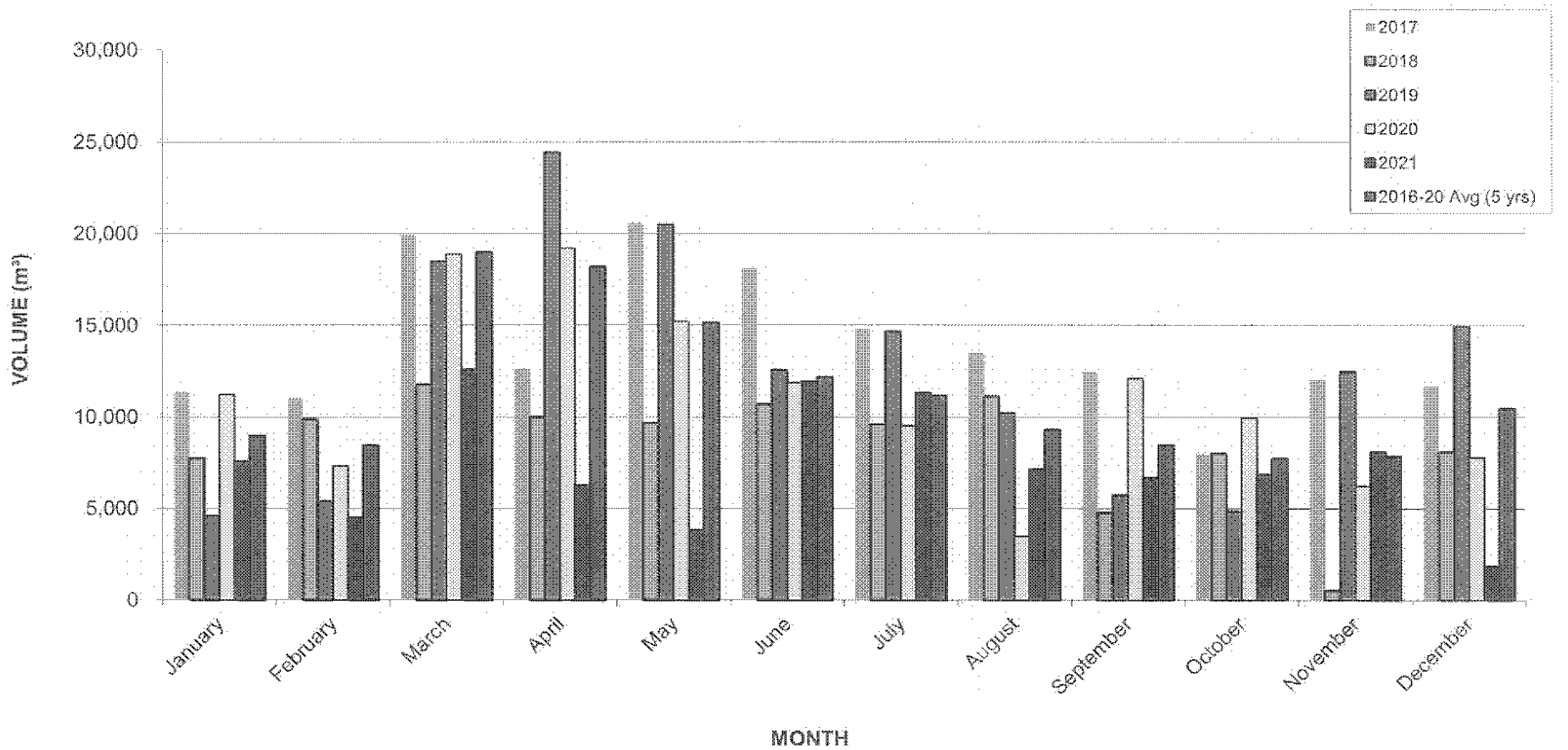


Figure 6.4: Cumulative Monthly Volume of Pre-treated Leachate Discharged to City of Ottawa Sewer

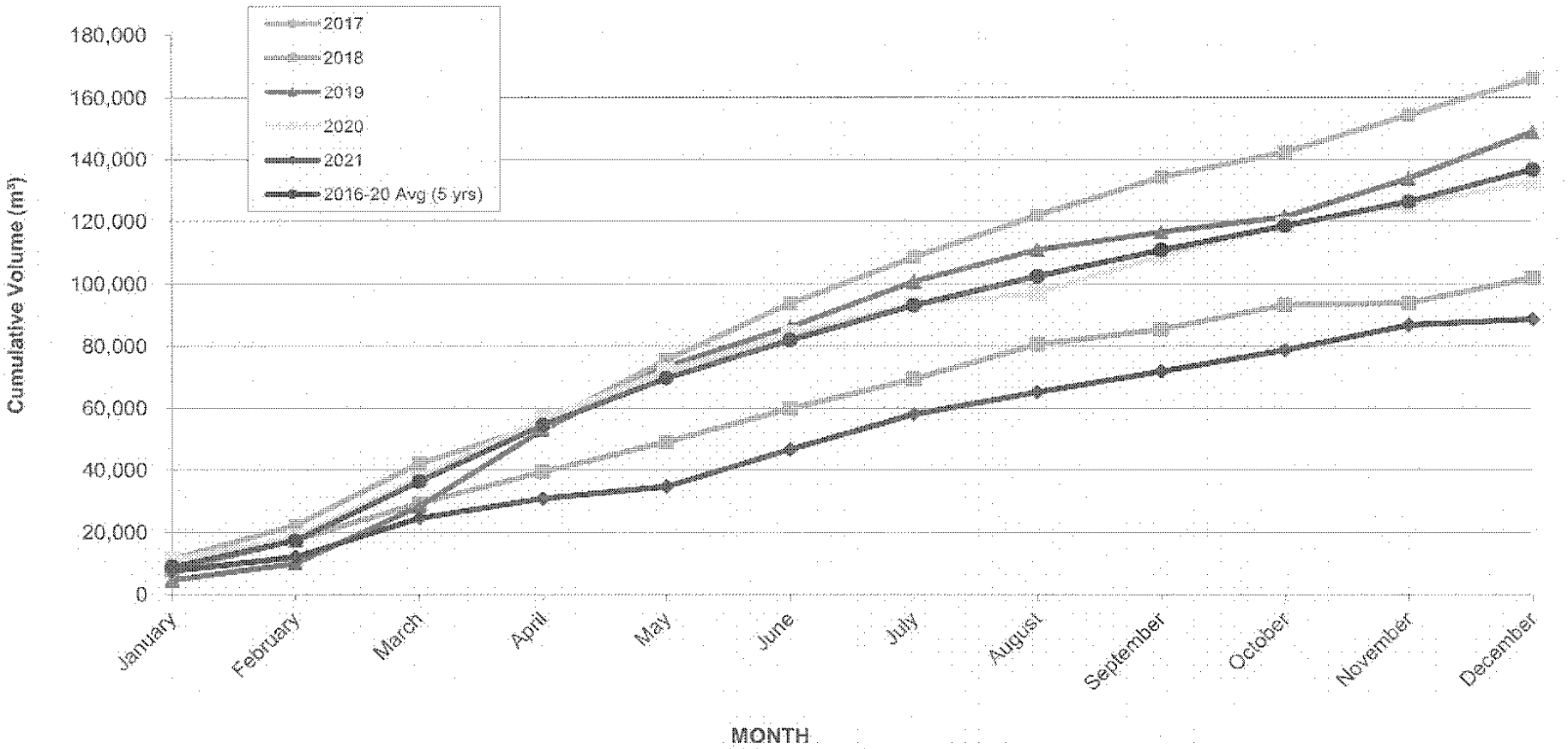
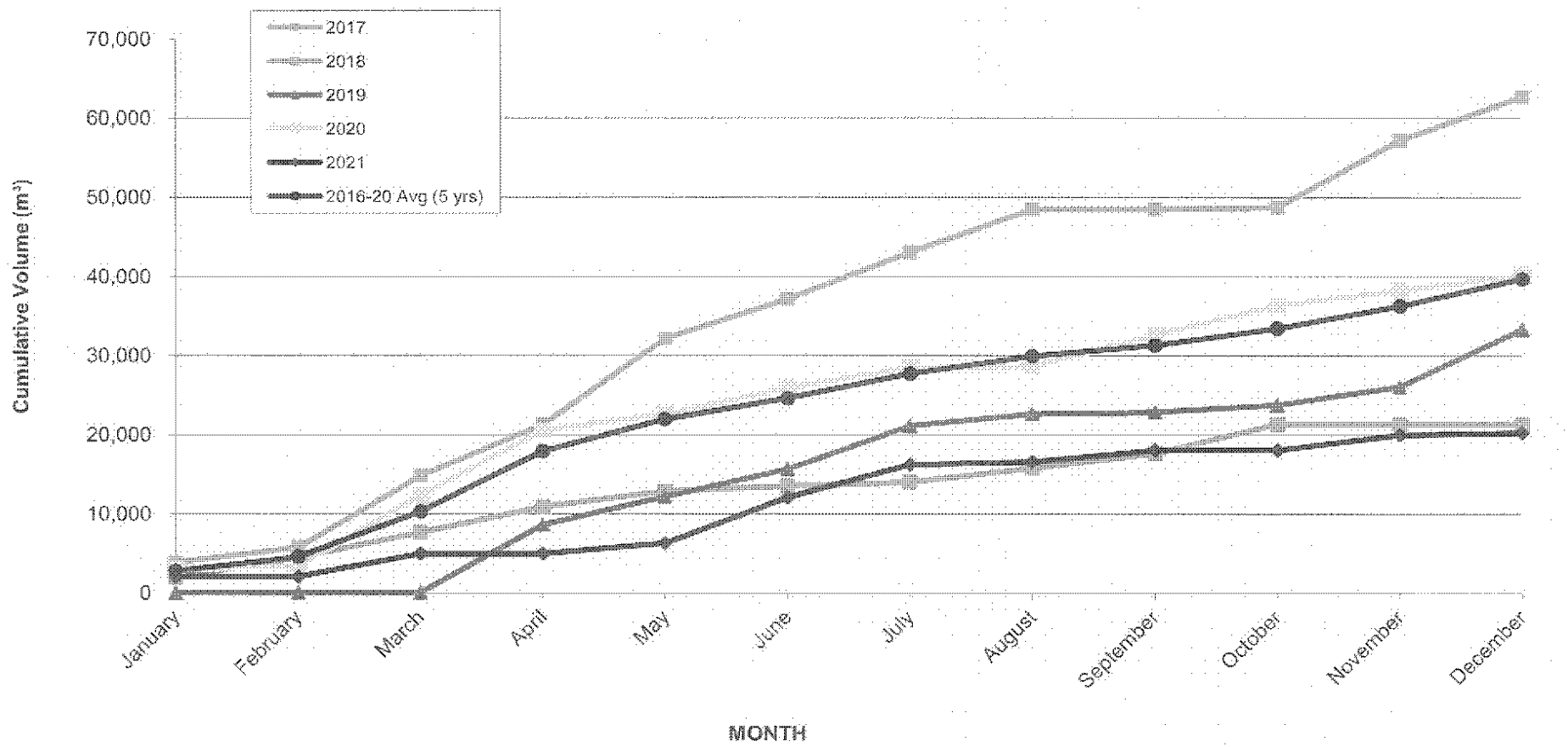


Figure 6.5: Cumulative Monthly Volume of Pre-treated Leachate From East Cell



7. WATER QUALITY MONITORING

Water quality monitoring undertaken to date at the Navan Waste Recycling and Disposal Facility consists of water quality analysis of surface water, groundwater, leachate and sediment. The location of water monitoring stations is shown on Figure 7.1. In 2021, Golder Associates Ltd. (GAL) was retained to carry out the annual water quality monitoring program and reporting requirements for the Navan Waste Recycling and Disposal Facility and prepare a report to fulfill the reporting requirements outlined in Conditions 135 and 136 of the Environmental Compliance Approval (ECA) No. A460702. The 2021 GAL report is attached in Appendix 1 and summarized below.

The following summary highlights key points only; for complete information and findings it is necessary for the reader to examine the GAL report provided in Appendix 1.

The monitoring program undertaken in 2021 was a continuation of the monitoring program carried out in 2020 and followed the program outlined in Conditions 109 and 112 of the ECA and Condition 10.1 of the Conditions of Environmental Assessment Approval. As per Condition 109, the monitoring program includes sampling of the monitoring wells located in BH09-1 in order to assess the groundwater quality in the Mer Bleue Bog. The original monitoring program indicated the wells would be sampled during the winter, when the Mer Bleue Bog is frozen and the wells are accessible. However, the groundwater in the monitoring wells has frequently been frozen during these events. In the 2013 monitoring report (Golder, 2014), it was proposed to sample them during the summer, rather than the winter, and this recommendation has carried forward to the present (monitoring is now completed either in summer or in fall, depending on site conditions). Groundwater samples were successfully collected at monitoring wells MW09-1A, MW09-1B, and MW09-C during the summer monitoring session in August, 2021 (no sample was collected from monitoring well MW09-D due to dry conditions).

Groundwater monitoring sessions in 2021 were carried out by GAL on May 26, August 24 and November 30. Surface water monitoring sessions were carried out by GAL on May 27, August 24 and November 24. Leachate quality analysis was undertaken on samples obtained by GAL from the pump station (L5) on May 27, August 24 and November 24. The following is a summary of the results of the monitoring sessions undertaken in 2021 presented in the GAL report provided in Appendix '1'. Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected in August 2021. The monitoring wells screened in the intact clay deposit and in the glacial till/upper bedrock zone will be sampled again in the spring of 2023.

During the spring monitoring session, the condition of each well within the monitoring well network at the site was assessed. A summary of the findings of the 2021 monitoring well network condition survey (properly cased, capped and locked) are provided in Table 3 of the GAL report attached in Appendix 1. At the time of the condition survey it was observed that all monitoring wells were in good condition.

In addition, sediment quality is also monitored at three locations within the Mer Bleue Bog. The sampling locations are the same as the surface water sampling stations located within the bog, i.e., SED-W was obtained at SW-W, SED-C at SW-C and SED-E at SW-E (refer to Figure 7.1). This program was initiated

in 2000 at the request of the National Capital Commission (NCC). In 2021, sediment samples were obtained by GAL on May 27 and November 24.

A Monitoring and Screening Checklist prepared and signed by a Competent Environmental Practitioner (CEP) is included with the Golder 2021 Landfill Monitoring Report attached as Appendix `1`.

The objectives of the 2021 environmental monitoring program were:

- To comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of Environmental Compliance Approval No. A460702;
- To assess any potential impacts on water quality at the site resulting from landfill operations;
- To continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill;
- To document the chemical composition of groundwater and surface water in the vicinity of the landfill;
- To assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate; and
- To document the chemical composition of sediment at three locations in the Mer Bleue Bog.

7.1 *Groundwater Quality Assessment*

Groundwater has been monitored at observation wells since 1981. However, since 1985, landfilling operations expanded over the original down-gradient observation wells which have since been replaced with the existing wells. Existing observation wells were installed in 1992, 1994, 1995, 1998, 2005, 2007, 2009, 2010 and 2011.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as follows:

- a shallow surface sand layer at depths ranging from 1.5 to 2.5 m below original grade
- the weathered clay zone of a thick clay deposit at depths ranging from 3.5 to 4.5 m below original grade
- the intact clay deposit at depths ranging from 7 to 8 m below original grade
- glacial till/bedrock contact zone at depths ranging from 22.3 to 37.1 m below original grade

Monitoring wells are present up-gradient, at the down-gradient edge (used to assess compliance) and further down-gradient of the landfill in each of these units. The two upper stratigraphic units, the sand and weathered clay units, were sampled for both the May and November monitoring events. The two lower stratigraphic units, the intact clay and near bedrock units, are sampled every 18 months. Groundwater samples from these units were collected in November 2021 and the next sampling session for the monitoring wells screened in these units will be in the spring of 2023.

Based on the groundwater levels obtained during the 2021 monitoring program, no significant change in groundwater flow patterns was observed.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

Traditional methods of site compliance provide very limited useful and/or reliable parameters for assessment of the WCC Navan Facility; therefore, an alternate method must be used. The difference in hydrogeology across the site coupled with the very saline environment of the clay deposit that underlies the Mer Bleue clay have resulted in the MECP accepting that Guideline B-7 (RUPO) is not applicable at this site. The MECP's position in this regard was documented in a November 2000 memorandum issued by the MECP (MOE, 2000). Therefore, the Leachate Indicator Parameter list and the method to determine if leachate from the site is impacting local groundwater was developed in the Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The Leachate Indicator Parameter list includes alkalinity, ammonia, boron, chloride, hardness, magnesium, manganese and potassium.

After the completion of a monitoring session, the concentration of each Leachate Indicator Parameter for all groundwater locations used to assess compliance should be visually checked. If a parameter concentration appears to be elevated, a comparison to the background concentration range should be completed. The potential for an increase in concentration of a Leachate Indicator Parameter will be investigated by comparing the concentrations for each parameter to the background range for its corresponding stratigraphic unit. The background range will be derived from the maximum and minimum data obtained at the locations used to assess compliance from 1998 to present in each stratigraphic unit. In addition, data from monitoring wells MW05-3A to D located to the east of the site and not impacted by landfill leachate will be used to define the background range. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each location used to assess compliance are presented in time-concentration graphs in Appendix F of the GAL report (provided in Appendix 1). The background ranges will be updated annually using the most recent data if it is not deemed impacted by landfill leachate. An exceedance of the background range is considered an exceedance of the trigger mechanism and the implementation of the trigger format outlined in the trigger mechanism report should proceed.

Following the confirmed exceedances reported in the 2018 annual monitoring report (Golder, 2019), in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. Trigger results of the spring and fall monitoring sessions were reported by Golder, on behalf of WCC, to the MECP Ottawa District Office via email on August 8, 2019 and December 24, 2019, respectively. In accordance with the proposed course of action presented to the MECP in the 2018 annual monitoring report and communications in 2019, WCC acquired a spare leachate pump to reduce down time when a pump requires servicing and WCC intends to proactively maintain the forcemain in good working condition in a continuing effort to achieve a drained state in the leachate collection system.

Leachate pumping and disposal operating issues reported in the fall 2018 had an impact to groundwater quality in the sand and weathered clay units in monitoring wells located immediately down gradient of the leachate collection system (less than 10 m south of the leachate collection system and close to the south toe collector).

Concentrations of some Leachate Indicator Parameters in the sand unit spiked in November 2018, but the efforts from WCC in 2019 were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented. Since the hydraulic conductivity of the sand is greater than the weathered clay, elevated concentrations have been taking longer to dissipate in the weathered clay unit.

Golder contacted the MECP Ottawa District Office via email on July 9, 2020 to update them on the trigger exceedances and to notify them that no trigger exceedance was reported in the spring of 2020 following two previous exceedances showing an increasing trend and that there was no need to implement a contingency plan at this time.

In 2021, WCC continued to implement the proposed voluntary action plan to control potential increases in concentrations. Manganese concentrations in the weathered clay at OW-92-10 in November 2021 marked a confirmed increase and the ammonia concentration in the intact clay at MW-07-1B also marked a confirmed exceedance. These two confirmed exceedances were reported to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in the attached Golder report (Appendix 1) and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions.

It is WCC's intention to continue implementing in 2022 the proposed voluntary action plan to control potential increases in concentrations.

A Phase II Environmental Site Assessment was conducted at the landfill by Intera (Intera, 2003). This assessment concluded that groundwater within the sand layer, the upper weathered clay and perhaps the deeper intact clay deposit on down-gradient lands has slightly elevated concentrations of parameters previously thought to be indicative of landfill leachate (e.g., boron, ammonia, TKN). However, there is no obvious spatial correlation of these parameters with proximity to the landfill or groundwater migration pathway. The lack of spatial correlation suggests that groundwater on down-gradient lands is representative of naturally elevated background groundwater quality associated with the Mer Bleue environment.

In addition, the groundwater and surface water trigger mechanism report prepared by Golder (Golder, 2007b) demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are not potential impacts from landfill activities. Naturally elevated parameters measured included boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

7.2 Leachate Water Quality Assessment

Prior to the construction of the leachate collection system (LCS) in 1991-1992, leachate was sampled and analysed in areas where surface breakout was observed. Breakout of leachate, when encountered, usually occurred at the down-gradient toe of the landfill.

The monitoring program for leachate quality has focused on the LCS. For the purpose of the annual monitoring report, leachate generated by the landfill is monitored at the down-gradient end of the south toe collector at L5 at the same time surface water is monitored. A more extensive leachate monitoring program is carried out throughout the year in accordance with a City of Ottawa Leachate Discharge Agreement for the discharge of treated leachate at the Robert O. Pickard Environmental Centre (ROPEC), the municipal wastewater treatment plant.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation. The landfill is underlain by a thick natural clay deposit which has a hydraulic conductivity, K, of less than 10^{-9} metres per second and as such performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater, but rather it is predominantly precipitation that has infiltrated through the waste pile. It should be noted that leachate at the site could also consist of pore water from the underlying clay as a result of upward gradients and/or consolidation, noting that pore water release to the leachate collection system is slowed by the low hydraulic conductivity of the clay.

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. The intrinsic biodegradability of municipal landfill leachate can be measured by a BOD:COD ratio. During the first several years of production, the BOD:COD ratio generally is in the 0.5 range. As the landfill ages, the ratio decreases to levels less than 0.1 suggesting a more or less biologically recalcitrant organic composition (Andreottola et al., 1989). Also, the concentration of ammonia tends to increase with landfill age since ammonia is a by-product of the stabilization of organic matter (Elefiniotis et al., 1989), although at a dry waste facility such as the WCC Facility, ammonia concentrations can be expected to remain relatively low.

Leachate quality monitoring results for 2021 indicate that the leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Concentrations of field measured dissolved oxygen, ammonia, boron, potassium, and TKN show a generally increasing trend over time although boron concentrations have been relatively stable in recent years. The concentration of chloride was previously indicated to be increasing but has been stable for approximately five years. The concentrations of DIC and manganese, show a general decreasing trend over time although they have stabilized in recent years. Previously reported decreasing trend in hardness appears to be stabilizing. The concentrations of certain parameters remain above the surface water and groundwater quality near the site.

7.3 *Surface Water Quality Assessment*

The WCC Navan Facility is located on a watershed divide resulting in drainage of surface water to both the east and west of the site. The east side of the site drains to the Bear Brook or Mer Bleue drainage basin and the west side into the Mud Creek drainage basin which drains into Green's Creek. The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog.

For the purpose of surface water quality assessment, the background surface water quality is assumed to be represented by the data available from stations located in close proximity to the landfill and up-gradient of surface water flow. For the 2021 monitoring program, the PWQO is being applied for the purpose of water quality assessment at the surface water sampling stations.

A total of eleven surface water stations continue to be monitored on an on-going basis at this site. The monitoring stations have been located to obtain representative information on water quality up-gradient from the landfill at stations S1, S3, S15, S16 and S17 (background), on water quality at compliance sites down-gradient from the landfill at stations S5, S8 and S9 and on water quality in the Mer Bleue Bog at S10 (SW-W), S11 (SW-C) and S12 (SW-E). Monitoring locations SW-W, SW-C and SW-E are location references used by the NCC.

The up-gradient surface water quality is characterized by concentrations of the following parameters which exceed or are outside the PWQO: cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorus. Occasional PWQO exceedances of cadmium, chromium, boron, and zinc have been observed in the past as well.

Surface water quality is generally consistent over time (with seasonal variability). An increasing trend in concentrations of alkalinity, chloride, and conductivity, can be observed at surface water station S1 over time. Previously observed overall increasing trends for concentrations of DIC, sodium, TDS, and hardness at surface water station S1, concentrations of alkalinity, ammonia, DIC and iron at surface water station S3, and concentrations of iron, magnesium, manganese, sodium and TDS at surface water station S15 appear to have stabilized, with seasonal variability remaining. Similarly, the previously observed decreasing trend in dissolved oxygen concentrations at surface water stations S3 appears to have stabilized with seasonal variability remaining. A slight increasing trend in magnesium is observed at S16 and S17. Hardness is also observed to be increasing at S16.

The current or historical increases in concentrations of parameters at these locations is not related to leachate impact as these stations are up gradient of the site.

The down-gradient surface water quality is characterized by dissolved oxygen, iron, and total phosphorus concentrations which exceed or are outside the PWQO. Occasional PWQO exceedances of boron, cadmium, cobalt, copper, chromium, phenols and zinc have been observed.

The concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the May, August and November 2021 monitoring sessions were generally similar to or slightly elevated compared to the surface water quality at the up-gradient station S16 during

the spring monitoring session. During the fall monitoring session, parameter concentrations tended to be similar or lower than at S16.

Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed with the exception of boron. Boron concentrations at S10, S11, and S12 were previously elevated in the mid to late 1990s, but have since decreased and remained stable, at concentrations slightly higher or similar to up-gradient surface water at most up-gradient stations for approximately 20 years.

Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. It becomes increasingly difficult to assess surface water site compliance with scattered data. The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater-based trigger mechanism is the appropriate approach for the WCC Navan Facility. Surface water quality monitoring will continue at the site, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the WCC Navan Facility.

7.4 Sediment Quality Assessment

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Analytical results on the sediment samples indicate that no parameters exceed the CCME Guidelines for freshwater sediment except for arsenic at SED-E. This is the highest arsenic concentration reported at SED-E (9.1 ug/g) with the previous highest concentration reported in May 2009 (7 ug/g). The laboratory was requested to re-analyze the sample and similar results were reported. Arsenic, copper, chromium and nickel concentrations exceed the MECP Table 1 sediment criteria. The analytical results observed at the sampling locations are consistent with historical results observed at the respective locations.

Analytical results on the sediment samples indicate that boron exceeds MECP Table 2 and Table 4 soil criteria during the spring monitoring sessions at each sampling location. Boron also exceeded MECP Table 2 and Table 4 during the fall monitoring session at SED-W. Selenium exceeded the CCME soil criteria during the spring monitoring session at SED-E and SED-W. In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

In 2002/2003, an assessment of the WCC Navan Facility operations was undertaken in support of a WCC-NCC (WSI-NCC) exchange of land parcels located south of the WCC Navan Facility along the

northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

7.5 *Proposed 2022 Monitoring Program*

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (these proposed changes were also listed in the 2020 Annual Monitoring Report).

In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in down gradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations of one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in down gradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As explained in Section 7.3, the MECP agreed that an excursion of landfill leachate would be apparent in the underlying stratigraphic units prior to a surface water impact and a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. Therefore, it is proposed to discontinue sediment monitoring and rely on the groundwater and surface water monitoring programs to assess off-site leachate impacts. With MECP concurrence, sediment monitoring could resume temporarily if leachate impacts and trigger exceedances are reported at the site.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during November 2021 monitoring session and will be monitored again in the spring of 2023.

NAVAN RD
S17
S1
S2
MW-05-1
(M.B.C.D)
LIMIT OF WASTE
EAST CELL
PUMP STATION
S8
S5
S9
S10
(SW-W)
MW-05-5
OW-92-1/8
MW-E
OW-92-9/11
MW-05-11
OW-95-9
OW-95-5/7
150 METRES

002465

8. LANDFILL GAS (LFG)

Golder Associates Ltd. (GAL) was retained to carry out the landfill gas monitoring program in 2021. The monitoring program undertaken was a continuation of the monitoring program already in place for this site and the results of the monitoring events undertaken are summarized below and presented in more detail in the GAL report provided in Appendix '2'.

8.1 *LFG Monitoring Results*

The report has been prepared to fulfill the reporting requirements outlined in Condition 110 of Environmental Compliance Approval No. A460702 dated April 16th, 2009.

LFG monitoring was undertaken on May 20th 2021, on August 25th 2021 and on December 16th 2021. At most locations monitored, methane gas was detected at concentrations lower than 1.25% by volume. Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system that also serves as a passive ventilation system, with methane concentrations measured in excess of 1.25% by volume at the following locations (refer to Fig 2, Appendix "2"):

- MH-2 (G-18-a), MH-3 (G-13a), MH-4 (G12-a), and MH-5 (G-11a) in August 2021
- MH-7 (G5-a), MH-9 (G3-a) and MH-10 (G2a) in December 2021

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the Navan Facility based on the 2021 monitoring results.

The Navan Facility is designed with a buffer area and natural barriers. The site has a favourable hydrogeological setting whereby the site is underlain and surrounded by a thick clay deposit of low permeability. The depth below grade to the water table at the perimeter of the site is shallow. The depth of the landfill between the ground surface and the water table is less than 2.5 metres. It is generally considered that methane gas migration of any significance may extend for a distance of ten times the depth of the landfill between the ground surface and the water table. Based on site conditions, this 10:1 general rule would suggest that methane migration could extend for a distance of 25 metres. The north, west,

south and east sides of the landfill footprint are surrounded by buffer zones of 30 to 70 metres, 100 metres, 10 metres and 140 metres, respectively. Note that on the south side of the landfill a 10-metre buffer zone exists between the south limits of the waste mound and the VIA Rail right-of-way (ROW) and an additional buffer strip with a width of 100 metres exists to the south of the VIA Rail ROW. These buffers would therefore, under present groundwater conditions, provide adequate natural venting. The natural barriers and the provision of adequate buffer area present at the Navan Facility are the preferred method of dealing with potential LFG migration. Although no monitoring locations are available below surface at the property boundary, based on the presence of a buffer area and natural barrier system, it is anticipated that the Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events with the exception of the following locations, which reported relatively low detection (1 part per million or 1 ppm):

MH-6 (G6a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), all in May 2021.

In the past, venting of LFG could be observed at ground surface along the west side of the landfill between MHs. The LFG venting was only noticeable once the ground surface was covered with snow. In 2021, venting of LFG at ground surface was not noticeable.

During the May 2021 monitoring session, faint odours were noted at the site, while no odours were noted during the August and December monitoring sessions by the Golder field technician. Gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2021, WCC personnel responded to one odour related complaints (received on October 14, 2021 from a resident west of the landfill).

It is noted that an interim LFG odour control system (refer to Section 6.4) was installed in 2011 and commissioned in April 2012. An extension to the LFG odour control system was installed in 2016, in 2017 and in 2019. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells (refer to Fig. 8.1). The additional vertical wells installed in 2017 and 2019 are intended to be part of the permanent LFG collection system. The purpose of this system is to control potential odorous emissions from the site until the full-scale LFG collection system is completed at the site. In 2021, construction of the permanent landfill gas collection system was started consisting of the construction of the 300 mm diameter HDPE landfill gas header pipe along the north, west and south perimeters of the waste footprint and construction of the concrete pads for the enclosed flare and abstraction plant.

In 2021 the interim LFG system operated for 8,252 hrs at an average of 391 scfm with a totalizer reading indicating 5,801,695 m^3 of landfill gas was recovered at a methane (CH4) concentration of approximately 49.5%. In 2021 a total of 2,871,839 m^3 of methane was flared using the interim landfill gas flaring system representing a 1.81% increase in methane recovery from 2020 to 2021.

8.2 *2019 Regulatory Reporting (NPRI, O.Reg. 127/01, O.Reg. 347, O.Reg 452/09 and Federal GHG)*

In 2021, Dillon Consulting Limited (Dillon) was retained by Waste Connections of Canada Inc. (WCC) to complete the following for the WCC Navan Facility:

- An assessment to determine the reporting requirements under the *National Pollutant Release Inventory* (NPRI) for the 2020 calendar year;
- Greenhouse Gas Reduction Reporting as required under *Ontario Regulation 347*;
- An assessment to determine the reporting requirements under *Ontario Regulation 390/18 – Greenhouse Gas Emissions: Quantification, Reporting and Verification (O.Reg. 390/18) and the Federal Government Greenhouse Gas Reporting for the 2020 calendar year;*
- An assessment to determine the reporting requirements under the Federal Government Greenhouse Gas Reporting Program (GHGRP) for the 2020 calendar year; and
- Assist with data input and submission for Environment Canada's online Single Window Information Manager (SWIM) module, if required.

The Navan Landfill has reported in past years to the NPRI program under ID 10967 and the GHGRP program under ID G10975. Site operations are identified by NAICS code number 562210 - Waste Treatment and Disposal.

Dillon conducted an assessment of facility operations and material usage in order to determine which substances must be reported to each of the programs mentioned above for the year 2020.

The reporting of releases to the NPRI is separated into on-site releases to air, land, and water, and off-site transfers for disposal and recycle for Part 1, 2 and 3 substances. Only air releases for Part 4 and 5 substances are reported to NPRI. Based on Dillon's assessment, the Navan Landfill was required to report in 2020 under the NPRI program for the year 2020. The total annual on-site releases and off-site transfers of the reportable NPRI Part 1, Part 2, and Part 3 substances are summarized in Table 8.1. Annual air releases for the NPRI Part 4 and Part 5 substances are also provided in Table 8.1.

The reports were made based on estimates and not measured values. Many of the parameters that are reportable are the result of handling high volumes of materials on site which are above the manufactured, processed or otherwise used reporting threshold, e.g. leachate and asbestos, but do not result in airborne emissions from the facility. The reporting of the emissions of particulate matter (PM10) was triggered by fugitive dust emissions from roads and is generally also reported by all industrial operations in Ontario due to very low thresholds.

It is noted that an interim landfill gas odour control system (refer to Section 6.4) was installed in 2011 and commissioned in April 2012. The purpose of this system is to control potential odorous emissions from the site until the full-scale landfill gas collection system is installed. The interim landfill gas odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical landfill gas extraction wells as shown on Figure 8.1.

Table 8.1: 2020 NPRI Reporting

NPRI Substance	On-site Releases (tonnes)			Off-site Transfers (tonnes)	
	Air	Land	Water	Disposal	Recycle
Part 1 Substances					
Asbestos	-	-	-	258.7 (on-site)	-
Part 2 Substances					
None	-	-	-	-	-
Part 3 Substances					
None	-	-	-	-	-
Part 4 Substances					
CO	72.80				
PM10	3.922	-	-	-	-
PM2.5	1.880	-	-	-	-
Part 5 Substances					
None	-	-	-	-	-

The reporting threshold for the federal Greenhouse Gas Emissions Reporting Program through Environment Canada is 10,000 tonnes of CO2 equivalent units.

Based on the assessment by Dillon, the Navan Landfill meets the GHG reporting requirements for the Federal reporting program and is therefore required to report for the 2020 calendar year. Table 8.2 provides the annual CO_2e release for comparison with the government reporting threshold. Only direct emissions are included in the annual totals shown. CO_2 emissions from biomass decomposition and emissions from indirect electricity consumption are not included in the federal threshold calculation for comparison purposes.

Table 8.2: 2020 GHG Reporting

Reporting Program	Annual CO_2e Release (tonnes)	Reporting Threshold (tonnes)	Required to Report (Y/N)
Environment Canada – Federal Greenhouse Gas Reporting	34,268	10,000	Y

The reporting threshold for O.Reg. 390/18 is 10,000 tonnes of CO_2 equivalent units. Table 8.3 provides the annual CO_2e release for comparison with the provincial government reporting threshold. Only direct emissions from stationary combustion are included in the annual totals shown.

The Navan Landfill is not required to report GHG emissions to the Province of Ontario as annual emissions are below the 10,000 tonnes CO_2e reporting threshold.

Table 8.3: 2020 Provincial GHG Reporting Requirements

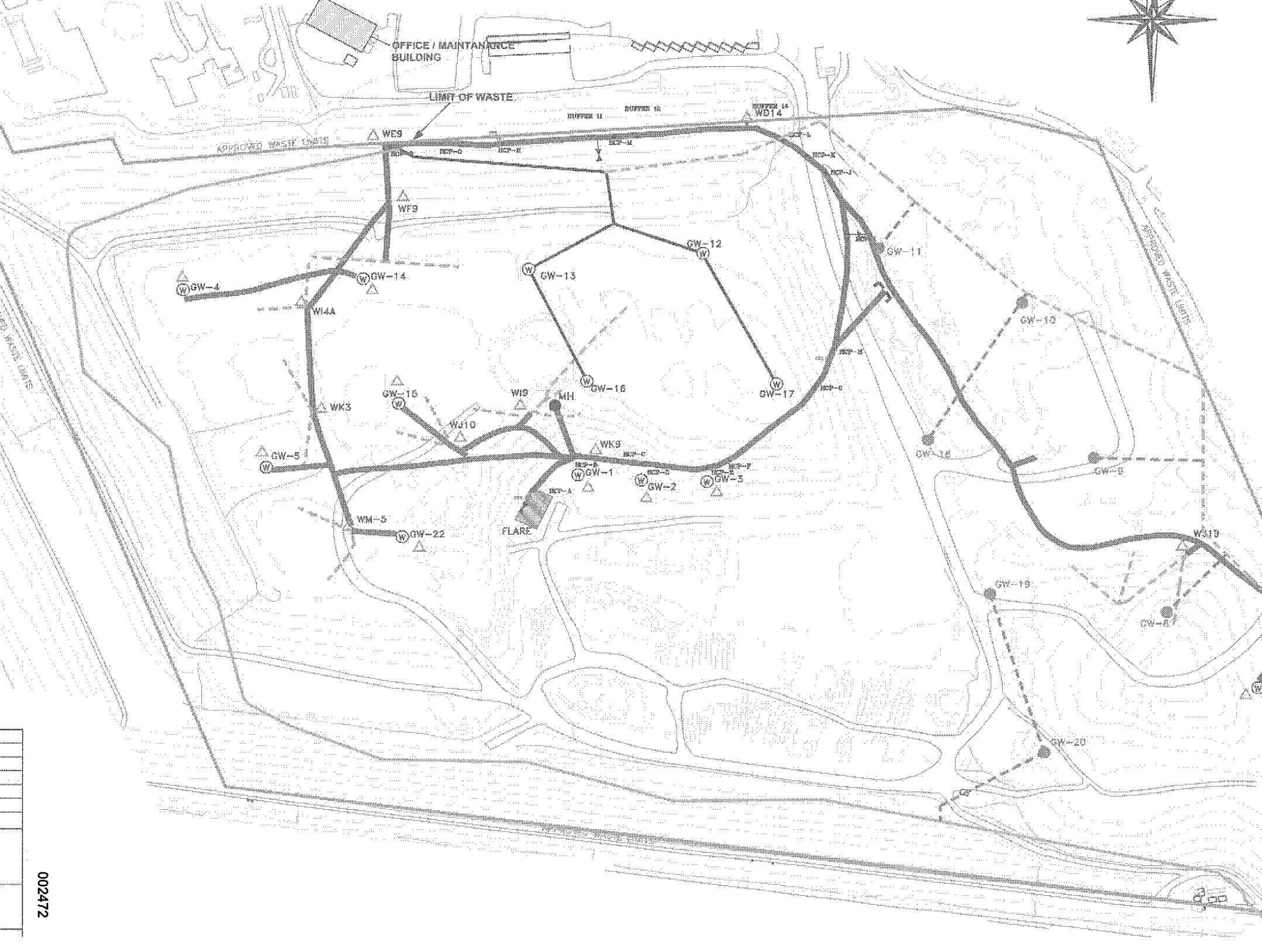
Reporting Program	Annual CO_2e Release (tonnes)	Reporting Threshold (tonnes)	Required to Report (Y/N)
O.Reg. 390/18 (with CO_2 from biomass)	14,604	-	-
O.Reg. 390/18 (without CO_2 from biomass)	1,055	10,000	N

Release Estimate Comparison: 2019 vs. 2020

Table 8.4 provides a comparison between 2019 and 2020 releases for reportable substances. Reasons for changes in release quantities for the two reporting years are provided for those substances/contaminants shown with a ±10% change in release quantity.

Table 8.4 – 2019 vs. 2020 Release Values

Substance	2019 Reported Value	2020 Reported Value	% Change	Reason/ Comments
Asbestos	Air = 0 tonnes Disposal = 369.4 tonnes Recycle = 0 tonnes	Air = 0 tonnes Disposal = 258.7 tonnes Recycle = 0 tonnes	(-) 30%	Decrease in asbestos waste received at the site
CO	Air = 75.54 tonnes	Air = 72.80 tonnes	(-) 4%	No significant change in air releases
PM_{10}	Air = 5,122 tonnes	Air = 3,922 tonnes	(-) 31%	Decrease distance traveled on unpaved roads
$PM_{2.5}$	Air = 2,056 tonnes	Air = 1,880 tonnes	(-) 9%	No significant change in air releases
CO_2e (Federal)	Air = 33,594 tonnes	Air = 34,268 tonnes	(+)2%	No significant change in GHG releases


OFFICE / MAINTANANCE BUILDING
LIMIT OF WASTE
APPROVED WASTE LIMITS
WE9
WD14
WF9
GW-12
GW-11
GW-4
GW-14
GW-13
WI4A
GW-10
GW-16
GW-17
GW-15
WI9
MH
WK3
WJ10
GW-18
GW-5
WK9
GW-9
GW-1
GW-2
GW-3
WM-5
GW-22
FLARE
WJ19
GW-19
GW-8
GW-20

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9. PROCESSING/RECYCLING

9.1 *Diversion of Waste and Other Materials from Disposal*

Diversion through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the WCC Navan Waste Recycling and Disposal Facility. For example, all daily and intermediate cover needs are met by substitution of virgin soils with the re-use of significant quantities of impacted soils. Brick, concrete, asphalt and rubble are also recovered for re-use each year in the construction of access roads and container storage pads. Roofing shingles free of paper and other debris are also re-used on site as a sub-base for roads and pads over which is placed a layer of aggregate or recycled asphalt. In addition, steel, aluminum, wood and white goods are recovered daily from the active face of the landfill and recycled. The site also currently assists local landscape and tree removal contractors by receiving wood waste that is put through a grinding process and sent to markets off site for use as bio-mass or bulking agent for organic composting. Other waste materials removed from the site for recycling include cardboard, tires, glass, drywall, E-waste, large boulders and screened rock.

Materials received by the Navan Waste Recycling and Disposal Facility are those which IC&I generators, contractors and local residents have generally deemed to be waste and of no further value (i.e., post diversion at the source). Many of the waste generators serviced by waste collection contractors who bring waste to the site also divert materials from the landfill at their place of business prior to collection. Recycling within the IC&I sector is regulated by the Ministry of the Environment, Conservation and Parks under Regulations 101, 103 and 104. While the site receives post-diversion waste materials from the IC&I sector, WCC has procedures in place to screen the incoming waste for recyclable material in what is known as a "last chance harvest" which is a "positive" sort where the recyclable item must be removed from the mixed waste mass. In this case, the majority of the material is not recyclable (i.e., it is waste). This is very different than recycling from "source separated" material, which results in a "negative" sort, where the waste components are removed from what is predominantly recyclable material. WCC also encourages and receives "clean" recyclable materials such as wood, metals, drywall, glass and E-waste. Such materials are shipped to market in bulk in efforts to make the recycling of these materials more economically viable.

Management at the WCC Navan Waste Recycling and Disposal Facility is constantly searching for on-site and off-site diversion opportunities to ensure that approved disposal capacity is preserved and used for the disposal of waste material of least commercial value. Given the provincial policy and regulations concerning waste diversion from landfill, the WCC Facility will continue to support the City and the Province in their efforts to meet diversion targets while at the same time ensuring essential disposal capacity is available locally.

Approval for the treatment of contaminated soils was received from the MECP in June of 2015. The treatment of hydrocarbon contaminated soils was started soon after in the processing area of the site located within the waste footprint (refer to Figure 2.4). Treated soils are re-used on site as final cover material or as structural fill within the east buffer along the limit of waste. Soils which had not reached the treatment criteria by the end of 2021 remained on the treatment pad until the treatment objectives could be achieved or landfilled as waste.

The amount of waste diversion achieved from "last chance harvest" at the WCC Navan Waste Recycling and Disposal Facility over the past five years is summarized in Table 9.1.

Table 9.1: Diversion at Navan Waste Recycling and Disposal Facility (2017 - 2021)

Material	2017	2018	2019	2020	2021	5-Year Total
Off-Site recycling:						
Materials removed for off-Site recycling	10,249	14,712	11,025	6,017	5,074	47,077
On-Site reuse:						
Aggregate material re-used (rubble; brick; concrete; rock)	8,480	11,935	5,949	25,788	40,041	92,193
Asphalt, clean fill, clean shingles	7,262	5,623	11,151	7,916	8,120	40,072
Treated/re-used soils	31,096	31,726	67,249	35,249	95,846	261,166
Total Diversion (excluding daily cover soils)	**57,087**	**63,996**	**95,374**	**74,970**	**149,081**	**440,508**
Waste to Landfill	171,419	233,994	222,976	224,497	190,415	1,043,301
WCC Recycling and Disposal Facility "last chance harvest" diversion rate (excluding daily cover soils)	**25.0%**	**21.5%**	**29.9%**	**25.0%**	**43.9%**	**29.7%**

NOTE: All quantities are in tonnes

At the Navan Waste Recycling and Disposal Facility, loads of clean rubble, rock, asphalt, clean shingles or concrete that are received for disposal from a construction job site are set aside for re-use in the construction of on-site roads and pads. From 2017 to 2021, approximately 132,265 tonnes of these materials were diverted from disposal, avoiding the use of a more valuable resource such as quarried stone.

Heavy equipment, equipped with a large magnet and grappling attachments, is in use for the recovery of metals from within the waste received for disposal after it has been dumped at the landfill. Five people have been hired full-time to focus on recycling opportunities and are assisted by landfill personnel. All refrigerant containing appliances have the refrigerant removed by a licensed technician prior to recycling. Metals, recovered on site and stockpiled, are removed in bulk by a local contractor using tractor-trailers. Smaller loads of more valued metals such as copper, aluminum and brass, are shipped regularly to local scrap metal recyclers such as American Iron and Metal (AIM). In response to market interests in recycled wood products, wood is recovered from waste received at the site and then processed through a wood grinder to reduce the wood to a chip size that is suitable to an end market and then removed in bulk using tractor-trailers. Wood chips, shipped off-site to local mills, are re-used in the production of wood pellets or used directly as an alternative fuel source. Wood chips are also used as a bulking agent at organic composting sites. Glass is also collected and removed in bulk from the site for recycling. From 2017 to 2021, over 47,077 tonnes of materials have been shipped off site for recycling and diverted from disposal at the site.

As indicated in Table 9.1, the Navan Waste Recycling and Disposal Facility diverted over 149,081 tonnes of material from disposal in 2021, and over 440,508 tonnes during the past 5 years. This represents a "last chance harvest" diversion rate of 29.7% over the past 5 years and excludes the re-use of impacted soils for daily cover material. This is in addition to the diversion rate for IC&I waste that occurs at the source. WCC will continue to improve waste diversion and recycling initiatives at the Navan Facility and pursue economically viable waste diversion opportunities to help the local community and WCC clients achieve a better IC&I recycling rate.

9.2 *Recycling*

For years, an independent contractor has undertaken processing (recycling) of steel and wood at the active face of the landfill. In 2009, the use of heavy equipment and permanent staff were introduced to improve health and safety as well as productivity. Daily records of materials received for processing and materials recycled and/or reused are maintained on site. In 2021, there were no operational problems reported related to the processing (recycling) facility.

A total of 5,074 tonnes of waste materials consisting of aluminium, wood, glass, drywall, e-waste, white goods, tires and ferrous metals were recycled and removed from the site in 2021. At the end of the year some materials remained stockpiled for removal in bulk at a later date such as white goods and metals. Wood waste also remained stockpiled in the material recycling area for further size reduction with the use of a wood grinder prior to shipment to off-site markets.

Brick, aggregate, rock and rubble received at the site and re-used in 2021 as aggregate for road construction totalled 40,041 tonnes. Clean fill, clean shingles and asphalt re-used on site as final grading, road/pad construction and engineered fill totalled 8,120 tonnes.

Drywall material received at the site free of debris was stored in a designated area for recycling and when sufficient volumes were received, drywall was processed through a grinder and re-used in powder form as a soil amendment.

Glass received at the site free of debris was stored in a designated area and when a sufficient volume was received, the glass was shipped in bulk to a recycling facility in Montreal, Quebec or Guelph, Ontario.

Treatment of hydrocarbon contaminated soils was started at the site in 2015 following the receipt of MECP approval. Treated soils were re-used on site as final cover material and as structural fill along the waste limit within the east buffer. Soils which had not reached the treatment criteria by the end of 2021 remained on the treatment pad until the treatment objectives could be achieved or were landfilled as waste. In 2021, 95,846 tonnes of hydrocarbon impacted soils were treated at the recycling facility for re-use in the east buffer or re-used within the landfill footprint as construction materials.

10. PROPOSED 2022 OPERATIONS

10.1 *Landfill Development*

10.1.1 Phasing of Remaining Operations

In 2022, WCC will continue to develop the landfill in a manner consistent with their past operating practices and proceed with capital projects required for the site operations as presented in the revised D&O (Golder, 2008). Over the past number of years, landfilling has progressed in a counter-clockwise pattern starting in the northwest corner of the site (area indicated as north half of Phase 3 on Figure 10.1). To date waste has been placed over the entire permitted waste footprint of the landfill as shown on Figure 10.1 with Phases 2 and 3 having been completed. In areas where significant settlement has occurred, re-grading will be carried out. In 2022, landfilling will continue in the last completed cell identified as Phase 6 with closure work to be carried out over the completed north slope of Phase 6 and the east slope of Phases 1 and 6 as shown on Figure 3.2.

The landfill development strategy for the 2022 operating period is presented on Figures 10.1 A & B and 10.2 and described in more detail in Section 10.1.2.

10.1.2 Development Schedule

The schedule for developing the remaining landfill capacity is driven by the on-going rate of waste receipts for disposal and readily available constructed landfill air space. Under the revised ECA (April 2009), the life expectancy remaining for the WCC Landfill as of January 1st, 2022 is estimated to be 5.1-5.2 years (2027) based on future projected annual waste receipts of 344,750 tonnes/yr and a 5 year average waste density of 1.42 tonnes/m^3 (refer to Chapter 5). The actual life of the landfill will vary based on the actual annual fill rate, waste densities achieved, waste diversion and recycling initiatives at the landfill and the rate of air space development.

Other site operations will evolve together with the on-going landfilling operation as follows:

a) Landscaping

- Continue applying topsoil and providing additional landscaping to completed final cover areas on the north surface of Phase 4 as well as planting additional trees in previously completed areas. This will include removing trees previously planted and re-planting them in other areas of the landfill that have been completed.

b) Final Cover Construction

- Complete filling to final grade in the north area of Phase 6 and east areas of Phases 1 and 6 (refer to Fig. 3.2). Complete final cover construction in completed areas of fill.

c) Surface Water Management

- As waste elevations in Phase 6 increase above the natural grade of the east buffer, re-align surface runoff away from the waste fill areas.
- Raise grades in the east buffer adjacent to the waste footprint and grade to direct surface runoff away from the landfilled waste.
- Place cover clay in areas where final waste elevations have been reached to direct surface runoff water to collection swales and ditches.

d) Recycling Operations

- "Last Chance Harvest" of recyclable waste will continue in the active face using specialized heavy equipment as per present practice.
- Increase efforts to sort and divert waste from small vehicles at the small vehicle drop-off area and provide incentives to clients to sort materials at source prior to arrival at the site.
- Establish markets for new recyclable materials in efforts to increase the types of materials to be recycled at the site.
- Enhance treatment of contaminated soil.
- Continue the screening of rock out of the contaminated soils received for re-use on and off site.
- Expand the working pad in the area of Phase 8 further north for recycling activities.

e) Landfill Gas Flaring System

- Where required, add additional wells (horizontal and/or vertical) to the landfill gas collection system to control fugitive gas in fill areas and enhance the odour control system (e.g. GW-8, GW-9 and GW-10).
- Construct the permanent perimeter landfill gas forcemain along the east perimeter as designed by Golder Associates and connect it to the existing landfill gas system.
- Construct, install and commission the permanent abstraction and flaring plant.
- De-commission the existing temporary landfill gas flaring plant.

f) East Cell Construction (Phase 6)

- Complete landfilling on the north and northeast cell slopes in Phase 6 to above the perimeter grade to allow for improved surface runoff.
- Construct a barrier wall in the east buffer at the limit of waste.

g) Access Road Construction

- Construct an access road extending from the east of Phase 6 onto the top of Phase 1.
- Excavate the existing access road running north to south through the landfill west of Phase 6 and Phase 1.

10.1.3 Soil Management

The development of the remaining landfill capacity in the area of Phase 6 (east cell) requires filling and compacting material including side slopes. Soil management practices will include the following:

- Excavation of clay from the Phase 8 area will occur in the first three quarters of 2022;
- Sediment control measures will be taken so that inactive areas such as soil stockpile side slopes are seeded; silt fences are installed as required around the perimeter of disturbed areas; and surface runoff from the stockpile areas will be channeled to the internal ditch system which will drain to the site's stormwater retention ponds.

10.2 *Proposed Surface Water Control Improvements*

The current surface water management system is described in the "Design and Operations Report - Navan Landfill Site Expansion Approvals" (Golder 2008). The surface water management system operates at the site to maintain the pre-landfill drainage conditions to each watershed; to divert surface water and shallow groundwater flows originating upstream of the site around the landfill; to minimize the amount of surface water that comes into contact with waste; and to maximize the removal of suspended sediment from surface water generated prior to it's release to the downstream watersheds. Water that comes into contact with waste is collected and managed as leachate. For the revision and updating of the D&O plan, the existing surface water system was assessed in regards to the storm flows that can be transmitted and these flows were compared to the requirements of the Landfill Standards. Improvements were proposed where the existing system was deficient relative to the Standards. Further modifications have been proposed in support of the EPA/OWRA application for the landfill expansion. As a result of these assessments, WCC has proceeded with changes to the surface water management system at the site in order to improve the overall system. The proposed changes to the drainage system are described as follows:

- The east diversion ditch has been deemed a fish habitat and its construction included various features to promote and support fish habitat. This work was completed and continues to be maintained. However, base flow volumes to this ditch originating north of Navan Road will cease due to residential development and new storm water management practices on these lands.
- A storm water management pond was constructed in the southeast corner of the site and a ditch discharging surface runoff water to the pond was constructed along the east access road connecting the pond to the north drainage ditch. In 2022, inspection of sediment accumulation should be carried out and if required, dredging could be planned and budgeted for 2023. In 2019, construction of a

HDPE drainage culvert in the existing ditch alignment along the north and north-east edge of the waste cell was completed and the clay cut-off wall above the culvert was constructed in 2020. In 2022, the east cell wall at the waste limit will be completed.

- A stormwater management pond located in the northwest corner of the site was constructed in 2012 to manage runoff water from the west side of the site. Landscaping consisting of the planting of shrubs and trees in this area is on-going. Drainage chutes in the northwest and southwest corners of Phase 3 were constructed in 2015 to control surface runoff water from the completed surface of Phase 3 and Phase 4. As the access roads at the top of Phase 3 and Phase 4 continue to be extended, swales to promote drainage and seeding will also be carried out;

- Efforts will be made on a continuing basis to maximize the diversion of surface runoff from the active working face in order to reduce leachate generation. This will involve the redirection of internal ditching on an as-needed basis to direct runoff water from capped and stabilized areas to the perimeter ditch system.

10.3 *Leachate Management*

All leachate collected in the existing leachate collection system is designed to drain to a collection well and pump station located at the southeast corner of the existing waste footprint near Grids Q-16. A forcemain connection allowing treated leachate to be pumped directly to the municipal sewage system for conveyance to the city waste water treatment plant has been constructed and an agreement is in place with the City of Ottawa to discharge pre-treated leachate to the City sewer system. The forcemain was commissioned in early 2008 and has since been successfully in use. The use of the forcemain to discharge leachate from the site to the City of Ottawa sewer system is anticipated to continue throughout 2022. Connection to a new City sewer line located at the north-west corner of the site is anticipated in late 2022. This will effectively eliminate the need for the forcemain to run along the south shoulder of Navan Road and east shoulder of Renaud Road and reduce the length of the existing leachate forcemain in half.

Approved modifications to the pre-treatment/pumping system were completed in 2011. These improvements were initiated in advance of the east expansion cell construction to improve the treatment efficiency and capacity of the system and to increase the pump station flow rates as well as reduce maintenance. The system improvements were commissioned in early 2012 and will continue operations throughout 2022.

The "Navan Landfill Leachate Collection and Maintenance System Lateral Expansion Area – Quality Assurance/Quality Control Plan and Specifications" prepared by Golder Associates was submitted and approved by the MECP in 2009. Excavation and construction of the east expansion cell, Phase 1, was completed in 2015 with Phase 6 completed in 2019 which included the construction of the drainage layer and leachate drainage features and the east cell pumping system. This system will continue to be in full operation in 2022 discharging collected leachate from the east cells to the leachate treatment system. Completing the east wall within the east buffer should occur in 2022.

A vertical manhole, connected to the leachate collection system in the centre of the existing waste footprint (referred to as "the central manhole"), provides an alternative point of access to evacuate leachate from this

part of the leachate collection system in the event positive drainage to the wet well and pump station cannot be maintained due to sub-grade settlement. This manhole has been raised to an elevation of 101 metres and will require that it be raised with additional MH sections in 2022. Water levels within this manhole should be measured to assess the depth of leachate ponding on top of the leachate collection system in this area and if required, consideration be given to installing a pump at the base of this manhole.

10.4 *Surface Water, Groundwater and Leachate Monitoring*

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021. As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or fall) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the fall of 2021 monitoring session and will be monitored again in the spring of 2023.

The objectives of the 2022 environmental monitoring program are:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

10.5 *Landfill Gas Management*

Construction of an approved landfill gas collection and flaring system to serve as an interim odour control system was completed in 2011. Commissioning of this system was carried out in April 2012. In 2022, the permanent landfill gas collection system will be constructed consisting of a closed flare and abstraction plant located at the south-east corner of the landfill. A gas collection forcemain extending along the south, west and north perimeter of the waste footprint was constructed in 2021. Extending and completing this forcemain along the east waste limit will occur in 2022. This forcemain will also be connected to the existing

landfill gas collection system. The exiting interim landfill gas flaring plant will be de-commissioned as soon as the new flaring plant is commissioned and running.

The landfill gas monitoring program undertaken by Golder Associates in 2021 will be continued in 2022. Monitoring of landfill gas is carried out three times per year at the property boundary and within facilities located on the site. Monitoring of the odour control and flaring system will also be part of this program.

Assessment of air emissions will again be undertaken for the landfill site in accordance with MECP Reg.127/01 and NPRI reporting requirements.

10.6 *Recycling and Small Vehicle Unloading Facility*

Recycling will continue at the WCC Landfill site in 2022. Heavy equipment equipped with a large magnet and grappler is used for the removal of metal and wood from waste received at the active face of the landfill. A small vehicle unloading pad consisting of a raised paved surface with concrete retaining walls has been constructed at the front of the site east of the new site entrance to serve as an area for small vehicles to unload and sort materials. Concrete bunkers for the receipt of small loads of recyclable materials such as clean fill, asphalt, aggregates, and roofing shingles were added just south of the scale house with access from the small vehicle pad to the east. This small vehicle unloading area improves safety at the site by eliminating the need for small vehicles to access the active face. The facility is grade separated such that bins for various types of wastes and recyclables are easily accessible (i.e., with the top of the bins at or near the ground surface in the drop off area). A utility road has been included to provide access to collect or drop off roll-off containers. Small vehicles are required to be weighed on the scales when entering and exiting the site.

Another recycling area is located within the waste footprint along the southern edge of the area identified as Phase 8. This area is used for the storage of processed materials for later removal in bulk and shipment to local markets. White goods containing refrigerants are also stored in this area for refrigerant removal by an on-site technician. Recycling activities in this area consist of tires, drywall, glass, clean shingles, metals and wood. In 2022, it is proposed to construct a recycling pad at the south end of Phase 1 and expand the east end of the existing pad north into Phase 8.

E-waste recycling services are also offered for the benefit of the local community.

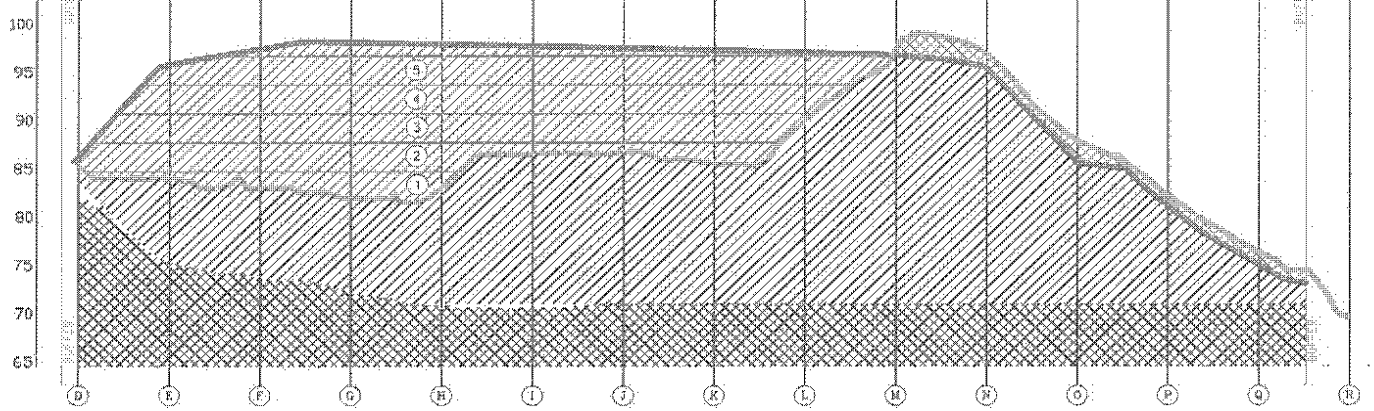
The treatment of contaminated soil as part of the recycling initiatives at the site was approved by the MECP in 2015. Contaminated soils will be treated to a level sufficient for an alternative use on-site and/or off-site. The treatment of impacted soils will continue throughout 2022.

These recycling activities will continue throughout 2022 as will efforts to expand on recycling services and finding new markets for recycled materials.

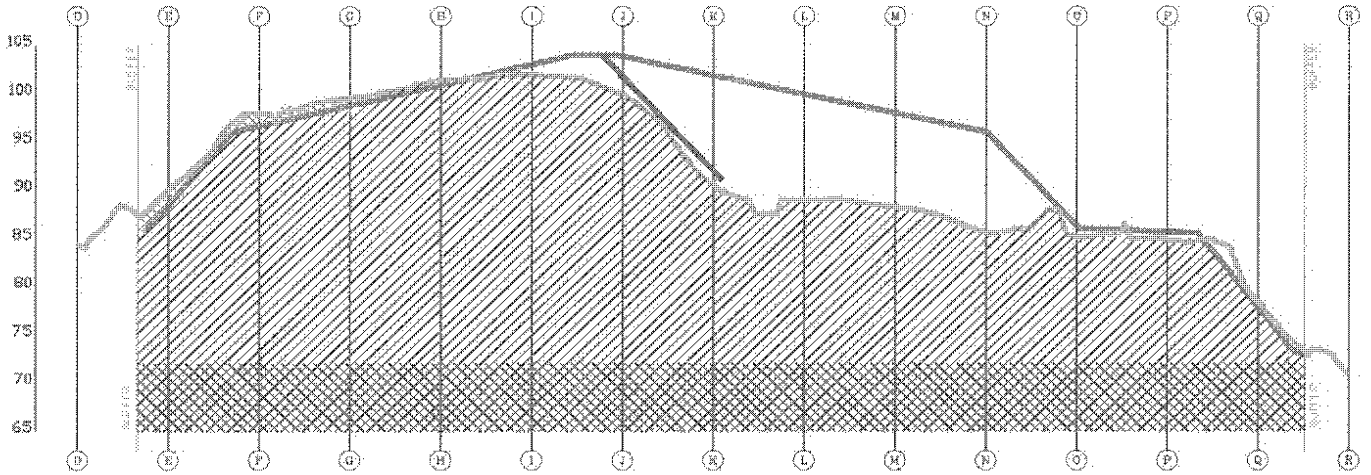
10.7 *Capital Improvements*

A major capital improvement project to take place in 2022 will be the completion of construction of the permanent landfill gas collection and flaring plant. Connecting the existing leachate forcemain to a new sewer line under construction on Navan Road is anticipated for the end of 2022. The acquisition of a new dozer is also being considered for 2022 to assist landfill operations. No other capital site improvement projects other than on-going access road construction, landscaping and minor site improvements are anticipated. The access road running along the north and east perimeter of Phase 6 will be extended onto the top of Phase 1 and connect to existing internal landfill access roads. Landscaping efforts will continue on the north, west, south and southeast facing slopes where cover construction has been completed. Preserving existing vegetation by transplanting trees to the east and north sides of the landfill in addition to adding new trees and shrubs will also continue.

PHASE 7
PHASE 1
PHASE 6
PHASE 4
PHASE 5
PHASE 2
(COMPLETED)
PHASE 3



SECTION A2–A2



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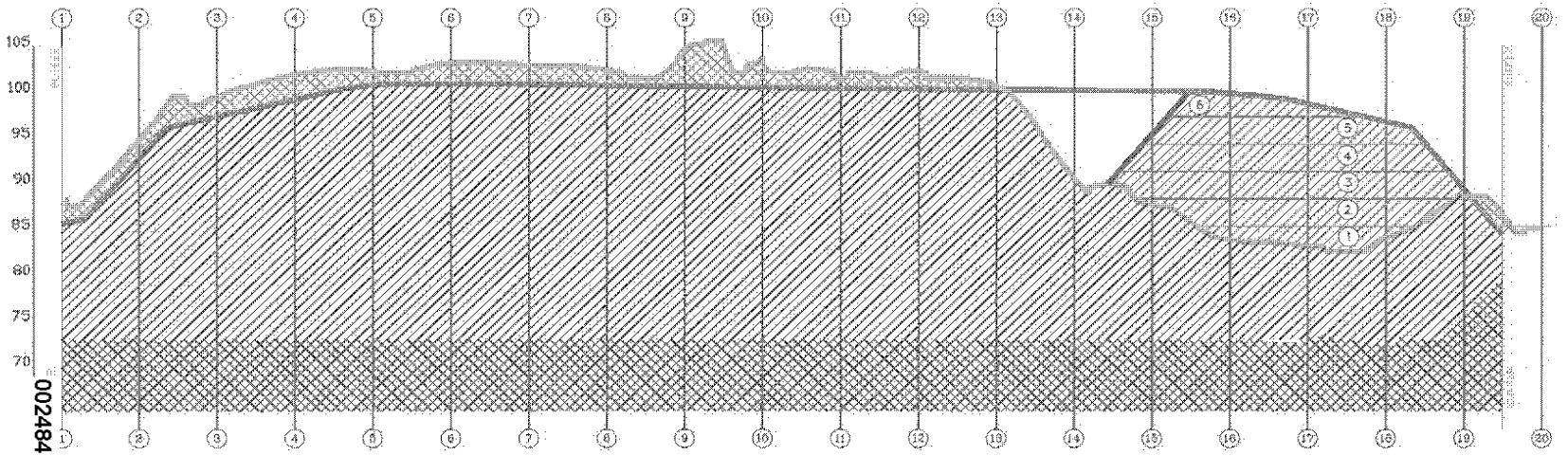

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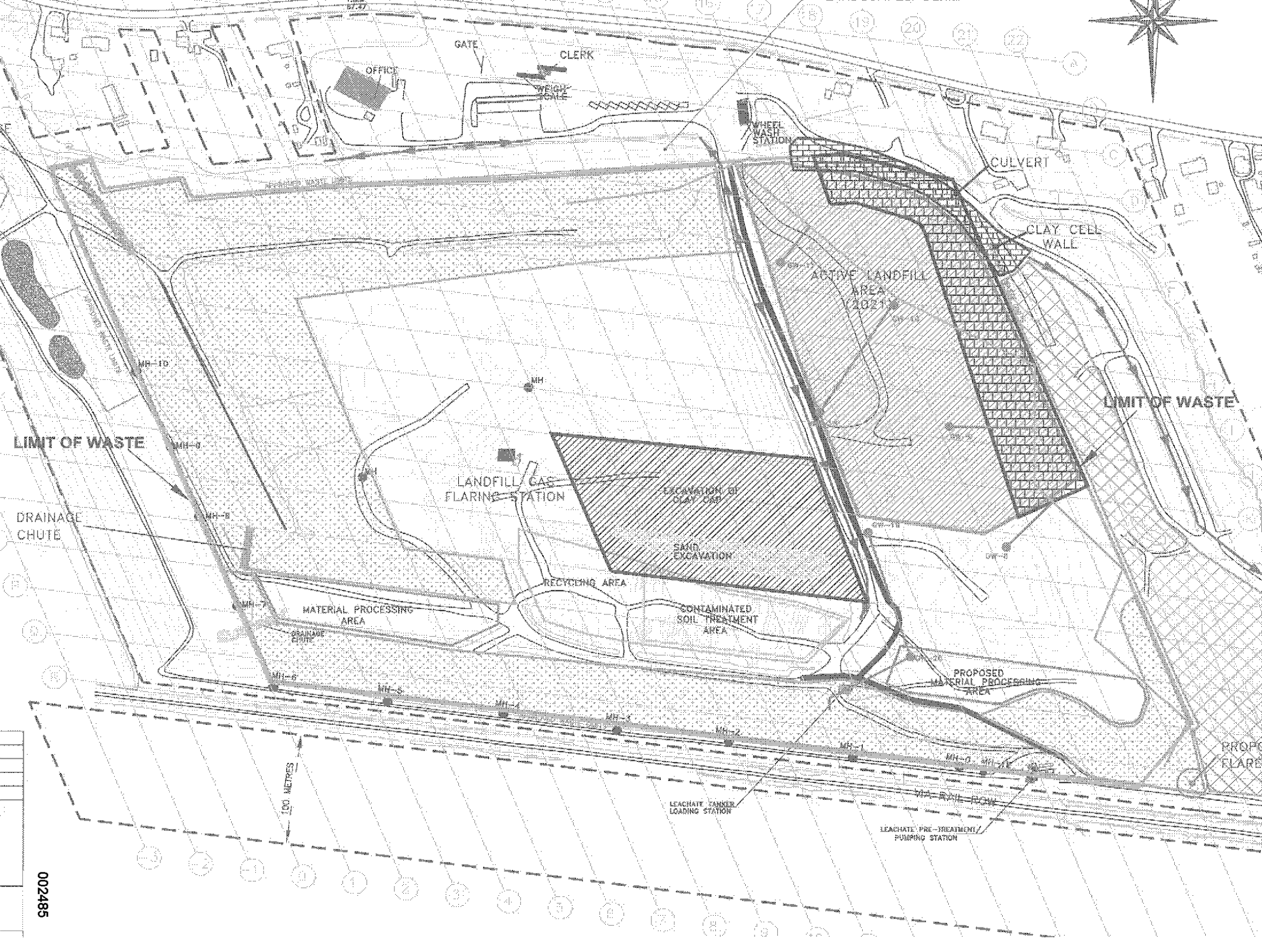
GATE
CLERK
OFFICE
WEIGH SCALE
WHEEL WASH STATION
CULVERT
CLAY CELL WALL
ACTIVE LANDFILL AREA (2021)
LIMIT OF WASTE
LIMIT OF WASTE
MH-10
MH-9
MH
MH-8
LANDFILL GAS FLARING STATION
EXCAVATION OF CLAY CAP
SAND EXCAVATION
DRAINAGE CHUTE
RECYCLING AREA
MH-7
MATERIAL PROCESSING AREA
DRAINAGE CHUTE
CONTAMINATED SOIL TREATMENT AREA
PROPOSED MATERIAL PROCESSING AREA
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-R/W
MH-R/W-ROW
100 METRES
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT/ PUMPING STATION
PROPO
FLARE

002485

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Appendix '1'

Golder 2021 Landfill Monitoring Report

WSP GOLDER

REPORT

2021 Landfill Monitoring

Waste Connections of Canada
Navan Waste Recycling and Disposal Facility
Ottawa, ON

Submitted to:

Waste Connections of Canada
Waste Connections of Canada
3354 Navan Road
Ottawa, Ontario
K4B 1H9

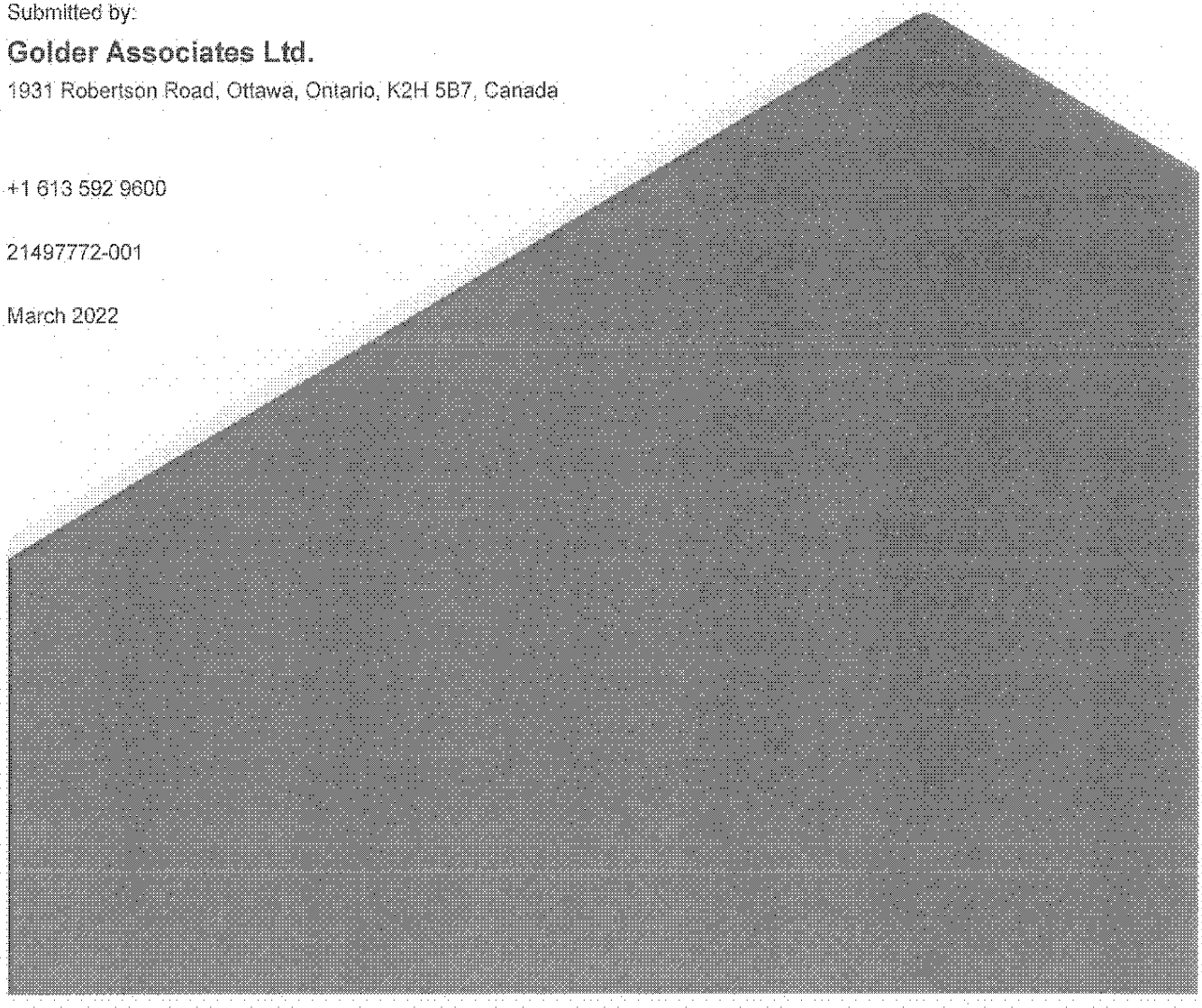
Submitted by:

Golder Associates Ltd.
1931 Robertson Road, Ottawa, Ontario, K2H 5B7, Canada

+1 613 592 9600

21497772-001

March 2022



Appendix D-Monitoring and Screening Checklist
General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.
Instructions: A complete checklist consists of:
(a) completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
(b) completed contact information for the Competent Environmental Practitioner (CEP)
(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:
For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:
(a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..
Definition of Surface water CEP:
A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site (WDS) Name	Navan Waste Recycling and Disposal Facility
Location (e.g. street address, lot, concession)	3354 Navan Road. Parts of Lots 2, 3 and 4, Concession IV
GPS Location (taken within the property boundary at front gate/ front entry)	460569.6m E 5030570.0m N (Zone 18)
Municipality	City of Ottawa (formerly City of Gloucester)
Client and/or Site Owner	Waste Connections of Canada
Monitoring Period (Year)	2021
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval (ECA) Number (formerly "Certificate of Approval" (C of A)) :	No. A460702
ector's Order No.:	N/A
Provincial Officer's Order No.:	N/A

Other:	N/A		
Report Submission Frequency	(•) **Annual** ( ) **Other**	Due March 31	
The site is: **(Operation Status)**	(•) **Open** ( ) **Inactive** ( ) **Closed**		
Is there an active waste transfer station at the site?	( ) **Yes** (•) **No**		
Does this WDS have a Closure Plan?	(•) **Not yet submitted** ( ) **Submitted and under review** ( ) **Submitted and approved**		
Total Approved Capacity	7,600,000 (excl. final cover)	*Units*	Cubic Metres
Maximum Approved Fill Rate	1,500	*Units*	Tonnes per Day
Total Waste Received within Monitoring Period (Year)	190,415	*Units*	Tonnes
Total Waste Received within Monitoring Period (Year) *Describe the methodology used to determine this quantity*	Weighed		
Estimated Remaining Capacity	1,252,969	*Units*	Cubic Metres
Estimated Remaining Capacity *Describe the methodology used to determine this quantity*	Estimation		
Estimated Remaining Capacity *Date Last Determined*	31-Dec-2021		
Non-Hazardous Approved Waste Types	[x] Domestic [x] Industrial, Commercial & Institutional (IC&I) [ ] Source Separated Organics (Green Bin) [ ] Tires	[x] Contaminated Soil [x] Wood Waste [ ] Blue Box Material [ ] Processed Organics [ ] Leaf and Yard Waste	[ ] Food Processing/Preparation Operations Waste [ ] Hauled Sewage Other: Asbestos waste. Petruscible waste are not accepted for landfilling.
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*	None		

Year Site Opened *(enter the Calendar Year only)*	1960	**Current ECA Issue Date**	April 16, 2009, not incl. notices
Is your Site required to submit Financial Assurance?		(•) **Yes** ( ) **No**	
Describe how your WDS is designed.		( ) Natural Attenuation only (•) Fully engineered Facility ( ) Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		( ) **Yes** (•) **No**	
If closed, specify ECA, control or authorizing document closure date:		N/A	
Has the nature of the operations at the site changed during this monitoring period?	( ) **Yes** (•) **No**		
If yes, provide details:			

Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)	○ Yes ◉ No

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) **The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:**	◉ **Yes** ○ **No**	
2) **All groundwater, leachate and landfill gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by ECA or other relevant authorizing/ control document(s):**	○ **Yes** ◉ **No** ○ **Not Applicable**	If no, list exceptions below or attach information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**
MW09-1A, 1B, 1C, and 1D	Those groundwater monitoring locations were not sampled during the winter of 2022 due to historical conditions of frozen water in the monitoring wells. Instead, they were monitored in August 2021. MW09-1D was dry at the time and no sample was collected at this location.	24-Aug-2021

3) a) Some or all groundwater, leachate and landfill gas sampling and monitoring requirements have been established or defined outside of a ministry ECA, authorizing, or control document *or Ministry concurrence.*	○ Yes ◉ No ○ Not Applicable	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	○ Yes ○ No ◉ Not Applicable	If no, list exceptions below or attach additional information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

4) All field work for groundwater investigations was done in accordance with Standard Operating Procedures (SOP) as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	○ Yes ◉ No	Golder Associates Ltd. standard practices were followed as described in the report.
Sampling and Monitoring Program Results/WDS Conditions and Assessment:		
5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/ or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.	◉ Yes ○ No	
6) The site meets compliance and assessment criteria.	○ Yes ◉ No	In 2021, two confirmed (continued increase in concentration beyond the background range) trigger exceedances of the background range were reported in the weathered clay and intact clay stratigraphic units. Manganese exceeded at monitoring well OW-92-10 in the weathered clay and ammonia exceeded at monitoring well 07-1B in the intact clay.
7) The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.	◉ Yes ○ No	Trigger exceedances are not interpreted to be a result of further migration of landfill leachate. Results will be monitored in the future.

1) Is one or more of the following risk reduction practices in place at the site: *(a)* There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or *(b)* There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or *(c)* The site meets the following two conditions (typically achieved after 15 years or longer of site operation): *i.* The site has developed stable leachate mound(s) and stable leachate plume geometry/ concentrations; and *ii.* Seasonal and annual water levels and water quality fluctuations are well understood.	◉ Yes ○ No	Note which practice(s):	☒ (a) ☒ (b) ☐ (c)
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	◉ Yes ○ No ○ Not Applicable	In 2021, two confirmed (continued increase in concentration beyond the background range) trigger exceedances of the background range were reported in the weathered clay and intact clay stratigraphic units. Manganese exceeded at monitoring well OW-92-10 in the weathered clay and ammonia exceeded at monitoring well 07-1B in the intact clay.	

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

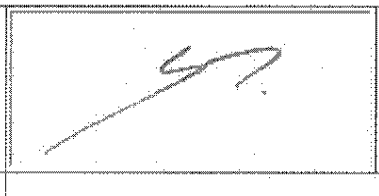
I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

○ **No changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/ are recommended:**	Due to on-going inability to collect water samples in monitoring wells MW09-1A through D located in Mer Bleue because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or fall). It is also proposed to remove VOCs from the list of parameters of the groundwater monitoring program as well as discontinue sediment monitoring (see rationale in Section 9.0).
◉ **No Changes to site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/are recommended:**	
Name:	Yannick Marcerou, M.Eng., P.Eng.
Seal:	

Signature:		**Date:**	16-Mar-2022
CEP Contact Information:			
Company:	Golder Associates Ltd.		
Address:	1931 Robertson Road, Ottawa, Ontario, K2H 5B7		
Telephone No.:	613-592-9600	Fax No. :	613-592-9601
E-mail Address:	Yannick_Marcerou@golder.com		

Co-signers for additional expertise provided:

Signature:		**Date:**	
Signature:		**Date:**	

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):

Name (s)	See Attachment A.

Distance(s)	N/A

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	(•) Yes ( ) No	
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the ECA or relevant authorizing/control document(s) (if applicable):	(•) Yes ( ) No ( ) Not applicable	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry ECA or authorizing/control document, *or Ministry concurrence.*	( ) Yes (•) No ( ) Not Applicable	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:	( ) Yes ( ) No (•) Not Applicable	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

All field work for surface water investigations was done in accordance with SOP, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	○ Yes ◉ No	Golder Associates Ltd. standard practices were followed as described in the report.

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):	◉ Yes ○ No

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table on the following page or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. ECA limit, PWQO, background	e.g. X% above PWQO
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	(•) **Yes** ( ) **No**	There are no exceedances as there is no surface water-related compliance criteria (see question 7).

All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.	(•) **Yes** ( ) **No**	The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility. The MECP has agreed that this is the preferred approach for the WCC Navan Facility.
8) **For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g., PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):**	( ) Yes ( ) No ( ) Not Known (•) Not Applicable	
9) **Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):**	( ) **Yes** ( ) **No** (•) **Not Applicable**	

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

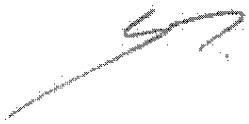
I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

○ **No Changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/are recommended:**	it is proposed to discontinue sediment monitoring (see rationale in Section 9.0).
◉ **No changes to the site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/ are recommended:**	

CEP Signature	
Relevant Discipline	P.Eng. with demonstrated relevant experience.
Date:	16-Mar-2022
CEP Contact Information:	Yannick Marcerou, M.Eng., P.Eng.
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Telephone No.:	613-592-9600
Fax No. :	613-592-9601
E-mail Address:	Yannick_Marcerou@golder.com

Save As | Print Form

Attachment A

In the event that leachate-impacted water was to reach either stormwater management ponds or ditches on the site, the source of the impact would be determined and then intercepted, as required. If necessary, the affected pond and/or ditches could then be emptied through a temporary pumping operation and the pumped water could be combined with the leachate and directed for off-site treatment. Therefore, there are no surface water bodies potentially receiving waste disposal site effluent.

002506

Distribution List

10 copies	Waste Connections of Canada
1 copy	National Capital Commission
1 e-copy	Golder Associates Ltd.

Executive Summary

This report serves as the annual environmental monitoring portion of the 2021 site operations and monitoring report and presents the results of groundwater, surface water, leachate and sediment monitoring activities carried out during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility). This report has been prepared to fulfill the reporting requirements outlined in Conditions 135 and 136 of Environmental Compliance Approval (ECA) No. A460702.

The following executive summary highlights key points only; for complete information and findings it is necessary for the reader to examine the complete report.

Based on the groundwater levels obtained during the 2021 monitoring program, no significant change in groundwater flow patterns has been observed.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (un-weathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present up-gradient, at the down-gradient edge (used to assess compliance) and further down-gradient of the landfill in each of these units.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2020 background range.

Leachate quality monitoring results for 2021 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Trigger concentration exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

WCC's efforts were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented.

In 2021, there were two confirmed exceedances (continued increase in concentration beyond the background range), manganese concentration in the weathered clay at OW-92-10 in November 2021 and the ammonia concentration in the intact clay at MW-07-1B in November 2021. These two confirmed exceedances were reported to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in this report and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions. The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (see Section 9.0). As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or the fall depending on site conditions) as has been done between 2014 and 2021.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the November 2021 monitoring session and will be monitored again in the spring of 2023.

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1.0 INTRODUCTION

This report serves as the 2021 annual monitoring report and presents the results of monitoring activities carried out during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility).

The WCC Navan Facility is a 91.87 hectare (ha) waste management facility that includes a 40 ha landfill, as well as processing (recycling). The site is located on parts of Lots 2, 3 and 4, of Concession IV, Ottawa Front in the City of Ottawa (formerly the city of Gloucester), Ontario (see Key Plan, Figure 1). This site has been in operation since 1960 and operates under Environmental Compliance Approval (ECA) No. A460702. In April 2009, WCC received *Environmental Protection Act* approval for the expansion of the WCC Navan Facility.

The monitoring program undertaken in 2021 by Golder Associates Ltd. (Golder) is outlined in Tables 1a through 1c. Monitoring to date at the WCC Navan Facility consists of water quality analysis of surface water, groundwater and leachate. The 2021 monitoring program was a continuation of the monitoring program carried out in 2020 and followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and Condition 10.1 of the Conditions of Environmental Assessment Approval. As per Condition 109 of ECA No. A460702, the monitoring program includes sampling of the monitoring wells located in BH09-1, in order to assess the groundwater quality in the Mer Bleue Bog. The original monitoring program indicated that the wells would be sampled during the winter, when the Mer Bleue Bog is frozen and the wells are accessible. However, the groundwater in the monitoring wells has frequently been frozen during these events. In the 2013 monitoring report (Golder, 2014), it was proposed to sample them during the summer, rather than winter, and this recommendation has carried forward to present (monitoring is now completed either in summer or in the fall, depending on site conditions). Groundwater samples were successfully collected at monitoring well MW09-1A, MW09-1B, and MW09-C, during the summer monitoring session (no sample was collected from monitoring well MW09-1D due to dry conditions).

In addition, sediment quality monitoring which started in 2000 at the request of the National Capital Commission (NCC) at three locations within the Mer Bleue Bog is also documented in this report. Results of landfill gas, noise and odour monitoring undertaken in 2021 are provided under separate covers in Attachments 2 and 3.

2.0 FIELD PROCEDURES

2.1 Objectives

The objectives of the 2021 water quality monitoring program were:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

2.2 Environmental Monitoring Program

2.2.1 Groundwater Component

The 2021 groundwater monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and satisfies objectives listed above. Water quality monitoring at the WCC Navan Facility was initiated in 1981. Since 1991, semi-annual monitoring programs were undertaken. Observation wells were added in 1992, 1994, 1995, 1998, 2000, 2005, 2007, 2009, 2010 and 2011. Groundwater monitoring sessions were carried out on May 26, August 24, and November 30, 2021. The groundwater monitors are outlined in Tables 1a, 1b and 1c and illustrated on the Site Plan (Figure 2). Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected in November 2021. The monitoring wells screened in the intact clay deposit and in the glacial till/upper bedrock zone will be sampled again in the spring of 2023.

The approved groundwater monitoring program was followed, except that as discussed in Section 1.0, groundwater monitoring locations BH09-1A, BH09-1B, BH09-1C and BH09-1D were not sampled during the winter of 2021 due to historical conditions of frozen water in the monitoring wells. Monitoring wells BH09-1A, BH09-1B, and BH09-1C were sampled during the summer session on August 24, 2021 (monitoring well BH09-1D was dry and therefore no sample could be collected at the time).

Detailed logs of the subsurface conditions encountered in each borehole are provided on the Record of Borehole sheets in Appendix A for most of the groundwater monitors included in the 2021 groundwater monitoring program. The top of pipe and ground surface elevations at each groundwater monitor location were surveyed with reference to geodetic datum following completion of the corresponding borehole drilling and groundwater installation program. The top of pipe for each of the monitoring wells included in the groundwater monitoring program were re-surveyed by WCC during November 2011 to account for any movement of the monitors over time.

The groundwater levels in the monitors included in the sampling sessions were measured on May 19, 2021 and November 23, 2021.

All monitors sampled during 2021 were developed through the removal of at least one standing volume of water using dedicated samplers which have been provided in each groundwater monitor. Sampling of groundwater was generally performed one week after monitor development, because the wells recover slowly.

As part of the Quality Assurance/Quality Control (QA/QC) program, a total of five field groundwater samples duplicates were prepared (two in the spring and three in the fall) along with three field blanks (one in the spring, one in the summer, and one in the fall) and three trip blanks (one in the spring, one in the summer, and one in the fall).

The temperature, pH and electrical conductivity of the groundwater samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private certified analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol provided below was followed for the groundwater samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, hardness (calcium and magnesium), potassium, sodium, manganese and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
total dissolved solids (TDS), alkalinity, sulphate, nitrate, nitrite, chloride, bicarbonate, and carbonate	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with hydrochloric acid or sodium bisulphate

Notes: * Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.

Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario performed all laboratory chemical and physical analyses on the groundwater samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The reportable detection limits (RDLs) for the specific groundwater analyses were generally commensurate with the standards established in the Ontario Drinking Water Quality Standards, Objectives and Guidelines (referred to as ODWQS, MOE, 2006, revised January 1, 2020).

2.2.2 Leachate Component

The leachate monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702. Leachate quality analysis was undertaken on samples obtained from the pump station (L5) during the May 27, August 24 and November 24 monitoring sessions as outlined in Tables 1a through 1c. The location of the leachate monitor is illustrated on the Site Plan (Figure 2).

As part of the QA/QC program, one field blank and one trip blank for the volatile organic compounds (VOCs) were prepared during the August sampling session.

The temperature, pH, electrical conductivity and dissolved oxygen of the collected leachate samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All leachate samples were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2.

The sample preparation and preservation protocol outlined below was followed for the leachate samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, hardness (calcium and magnesium), potassium, sodium and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, total suspended solids (TSS), and biochemical oxygen demand (BOD)	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)**, dissolved organic carbon (DOC)	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with hydrochloric acid or sodium bisulphate

Notes:
* Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.
** Dissolved inorganic carbon (DIC) calculated based on laboratory dissolved organic carbon (DOC) and total dissolved carbon

Paracel performed all laboratory chemical and physical analyses on the leachate samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific leachate analyses were commensurate with the standards established in the ODWQS (MOE, 2006, revised January 1, 2020).

2.2.3 Surface Water

The 2021 surface water monitoring program followed the program outlined in Condition 109 of ECA No. A460702. The 2021 surface water monitoring program is outlined in Tables 1a through 1c and monitoring stations are illustrated on Figure 2. Surface water samples were obtained on May 27, August 24, and November 24, 2021.

The only deviations from the approved surface water monitoring program were due to dry or stagnant conditions. Surface water monitoring station S5 was not sampling May 2021, stations S5, S8, S10, S11, and S16 were not sampled in August 2021 and station S5 in November 2021.

The estimation of surface water flow was obtained concurrently with surface water sampling on May 27, August 24 and November 24, 2021.

One field duplicate was prepared during the May, August, and November sampling sessions as part of the QA/QC program.

The temperature, pH, electrical conductivity and dissolved oxygen of the surface water samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The same preparation and preservation protocol below was followed for each of the surface water samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, hardness (calcium and magnesium), potassium, sodium, manganese and zinc	plastic bottle, unfiltered and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, TSS, and BOD	plastic bottle, unfiltered and unpreserved
ammonia*, total phosphorus, dissolved organic carbon (DOC), phenols, COD and TKN	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)	amber glass bottle, unfiltered and unpreserved

Notes: * Unionized ammonia calculated based on laboratory ammonia concentration, field temperature and pH measurements.

Paracel performed all laboratory chemical and physical analyses on the surface water samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific surface water analyses were generally commensurate with the standards established in the Provincial Water Quality Objectives (referred to as PWQO, MOE, 1994, reprinted 1999).

2.3 Sediments

Sediment quality was monitored at three locations within the Mer Bleue Bog. The sampling locations are the same as the surface water sampling stations located within the bog, i.e., SED-W was obtained at SW-W, SED-C at SW-C and SED-E at SW-E (refer to Figure 2). Sediment quality monitoring in the Mer Bleue Bog was added to the monitoring program in 2000 and sediment samples were obtained in 2021 at three locations on May 27 and November 24.

All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol outlined below was followed for the sediment samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium and zinc	glass jar, with a plastic lid

Paracel performed all laboratory chemical and physical analyses on the sediment samples. The Report of Analyses sheets from Paracel are provided in Appendix B.

2.4 Status of Monitoring Well Network

During the spring monitoring session, the condition of each well within the monitoring well network at the site was assessed. A summary of the findings of the 2021 monitoring well network condition survey (properly cased, capped and locked) are provided in Table 3. At the time of the condition survey it was observed that all monitoring wells were in good condition.

3.0 WATER LEVEL DATA

3.1 Groundwater Levels

Records of monitoring well water elevations obtained in May and November 2021 are provided in Tables C-1 and C-2, Appendix C and are shown graphically on Figures C1 through C10. Water level changes for 2021 are discussed in the following sub-sections. It should be noted that all monitoring wells were resurveyed in 2011 which resulted in an increase in water elevations at some locations. This reflects the more accurate survey data and does not necessarily reflect changes in the groundwater elevations.

3.1.1 Up-Gradient Control Wells

The results of water levels measured at the up-gradient wells are shown graphically on Figure C1 through Figure C4 in Appendix C. There are no significant changes indicated in groundwater levels measured at these locations. The results indicate the shallow water table to be typically located approximately 1 to 2 metres (m) below ground surface at up-gradient wells OW-92-12 to OW-92-19 and MW05-1A to MW05-1D. There are only small fluctuations in water levels indicated for recent years, except for an unusually elevated groundwater level recorded in November 2017 at monitoring location OW-92-15 which returned to levels similar to historical levels during 2018.

Hydraulic head profiles for monitoring wells OW-92-12 to OW-92-19 for May and November 2021 are shown on Figure 3 illustrating a downward hydraulic gradient. The only variation in the direction of the hydraulic gradient is indicated in the upper 5.6 m to 10.4 m below ground surface in the spring and in the upper 6.4 m to 10.4 m in the fall, from a downward gradient to an upward gradient in the intact clay and weathered clay. This result may be attributed to a perched water table at the interface of the weathered clay and the intact clay. The relatively weak downward gradient from the sand to the weathered clay suggests a hydraulic interconnection between these units. The downward gradient is quite pronounced from the weathered clay down to the lower reaches of the intact clay deposit. It is interpreted that the intact clay deposit at depth beneath the landfill site acts as a barrier to groundwater flow.

3.1.2 Immediate Down-Gradient Wells and Wells in Line with Immediate Down-Gradient Wells

The results of the water levels measured at the large down-gradient nest of observation wells (OW-92-1 to OW-92-8 and MW05-8) are shown graphically on Figure C5 provided in Appendix C. These results indicate the shallow groundwater table lies within the sand deposit close to the original ground surface ranging in elevation from about 68.58 m to 71.46 m. Similar results are indicated at observation wells OW-92-9 to OW-92-11 and MW05-11 as well as OW-94-1 to OW-94-3 and MW05-R3 as shown graphically on Figures C6 and C7, respectively. Seasonal variations of nearly 1 m have previously been indicated. The high water levels generally occur during the wet spring whereas the lower water levels are recorded during the dry summer months and fall. Similar trends were observed in 2021 at most wells, with the higher spring elevations being more pronounced in the spring of 2021.

Hydraulic head profiles for the nest of observation wells OW-92-1 to OW-92-8 are presented on Figure 3. Unlike the up-gradient groundwater level profiles, the down-gradient profiles historically have indicated a slight upward vertical gradient and a localized weak downward gradient observed at times between the upper 6.3 m to 7.6 m within the weathered clay. Similar to 2019 and 2020, a slight downward gradient is observed from the sand to the weathered clay in 2021. A slight downward gradient was also observed from the weathered clay to the intact clay in the fall of 2021. The upper four wells historically have appeared to be hydraulically connected with near vertical or

hydrostatic water level profiles. A slight upward gradient from the bedrock to the weathered clay at the down-gradient boundary of the landfill would suggest there is upward vertical flow at this location, which would retard the potential for leachate migration into the deeper groundwater system. In the spring and fall of 2021, there was near vertical or a hydrostatic water level profile between the bedrock and weathered clay.

3.1.3 Mer Bleue/Down-Gradient Control Wells

Water levels obtained at the down-gradient control wells are shown graphically on Figures C8, C9 and C10 in Appendix C. These results indicate artesian conditions at OW-94-4 to OW-94-6, OW-95-5 to OW-95-7 and OW-95-9, while at OW-95-1 to OW-95-3, the shallow groundwater table is close to the ground surface within the upper sand, weathered and intact clay. Monitoring well OW-95-9 and OW-95-5 were frozen during the fall 2021 monitoring session.

Hydraulic head profiles for the nest of observation wells OW-95-5 to 95-7 and OW-95-9, as shown on Figure 3, illustrate an upward gradient through most of the profile with a weak downward gradient from the sand to the weathered clay. Historically, there has been an upward gradient through the entire profile. The presence of an upward gradient suggests upward groundwater flow is occurring south of the landfill. These results may also suggest upward leaching of porewater from the Champlain Sea clay, a brackish water deposit, may be occurring at the southern boundary of the landfill. North of the landfill, downward leaching of the clay porewater is indicated. Hydraulic gradients between 95-9 and 95-5 were unable to be determined the fall monitoring session due to frozen conditions.

3.1.4 Horizontal Hydraulic Gradients

The horizontal hydraulic gradient in the shallow sand deposit and weathered clay at this site is consistent with the relief of the property which changes in elevation by approximately 15 m to 18 m between the up-gradient and down-gradient boundaries of the landfill. Since the shallow water table appears to be a reflection of the original surface topography, horizontal hydraulic gradients are expected to vary between 0.007 in the plateau above the escarpment and 0.014 in the valley below. Water levels measured south of the landfill indicate shallow groundwater is flowing in a south to southwest direction with a small hydraulic gradient ranging between 0.005 and 0.025. The horizontal gradients in the bog area are influenced by seasonal fluctuations in the surface water levels. Hydraulic gradients could also be influenced by the leachate collection system (LCS) located along the south toe of the landfill. Keeping the LCS drained could result in a lowering of the water table at the southeast corner of the landfill by more than 3 m below the original grade at the southeast corner of the landfill and by 2 m at the southwest corner. This water table lowering could significantly influence the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient side of the LCS was constructed to alleviate any potential problems related to lowering of the groundwater table south of the landfill.

Water levels measured in the up-gradient and down-gradient deep wells (OW-92-12 and OW-95-9) indicate a typical difference in water levels of about 6 m, which represents a hydraulic gradient of approximately 0.01 (0.008 in spring 2021) across the site within the glacial till/upper bedrock.

Many factors, such as mounding within the waste pile, the installation of the leachate collection system and the construction of waste cells with under drainage will influence the rate of groundwater flow across the site.

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3.2 Surface Water Flow Measurements

Estimates of surface water flow measurements for 2021 are summarised below along with the historical minimum and maximum flow rates estimated at each monitoring station.

Monitoring Station	Minimum Flow L/s	Maximum Flow L/s	Expected Dry Weather Flow L/s	Estimated Flow May 27, 2021 L/s	Estimated Flow Aug. 24, 2021 L/s	Estimated Flow Nov. 24, 2021 L/s
S-1	No flow	73	0.5 – 2	0.2	0.2	21
S-3	No flow	140	<0.5	No flow	0.4	No flow
S-5	No flow	No flow	No flow	Dry	Dry	No flow
S-8	No flow	5 – 10	0.5 – 2	No flow	Dry	No flow
S-9	No flow	94	2 – 5	0.2	1.6	7.0
S-10 (SW-W) [a]	No flow	No flow	No flow	No flow	No flow	No flow
S-11 (SW-C) [a]	No flow	No flow	No flow	No flow	No flow	No flow
S-12 (SW-E) [a]	No flow	No flow	No flow	No flow	No flow	No flow
S-15	No flow	120	0.3 – 2	3	No flow	1.5
S-16	No flow	56	No flow	8.3	Dry	No flow
S-17	No flow	44	0.5 – 2	No flow	No flow	13.0

Notes:
[a] Monitoring stations S-10 (SW-W), S-11 (SW-C) and S-12 (SW-E) are located at the northern edge of the Mer Bleue Bog and consist of stagnant bog water.

Input: ETB
Checked: RPM

4.0 GROUNDWATER QUALITY ASSESSMENT

Groundwater has been monitored at observation wells since 1981. However, since 1985, landfilling operations expanded over the original down-gradient observation wells which have since been replaced with the existing wells. Existing observation wells were installed in 1992, 1994, 1995, 1998, 2005, 2007, 2009, 2010 and 2011.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as follows:

- a shallow surface sand layer at depths ranging from 1.5 to 2.5 m below original grade
- the weathered clay zone of a thick clay deposit at depths ranging from 3.5 to 4.5 m below original grade
- the intact clay deposit at depths ranging from 7 to 8 m below original grade
- glacial till/bedrock contact zone at depths ranging from 22.3 to 37.1 m below original grade

The two upper stratigraphic units, the sand and weathered clay units, were sampled for both the May and November monitoring events. The two lower stratigraphic units, the intact clay and near bedrock units, are sampled every 18 months. Groundwater samples from these units were collected in November 2021 and the next sampling session for the monitoring wells screened in these units will be in the spring of 2023. The observation wells monitored in 2021 are listed in Tables 1a, 1b and 1c and illustrated on Figure 2.

As previously discussed, Condition 109 of the ECA requires groundwater monitoring locations MW09-1A, MW09-1B, MW09-1C and MW09-1D to be sampled once per year. Due to expected frozen conditions in the winter, MW09-1A, MW09-1B, MW09-1C and MW09-D have been monitored during the summer sessions starting

in 2014. Due to dry conditions, no sample could be collected from monitoring well MW09-1D in August 2021. Data from these wells is being collected to assess the groundwater quality in the area of the Mer Bleue as part of the expansion of the landfill.

Current and historical analytical results for groundwater in all units are presented in Appendix D.

4.1 Quality Assurance/Quality Control

The 2021 QA/QC protocol included the following: (i) preparation of one laboratory trip blank and one field blank for the May and November 2021 monitoring session to be analyzed for VOCs; (ii) the collection and analysis of two blind groundwater sample duplicate for the May 2021 sampling session and (iii) two blind groundwater sample duplicates for the November 2021 sampling session. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the RPD between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All QA/QC results for groundwater were within acceptable tolerance limits during the May 2021 monitoring session, except for the TKN concentration in the sample collected from MW95-8 (identified as 95-8 in the laboratory report) and its duplicate (identified as Dupe-3 in the laboratory report). A data check was requested for the sample collected at MW95-8 in May 2021 and its duplicate; it was determined that there was an error on the original and duplicate TKN concentrations and a revised report was issued. Following the revised report, the TKN concentration does not exceed the acceptable tolerance limits. MW-95-8 and its duplicate had TKN concentrations consistent with historical results.

Three blind groundwater sample duplicates were analyzed during the November 2021 session. All QA/QC results for groundwater were within acceptable tolerance limits during the November 2021 monitoring session except for the copper concentrations, iron concentrations, and phosphorous concentrations in the sample collected from MW95-8 (identified as 95-8 in the laboratory report) and its duplicate (identified as Dupe-2 in the laboratory report) as well as the manganese concentrations in the sample collected from MW92-7 (identified as 92-7 in the laboratory report) and its duplicate (identified as Dupe-3 in the laboratory report). The sample collected at MW95-8 and its duplicate were re-analyzed by the laboratory and the results demonstrated that the QC on the original sample concentrations was acceptable. Copper and iron concentrations are consistent with historical results for both MW95-8 and its duplicate. The phosphorous concentration reported at MW95-8 in the fall was elevated compared to recent historical concentrations, but still within historical concentrations at this location. Manganese concentrations reported at MW92-7 in the primary and duplicate samples were both within the range of historical concentrations for this parameter at this location (which have been typically variable) and the laboratory could not explain the discrepancy.

It is believed that the discrepancies noted should not affect the interpretation of the groundwater results.

The results of the VOCs analyses of the field blanks and trip blank (identified respectively as Field Blank and Trip Blank in the laboratory report from the May and November 2021 monitoring sessions) were within acceptable tolerance limits with all parameters concentrations below their respective RDL.

4.2 Up-Gradient Control Wells

Monitoring of groundwater quality up-gradient from the site was made possible with the use of observation wells installed in 1992 behind the WCC administration office at 3354 Navan Road (OW-92-12 to OW-92-19). In 1995, two additional wells were installed within the shallow sand deposit to the southeast (OW-95-4) and west (OW-95-8) of the administration office. Four additional wells were installed in the fall of 1998 at the up-gradient corners of the waste footprint (OW-98-1 to 98-4). In August 2011, a borehole was drilled and a new observation well was installed to replace OW-98-2 in the intact clay deposit, as it was filled with sand. Monitoring wells OW-95-4, OW-98-4 and OW-98-3 were decommissioned in 2012 and replaced by existing monitoring wells MW05-1A to D as per Item 42 listed in Schedule A of ECA No. A460702. All these wells are referred to as the up-gradient control wells. The up-gradient groundwater quality in each stratigraphic unit was compared to the ODWQS for which aesthetic objectives or maximum or interim maximum acceptable concentrations exist.

4.2.1 Sand Layer

The background groundwater quality within the sand layer was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-19, MW05-1D (replacing OW-95-4), and OW-95-8.

The groundwater quality during 2021 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-19	TDS and manganese	Chloride, manganese, sodium and TDS
05-1D	Chloride and TDS	Chloride and TDS
95-8	Manganese and TDS	Iron, manganese and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, manganese, iron, sodium and TDS that exceed the ODWQS.

4.2.2 Weathered Clay Deposit

The background groundwater quality within the weathered clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-18, OW-98-1 and MW05-1C (replacing OW-98-4).

The groundwater quality during 2021 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-18	Chloride and TDS	Chloride, manganese and TDS
98-1	Chloride, sodium and TDS	Chloride, iron, manganese, sodium and TDS
05-1C	Manganese	[None]

Input: ETB
Checked: RPM

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As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS that exceed the ODWQS.

4.2.3 Intact Clay Deposit

The background groundwater quality within the intact clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-16, MW11-1 (replacing OW-98-2) and MW-05-1B (replacing OW-98-3).

The groundwater quality during 2021 at the intact clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-16	[None]
05-1B	[None]
11-1	Chloride, sodium, manganese and TDS

Input: ETB
Checked: YJM

As apparent from the above table and historical data, the groundwater quality within the intact clay deposit is characterized by concentrations of chloride, manganese, sodium and TDS that exceed the ODWQS.

4.2.4 Glacial Till/Upper Bedrock Zone

The background groundwater quality within the glacial till/upper bedrock was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-12 and MW-05-1A.

The groundwater quality during 2021 at the glacial till/upper bedrock groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-12	Sodium and TDS
05-1A	Sodium and TDS

Input: ETB
Checked: RPM

As apparent from the above table, the groundwater quality within the glacial till/upper bedrock is characterized by concentrations of sodium and TDS which regularly exceed the ODWQS.

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4.3 Mer Bleue/Down-Gradient Control Wells

Groundwater further down-gradient from the landfill is monitored with the use of nested observation wells installed in 1994 and 1995 south of the landfill at the northern edge of the Mer Bleue Bog. These observation wells were installed to obtain a better understanding of the hydrogeology of the area and geochemistry of the groundwater south of the landfill. The nested wells are located in line with the eastern limits of the landfill (OW-94-4, OW-94-5 and OW-94-6), east of the landfill centre line (OW-95-5, OW-95-6, OW-95-7 and OW-95-9) and in line with the western limits of the existing landfill (OW-95-1, OW-95-2 and OW-95-3). All these wells are referred to as the down-gradient control wells. The groundwater quality of the down-gradient control wells in each stratigraphic unit was compared to the ODWQS for aesthetic objectives or maximum or interim maximum acceptable concentrations.

4.3.1 Sand Layer

The down-gradient groundwater quality within the sand layer was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-6, OW-95-3, and OW-95-7.

The groundwater quality during 2021 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
94-6	Iron, manganese, and TDS	Sodium, manganese, and TDS
95-3	Manganese, sodium and TDS	Manganese, sodium and TDS
95-7	Chloride, iron, manganese, sodium and TDS	Chloride, manganese, sodium and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, iron, manganese, sodium and TDS that exceed the ODWQS. Similar ODWQS exceedances for these parameters were also observed in the up-gradient groundwater at similar concentrations.

4.3.2 Weathered Clay Deposit

The down-gradient groundwater quality within the weathered clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-5, OW-95-2, and OW-95-6.

The groundwater quality during 2021 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
94-5	Chloride, iron, manganese, sodium, and TDS	Chloride, manganese, sodium, and TDS
95-2	Chloride, manganese, sodium, and TDS	Chloride, sodium, and TDS
95-6	Chloride, manganese, sodium, and TDS	Chloride, manganese, sodium, and TDS

Input: ETB
Checked: RPM

002525

As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS that exceed the ODWQS, similarly to groundwater quality within the same deposit upgradient of the landfill.

4.3.3 Intact Clay Deposit

The down-gradient groundwater quality within the intact clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-4, OW-95-1, and OW-95-5.

The groundwater quality during 2021 at the intact clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
94-4	Chloride, manganese, sodium, and TDS
95-1	[monitoring location was frozen]
95-5	Chloride, manganese, sodium, and TDS

Input: ETB
Checked: RPM

As apparent from the above table as well as historical data, the groundwater quality within the intact clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS which exceed the ODWQS. Up-gradient groundwater quality is different than down-gradient water quality, even though similar parameters exceed ODWQS at up-gradient observation well MW11-1. The concentrations observed at the down-gradient locations were generally higher than at the up-gradient locations.

4.3.4 Glacial Till/Upper Bedrock Zone

The down-gradient groundwater quality within the glacial till/upper bedrock zone was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitor OW-95-9.

The groundwater quality during 2021 at the glacial till/upper bedrock zone groundwater monitor met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
95-9	[monitoring location was frozen]

Input: ETB
Checked: RPM

As apparent from historical data, the groundwater quality within the glacial till/upper bedrock zone is characterized by concentrations of chloride, sodium, and TDS that regularly exceed the ODWQS. Historically, concentrations of iron and manganese have occasionally exceeded the ODWQS. The concentrations of chloride and sodium in the down-gradient groundwater quality are typically higher than in the up-gradient groundwater quality.

002526

4.4 Results

Piper trilinear diagrams for groundwater in the sand layer during May and November 2021 are shown on Figures 4 and 5, respectively. The diagrams indicate that shallow groundwater at the immediately down-gradient locations is somewhat variable and has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the sand within the Mer Bleue Bog. Similar to past observations, the distribution of up-gradient groundwater quality on the Piper diagrams is reflecting elevated but stable chloride and hardness (calcium and magnesium) concentrations at MW05-1D since 2012.

Figures 6 and 7 indicate that groundwater in the weathered clay at the immediately down-gradient site OW-92-10 has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the weathered clay within the Mer Bleue Bog (with a fingerprint very similar to leachate quality). Groundwater at other compliance sites is more like groundwater in the weathered clay within the Mer Bleue Bog. These diagrams also indicate that groundwater in the weathered clay deposit up-gradient of the landfill is different from groundwater in the bog. There are no significant changes from the previous year.

Figure 8 indicates that groundwater in the intact clay downgradient of the site has a geochemical fingerprint similar to groundwater quality in the intact clay in the Mer Bleue Bog. Although historically a similar observation was reported for groundwater quality in the glacial till/upper bedrock zone, this comparison could not be done in 2021 because the only Mer Bleue Bog well in this stratum (OW-95-9) was frozen in November 2021 (see Figure 9).

A Phase II Environmental Site Assessment was conducted at the landfill by Intera (Intera, 2003). This assessment concluded that groundwater within the sand layer, the upper weathered clay and perhaps the deeper intact clay deposit on down-gradient lands has slightly elevated concentrations of parameters previously thought to be indicative of landfill leachate (e.g., boron, ammonia, TKN). However, there is no obvious spatial correlation of these parameters with proximity to the landfill or groundwater migration pathway. The lack of spatial correlation suggests that groundwater on down-gradient lands is representative of naturally elevated background groundwater quality associated with the Mer Bleue environment.

In addition, the groundwater and surface water trigger mechanism report prepared by Golder (Golder, 2007b) demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are not potential impacts from landfill activities. Naturally elevated parameters measured included boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

5.0 LEACHATE CHARACTERISTICS

Prior to the construction of the leachate collection system (LCS) in 1991-1992, leachate was sampled and analysed in areas where surface breakout was observed. Breakout of leachate, when encountered, usually occurred at the down-gradient toe of the landfill.

The monitoring program for leachate quality has focused on the LCS. For the purpose of the annual monitoring report, leachate generated by the landfill is monitored at the down-gradient end of the south toe collector at L5 at the same time surface water is monitored. A more extensive leachate monitoring program is carried out throughout the year in accordance with a City of Ottawa Leachate Discharge Agreement for the discharge of treated leachate at the Robert O. Pickard Environmental Centre (ROPEC), the municipal wastewater treatment plant.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation. The landfill is underlain by a thick natural clay deposit which has a hydraulic conductivity, K, of less than 10^{-9} metres per second and as such performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater, but rather it is predominantly precipitation that has infiltrated through the waste pile. It should be noted that leachate at the site could also consist of porewater from the underlying clay as a result of upward gradients and/or consolidation, noting that porewater release to the leachate collection system is slowed by the low hydraulic conductivity of the clay.

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. The intrinsic biodegradability of municipal landfill leachate can be measured by a BOD:COD ratio. During the first several years of production, the BOD:COD ratio generally is in the 0.5 range. As the landfill ages, the ratio decreases to levels less than 0.1 suggesting a more or less biologically recalcitrant organic composition (Andreottola et al., 1989). Also, the concentration of ammonia tends to increase with landfill age since ammonia is a by-product of the stabilisation of organic matter (Elefiniotis et al., 1989), although at a dry waste facility such as the WCC Navan Facility, ammonia concentrations can be expected to remain relatively low.

Typical parameter concentrations in leachate are provided in the tables below. Average concentrations indicate that the WCC Navan Facility leachate is distinctly different from most other landfill sites in Ontario, including the City of Ottawa Trail Waste Facility, with most analytes measured in the WCC Navan Facility leachate having much lower concentrations. The concentration of various parameters listed below suggests a comparatively low strength leachate is generated at the WCC Navan Facility. The concentration of the traditional indicators of environmental quality (conventional pollutants) such as BOD_6, suspended solids, ammonia and metals such as iron and zinc are relatively low. The WCC Navan Facility leachate has much lower concentrations because it is not generated from municipal waste.

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Parameter	WCC Navan Waste Recycling and Disposal Facility L5 *			Trail Road & Nepean Landfills [1]			Ontario Landfills [2]		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
Boron	0.37	29.3	15.3	3.92	6.22	5.348	0.8	52	10.4
Ammonia	0.01	112	44.5	----	----	----	7.6	1,820	175
BOD_5	1.6	662	99.9	111	1,790	652	1	66,000	4,975
Conductivity	669	5,640	3,866	----	----	----	475	26,100	6,088
TDS	1,690	10,300	2,853	----	----	----	196	9,030	4,327
Sodium	53.9	850	541.4	----	----	----	13.8	16,000	936
Manganese	0.066	13.2	1.25	0.0879	1.62	0.627	0.03	793	3.54
COD	69.2	1,240	441	380	4,700	1,493	1	47,300	7,855
Iron	0.003	32.7	7.8	0.798	58.3	13.26	0.01	1,300	58
Copper	<0.0005	0.254	0.011	0.0165	0.374	0.1567	0.007	7	0.045
TSS	<2	1,190	109	2	12,400	92.1	3	8,130	445
Chloride	76.5	1,000	478.8	1,000	1,640	1,308	0.4	12,000	270
Lead	<0.00002	0.1	0.008	<0.05	0.276	----	0.001	2.1	0.070
Zinc	<0.005	4.54[3]	0.11	0.0366	2.21	0.62	----	16	1.42

Notes:
All concentrations are in mg/L except conductivity (µS/cm)

Updated by: ETB
Checked by: RPM

* Calculated using all historical data collected for the Annual Monitoring Report since 1992 for L5.

< Denotes concentration is lower than the Reportable Detection Limit (RDL).

[1] City of Ottawa Trail Road Annual Operating and Monitoring Report – 2000.

[2] Howard and Livingston, "Contaminant Source Audits and Groundwater Quality", Environmental Geology of Urban Areas, 104-116, Ed. by N. Eyles, Geological Association of Canada, 1997.

[3] The concentration of zinc reported in August 2020 is considered anomalous but has been used in the calculation of the average zinc concentration in the leachate monitor.

Water impacted by leachate will typically have high concentrations of dissolved constituents with chemical concentrations ten to several hundred times higher than those measured at reference monitoring locations. Chemical concentrations have a high temporal variability due to variations in the composition, age and moisture of the waste and meteorological conditions.

Leachate monitored in 2021 to assist with assessment of surface water and groundwater quality was sampled on May 27, August 24 and November 24, 2021. Results of the chemical analysis undertaken by Paracel and the field measured parameters are provided along with historical data in Appendix E. The results indicate that leachate generated at the WCC Navan Facility continues to be a relatively weak wastewater when compared to municipal landfill leachate.

One field blank and one laboratory trip blank were analyzed during the August 2021 monitoring session. The results of the VOCs analyses for these two samples were within acceptable tolerance limits with all parameters concentrations below the RDL.

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Leachate quality monitoring results for 2021 indicate that the leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Concentrations of field measured dissolved oxygen ammonia, boron, potassium, and TKN show a generally increasing trend over time although boron concentrations have been relatively stable in recent years. The concentration of chloride was previously indicated to be increasing but has been stable for approximately five years. The concentrations of DIC and manganese, show a general decreasing trend over time although they have stabilized in recent years. Previously reported decreasing trend in hardness appears to be stabilizing. The concentrations of certain parameters remain above the surface water and groundwater quality near the site.

6.0 GROUNDWATER COMPLIANCE ASSESSMENT

6.1 Compliance Mechanism

The objectives of groundwater trigger mechanisms at the WCC Navan Facility are to utilize the results of the ongoing groundwater monitoring program to assess site compliance and to trigger implementation of the contingency plans, when and if necessary. The purpose of the trigger mechanisms is to prevent leachate-impacted groundwater exceeding a certain negative threshold level from occurring. The trigger mechanism was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the Navan Facility.

Traditional methods of site compliance provide very limited useful and/or reliable parameters for assessment of the WCC Navan Facility; therefore, an alternate method must be used. The difference in hydrogeology across the site coupled with the very saline environment of the clay deposit that underlies the Mer Bleue clay have resulted in the MECP accepting that Guideline B-7 (RUPO) is not applicable at this site. The MECP's position in this regard was documented in a November 2000 memorandum issued by the MECP (MOE, 2000). Therefore, the Leachate Indicator Parameter list and the method to determine if leachate from the site is impacting local groundwater was developed in the Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The Leachate Indicator Parameter list includes alkalinity, ammonia, boron, chloride, hardness, magnesium, manganese and potassium.

After the completion of a monitoring session, the concentration of each Leachate Indicator Parameter for all groundwater locations used to assess compliance should be visually checked. If a parameter concentration appears to be elevated, a comparison to the background concentration range should be completed. The potential for an increase in concentration of a Leachate Indicator Parameter will be investigated by comparing the concentrations for each parameter to the background range for its corresponding stratigraphic unit. The background range will be derived from the maximum and minimum data obtained at the locations used to assess compliance from 1998 to present in each stratigraphic unit. In addition, data from monitoring wells MW05-3A to D located to the east of the site and not impacted by landfill leachate will be used to define the background range. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each location used to assess compliance are presented in time-concentration graphs in Appendix F. The background ranges will be updated annually using the most recent data if it is not deemed impacted by landfill leachate. An exceedance of the background range is considered an exceedance of the trigger mechanism and the implementation of the trigger format outlined in the trigger mechanism report should proceed.

No comments from the MECP have been received on the groundwater aspects of the 2020 annual monitoring report at the time this report was completed.

6.2 Immediately Down-Gradient Wells Used to Assess Compliance

At the down-gradient limit of the landfill, groundwater quality was monitored at three nests of observation wells installed in 1992 and 1994. These wells are located at the southeast corner of the landfill (OW-92-9, OW-92-10 and OW-92-11), east of the landfill centre line at grid line 9 (OW-92-1 to OW-92-8) and at the southwest corner of the landfill (OW-94-1, OW-94-2 and OW-94-3). Two additional wells, MW-C and MW-E, were installed within the upper sand unit and shallow clay in 2000 at the northern boundary of the NCC property (now WCC property) located south of the VIA ROW. These observation wells are referred to as wells used to assess compliance.

MW07-1 is located in line with the wells used to assess compliance, to the southeast of the landfill in an area that has historically not been impacted by landfill leachate. These wells were installed in 2007 and their purpose is to monitor the future performance of the landfill expansion. With the commencement of landfilling operations in the expansion area east of the historical landfill footprint in 2016, these wells will be used along with the wells used in past reports to assess compliance along the southern property line.

New trigger concentrations were proposed in the 2020 monitoring report (Golder, 2021). These trigger concentrations are implemented herein.

In 2005, three sand layer wells used to assess compliance were installed to evaluate some unusual results at OW-94-3, OW-92-8 and OW-92-11. The monitoring wells are called MW05-R3, MW05-8 and MW05-11 and have replaced OW-94-3, OW-92-8 and OW-92-11 for groundwater quality results, respectively, as of November 2006.

6.2.1 Sand Layer

The down-gradient compliance site groundwater quality within the sand layer was monitored during the 2021 groundwater monitoring program through the inclusion of monitors MW05-R3, MW05-8, MW05-11, MW-C, MW-E and MW07-1D.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the sand layer are presented in time-concentration graphs in Appendix F-A.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	May 2021 Monitoring Session	November 2021 Monitoring Session
MW-C	None	None
MW-E	None	None
05-R3	None	None
05-8	Manganese	Alkalinity and manganese
05-11	None	None
07-1D	None	None

Input: ETB
Checked: RPM

002531

6.2.2 Weathered Clay Deposit

The down-gradient compliance site groundwater quality within the weathered clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of monitors OW-92-7, OW-92-10, OW-94-2 and MW07-1C.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the weathered clay deposit are presented in time-concentration graphs in Appendix F-B.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	May 2021 Monitoring Session	November 2021 Monitoring Session
92-7	None	None
92-10	Hardness, magnesium, and manganese	Manganese
94-2	None	None
07-1C	None	None

Input: ETB
Checked: RPM

6.2.3 Intact Clay Deposit

The down-gradient compliance site groundwater quality within the intact clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of monitors OW-94-1, OW-92-5, OW-92-9 and MW07-1B.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the intact clay deposit are presented in time-concentration graphs in Appendix F-C.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations
	November 2021 Monitoring Session
94-1	None
92-5	None
92-9	None
07-1B	Ammonia

Input: ETB
Checked: RPM

The manganese concentration reported at OW-94-1 in May 2020 was unusually elevated and returned to typical historic concentration levels in November 2021, below the trigger concentration.

6.2.4 Glacial Till/Upper Bedrock Zone

The down-gradient compliance site groundwater quality within the glacial till/upper bedrock zone was monitored during the 2021 groundwater monitoring program through the inclusion of monitors OW-92-1 and MW-07-1A.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the glacial till/upper bedrock zone are presented in time-concentration graphs in Appendix F-D.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations November 2021 Monitoring Session
92-1	None
07-1A	Hardness, magnesium

Input: ETB
Checked: RPM

The manganese concentration reported at OW-92-1 in May 2020 was unusually elevated but not as high as has been observed historically. The concentration of manganese at OW-92-1 returned to typical historic concentration levels below the trigger concentration in 2021.

6.3 Results

The Leachate Indicator Parameters at all groundwater monitoring locations used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2020 background range.

As proposed in the 2020 Annual Monitoring Report (Golder, 2021), the maximum background potassium concentration in the sand stratigraphic unit was increased to 18.3 mg/L and the maximum background manganese concentration in the glacial till stratigraphic unit was increased to 0.025 mg/L.

After the reported 2018 increases in several parameter concentrations above the background ranges observed in the sand stratigraphic unit, the increasing trend for manganese at MW05-8 has stabilized in 2020 with concentrations reported lower than in 2019, although still above the trigger concentration. Manganese concentrations at MW05-8 in 2021 were lower than 2020, but still elevated above the trigger concentration.

Manganese concentrations at this location have been variable in the past but overall there is a general increasing trend. The maximum historical manganese concentration observed in the groundwater at MW05-8 is slightly higher than the maximum concentration of manganese reported for leachate from L5 (13.2 mg/L). As such, it is possible that the overall increasing trend of manganese concentrations is not caused entirely by landfill leachate.

Exceedances of trigger concentration for alkalinity in November 2021 at MW05-8 does not appear to be a part of an overall increasing trend. Previously reported increasing concentrations at MW05-11 for ammonia, continued to decrease in 2021 and are below the trigger concentration.

Therefore, there were no continued increases throughout 2021 above the background ranges observed in the sand stratigraphic unit in 2021 at trigger locations.

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There were no continued increases above the background ranges observed in the weathered clay stratigraphic unit in 2021 at trigger locations except for the manganese concentration at OW-92-10 in May and November 2021. The concentration in May (1.33 mg/L) increased from the previous concentration in November 2020 of 0.911 mg/L. This increase was followed by another increase in November 2021 to 1.65 mg/L which marks a confirmed exceedance. In November 2018, there were spikes in concentrations of leachate indicator parameters in the sand unit. As a contingency measure, WCC purchased a spare leachate pump to reduce the downtime when pumps require servicing. This course of action effectively reduced parameter concentrations in the sand unit. Some of these concentration increases were also observed in the weathered clay unit, including manganese. Due to the lower hydraulic conductivity within the weather clay unit compared to the sand unit, the parameter concentrations are taking longer to dissipate in the weathered clay. However, the manganese concentrations in the sand unit are still elevated above the respective trigger concentration. The water quality within the sand unit influences the water quality in the weathered clay unit due to the slight downward hydraulic gradient from the sand to the weathered clay. The maximum manganese concentration in the sand unit is elevated above the maximum leachate concentration, indicating that elevated manganese concentrations are likely not entirely caused by landfill leachate. Therefore, the elevated manganese concentrations in the weathered clay unit may be a delayed result of the implementation of the parameter spike increase and slower dissipation but may also not be entirely resulting from landfill leachate.

Concentrations of hardness and magnesium at OW-92-10 exceeded their corresponding background concentrations in May 2021 (550 mg/L for hardness and 79.7 mg/L for magnesium, respectively). In both cases, they decreased slightly in the fall 2021 below the maximum background concentrations. While other leachate indicator parameters at this location were reported to be well within the background range, an increasing trend since 2012 in concentrations of alkalinity and ammonia has been observed. The concentrations of alkalinity, ammonia, and chloride in the groundwater from the weathered clay are lower than the concentrations observed in the groundwater from the underlying intact clay. The historic upward gradients between the intact clay and weathered clay and potential release of porewater within the intact clay may, at least in part, be the source of the increased concentrations overtime observed in the weathered clay.

Groundwater quality in the intact clay and glacial till/upper bedrock unit was monitored during the fall 2021 monitoring session. Monitoring of these stratigraphic units occurs every 18 months with the next scheduled session in spring 2023.

Concentrations of Leachate Indicator Parameters in groundwater samples collected in 2021 from compliance monitors screened in the intact clay unit were all below the respective trigger concentrations, except for the concentration of ammonia at MW07-1B. The exceedance for ammonia at MW07-1B was preceded by a concentration reported above the maximum background level, marking two increased concentrations and a confirmed exceedance. If future results do not reflect an upward trend and the data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in the MW07-1B monitoring well is still considered unimpacted by landfill leachate.

Concentrations of Leachate Indicator Parameters in groundwater samples collected from compliance monitors screened in the glacial till/upper bedrock unit in 2021 were all below the respective trigger concentrations, except for the concentrations of hardness and magnesium from monitoring well MW07-1A reported in November 2021. Both concentrations reported at MW07-1A follow exceedances reported in the spring of 2017, the fall of 2018, and the spring of 2020 with a slight decrease in both concentrations in the fall of 2021. This is two consecutive monitoring sessions marking a decrease in both concentrations since the fall of 2018. Leachate indicator parameter concentrations within the intact clay are fairly stable and there are no increasing trends amongst other parameters or

monitoring wells. Previous exceedances have been reported at MW07-1B and other monitoring wells within the intact clay but typically decrease below the max background during the next scheduled monitoring session. Given the lack of increasing trends amongst other monitoring wells and parameters, it is not interpreted that this exceedance is a result of landfill leachate. If future results do not reflect an upward trend and the data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in this monitoring well is still considered unimpacted by landfill leachate.

6.3.1 Confirmed Exceedances and Proposed Course of Action

As mentioned above, there are two confirmed exceedances (continued increase above the background range) of the trigger concentrations for the weathered clay and intact clay stratigraphic units in the 2021 monitoring session.

Following the confirmed exceedances reported in the 2018 annual monitoring report (Golder, 2019), in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. Trigger results of the spring and fall monitoring sessions were reported by Golder, on behalf of WCC, to the MECP Ottawa District Office via email on August 8, 2019 and December 24, 2019, respectively. In accordance with the proposed course of action presented to the MECP in the 2018 annual monitoring report and communications in 2019, WCC acquired a spare leachate pump to reduce down time when a pump requires servicing and WCC intends to proactively maintain the forcemain in good working condition in a continuing effort to achieve a drained state in the leachate collection system.

Leachate pumping and disposal operating issues reported in the fall 2018 had an impact to groundwater quality in the sand and weathered clay units in monitoring wells located immediately downgradient of the leachate collection system (less than 10 m south of the leachate collection system and close to the south toe collector).

Concentrations of some Leachate Indicator Parameters in the sand unit spiked in November 2018, but the efforts from WCC in 2019 were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented. Since the hydraulic conductivity of the sand is greater than the weathered clay, elevated concentrations have been taking longer to dissipate in the weathered clay unit.

Golder contacted the MECP Ottawa District Office via email on July 9, 2020 to update them on the trigger exceedances and notify them that no trigger exceedance reported in the spring of 2020 was following two previous exceedances showing an increasing trend and that there was no need to implement a contingency plan at this time.

In 2021, WCC continued to implement the proposed voluntary action plan to control potential increases in concentrations. Manganese concentration in the weathered clay at OW-92-10 in November 2021 marked a confirmed increase and the ammonia concentration in the intact clay at MW-07-1B also marked a confirmed exceedance. These two confirmed exceedances were reported to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in this report and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions. A copy of this correspondence is provided in Appendix H.

It is WCC's intention to continue implementing in 2022 the proposed voluntary action plan to control potential increases in concentrations.

7.0 SURFACE WATER QUALITY ASSESSMENT

7.1 Quality Control/Quality Assurance

One blind sample duplicate was analyzed per surface water monitoring session in 2021 as part of the QA/QC protocol. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the RPD between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All duplicate results for surface water were within acceptable tolerance limits in 2021 with the exception of manganese and total suspended solids (TSS) concentrations in August 2021 from the sample collected from S9 (identified as S-9 in the laboratory report) and its duplicate (identified as Dupe-1 in the laboratory report). A data check was requested for the sample collected at S9 in August 2021 and its duplicate; it was determined that there was more particulate matter in the duplicate sample than the original. Higher metals concentrations were also noted in the duplicate compared to the original which could be attributed to the variability in results. The surface water analytical results are considered acceptable.

7.2 Surface Water Quality Monitoring

A total of eleven surface water stations continue to be monitored on an on-going basis at this site. The monitoring stations have been located to obtain representative information on water quality up-gradient from the landfill at stations S1, S3, S15, S16 and S17 (background), on water quality at compliance sites down-gradient from the landfill at stations S5, S8 and S9 and on water quality in the Mer Bleue Bog at S10 (SW-W), S11 (SW-C) and S12 (SW-E). Monitoring locations SW-W, SW-C and SW-E are location references used by the NCC.

Stations S1 and S17 are located northeast and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Stations S3, S15 and S16 are located to the west/northwest and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Station S1 is located at the northeast corner of the landfill below a culvert that discharges into a south flowing east perimeter ditch. Station S3 is located at the northwest corner within the site buffer, down-gradient from where a north diversion ditch flows into a west drainage channel. Station S15 is located to the west of the landfill where the north ditch flows into a southward flowing west perimeter ditch. Station S16 is located northwest of the site in a ditch along the south side of Navan Road and up-gradient from station S15. Station S17 is located in an east ditch along the south side of Navan Road and up-gradient from station S1. These stations are considered to be representative of up-gradient background surface water quality.

Stations S5, S8 and S9 are located down-gradient from the landfill. Station S5 is located at a culvert beneath the VIA Rail right-of-way (ROW) just east of the landfill centre line near grid line 10 and is dry throughout most of the year. Station S8 is located in a wide and shallow westward flowing channel having a swamp environment and is down-gradient from the southwest corner of the landfill and north of the VIA ROW, immediately west from where the west drainage channel discharges into the ditch. Station S9 is located near a large concrete box culvert beneath the VIA ROW and down-gradient from the southeast corner of the landfill. Since the fall of 2013, water has been backing up upstream of surface water station S9 as a result of blockage in the box culvert by aggressive beaver activity. Steps were taken by WCC in spring 2017 to reduce the beaver activity in the area and no blockage was observed during the fall monitoring session. No specific beaver activity was noted in 2021.

Surface water sampling stations S10, S11 and S12, also referred to by the NCC in other reports as SW-W, SW-C and SW-E, respectively, are located south of the landfill at the northern edge of the Mer Bleue Bog and consist of stagnant bog water. Stations S10, S11 and S12 were added in 1995 to obtain data considered to be representative of water quality in the receiving water at the perimeter of the bog.

For the purpose of surface water quality assessment, the background surface water quality is assumed to be represented by the data available from stations located in close proximity to the landfill and up-gradient of surface water flow. For the 2021 monitoring program, the PWQO is being applied for the purpose of water quality assessment at the surface water sampling stations.

Surface water monitoring for 2021 was carried out on May 27, August 24, and November 24 at up-gradient control sites S1, S3, S15, S16 and S17, sites S5, S8 and S9 and the down-gradient control sites S10, S11 and S12. Analytical test reports submitted by Paracel for water samples obtained in 2021 are provided in Appendix B. Historical data are also provided in Appendix G.

Station S5, S8, and S16 were found to be dry during the summer monitoring session in 2021. Station S5 was also dry in the spring monitoring session. Therefore, samples could not be collected at these stations at those times.

Water quality data was compared to historical data obtained at each station and trends in the concentration of key indicator parameters were examined.

The PWQO criteria for chromium changed in 1999 from chromium to chromium III and chromium VI. The laboratory reports total chromium and the exceedances noted in the tables in the following sections are values of total chromium that are greater than the PWQO for chromium III, i.e. 8.9 µg/L (there is no PWQO for total chromium). Should current data show an increasing trend, attempts will be made to separate the analysis into chromium III and chromium VI.

7.2.1 Up-Gradient Control Stations

The up-gradient surface water quality was monitored during the 2021 monitoring program through the inclusion of up-gradient stations S1, S3, S15, S16 and S17.

The surface water quality during 2021 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Station	Parameter(s) Exceeding or Outside PWQO		
	May 2021 Monitoring Session	August 2021 Monitoring Session	November 2021 Monitoring Session
S1	Dissolved oxygen, iron, and phenols	Iron	Cobalt, copper, iron, and phenols
S3	Dissolved oxygen, total phosphorous, cobalt, iron, and phenols	Dissolved oxygen, total phosphorous, cobalt, iron, and zinc	Dissolved oxygen, cobalt, iron total phosphorous, zinc, and phenols
S15	Iron and phenols	Dissolved oxygen and iron	Iron and phenols
S16	Cobalt, iron, and phenols	[No sample collected due to dry conditions]	Dissolved oxygen, total phosphorous, cadmium, chromium, cobalt, copper, lead, zinc, and phenols
S17	Total phosphorus, iron and phenols	Iron	Phenols

Input: ETB
Checked: RPM

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As apparent from the above table, the up-gradient surface water quality is characterized by concentrations of the following parameters which exceed or are outside the PWQO: cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorus. Occasional PWQO exceedances of cadmium, chromium, boron, and zinc have been observed in the past as well.

Surface water quality is generally consistent over time (with seasonal variability). An increasing trend in concentrations of alkalinity, chloride, and conductivity, can be observed at surface water station S1 over time. Previously observed overall increasing trends for concentrations of DIC, sodium, TDS, and hardness at surface water station S1, concentrations of alkalinity, ammonia, DIC and iron at surface water station S3, and concentrations of iron, magnesium, manganese, sodium and TDS at surface water station S15 appear to have stabilized, with seasonal variability remaining. Similarly, the previously observed decreasing trend in dissolved oxygen concentrations at surface water stations S3 appears to have stabilized with seasonal variability remaining. A slight increasing trend in magnesium is observed at S16 and S17. Hardness is also observed to be increasing at S16.

The current or historical increases in concentrations of parameters at these locations is not related to leachate impact as these stations are up-gradient of the site.

7.2.2 Down-Gradient Control Stations

The down-gradient surface water quality was monitored during the 2021 monitoring program through the inclusion of down-gradient stations S10, S11 and S12.

The surface water quality during 2021 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Monitor	Parameter(s) Exceeding or Outside PWQO		
	May 2021 Monitoring Session	August 2021 Monitoring Session	November 2021 Monitoring Session
S10	Dissolved oxygen, iron, total phosphorous, cadmium, chromium, cobalt, copper, lead, zinc, and phenols	Dissolved oxygen, pH, total phosphorous, cobalt, copper, iron, lead, and phenols	Dissolved oxygen, cobalt, iron, zinc, phenols and total phosphorus
S11	Dissolved oxygen, cobalt, iron, total phosphorus, and phenols	Dissolved oxygen, total phosphorous, cadmium, chromium, cobalt, copper, iron, lead, and zinc	Cobalt, dissolved oxygen, iron, phenols, and total phosphorus
S12	Dissolved oxygen, cobalt, iron, total phosphorus, and phenols	Dissolved oxygen, iron, phenols, and total phosphorous	Dissolved oxygen, iron, phenols, and total phosphorus

Input: ETB
Checked: RPM

As apparent from the above table, the down-gradient surface water quality is characterized by dissolved oxygen, iron, and total phosphorus concentrations which exceed or are outside the PWQO. Occasional PWQO exceedances of boron, cadmium, cobalt, copper, chromium, phenols and zinc have been observed.

The concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the May, August and November 2021 monitoring sessions were generally similar or slightly elevated compared to the surface water quality at the up-gradient station S16 during the spring monitoring session. During the fall monitoring session, parameter concentrations tended to be similar or lower than at S16.

Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed with the exception of boron. Boron concentrations at S10, S11, and S12 were previously elevated in the mid to late 1990s, but have since decreased and remained stable, at concentrations slightly higher or similar to up-gradient surface water quality at most up-gradient stations for approximately 20 years.

7.3 Surface Water Compliance Assessment

As previously mentioned, surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. It becomes increasingly difficult to assess surface water site compliance with scattered data. The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater-based trigger mechanism is the appropriate approach for the WCC Navan Facility. Surface water quality monitoring will continue at the site, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the WCC Navan Facility.

8.0 SEDIMENTS

Sediment samples SED-W, SED-C and SED-E were obtained at the surface water sampling stations SW-10, SW-11 and SW-12, respectively, on May 27 and November 24, 2021. Laboratory reports are presented in Appendix B and the results are summarized in Table 4 and Table 5. Included for comparison in Table 4 and Table 5 are the MECP Table 1 sediment criteria and Table 2 and Table 4 Recreation/Parkland soil criteria (MOE, 2011) and the CCME freshwater sediment and Recreation/Parkland soil criteria (CCME, 1999). The table below summarizes the parameters which exceeded sediment criteria.

Sediment Monitor	Parameter(s) Exceeding MECP Table 1 Sediment		Parameter(s) Exceeding CCME Freshwater Sediment	
	May 2021 Monitoring Session	November 2021 Monitoring Session	May 2021 Monitoring Session	November 2021 Monitoring Session
SED-E	Arsenic, chromium, copper, nickel	[None]	[None]	Arsenic
SED-C	[None]	Copper	[None]	[None]
SED-W	Chromium, copper, nickel	Copper	[None]	[None]

Input: ETB
Checked: RPM

Analytical results on the sediment samples indicate that no parameters exceed the CCME Guidelines for freshwater sediment except for arsenic at SED-E. This is the highest arsenic concentration reported at SED-E (9.1 ug/g) with the previous highest concentration reported in May 2009 (7 ug/g). The laboratory was requested to re-analyzed the sample and similar results were reported. Arsenic, copper, chromium and nickel concentrations exceed the MECP Table 1 sediment criteria. The analytical results observed at the sampling locations are consistent with historical results observed at the respective locations.

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The following table summarizes the parameters which exceeded the soil criteria in 2021.

Sediment Monitor	Parameter(s) Exceeding MECP Table 2/Table 4 Soil		Parameter(s) Exceeding CCME Soil	
	May 2021 Monitoring Session	November 2021 Monitoring Session	May 2021 Monitoring Session	November 2021 Monitoring Session
SED-E	Boron	[None]	Selenium	[None]
SED-C	Boron	[None]	[None]	[None]
SED-W	Boron	Boron	Selenium	[None]

Input: ETB
Checked: RPM

Analytical results on the sediment samples indicate that boron exceeds MECP Table 2 and Table 4 soil criteria during the spring monitoring session at each sampling location. Boron also exceeded MECP Table 2 and Table 4 during the fall monitoring session at SED-W. Selenium exceeded the CCME soil criteria during the spring monitoring session at SED-E and SED-W. In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Natural wetland systems have been used to treat a variety of wastewater including agricultural and surface mine runoff, irrigation return flows, leachate, urban storm water discharge and other sources of water pollution (U.S. Environmental Protection Agency, 1987). Today, increasing attention is being given to artificial wetlands for the treatment of wastewater. Approximately 90% of Canada's 127 million hectares of wetlands are classified as peatlands where peaty soils are predominant (NAWCC, 1994). The value of peat as an agent for pollution prevention and control has been recognized during the last three decades. Peat's value is directly related to its unique physical and chemical properties. Compared to other mineral soils, peat has a very high organic content (60% carbon), with lignin and cellulose as its main constituents. Peat has a large specific area and is highly porous, properties similar to natural zeolites and activated carbon, which makes it a good adsorbent material (McLellan and Rock, 1988). These contain some functional organic groups such as carboxyl and amino groups that form complexes with metal ions (Dissanayake and Weerasooriya, 1981). Peat is also reported to exhibit ion exchange capacities (Sharma and Froster, 1993). The combination of the above mentioned properties, i.e., being a good adsorbent, forming complexes with metals and having ion exchange capacity makes peat an excellent metal trapping media. Peat is proven to be effective in removal of lead, cadmium, zinc and chromium from raw wastewater (Zhipie et al., 1984), removal of hexavalent chromium from wastewater, removal of copper, iron, manganese, zinc, lead and potassium from industrial wastewater (Cameron, 1978). Sphagnum peat, such as the peat found in eastern Ontario, is reported to be the most suitable peat to use for wastewater treatment systems, in terms of decay resistance (Warith, 1996).

The peat deposit in the Mer Bleue Bog predates any human activity in this area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink. Water levels in the Mer Bleue Bog fluctuate naturally from time to time and have been aggressively drained (in the early 1930's) to promote agricultural exploitation of the bog. Drainage of the Mer Bleue Bog is now under the management of the NCC. In more recent years, water levels have been allowed to rise and agricultural use of the bog has been significantly reduced. From time to time, given the right water levels and environment,

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the release of constituents absorbed by the peat can be expected. Therefore, it would appear that metals in excess of sediment criteria are the result of natural peat processes and not impacts from the landfill.

In 2002/2003, an assessment of the WCC site operations was undertaken in support of a WCC-NCC exchange of land parcels located south of the Navan landfill along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

9.0 PROPOSED 2022 MONITORING PROGRAM

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (these proposed changes were also listed in the 2020 Annual Monitoring Report).

In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in downgradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations of one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in downgradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As explained in Section 7.3, the MECP agreed that an excursion of landfill leachate would be apparent in the underlying stratigraphic units prior to a surface water impact and a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. Therefore, it is proposed to discontinue sediment monitoring and rely on the groundwater and surface water monitoring programs to assess off-site leachate impacts. With MECP concurrence, sediment monitoring could resume temporarily if leachate impacts and trigger exceedances are reported at the site.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during November 2021 monitoring session and will be monitored again in the spring of 2023.

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The objectives of the 2022 environmental monitoring program are:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

10.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Waste Connections of Canada. The report, which specifically includes all tables and figures, is based on data and information collected by Golder and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder as described in this report.

Golder has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Groundwater, leachate and/or surface water quality conditions may vary from these sampled locations.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Signature Page

We trust this report satisfies your current requirements. If you have any further questions regarding this report, please contact the undersigned.

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Table 1a: Summary of Water Sampling Stations for May 2021

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5* S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-4/05-1D 95-8	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2 05-3C 07-1C	94-5 95-2 95-6
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Table 1b: Summary of Water Sampling Stations for August 2021

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16* S17	S5* S8* S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer			09-1D*
Weathered Clay Deposit			09-1C
Intact Clay Deposit			09-1B
Glacial Till/Upper Bedrock			09-1A
Leachate	L-5		

Notes: * Dry conditions did not permit sampling at this station.

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Checked by: RPM

Table 1c: Summary of Water Sampling Stations for November 2021

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5 S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-8 95-4/05-1D	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2 05-3C 07-1C	94-5 95-2 95-6
Intact Clay Deposit	92-16 98-3/05-1B 98-2/11-1	92-5 92-9 94-1 05-3B 07-1B	94-4 95-1** 95-5
Glacial Till/Upper Bedrock	92-12 05-1A	92-1 05-3A 07-1A	95-9**
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Notes:
* Monitoring location was dry during this sampling event. No sample was collected.
** Monitoring location was frozen during this sampling event. No sample was collected.

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Checked by: RPM

Table 2: List of Parameters Analyzed or Calculated in 2021

Parameter	Surface Water	Leachate	Groundwater	Sediments
Hardness ($CaCO_3$)	X	X	X	
Alkalinity ($CaCO_3$)	X	X	X	
Total Suspended Solids	X	X		
Bicarbonate (HCO_3)			X	
Carbonate (CO_3)			X	
Calcium	X	X	X	
Chloride	X	X	X	
Magnesium	X	X	X	
Total Phosphorous	X	X	X	
Potassium	X	X	X	
Sodium	X	X	X	
Sulphate	X	X	X	
Nitrate nitrogen	X	X	X	
Nitrite nitrogen	X	X	X	
Ammonia nitrogen[1]	X	X	X	
Total Kjeldahl nitrogen	X	X	X	
TDS	X	X	X	
Metals				
Arsenic	X	X	X	X
Boron	X	X	X	X
Cadmium	X	X	X	X
Chromium	X	X	X	X
Cobalt	X	X	X	X
Copper	X	X	X	X
Iron	X	X	X	X
Lead	X	X	X	X
Manganese	X	X	X	X
Mercury				X
Molybdenum				X
Nickel				X
Selenium				X
Zinc	X	X	X	X

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Parameter	Surface Water	Leachate	Groundwater	Sediments
Bulk Organics				
Phenols	X	X	X	
BOD_5	X	X		
COD (Chemical Oxygen Demand)	X	X	X	
DIC (Dissolved Inorganic Carbon)	X	X		
DOC (Dissolved Organic Carbon)	X	X		
1,1-Dichloroethane		X	X	
Benzene		X	X	
Ethylbenzene		X	X	
Methylene Chloride		X	X	
Toluene		X	X	
Vinyl Chloride		X	X	
Xylene – m/p		X	X	
Xylene – o		X	X	
Field Measured Parameters				
pH	X	X	X	
Conductivity	X	X	X	
Temperature	X	X	X	
Dissolved Oxygen	X	X		
Flow	X			

Notes: [1] Unionized ammonia calculated for surface water.

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Table 3: 2021 Monitoring Well Network Condition Survey

Well Number	Properly Cased?	Cap?	Lock?	Comments
OW-92-1	√	√	√	
OW-92-2	√	√	√	
OW-92-3	√	√	√	
OW-92-4	√	√	√	
OW-92-5	√	√	√	
OW-92-6	√	√	√	
OW-92-7	√	√	√	
OW-92-8	√	√	√	
OW-92-9	√	√	√	
OW-92-10	√	√	√	
OW-92-11	√	√	√	
OW-92-12	√	√	√	
OW-92-13	√	√	√	
OW-92-14	√	√	√	
OW-92-15	√	√	√	
OW-92-16	√	√	√	
OW-92-17	√	√	√	
OW-92-18	√	√	√	
OW-92-19	√	√	√	
OW-94-1	√	√	√	
OW-94-2	√	√	√	
OW-94-3	√	√	√	
OW-94-4	√	√	√	
OW-94-5	√	√	√	
OW-94-6	√	√	√	
OW-95-1	√	√	√	
OW-95-2	√	√	√	
OW-95-3	√	√	√	
OW-95-4				Abandoned, well removed.
OW-95-5	√	√	√	
OW-95-6	√	√	√	
OW-95-7	√	√	√	
OW-95-8	√	√	√	
OW-95-9	√	√	√	
OW-98-1	√	√	√	
OW-98-3				Abandoned, well removed.
OW-98-4				Abandoned, well removed.
MW05-R3	√	√	√	
MW05-8	√	√	√	
MW05-11	√	√	√	
MW-C	√	√	√	
MW-E	√	√	√	

Well Number	Properly Cased?	Cap?	Lock?	Comments
MW05-1A	√	√	√	
MW05-1B	√	√	√	
MW05-1C	√	√	√	
MW05-1D	√	√	√	
MW05-2A	√	√	√	
MW05-2B	√	√	√	
MW05-2C	√	√	√	
MW05-2D	√	√	√	
MW05-3A	√	√	√	
MW05-3B	√	√	√	
MW05-3C	√	√	√	
MW05-3D	√	√	√	
MW07-1A	√	√	√	
MW07-1B	√	√	√	
MW07-1C	√	√	√	
MW07-1D	√	√	√	
MW09-1A	√	√	√	
MW09-1B	√	√	√	
MW09-1C	√	√	√	
MW09-1D	√	√	√	
MW11-1	√	√	√	

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Table 4: Summary of Analytical Results – Sediments (May 2021)

Parameter	May 27, 2021			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	**9.1**	1.1	3.4	18	18	12	6	5.9
Boron*	**4.2**	**1.9**	**10.6**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	**35.8**	13.3	**30.5**	160	160	64	26	37.3
Cobalt	7.9	2.0	5.4	22	22	50	50	nac
Copper	**17.1**	<5.0	**23.7**	180	180	63	16	35.7
Iron	82,800	4,950	13,100	nac	nac	nac	nac	nac
Lead	10.0	4.2	10.6	120	120	140	31	35.0
Manganese	1,260	88	322	nac	nac	nac	nac	nac
Mercury	<0.1	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	1.3	<1	3.9	6.9	6.9	10	nac	nac
Nickel	**22.5**	6.2	**19.2**	130	130	45	16	nac
Selenium	**1.2**	<1	**1.4**	2.4	2.4	1	nac	nac
Zinc	76.5	<20.0	72.8	340	340	250	120	123

Notes:
All concentrations are reported in µg/g dry.
nac - no applicable criteria for this parameter. **Bold** indicates that a concentration exceeds one or more of the applicable soil quality guidelines in this table.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2018 (CCME, 1999).
* Criteria based on a hot water extract for available boron.

Prepared by: ETB
Checked by: RPM

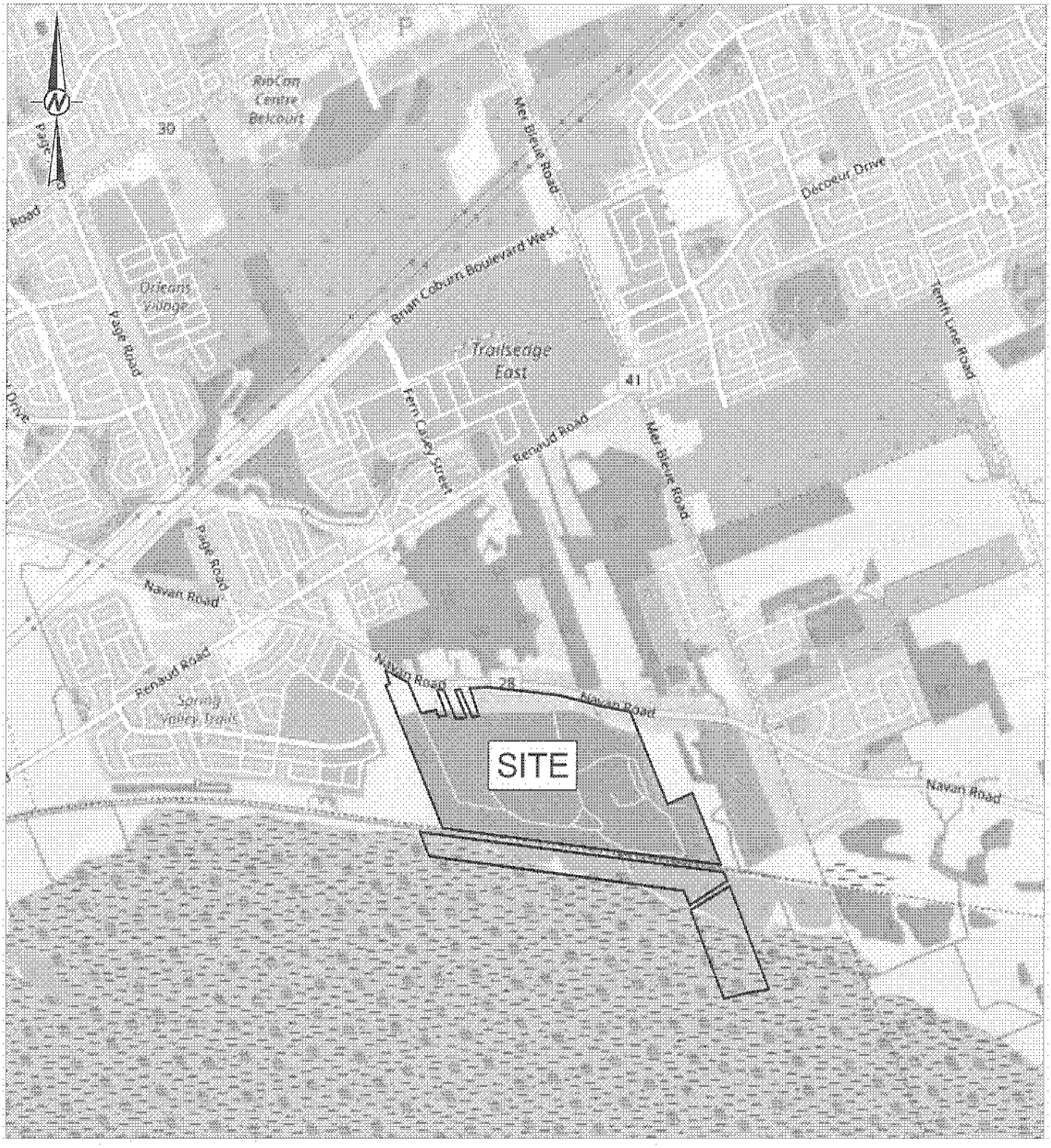
Table 5: Summary of Analytical Results – Sediments (November 2021)

Parameter	November 24, 2021			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	<1	1.5	2.1	18	18	12	6	5.9
Boron*	<0.5	1.0	**7.2**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	10.5	13.5	16.2	160	160	64	26	37.3
Cobalt	1.6	2.0	3.2	22	22	50	50	nac
Copper	<5.0	**16.2**	**16.3**	180	180	63	16	35.7
Iron	6,290	5,100	8,340	nac	nac	nac	nac	nac
Lead	4.8	4.2	6.2	120	120	140	31	35.0
Manganese	68	74	268	nac	nac	nac	nac	nac
Mercury	<0.1	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	<1	<1	2.1	6.9	6.9	10	nac	nac
Nickel	<5.0	6.2	11.6	130	130	45	16	nac
Selenium	<1	<1	<1	2.4	2.4	1	nac	nac
Zinc	<20	<20	54.9	340	340	200	120	123

Notes:
All concentrations are reported in µg/g dry.
nac - no applicable criteria for this parameter. **Bold** indicates that a concentration exceeds one or more of the applicable soil quality guidelines in this table.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2007 (CCME, 1999).
* Criteria based on a hot water extract for available boron.

Prepared by: ETB
Checked by: RPM

002551



WASTE CONNECTIONS OF CANADA

0 500 1,000
1:25,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

CLIENT
WASTE CONNECTIONS OF CANADA

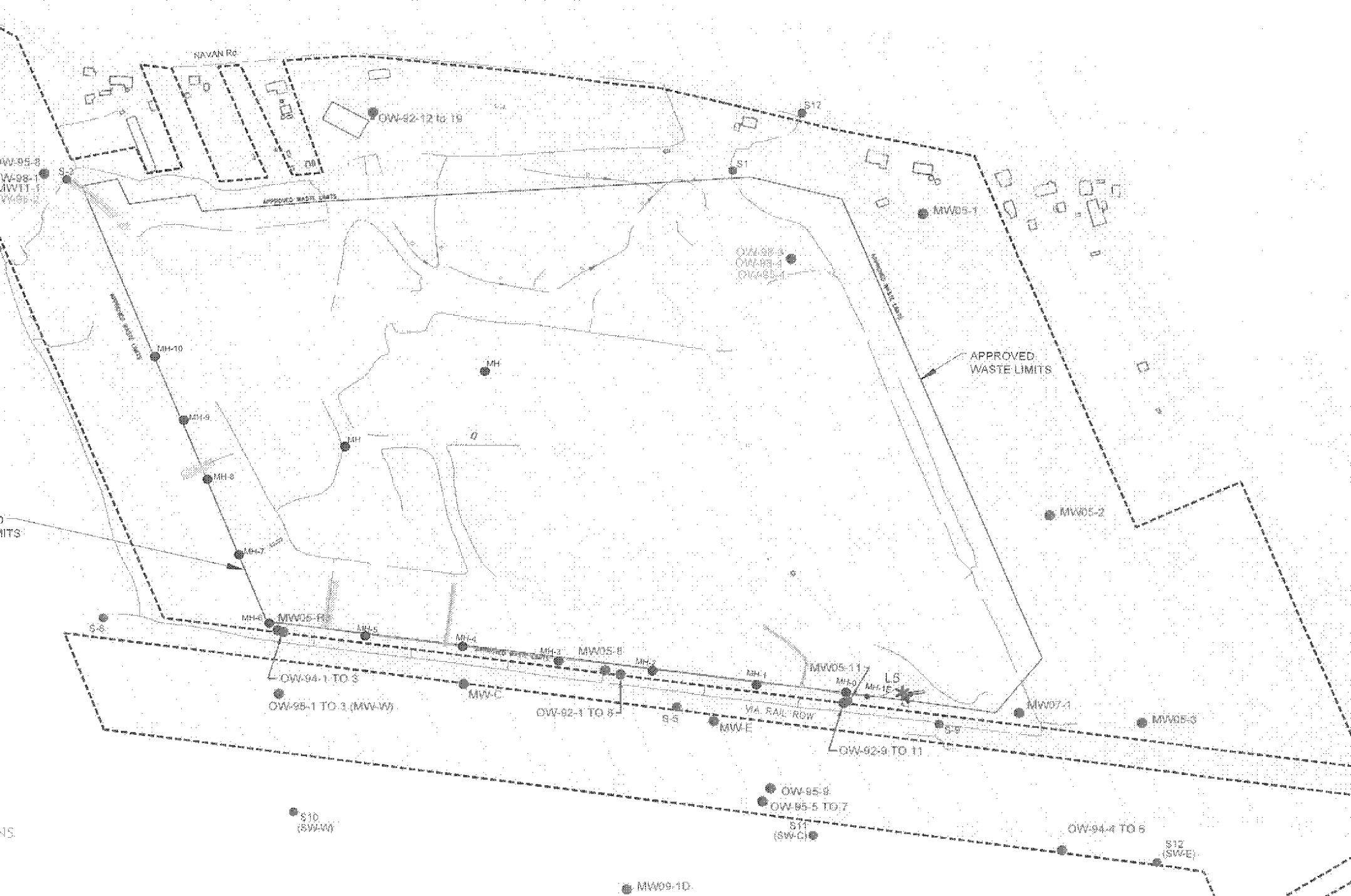
CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-01-05
DESIGNED	YJM
PREPARED	ABD
REVIEWED	YJM
APPROVED	PLE

PROJECT
REPORT ON 2021 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
21497772	0002	0	002552



FENCE LINE

SURFACE WATER SAMPLING STATION

GROUNDWATER SAMPLING STATION

002553

REFERENCE(S)

1. PROPERTY LINE PROVIDED IN ELECTRONIC FORMAT BY: FARLEY, SMITH & DENIS SURVEYING LTD. FILE NO.: 508-05, DATED: APRIL 13, 2007.
2. BASE INFORMATION PROVIDED BY THE BASE MAPPING CO. LTD. IN A DIGITAL FORMAT FROM CONTRACT No. 2748.21, DATED MAY 1, 2021.
3. COORDINATE SYSTEM NAD 83-UTM, VERTICAL DATUM: GEODETIC

CLIENT
WASTE CONNECTIONS OF CANADA

PROJECT
REPORT ON 2021
NAVAN WASTE RE
3354 NAVAN ROAD

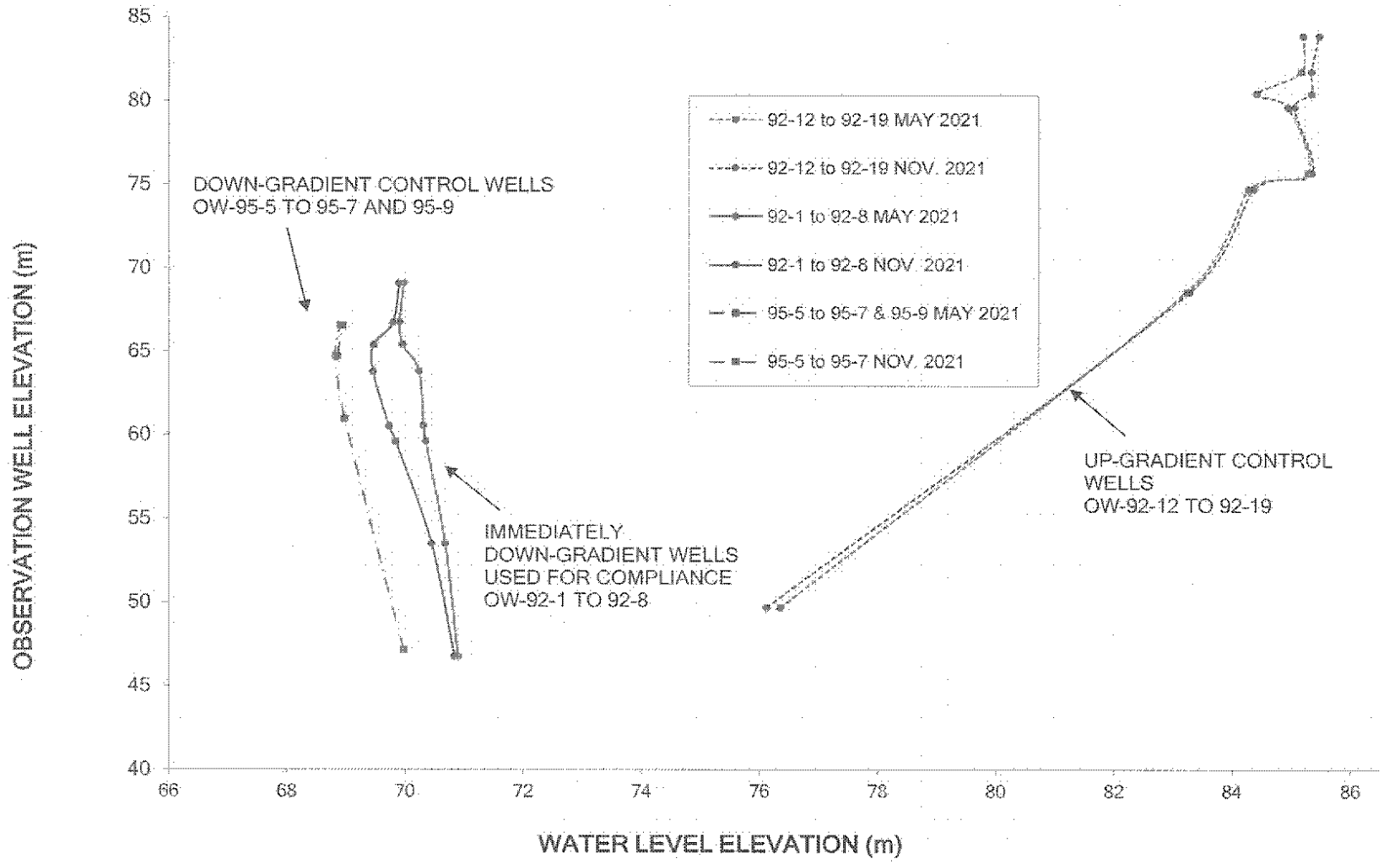


FIGURE 3

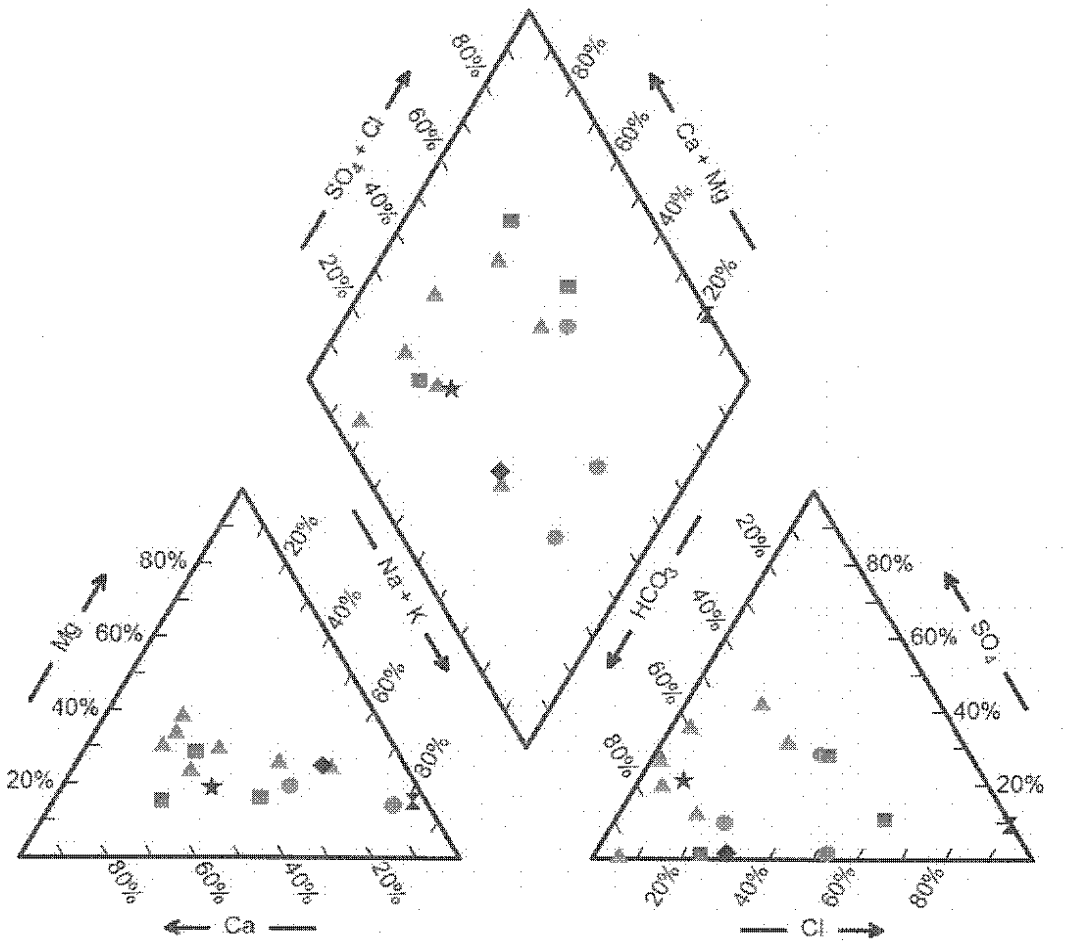
Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

HYDRAULIC HEAD PROFILES

WSP GOLDER

002554



Legend

- 05-11
- 05-3D
- 05-8
- 05-R3
- 07-1D
- MW-C
- MW-E
- 94-6
- 95-3
- 95-7
- 05-1D
- 92-19
- 95-8
- L5
- Potable GW
- Sea Water

WCC NAVAN FACILITY

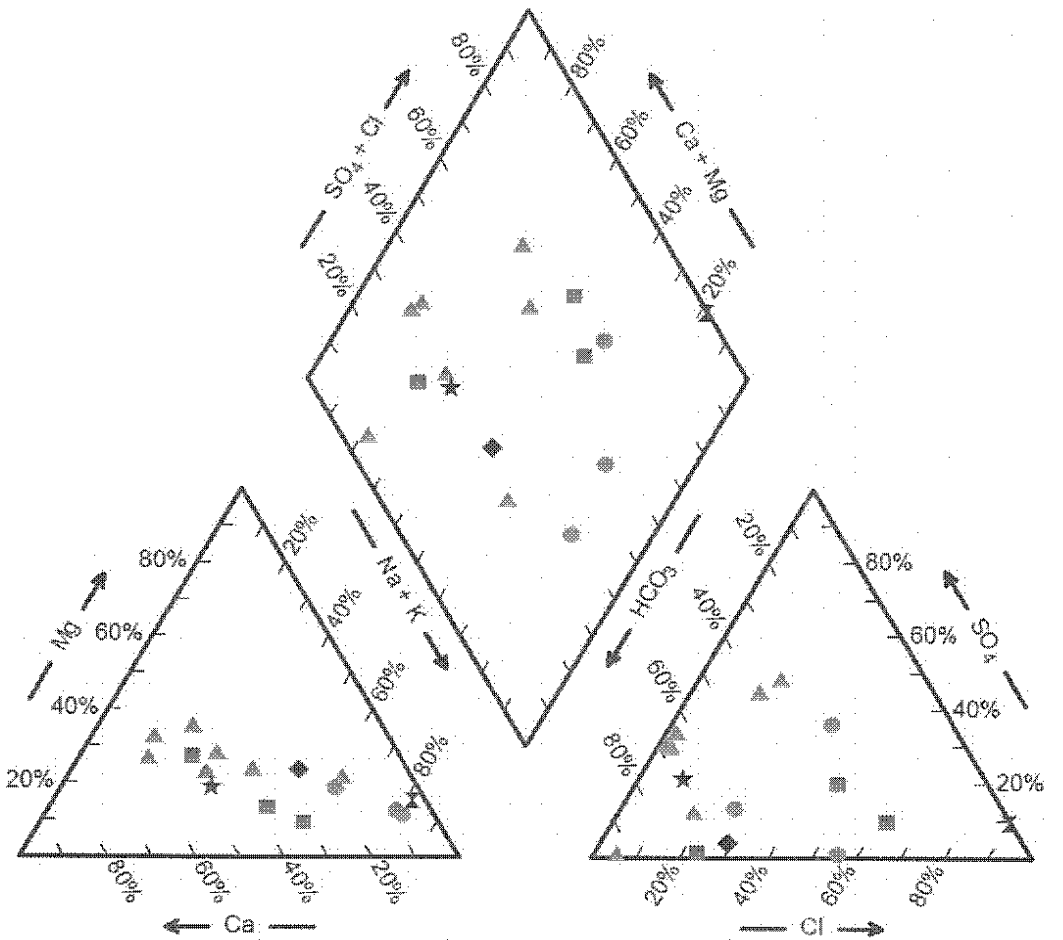
GOLDER

Drawn By	YJM
Checked By	ETB
Reviewed By	PLE

Chemical Analyses of Groundwater
Plotted on a Piper Trilinear Diagram
Sand Deposit (May 2021)

March 2022	21497772-02	Figure 4

002555



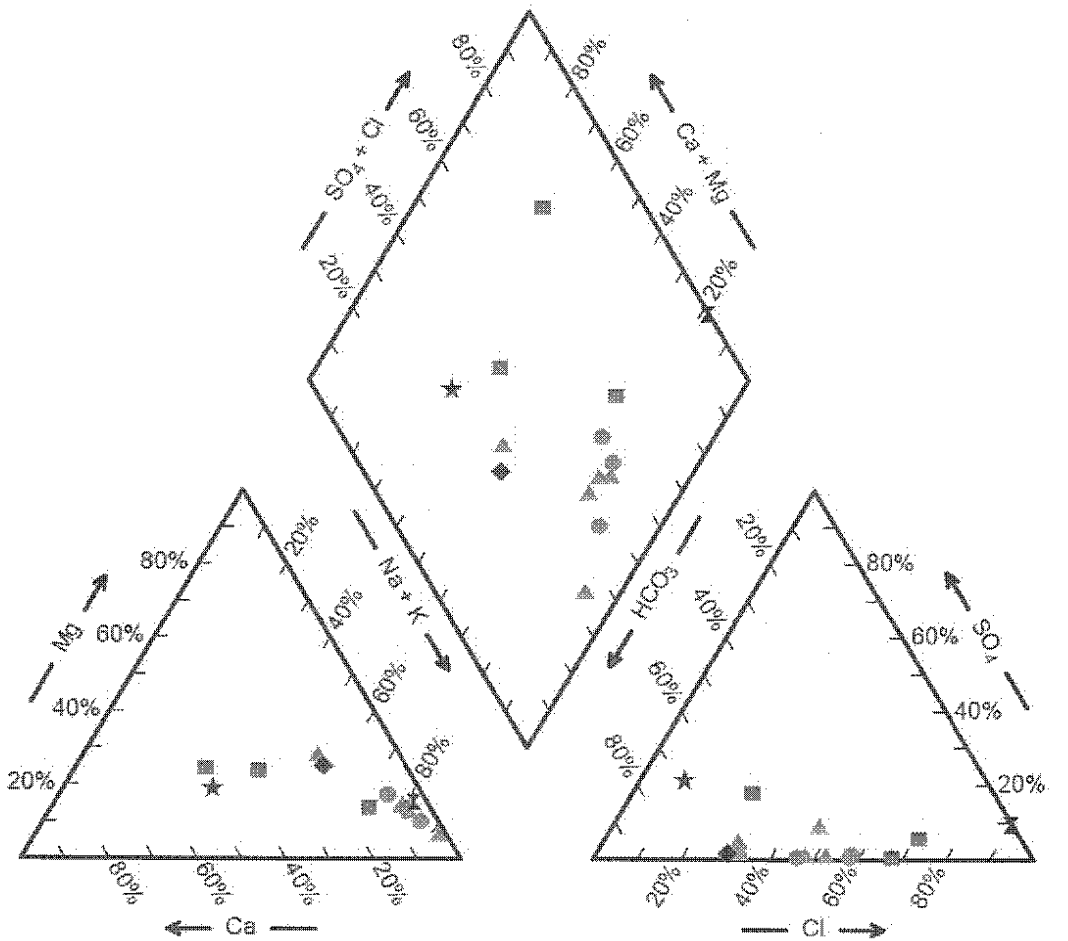
Legend

- 05-11
- 05-3D
- 05-8
- 05-R3
- 07-1D
- MW-C
- MW-E
- 94-6
- 95-3
- 95-7
- 05-1D
- 92-19
- 95-8
- L5
- Potable GW
- Sea Water

WCC NAVAN FACILITY

wsp GOLDER	Drawn By:	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Sand Deposit (November 2021)	
	Checked By:	ETB		
	Reviewed By:	PLE	March 2022	21497772-02	Figure 5

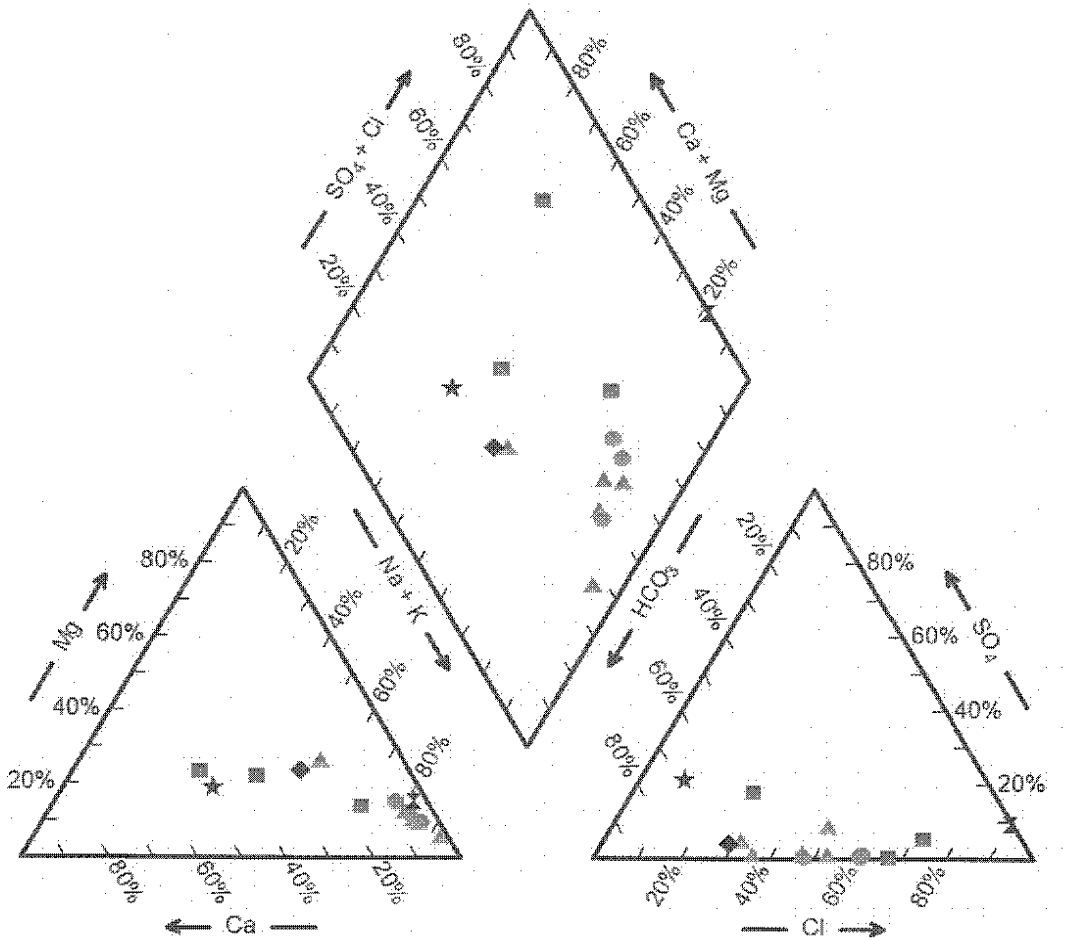
002556



WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Weathered Clay Deposit (May 2021)	
	Checked By	ETB		
	Reviewed By	PLE	March 2022	21497772-02	Figure 6

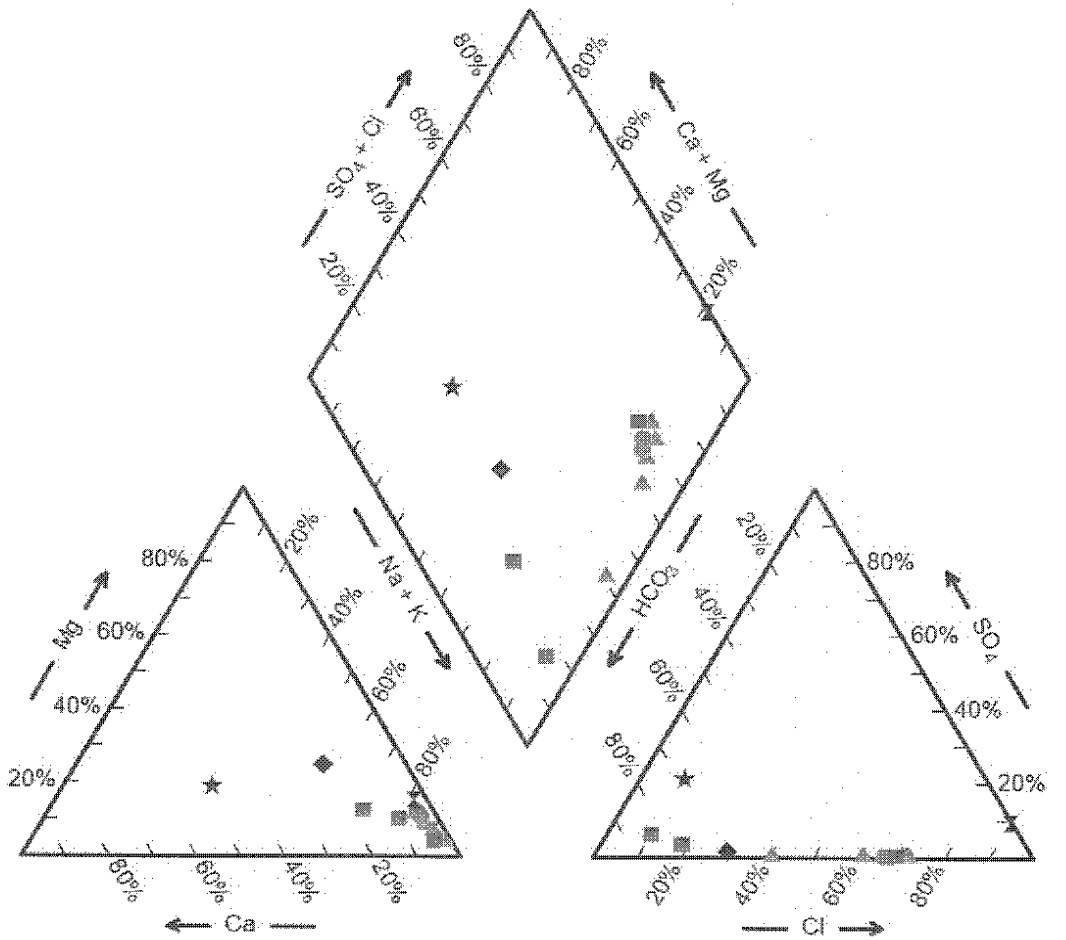
002557



WCC NAVAN FACILITY

WSP GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Weathered Clay Deposit (November 2021)
	Checked By	ETB	
	Reviewed By	PLE	March 2021 | 21497772-02 | Figure 7

002558



Legend

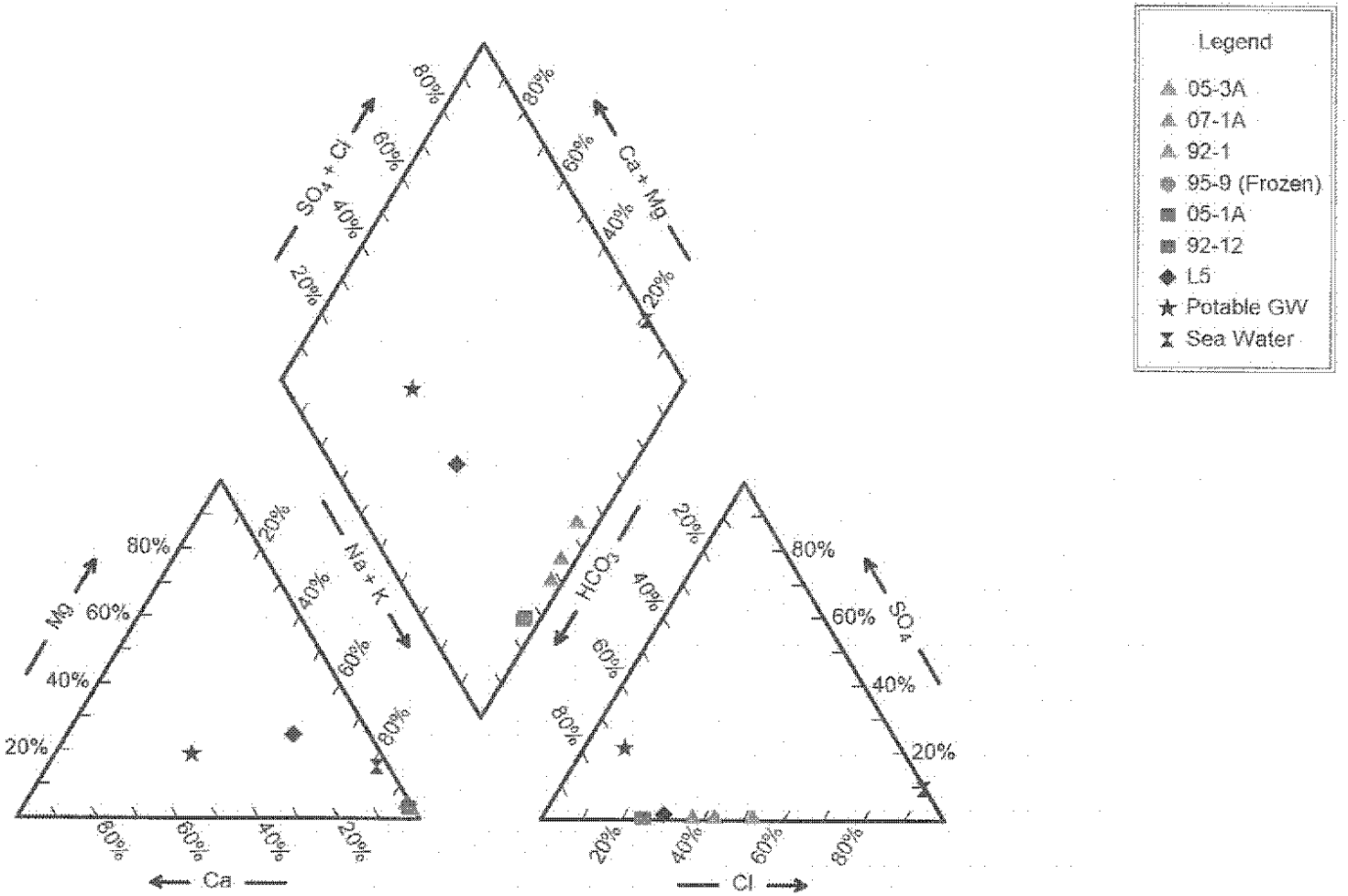
- 05-3B
- 07-1B
- 92-5
- 92-9
- 94-1
- 94-4
- 95-1 (Frozen)
- 95-5
- 05-1B
- 11-1
- 92-16
- L5
- Potable GW
- Sea Water

WCC NAVAN FACILITY

Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Intact Clay Deposit (November 2021)
Checked By	ETB	
Reviewed By	PLE	March 2022 | 21497772-02 | Figure 8

wsp GOLDER

002559



WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Glacial Till / Upper Bedrock Zone (November 2021)
	Checked By	ETB	
	Reviewed By	PLE	March 2022 | 21497772-02 | Figure 9

002560

APPENDIX A

Record of Borehole Sheets

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX B

Laboratory Certificates of Analysis

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX C

Groundwater Level Records

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	24-Mar-92 Elevation	25-Mar-92 Elevation	26-Mar-92 Elevation	30-Mar-92 Elevation	31-Mar-92 Elevation	01-Apr-92 Elevation	02-Apr-92 Elevation	03-Apr-92 Elevation	06-Apr-9 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	71.10	70.00	70.00	69.96		69.95		69.80	
73.50		71.10	18.32	53.53	52.03	53.25	58.88	60.78	67.15		68.15		69.28	
73.64		71.10	12.22	59.63	58.13		63.48	64.58	67.28		67.78		68.38	
73.67		71.10	g	60.54	59.04		62.54	63.09	65.12		65.73		66.69	
73.64		71.10	8.06	63.79	62.29		65.04	65.54	67.22		67.67		68.29	
73.74		71.10	6.47	65.38	63.88		69.06	69.30	69.76		69.73		69.63	
73.59		71.10	5.13	66.72	65.22		69.32	69.41	69.84		69.87		69.77	
73.52		71.10	2.8	69.05	67.55		69.49	69.58	69.85		69.84		69.69	
73.39		70.67	7.6	63.82	62.32			64.27	66.67		67.44		68.12	
73.27		70.70	4.6	66.85	65.35			69.35	69.75		69.75		69.75	
73.33		70.75	2.6	68.9	67.4			69.40	69.78		69.79		69.76	
87.41		86.03	37.1	49.68	48.18					74.31	74.25	74.25	74.25	74.25
87.26		86.03	18.22	68.56	67.06							80.61	81.01	81.68
87.24		86.03	12.11	74.67	73.17								79.12	82.95
87.35		86.03	11.11	75.67	74.17								76.62	79.92
87.19		86.03	7.19	79.59	78.09								81.36	82.72
87.37		86.03	6.38	80.4	78.9								83.75	84.29
87.28		86.03	5.05	81.73	80.23								84.12	84.92
87.22		86.03	2.93	83.85	82.35								84.35	85.39
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02									
72.84		71.33	4.57	67.51	66.01									
72.74		71.33	2.58	69.5	68									
69.61		68.7	8.38	61.07	59.57									
70.2		68.7	3.55	65.9	64.4									
70.13		68.7	1.91	67.54	66.04									
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ed in November 2005

002566

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-May-92 Elevation	01-Jun-92 Elevation	17-Jun-92 Elevation	30-Jun-92 Elevation	21-Jul-92 Elevation	05-Aug-92 Elevation	19-Jul-93 Elevation	02-Nov-93 Elevation	04-Apr-[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	60.49	66.30	68.85	69.35	69.63	69.66	69.81	69.82	69.85
73.50		71.10	18.32	53.63	52.03	67.93	69.51	69.58	69.60	69.60	69.58	69.65	69.58	69.50
73.64		71.10	12.22	59.83	58.13	67.66	69.16	69.40	69.43	69.42	69.44	69.63	69.42	69.27
73.67		71.10	g	60.54	59.04	65.99	68.60	69.29	69.37	69.38	69.43	69.62	69.40	69.24
73.64		71.10	8.06	63.79	62.29	68.54	69.17	69.28	69.25	69.31	69.36	69.38	69.43	69.09
73.74		71.10	6.47	65.38	63.88	69.44	69.45	69.13	69.14	69.59	69.67	69.10	69.43	69.74
73.59		71.10	5.13	66.72	65.22	69.29	69.50	69.12	69.17	69.55	69.67	69.11	69.41	69.85
73.52		71.10	2.8	69.05	67.55	69.40	69.49	69.12	69.16	69.54	69.66	69.07	69.37	69.75
73.39		70.67	7.6	63.82	62.32	67.29	69.09	69.14	69.12	69.23	69.23	69.14	69.22	68.95
73.27		70.70	4.6	66.85	65.35	69.29	69.34	69.12	69.16	69.38	69.44	68.94	69.24	69.36
73.33		70.75	2.6	68.9	67.4	69.33	69.38	69.15	69.17	69.40	69.46	68.98	69.27	69.40
87.41		86.03	37.1	49.68	48.18	74.64	74.68	74.57	74.53	74.64	74.65	74.72	74.43	
87.26		86.03	18.22	68.56	67.06	81.01	82.31	82.44	82.46	82.51	82.50	82.42	82.46	82.47
87.24		86.03	12.11	74.67	73.17	83.34	83.50	83.56	83.58	83.62	83.63	83.57	83.55	83.41
87.35		86.03	11.11	75.67	74.17	82.12	83.70	83.78	83.78	83.83	83.82	83.77	83.76	83.57
87.19		86.03	7.19	79.59	78.09	83.32	84.18	84.32	84.29	84.41	84.43	84.32	84.41	84.12
87.37		86.03	6.38	80.4	78.9	84.19	84.50	84.55	84.49	84.75	84.72	84.51	84.69	84.44
87.26		86.03	5.05	81.73	80.23	84.19	84.58	84.62	84.56	84.86	84.82	84.57	84.75	84.92
87.22		86.03	2.93	83.85	82.35	84.74	84.88	84.56	84.57	85.14	85.29	84.48	84.82	85.24
		86.96				-	84.61	84.49	85.13	84.99	84.56			
		71.99				68.67	70.37	70.32	70.28	70.56	70.46			
		72.00				68.99	70.41	70.64	70.59	70.62	70.52			
72.83		71.33	8.56	63.52	62.02									
72.84		71.33	4.57	67.51	66.01									
72.74		71.33	2.58	69.5	68									
69.61		68.7	8.38	61.07	59.57									
70.2		68.7	3.55	65.9	64.4									
70.13		68.7	1.91	67.54	66.04									
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ed in November 2005

002567

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	25-Oct-94 Elevation	06-Dec-94 Elevation	28-Mar-95 Elevation	20-Apr-95 Elevation	16-May-95 Elevation	23-Jun-95 Elevation	12-Jul-95 Elevation	26-Jul-95 Elevation	09-Aug- Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	69.88	69.83	69.90	69.88	69.92	69.92			
73.50		71.10	18.32	53.53	52.03	69.56	69.50	69.81	69.77	69.72	69.70			
73.64		71.10	12.22	59.63	58.13	69.39	69.28	69.61	69.63	69.57	69.58			
73.67		71.10	g	60.54	59.04	69.35	69.21	69.54	69.57	69.53	69.56			
73.64		71.10	8.06	63.79	62.29	69.15	69.27	69.45	69.43	69.40	69.50			
73.74		71.10	6.47	65.38	63.88	69.01	69.51	69.49	69.48	69.72	69.21			
73.59		71.10	5.13	66.72	65.22	69.00	69.50	69.48	69.49	69.82	69.23			
73.52		71.10	2.8	69.05	67.55	68.94	69.43	69.05	69.43	69.76	69.20			
73.39		70.67	7.6	63.82	62.32	69.05	69.15	69.17	69.21	69.16	69.18			
73.27		70.70	4.6	66.85	65.35	68.90	69.32	69.25	69.32	69.44	69.08			
73.33		70.75	2.6	68.9	67.4	68.92	69.36	69.29	69.35	69.50	69.11			
87.41		86.03	37.1	49.68	48.18	74.57	74.33	74.59	74.69	74.97	74.86			
87.26		86.03	18.22	68.56	67.06	82.47	82.50	82.52	82.49	82.47	82.44			
87.24		86.03	12.11	74.67	73.17	83.48	83.49	83.48	83.48	83.50	83.50			
87.35		86.03	11.11	75.67	74.17	83.65	83.68	83.65	83.65	83.66	83.71			
87.19		86.03	7.19	79.59	78.09	84.18	84.26	84.15	84.24	84.20	84.26			
87.37		86.03	6.38	80.4	78.9	84.40	84.54	84.46	84.52	84.46	84.47			
87.28		86.03	5.05	81.73	80.23	84.52	84.63	84.55	84.62	84.85	84.54			
87.22		86.03	2.93	83.85	82.35	84.48	84.85	84.85	84.73	84.46	84.45			
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02					71.09	71.09			
72.84		71.33	4.57	67.51	66.01					70.52	70.47			
72.74		71.33	2.58	69.5	68					70.39	70.33			
69.61		68.7	8.38	61.07	59.57					68.54	68.54			
70.2		68.7	3.55	65.9	64.4					68.51	68.35			
70.13		68.7	1.91	67.54	66.04					68.42	68.32			
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ned in November 2005

002568

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	21-Aug-95 Elevation	28-Aug-95 Elevation	13-Sep-95 Elevation	18-Sep-95 Elevation	29-Sep-95 Elevation	11-Nov-95 Elevation	06-Jun-96 Elevation	08-Aug-96 Elevation	04-Sep-9 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25					69.8	69.97	69.89	69.9	69.89
73.50		71.10	18.32	53.53	52.03					69.95	69.92	69.7	69.63	69.6
73.64		71.10	12.22	59.63	58.13					69.89	69.9	69.62	69.39	69.45
73.67		71.10	g	60.54	59.04					69.89	69.87	69.62	69.38	69.44
73.64		71.10	8.06	63.79	62.29					69.45	69.77	69.54	69.24	69.34
73.74		71.10	6.47	65.38	63.88					69.13	69.55	69.35	69.2	69.17
73.59		71.10	5.13	66.72	65.22					69.13	69.5	69.4	69.17	69.17
73.52		71.10	2.8	69.05	67.55					69.1	69.46	69.35	69.11	69.17
73.39		70.67	7.6	63.82	62.32					68.99	69.36	69.21	69.08	69.15
73.27		70.70	4.6	66.85	65.35					68.92	69.34	69.22	68.97	69
73.33		70.75	2.6	68.9	67.4					68.91	69.36	69.23	68.99	69.03
87.41		86.03	37.1	49.68	48.18					74.67	74.69	74.82	74.62	74.49
87.26		86.03	18.22	68.56	67.06					82.4	82.45	82.62	82.58	82.77
87.24		86.03	12.11	74.67	73.17					83.41	83.55	83.72	83.56	83.51
87.35		86.03	11.11	75.67	74.17					83.6	83.74	83.9	83.7	83.67
87.19		86.03	7.19	79.59	78.09					84.04	84.37	84.42	84.25	84.24
87.37		86.03	6.38	80.4	78.9					84.22	84.63	84.58	84.47	84.42
87.28		86.03	5.05	81.73	80.23					84.24	84.66	84.64	84.62	84.47
87.22		86.03	2.93	83.85	82.35					84.24	84.79	84.57	84.47	84.41
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02					69.13	69.29	69.626	69.316	68.81
72.84		71.33	4.57	67.51	66.01					68.65	69.31	68.911	68.951	68.91
72.74		71.33	2.58	69.5	68					68.62	69.62	69.041	68.891	68.85
69.61		68.7	8.38	61.07	59.57					67.7	68.08	68.51	68.25	68.28
70.2		68.7	3.55	65.9	64.4					68.13	68.5	68.38	67.95	67.54
70.13		68.7	1.91	67.54	66.04					68.83	69.02	68.35	68.01	67.51
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

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Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-Aug-98 Elevation	26-Oct-98 Elevation	03-May-99 Elevation	11-Oct-99 Elevation	02-May-00 Elevation	20-Oct-00 Elevation	08-Jun-01 Elevation	03-Oct-01 Elevation	17-May-[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	70.01	70.01	70.2	70.12	70.2	70.28	70.32	70.31	70.37
73.50		71.10	18.32	53.53	52.03	70.08	70.15	69.81	70.16	69.87	70.18	70.24	70.23	70.4
73.64		71.10	12.22	59.63	58.13	69.92	69.86	69.31	69.67	69.97	69.79	69.91	69.74	70.2
73.67		71.10	g	60.54	59.04				69.57	69.97	69.7	69.84	69.6	70.27
73.64		71.10	8.06	63.79	62.29	69.35	69.54	68.95	69.17	69.97	69.2	69.51	68.98	69.91
73.74		71.10	6.47	65.38	63.88	69.08	69.36	69.4	69.02	69.84	68.95	69.4	69.07	69.89
73.59		71.10	5.13	66.72	65.22	69.03	69.33	69.4	68.96	69.69	68.85	69.37	68.79	69.95
73.52		71.10	2.8	69.05	67.55	69.07	69.34	69.39	68.96	69.74	68.86	69.41	68.8	69.97
73.39		70.67	7.6	63.82	62.32	69.06	69.2	69.29	68.99	69.33	68.96	69.63	69.02	69.59
73.27		70.70	4.6	66.85	65.35	68.99	69.21	69.21		69.28	68.82	69.3	68.88	69.66
73.33		70.75	2.6	68.9	67.4	69.12	69.23	69.18	68.96	69.25	68.76	69.27	68.86	69.67
87.41		86.03	37.1	49.68	48.18	74.61	74.6	75.13	74.58	74.89	74.89	75.04	74.66	75.16
87.26		86.03	18.22	68.56	67.06	82.53	82.57	82.61	82.61	82.6	82.6	82.62	82.55	82.58
87.24		86.03	12.11	74.67	73.17	83.52	83.58	83.69	83.61	83.65	83.57	83.59	83.46	83.52
87.35		86.03	11.11	75.67	74.17	83.7	83.75	84.01	83.76	83.85	83.82	84.23	83.65	84.42
87.19		86.03	7.19	79.59	78.09	84.18	84.32	84.46	84.35	84.53	84.17	84.31	84.04	84.52
87.37		86.03	6.38	80.4	78.9	84.36	84.32	84.67	84.6	84.78	84.33	84.49	84.21	84.72
87.28		86.03	5.05	81.73	80.23	84.43	84.54	84.77	84.76	84.89	84.46	84.74	84.5	84.72
87.22		86.03	2.93	83.85	82.35	84.34	84.54	84.67	84.59	84.81	84.3	84.49	84.2	85.2
		86.96												
		71.99												
		72.00												
72.63		71.33	8.56	63.52	62.02	69.2	69.29	69.52	68.9	69.6	69.2	69.41	69.4	69.77
72.64		71.33	4.57	67.51	66.01	68.68	69.01	69.25	68.52	69.51	68.72	69.17	69.28	69.65
72.74		71.33	2.58	69.5	68	68.64	68.98	69.21	68.53	69.46	68.69	69.06	69.22	69.69
69.61		68.7	8.38	61.07	59.57	68.25	68.48	68.58	68.13	68.58	68.52	68.6	68.08	68.65
70.2		68.7	3.55	65.9	64.4	67.66	68.36	68.34	68.27	68.45	68.31	68.4	67.92	68.46
70.13		68.7	1.91	67.54	66.04	67.74	68.44	68.38	68.32	68.48	68.32	68.43	67.93	68.48
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

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Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	05-Nov-03 Elevation	08-May-04 Elevation	05-Nov-04 Elevation	29-May-05 Elevation	16-Nov-05 Elevation	19-May-06 Elevation	14-Nov-06 Elevation	07-May-07 Elevation	19-Nov-0 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	70.49	70.51	70.53	70.47	70.4	70.48	70.57	70.52	70.47
73.50		71.10	18.32	53.53	52.03	70.35	70.40	70.20	70.32	70.14	70.27	70.35	70.35	70.44
73.64		71.10	12.22	59.63	58.13	69.87	70.09	69.84	70.07	69.63	70.03	70.07	70.02	69.94
73.67		71.10	g	60.54	59.04	69.77	70.05	69.76	70.02	69.55	69.99	70.015	70.03	69.84
73.64		71.10	8.06	63.79	62.29	69.48	69.88	69.33	69.83	69.11	69.78	69.899	69.88	69.41
73.74		71.10	6.47	65.38	63.88	69.52	69.80	69.2	69.61	68.98	70.13	69.818	69.73	69.33
73.59		71.10	5.13	66.72	65.22	69.57	69.70	69.25	69.44	69.94	70.22	70.16	69.60	69.34
73.52		71.10	2.6	69.05	67.55	69.57	69.70	69.25	69.44	68.93	70.21	70.24	69.60	69.37
73.39		70.67	7.6	63.82	62.32	69.55	69.67	69.32	69.59	69.22	69.61	69.679	69.53	69.33
73.27		70.70	4.6	66.85	65.35	69.63	69.61	69.19	69.34	69.16	70.1	70.165	69.46	69.32
73.33		70.75	2.6	68.9	67.4	69.64	69.59	69.27	69.42	69.15	70.09	70.102	69.45	69.44
87.41		86.03	37.1	49.68	48.18	74.80	75.16	74.88	75.23	74.84	75.35	75.33	75.46	75.36
87.26		86.03	18.22	68.56	67.06	82.57	82.59	82.54	82.58	82.53	82.63	82.675	82.70	82.59
87.24		86.03	12.11	74.67	73.17	83.55	83.54	83.46	83.63	83.52	83.72	83.756	83.71	83.51
87.35		86.03	11.11	75.67	74.17	85.00	85.02	84.69	85	84.87	85.15	85.057	85.19	84.57
87.19		86.03	7.19	79.59	78.09	84.32	84.43	84.20	84.44	84.22	84.6	84.606	84.55	84.17
87.37		86.03	6.38	80.4	78.9	84.59	84.66	84.36	84.63	84.44	84.88	84.841	84.76	84.37
87.28		86.03	5.05	81.73	80.23	84.66	84.75	84.42	83.7	84.5	84.81	84.9	84.85	82.87
87.22		86.03	2.93	83.85	82.35	85.00	84.92	84.53	84.69	84.67	85.42	85.486	84.81	84.52
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02	69.60	69.76	69.55	69.756	69.506	69.756	70.03	69.91	70.06
72.84		71.33	4.57	67.51	66.01	69.52	69.53	68.99	69.331	69.361	69.671	69.576	69.45	69.22
72.74		71.33	2.58	69.5	68	69.56	69.56	69.06	69.301	69.361	69.841	70.111	69.42	69.21
69.61		68.7	8.38	61.07	59.57	68.48	68.55	68.63	68.67	68.49	68.69	68.755	68.67	68.45
70.2		68.7	3.55	65.9	64.4	68.56	68.51	68.50	68.47	68.44	68.46	68.485	68.37	68.30
70.13		68.7	1.91	67.54	66.04	68.54	68.51	68.51	68.48	68.45	68.56	68.507	68.41	68.35
70.23														
70.87														
86.27													78.55	78.68
86.33													84.275	83.975
86.34													84.915	84.625
86.39													84.88	84.58
81.38													66.21	66.11
81.31													68.195	67.535
81.20													70.38	67.99
81.25													71.2	68.02
70.93	74.53												70.02	70.02
70.85	74.47												69.9	69.91
70.80	74.52												69.46	69.43
70.91	74.46												69.355	69.405

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Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	18-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	16-May-11 Elevation	22-Nov-11 Elevation	23-May-12 Elevation	20-Nov-12 Elevation	21-May-13 Elevation	20-Nov-[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	70.49	70.52	70.01	70.38	70.49	70.59	70.53	70.62	70.56
73.50		71.10	18.32	53.53	52.03	70.35	70.37	70.03	70.20	70.33	70.43	70.24	70.37	70.26
73.64		71.10	12.22	59.63	58.13	69.96	70.21	69.69	70.09	69.86	70.21	69.87	70.17	69.85
73.67		71.10	g	60.54	59.04	69.90	70.28	69.63	70.07	69.78	70.20	69.80	70.15	69.78
73.64		71.10	8.06	63.79	62.29	69.47	69.88	69.60	70.00	69.23	70.03	69.45	69.92	69.48
73.74		71.10	6.47	65.38	63.88	70.27	69.55	69.72	69.95	69.02	69.94	69.32	69.82	69.46
73.59		71.10	5.13	66.72	65.22	69.17	69.40	69.89	70.05	68.93	69.77	69.23	69.69	69.63
73.52		71.10	2.8	69.05	67.55	69.10	69.41	69.66	69.44	68.93	69.77	69.26	69.73	69.59
73.39		70.67	7.6	63.82	62.32	69.39	69.76	69.64	69.61	69.73	69.80	69.62	69.65	69.65
73.27		70.70	4.6	66.85	65.35	69.19	69.41	69.66	69.80	69.85	69.73	69.63	69.62	69.88
73.33		70.75	2.6	68.9	67.4	69.18	69.42	69.16	69.80	69.81	69.68	69.59	69.58	69.86
87.41		86.03	37.1	49.68	48.18	75.46	75.36	74.71	75.43	75.00	75.01	75.35	75.81	75.64
87.26		86.03	18.22	68.56	67.06	82.90	82.84	82.94	83.03	83.13	83.21	83.18	83.23	83.24
87.24		86.03	12.11	74.67	73.17	83.94	83.83	83.91	84.05	84.13	84.32	84.30	84.33	84.31
87.35		86.03	11.11	75.67	74.17	84.57	84.58	85.15	85.32	84.70	85.46	85.11	85.32	84.73
87.19		86.03	7.19	79.59	78.09	84.50	84.57	84.70	84.77	84.60	85.01	84.86	84.99	84.78
87.37		86.03	6.38	80.4	78.9	84.62	84.74	84.94	84.98	84.81	85.24	85.05	85.20	85.00
87.28		86.03	5.05	81.73	80.23	84.60	84.81	85.03	85.04	84.73	85.26	85.01	85.22	85.01
87.22		86.03	2.93	83.85	82.35	84.51	84.80	85.01	85.27	84.74	85.35	85.00	85.20	85.15
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02	69.57	68.79	69.53	69.86	69.58	69.96	69.81	70.00	69.65
72.84		71.33	4.57	67.51	66.01	69.05	69.11	69.51	69.53	68.97	69.60	69.31	69.44	69.17
72.74		71.33	2.58	69.5	68	69.04	69.13	69.50	69.67	68.92	69.45	69.28	69.39	69.20
69.61		68.7	8.38	61.07	59.57	67.69	68.72	68.71	68.73	69.07	69.10	69.17	69.08	69.14
70.2		68.7	3.55	65.9	64.4	68.38	68.39	68.41	68.46	68.89	68.98	68.96	68.99	68.96
70.13		68.7	1.91	67.54	66.04	68.40	68.46	68.46	68.55	68.89	68.98	68.97	68.99	68.98
70.23										68.31	69.16	69.00	69.16	68.83
70.87										68.79	69.74	69.40	69.68	69.05
86.27						78.43	78.66	78.16	78.70	78.43	78.50	78.17	78.37	78.38
86.33						83.82	83.71	83.65	83.67	83.60	83.61	83.60	83.71	83.56
86.34						84.26	84.22	84.45	84.73	84.13	84.34	84.23	84.30	84.34
86.39						84.27	84.21	85.01	84.81	84.18	84.36	84.28	84.31	84.42
81.38						66.23	66.27	65.72	66.28	73.94	74.05	74.32	74.66	74.54
81.31						67.97	68.14	67.75	68.11	76.00	76.29	75.99	76.33	76.42
81.20						69.50	69.70	69.82	69.93	77.37	78.00	77.92	78.10	78.07
81.25						70.34	70.04	71.01	71.17	77.80	78.65	78.55	78.55	78.99
70.93	74.53					69.99	70.05	69.65	69.87	70.18	70.19	70.13	70.23	70.15
70.85	74.47					70.14	70.17	70.17	70.22	70.44	70.51	70.52	70.72	70.83
70.80	74.52					69.77	69.86	69.82	69.80	70.07	70.14	70.29	70.47	70.62
70.91	74.46					69.60	69.60	69.67	69.71	70.04	70.12	70.28	70.43	70.54

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Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	26-Aug-15 Elevation	19-Nov-15 Elevation	19-May-16 Elevation	18-Aug-16 Elevation	10-Nov-16 Elevation	17-May-17 Elevation	28-Aug-17 Elevation	22-Nov-17 Elevation	15-May-[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25		70.77	70.88		70.81	71.00		70.98	71.06
73.50		71.10	18.32	53.53	52.03		70.25	70.53		70.22	70.50		70.78	71.10
73.64		71.10	12.22	59.63	58.13		69.77	70.37		69.70	70.34		70.31	71.00
73.67		71.10	g	60.54	59.04		69.67	70.35		69.60	70.33		70.22	70.99
73.64		71.10	8.06	63.79	62.29		69.18	70.06		69.16	70.78		70.41	71.18
73.74		71.10	6.47	65.38	63.88		69.07	69.92		69.09	71.07		70.51	71.18
73.59		71.10	5.13	66.72	65.22		69.07	69.78		69.16	71.03		70.64	71.34
73.52		71.10	2.8	69.05	67.55		69.06	69.79		69.04	71.07		70.74	71.46
73.39		70.67	7.6	63.82	62.32		69.57	69.79		69.56	70.11		70.06	70.45
73.27		70.70	4.6	66.85	65.35		69.75	69.63		69.78	70.22		70.12	70.32
73.33		70.75	2.6	68.9	67.4		69.72	69.59		69.75	70.23		70.11	70.34
87.41		86.03	37.1	49.68	48.18		75.90	76.23		75.99	76.73		76.45	76.69
87.26		86.03	18.22	68.56	67.06		83.23	83.29		83.20	83.30		83.39	83.36
87.24		86.03	12.11	74.67	73.17		84.22	84.40		84.21	84.44		84.41	84.41
87.35		86.03	11.11	75.67	74.17		84.74	85.32		84.62	85.54		86.17	85.34
87.19		86.03	7.19	79.59	78.09		84.76	85.02		84.79	85.27		85.06	85.08
87.37		86.03	6.38	80.4	78.9		84.97	85.21		85.05	85.56		85.39	85.30
87.28		86.03	5.05	81.73	80.23		84.99	85.23		85.06	85.63		85.37	85.34
87.22		86.03	2.93	83.85	82.35		85.08	85.23		85.13	85.53		85.47	85.34
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02		69.59	70.09		69.50	70.25		70.09	70.55
72.84		71.33	4.57	67.51	66.01		69.02	69.37		68.94	69.80		69.62	69.84
72.74		71.33	2.58	69.5	68		69.03	69.38		68.94	69.75		69.66	69.80
69.61		68.7	8.38	61.07	59.57		69.16	69.12		69.02	69.13		69.18	69.15
70.2		68.7	3.55	65.9	64.4		68.88	68.86		68.88	68.86		68.89	68.85
70.13		68.7	1.91	67.54	66.04		68.96	68.95		68.96	68.97		68.99	68.94
70.23							68.63	69.15		68.08	69.24		69.24	69.24
70.87							69.24	69.69		69.26	69.80		69.83	69.74
86.27							78.44	78.32		78.25	78.83		78.45	78.75
86.33							83.56	83.78		83.44	83.78		83.71	83.80
86.34							84.33	84.33		84.18	84.68		84.51	84.46
86.39							84.37	84.32		84.23	84.59		84.65	84.41
81.38							74.74	75.08		74.82	75.55		75.31	75.52
81.31							76.55	76.82		76.51	76.86		76.96	77.10
81.20							78.07	78.49		77.90	78.71		78.42	78.76
81.25							78.81	78.94			79.36		79.21	79.19
70.93	74.53						70.33	70.49		70.92	70.59		70.64	70.73
70.85	74.47						70.85	70.85		72.18	71.32		71.49	71.46
70.80	74.52						70.57	70.65		71.46	70.81		70.80	70.99
70.91	74.46						70.54	70.57			70.83		70.87	70.75

ed in November 2005

002573

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	13-Jun-19 Elevation	14-Nov-19 Elevation	13-May-20 Elevation	17-Nov-20 Elevation	19-May-21 Elevation	23-Nov-21 Elevation
m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	71.12	70.95	70.95	70.87	70.90	70.84
73.50		71.10	18.32	53.53	52.03	71.04	70.63	70.70	70.48	70.68	70.45
73.64		71.10	12.22	59.63	58.13	70.69	69.95	70.38	69.85	70.35	69.84
73.67		71.10	g	60.54	59.04	70.63	69.82	70.35	69.73	70.31	69.73
73.64		71.10	8.06	63.79	62.29	70.19	69.45	70.37	69.35	70.24	69.46
73.74		71.10	6.47	65.38	63.88	69.92	69.32	70.26	69.21	69.96	69.47
73.59		71.10	5.13	66.72	65.22	69.95	69.47	70.13	69.30	69.91	69.80
73.52		71.10	2.8	69.05	67.55	70.04	69.57	70.21	69.38	69.98	69.90
73.39		70.67	7.6	63.82	62.32	70.09	69.72	70.13	69.85	70.01	69.99
73.27		70.70	4.6	66.85	65.35	69.86	69.87	69.82	69.68	69.68	70.09
73.33		70.75	2.6	68.9	67.4	69.84	69.84	69.79	69.65	69.66	70.07
87.41		86.03	37.1	49.68	48.18	76.74	76.30	76.59	76.16	76.35	76.12
87.26		86.03	18.22	68.56	67.06	83.29	83.26	83.27	83.21	83.23	83.28
87.24		86.03	12.11	74.67	73.17	84.39	84.27	84.34	84.21	84.28	84.36
87.35		86.03	11.11	75.67	74.17	85.33	85.25	85.41	84.63	85.29	85.35
87.19		86.03	7.19	79.59	78.09	85.04	84.80	85.04	84.74	84.94	85.05
87.37		86.03	6.38	80.4	78.9	85.23	85.10	85.26	84.99	84.41	85.34
87.28		86.03	5.05	81.73	80.23	85.28	85.10	85.30	84.94	85.16	85.34
87.22		86.03	2.93	83.85	82.35	85.34	85.16	85.28	84.96	85.20	85.47
		86.96									
		71.99									
		72.00									
72.83		71.33	8.56	63.52	62.02	70.21	69.61	70.13	69.61	69.99	69.68
72.84		71.33	4.57	67.51	66.01	69.41	69.27	69.58	69.14	69.44	69.53
72.74		71.33	2.58	69.5	68	69.37	69.30	69.57	69.08	69.35	69.50
69.61		68.7	8.38	61.07	59.57	69.16	68.74	69.12	69.03	69.09	69.21
70.2		68.7	3.55	65.9	64.4	68.85	68.74	68.82	68.78	68.77	68.84
70.13		68.7	1.91	67.54	66.04	68.97	68.88	68.92	68.89	68.89	68.95
70.23						69.10	68.55	69.18	68.32	69.04	69.00
70.87						69.59	69.07	69.76	68.98	69.61	69.68
86.27						78.58	78.39	78.66	77.85	78.13	78.11
86.33						83.79	83.44	83.75	83.49	83.71	83.49
86.34						84.31	84.18	84.41	84.14	84.24	84.38
86.39						84.26	84.26	84.39	84.22	84.23	84.47
81.38						75.54	75.14	75.38	75.02	75.15	74.94
81.31						77.26	77.07	77.04	76.86	77.09	76.87
81.20						78.72	78.35	78.71	78.28	78.64	78.45
81.25						79.04	79.01	79.21	78.83	78.97	79.45
70.93	74.53					70.81	70.64	70.66	70.55	70.60	70.53
70.85	74.47					71.32	71.29	71.30	71.26	71.22	71.23
70.80	74.52					70.90	70.87	70.87	70.92	70.81	70.86
70.91	74.46					70.77	70.77	70.75	70.66	70.69	70.75

ed in November 2005

002574

2009 op of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	23-Jun-95 Elevation	12-Jul-95 Elevation	26-Jul-95 Elevation	9-Aug-95 Elevation	13-Sep-95 Elevation	15-Aug-95 Elevation	18-Aug-95 Elevation	21-Aug-95 Elevation	25-Aug-95 Elevation	28- Elev
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
		69.232	8.12	61.2	60.45	68.8	68.576	68.686				68.736			
	69.65	69.232	4.57	64.7	63.95	68.6	68.206	68.366				68.596			
	69.81	69.232	2.33	66.7	66.325	68.52	68.276	68.486				68.536			
	85.67	85.312	2.72	83.34	82.59	83.01	82.57	83.46				83.22			
	69.73	68.477	8.25	60.98	60.23	68.55	68.367	68.437				68.507			
	69.7	68.477	4.52	64.71	63.96	68.46	68.27	68.352				68.432			
	69.83	68.477	2.31	66.55	66.18	68.45	68.41	68.377				68.427			
84.46	84.62	79.32	2.72	77.35	76.6	78.38	79.1	78.99				78.68			
	70.93	68.73	22.30	47.18	46.43	68.96	69.222	69.282				69.232			
84.3		79.32	4.57	75.5	74.75										
84.79	84.4	79.32	8.19	71.88	71.13										
	85.84	85.312	7.09	78.97	78.22										
	85.87	85.312	4.51	81.55	80.8										
	85.08				73.58										
			3.06				69.888		70.988	70.888	70.918	70.988	70.708	70.928	71.
			2.54				70.246		70.946	70.886	70.986	71.016	70.876	71.086	71.
			2.05				70.696		70.856	70.936	71.086	71.116	71.096	71.346	71.
			1.52				DRY		70.758	71.038	71.108	71.118	71.198	71.488	71.
			3.07				69.745		70.925	70.845	70.905	70.985	70.705	70.925	71.
			2.5				70.578		70.828	70.868	71.018	71.068	70.918	71.168	71.
			2.04				70.783		70.753	70.883	71.023	71.073	71.033	71.283	71.
			1.53				DRY		70.599	71.079	71.079	71.109	71.189	71.469	71.
			3.04				69.89		70.84	70.81	70.83	70.92	70.62	70.75	71
			2.52				70.326		70.826	70.786	70.846	70.956	70.756	70.876	71.
			2.01				70.631		70.351	70.881	71.061	71.081	71.021	71.201	71.
			1.52				DRY		69.974	71.414	71.134	71.124	71.204	71.474	71.
			3.05				69.752		70.822	70.692	70.792	70.852	70.502	70.562	71.
			2.49				70.192		70.562	70.812	70.962	71.012	70.822	70.972	71.
			2.01				70.505		70.305	70.905	71.085	71.105	71.025	71.205	71.
			1.53				DRY		70.058	71.308	71.108	71.108	71.198	71.418	71.
			3.05				69.782		71.042	70.902	70.892	70.912	70.602	71.392	71.
			2.56				70.353		70.863	70.943	71.083	71.143	70.953	71.16	71.
			2.02				70.684		70.724	71.184	71.144	71.164	71.114	71.414	71.
			1.53				DRY		70.66	71.28	71.11	71.12	71.21	71.53	71
												70.821	70.791	70.681	70.
												70.857	70.837	70.737	70.
	73.85			57.86	55.36										
	74.11			58.48	55.98										
	73.858			58.655	56.155										
	71.645		23.9	47.49	46.73										
	71.605		8.53	62.86	62.1										
	71.635		4.72	66.64	65.88										
	71.815		2.44	68.925	68.16										
	69.87														
	69.79														
	69.79														

. 20 ew survey done in Nov. 2011 for top of riser.
d fo November 2015 groundwater elevation
p ol d in November 2015 compared to the

002575

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	16-Oct-95	29-Oct-95	11-Nov-95	6-Jun-96	8-Aug-96	4-Sep-96	9-Jun-97	12-Oct-97	3-Jun-98	14-Aug-9_
m	m	m	m	m	m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m
		69.232	8.12	61.2	60.45			68.756	68.756	68.589	68.636		68.376		
	69.65	69.232	4.57	64.7	63.95			68.576	68.506	68.386	68.316	68.426	68.106	68.356	68.326
	69.81	69.232	2.33	66.7	66.325			68.536	68.436	68.266	68.096	68.286	67.966	68.256	
	85.67	85.312	2.72	83.34	82.59			84.24	82.79	82.56	82.56	82.76	82.59	82.67	82.6
	69.73	68.477	8.25	60.98	60.23			68.507	68.447	68.327	68.297		67.957		
	69.7	68.477	4.52	64.71	63.96			68.382	68.312	68.052	67.752	68.232	68.972	68.062	67.982
	69.83	68.477	2.31	66.55	66.18			68.427	68.387	68.027	67.727	68.217	67.627	68.047	67.917
84.46	84.62	79.32	2.72	77.35	76.6			77.81	78.79	78.48	78.26	78.4	78.23	79.45	78.2
	70.93	68.73	22.30	47.18	46.43			69.292	69.182	69.282	69.282			69.232	69.282
84.3		79.32	4.57	75.5	74.75										
84.79	84.4	79.32	8.19	71.88	71.13										
	85.84	85.312	7.09	78.97	78.22										
	85.87	85.312	4.51	81.55	80.8										
	85.08				73.58										
			3.06			71.448	71.428								69.838
			2.54			71.456	71.356								70.006
			2.05			71.426	70.966								70.516
			1.52			71.458	70.258								71.188
			3.07			71.445	71.345								69.965
			2.5			71.428	71.158								70.438
			2.04			71.433	70.983								71.413
			1.53			71.419	70.089								71.139
			3.04			71.46	71.43								69.72
			2.52			71.466	71.426								70.426
			2.01			71.441	71.021								71.011
			1.52			70.434	70.214								71.224
			3.05			71.462	71.422								69.932
			2.49			71.342	71.212								70.242
			2.01			71.406	70.925								70.745
			1.53			71.428	70.188								71.228
			3.05			71.472	71.462								69.452
			2.56			71.483	71.153								70.173
			2.02			71.474	70.244								70.654
			1.53			71.47	2.54								71.36
						71.021	71.061				69.911				70.941
						71.127	71.107				70.147				70.877
	73.85			57.86	55.36										
	74.11			58.48	56.98										
	73.858			58.655	56.155										
	71.645		23.9	47.49	46.73										
	71.605		8.53	62.86	62.1										
	71.635		4.72	66.64	65.88										
	71.815		2.44	68.925	68.16										
	69.87														
	69.79														
	69.79														

. 20(ew survey done in Nov. 2011 for top of riser.
d for November 2015 groundwater elevation
p ol d in November 2015 compared to the

002576

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	18-Oct-00 Elevation	8-Jun-01 Elevation	3-Oct-01 Elevation	17-May-02 Elevation	30-Oct-02 Elevation	22-May-03 Elevation	1-Oct-03 Elevation	5-Nov-03 Elevation	8-May-04 Elevation	5-Nov- Elevatio
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.806	68.76	68.51	68.78	68.386	68.67	68.54	68.71	68.84	68.76
	69.65	69.232	4.57	64.7	63.95	68.566	68.55	68.29	68.56	68.186	68.55	68.28	68.49	68.59	68.52
	69.81	69.232	2.33	66.7	66.325	68.476	68.48	68.28	68.51	68.146	68.5	68.24	68.47	68.46	68.44
	85.67	85.312	2.72	83.34	82.59	82.68	82.68	82.43	82.19	81.98	82.53	82.59	82.60	82.59	82.34
	69.73	68.477	8.25	60.98	60.23	68.507	68.49	68.07	68.54	68.047	68.34	67.95	68.37	68.53	68.48
	69.7	68.477	4.52	64.71	63.96	68.402	68.43	67.99	68.51	67.972	68.41	68.05	68.41	68.44	68.40
	69.83	68.477	2.31	66.55	66.18	68.297	68.32	67.92	68.37	67.897	68.18	67.90	68.41	68.43	68.40
84.46	84.62	79.32	2.72	77.35	76.6	78.71	78.92	78.45	79.13	78.42	79.08	78.61	79.15	79.12	79.15
	70.93	68.73	22.30	47.18	46.43	69.432	69.48	69.38	69.48	69.482	69.4	69.90	69.98	69.98	70.00
84.3		79.32	4.57	75.5	74.75	79.01	78.07	78.42	79.09	78.39	79.03	78.59	79.14	79.08	79.12
84.79	84.4	79.32	8.19	71.88	71.13	79.02	77.87	78.02	78.9	77.91	78.82	78.34	78.93	78.88	78.96
	85.84	85.312	7.09	78.97	78.22	81.43	81.39	81.24	81.51	81.31	81.44	81.34	81.48	81.44	81.46
	85.87	85.312	4.51	81.55	80.8	82.01	82.03	81.94	82.16	81.95	82.09	81.93	81.99	82.07	82.03
	85.08				73.58										
			3.06												
			2.54												
			2.05												
			1.52												
			3.07												
			2.5												
			2.04												
			1.53												
			3.04												
			2.52												
			2.01												
			1.52												
			3.05												
			2.49												
			2.01												
			1.53												
			3.05												
			2.56												
			2.02												
			1.53												
	73.85			57.86	55.36										
	74.11			58.48	55.98										
	73.858			58.655	56.155										
	71.645		23.9	47.49	46.73										
	71.605		8.53	62.86	62.1										
	71.635		4.72	66.64	65.88										
	71.815		2.44	68.925	68.16										
	69.87														
	69.79														
	69.79														

. 20(ew survey done in Nov. 2011 for top of riser.
d foi November 2015 groundwater elevation
p ol d in November 2015 compared to the

002577

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	14-Nov-06 Elevation	7-May-07 Elevation	19-Nov-07 Elevation	13-May-08 Elevation	3-Nov-08 Elevation	11-May-09 Elevation	18-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	16- Eleva
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.896	68.82	68.826	68.78	68.83	68.83	frozen	68.86	68.85	68.
	69.65	69.232	4.57	64.7	63.95	68.579	68.61	67.416	68.56	68.67	68.67	68.57	68.57	68.59	68.
	69.81	69.232	2.33	66.7	66.325	68.351	68.31	68.226	68.30	68.39	68.39	68.32	68.31	68.55	68.
	85.67	85.312	2.72	83.34	82.59	82.665	82.55	82.44	82.63	81.53	81.53	82.43	82.44	81.53	82.
	69.73	68.477	8.25	60.98	60.23	68.632	68.60	68.337	68.51	68.57	68.57	68.40	68.61	68.62	68.
	69.7	68.477	4.52	64.71	63.96	68.507	68.44	68.282	68.42	68.49	68.49	68.38	68.43	68.47	68.
	69.83	68.477	2.31	66.55	66.18	68.36	68.27	68.127	68.34	68.33	68.33	68.31	68.25	68.29	68.
84.46	84.62	79.32	2.72	77.35	76.6	79.178	79.12	78.8	79.06	79.16	79.16	79.80	79.74	79.66	79.
	70.93	68.73	22.30	47.18	46.43	68.769	68.68	68.762	68.72	68.82	68.82	68.67		68.30	68.
84.3		79.32	4.57	75.5	74.75	79.16	79.08	78.78	79.03	79.14	79.14	79.92	79.53	79.54	79.
84.79	84.4	79.32	8.19	71.88	71.13	79.005	78.90	76.99	78.86	78.88	78.88	80.02	80.24	80.24	80.
	85.84	85.312	7.09	78.97	78.22	81.784	81.73	81.57	81.76	81.65	81.65	81.67	81.65	81.71	81.
	85.87	85.312	4.51	81.55	80.8	82.255	82.19	81.98	82.28	82.12	82.12	81.98	82.08	82.21	82.
	85.08				73.58										
			3.06												
			2.54												
			2.05												
			1.52												
			3.07												
			2.5												
			2.04												
			1.53												
			3.04												
			2.52												
			2.01												
			1.52												
			3.05												
			2.49												
			2.01												
			1.53												
			3.05												
			2.56												
			2.02												
			1.53												
	73.85			57.86	55.36	69.43	68.82	68.60	68.87	68.60	68.83	68.39	68.51	68.90	69.
	74.11			58.48	55.98	69.52	68.99	68.80	69.63	68.98	69.17	68.58	68.79	69.08	69.
	73.858			58.655	56.155	69.56	68.87	68.78	69.22	68.94	69.06	68.60	68.91	69.08	69.
	71.645		23.9	47.49	46.73			69.87	69.94	69.90	69.92	69.85	69.93	69.56	69.
	71.605		8.53	62.86	62.1			69.33	69.46	69.46	69.54	69.50	69.61	69.57	69.
	71.635		4.72	66.64	65.88			69.23	69.21	69.55	69.47	69.41	69.25	69.66	69.
	71.815		2.44	68.925	68.16			69.23	69.21	69.50	69.45	69.39	69.24	69.70	69.
	69.87												69.51	69.41	69.
	69.79												68.65	68.77	68.
	69.79												68.56	68.58	68.
													69.20	69.25	69.

. 20 ew survey done in Nov. 2011 for top of riser.
ed fo November 2015 groundwater elevation.
up o ed in November 2015 compared to the

002578

2009 op of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	21-May-13 Elevation	20-Nov-13 Elevation	23-May-14 Elevation	27-Aug-14 Elevation	12-Nov-14 Elevation	26-May-15 Elevation	26-Aug-15 Elevation	19-Nov-15 Elevation	19-May-16 Elevation	1? Ele
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
		69.232	8.12	61.2	60.45	68.79	68.85	68.82		68.84	68.81		68.74	68.79	
	69.65	69.232	4.57	64.7	63.95	68.83	68.80	68.81		68.83	68.73		68.74	68.76	
	69.81	69.232	2.33	66.7	66.325	68.79	68.80	68.80		68.82	68.80		68.78	68.74	
	85.67	85.312	2.72	83.34	82.59										
	69.73	68.477	8.25	60.98	60.23	68.94	69.05	68.98		69.04	68.99		69.01	69.00	
	69.7	68.477	4.52	64.71	63.96	68.88	68.90	68.92		68.92	68.89		68.90	68.88	
	69.83	68.477	2.31	66.55	66.18	68.92	68.93	68.95		69.00	68.94		68.97	68.91	
84.46	84.62	79.32	2.72	77.35	76.6	80.32	79.79	80.41		80.04	80.18		79.97	80.48	
	70.93	68.73	22.30	47.18	46.43	69.79		69.93		69.89	69.91		69.88	69.96	
84.3		79.32	4.57	75.5	74.75	80.20	79.71	80.30		79.92	80.06		79.85	80.34	
84.79	84.4	79.32	8.19	71.88	71.13										
	85.84	85.312	7.09	78.97	78.22										
	85.87	85.312	4.51	81.55	80.8										
	85.08				73.58	80.52	79.98	80.58		80.24	80.33		80.09	80.61	
			3.06												
			2.54												
			2.05												
			1.52												
			3.07												
			2.5												
			2.04												
			1.53												
			3.04												
			2.52												
			2.01												
			1.52												
			3.05												
			2.49												
			2.01												
			1.53												
			3.05												
			2.56												
			2.02												
			1.53												
	73.85			57.86	55.36	69.48	69.30	69.78		69.33	69.38		69.11	69.46	
	74.11			58.48	55.98	69.67	69.61	70.13		69.38	69.63		69.05	69.78	
	73.858			58.655	56.155	69.61	69.89	69.81		69.92	69.73		69.74	69.62	
	71.645		23.9	47.49	46.73	69.95	69.86	70.02		70.02	70.03		70.01	70.19	
	71.605		8.53	62.86	62.1	69.82	69.99	69.94		70.18	69.85		69.87	69.94	
	71.635		4.72	66.64	65.88	69.73	69.85	69.80		70.09	69.81		69.85	69.73	
	71.815		2.44	68.925	68.16	69.87	69.98	69.93		70.22	69.94		69.98	69.87	
	69.87					69.47	68.52	69.40	69.45	69.47	69.45	69.43	69.73	69.60	6
	69.79					68.60	68.75	68.75	68.76	68.80	68.81	68.71	68.81	68.84	6
	69.79					68.73	69.43	68.62	68.60	68.63	68.62	68.56	68.61	68.61	6
									69.25	70.80		69.17			6

. 20(ew survey done in Nov. 2011 for top of riser.
d for November 2015 groundwater elevation
p of d in November 2015 compared to the

002579

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	22-Nov-17 Elevation	15-May-18 Elevation	3-Aug-18 Elevation	22-Nov-18 Elevation	13-Jun-19 Elevation	14-Nov-19 Elevation	13-May-20 Elevation	17-Nov-20 Elevation	19-May-21 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.87	68.87		68.88	68.83	68.73	68.67	68.71	68.77
	69.65	69.232	4.57	64.7	63.95	68.82	68.79		68.74	68.76	68.76	68.93	68.73	68.74
	69.81	69.232	2.33	66.7	66.325	68.80	68.77		68.73	68.76	68.72	68.77	68.72	68.71
	85.67	85.312	2.72	83.34	82.59									
	69.73	68.477	8.25	60.98	60.23	68.89	69.03		69.09	69.02	68.95	69.02	68.93	68.97
	69.7	68.477	4.52	64.71	63.96	68.90	68.86		68.88	68.84	68.79	68.83	68.81	68.82
	69.83	68.477	2.31	66.55	66.18	68.96	68.94		68.96	68.94	68.87	68.90	68.90	68.90
84.46	84.62	79.32	2.72	77.35	76.6	80.29	80.76		79.97	80.76	80.08	80.47	80.00	80.38
	70.93	68.73	22.30	47.18	46.43	70.03	70.11		frozen	70.11	frozen	70.00	69.93	69.97
84.3		79.32	4.57	76.5	74.75	80.14	80.62		79.83	80.63	79.94	80.34	79.89	80.27
84.79	84.4	79.32	8.19	71.88	71.13									
	85.84	85.312	7.09	78.97	78.22									
	85.87	85.312	4.51	81.55	80.8									
	85.08				73.58	80.43	80.87		80.10	80.83	80.18	80.58	80.15	80.51
			3.06											
			2.54											
			2.05											
			1.52											
			3.07											
			2.5											
			2.04											
			1.53											
			3.04											
			2.52											
			2.01											
			1.52											
			3.05											
			2.49											
			2.01											
			1.53											
			3.05											
			2.56											
			2.02											
			1.53											
	73.85			57.86	55.36	69.83	70.36		69.67	69.53	69.45	69.69	69.18	69.49
	74.11			58.48	55.98	70.58	71.32		70.21	69.86	69.43	70.05	69.26	69.82
	73.858			58.655	56.155	70.13	70.35		70.13	69.86	69.86	69.82	69.67	69.67
	71.645		23.9	47.49	46.73	70.33	70.39		70.30	70.46	70.29	70.29	70.21	70.26
	71.605		8.53	62.86	62.1	70.28	70.23		70.12	70.16	70.09	70.12	70.05	70.08
	71.635		4.72	66.64	65.88	70.05	69.83		69.81	69.91	69.90	69.91	69.88	69.81
	71.815		2.44	68.925	68.16	70.20	69.96		69.94	70.04	70.03	70.04	70.02	69.94
	69.87					Frozen	69.70	69.69	frozen	artesian	frozen	69.67	69.58	69.67
	69.79					70.20	68.90	68.76	70.20	68.88	68.74	68.86	68.83	68.86
	69.79					70.20	68.63	68.47	70.20	68.62	68.58	68.61	68.62	68.62
						70.20	69.28	69.18	70.20	Not monitored	69.22	Not monitored	69.16	Not monitored

. 20 ew survey done in Nov. 2011 for top of riser.
d fo November 2015 groundwater elevation
p o ed in November 2015 compared to the

002580

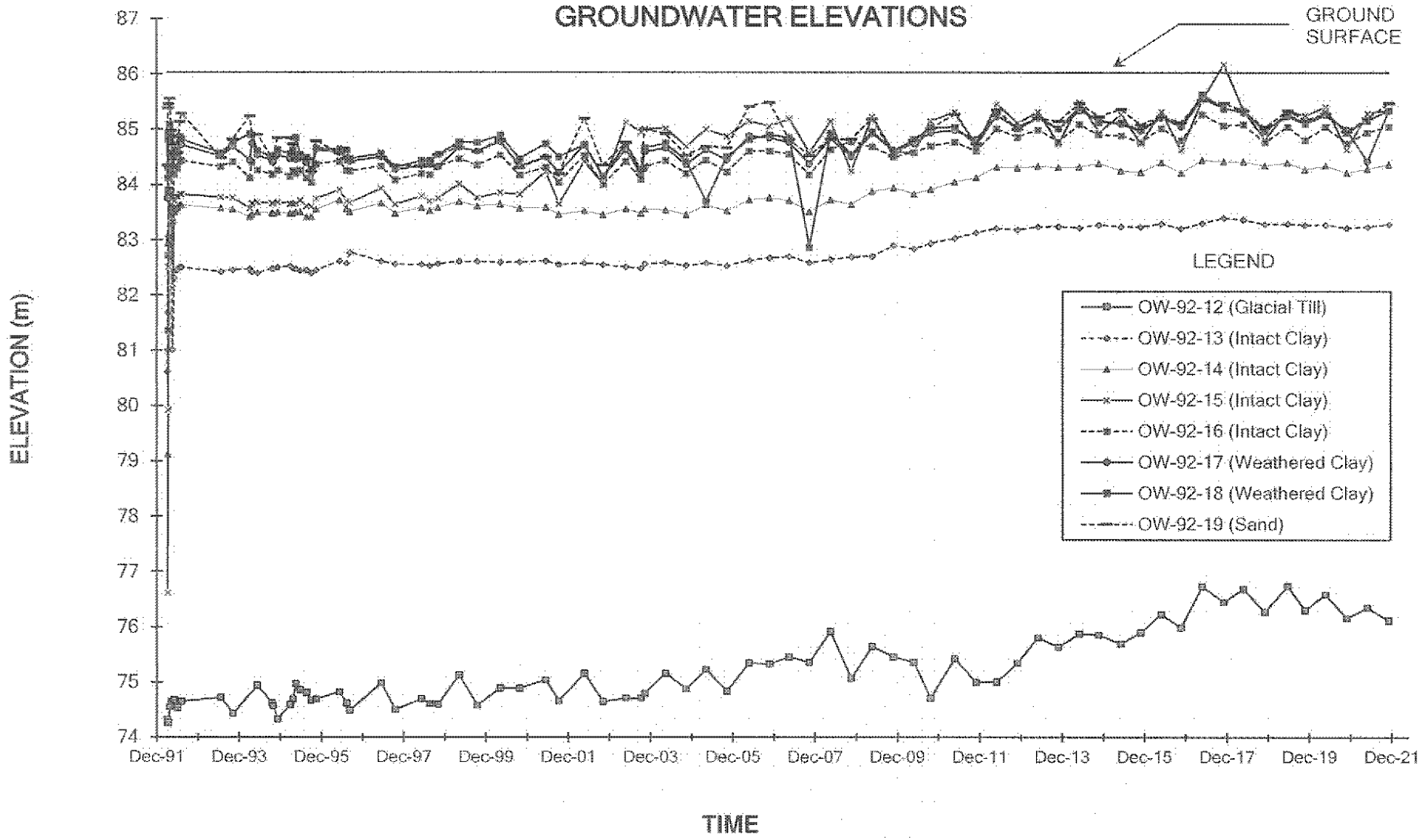

FIGURE C1

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-12 TO OW-92-19

WSP GOLDER

002581

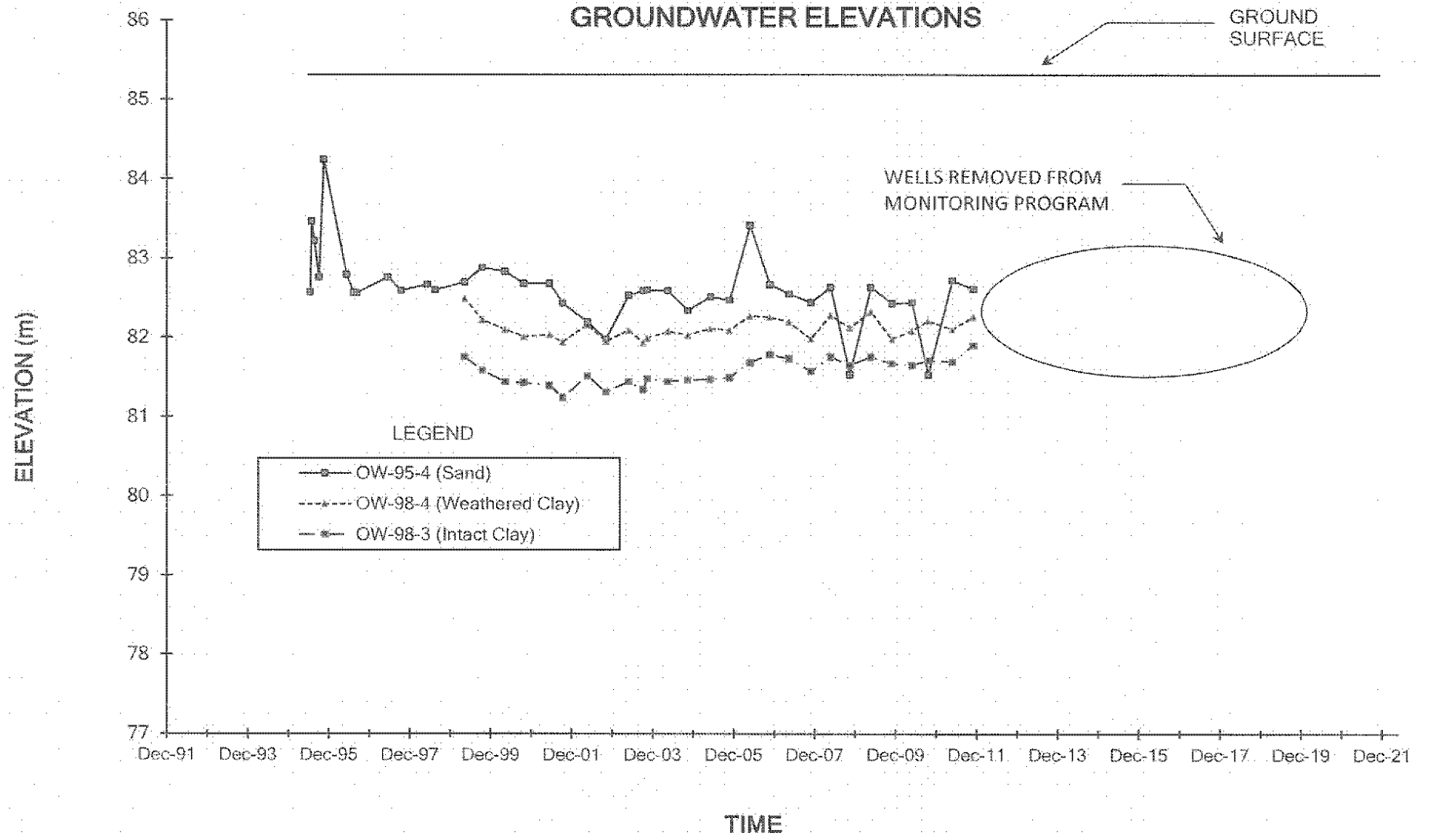

FIGURE C2

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-4 & OW-98-3 & 4

WSP GOLDER

002582

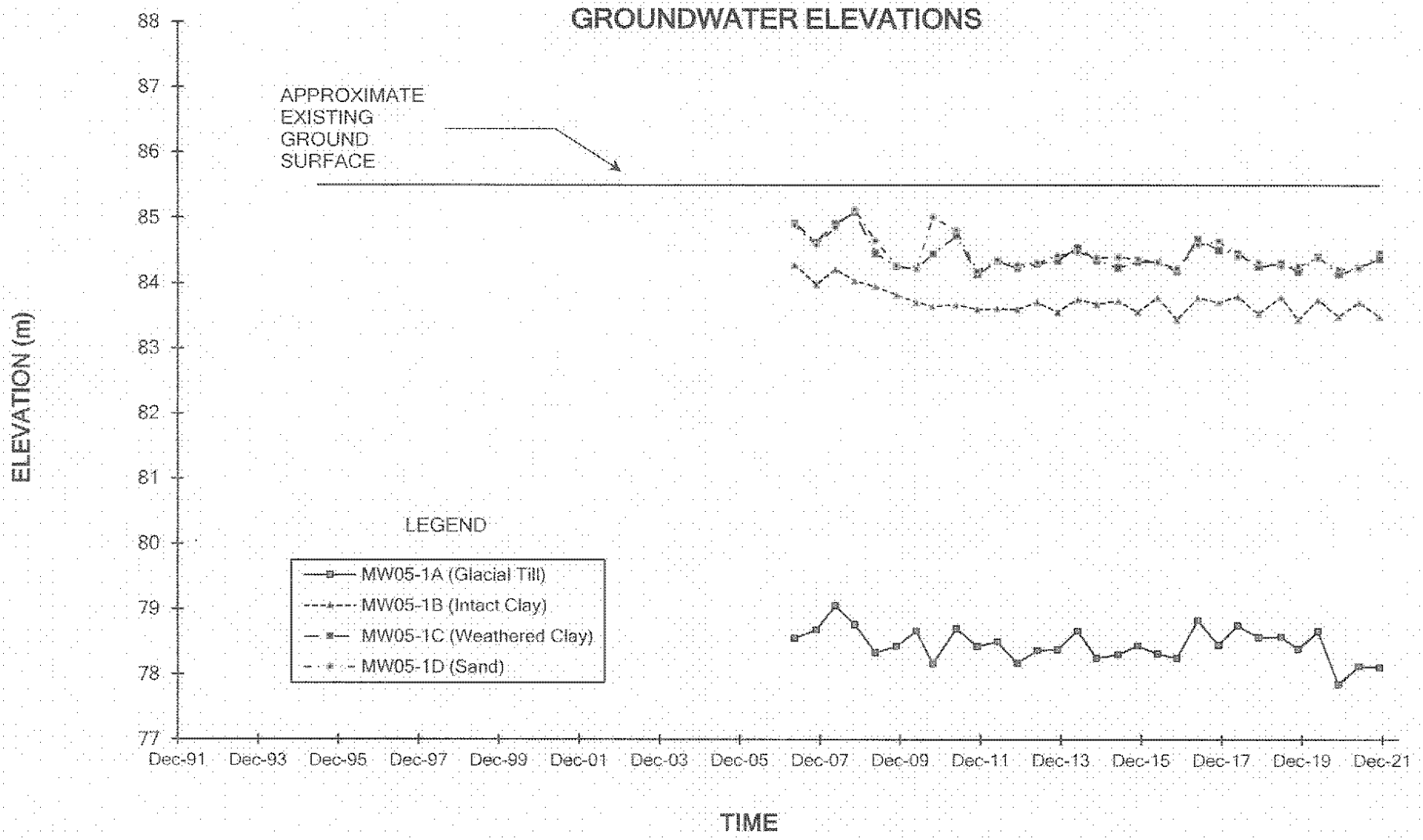

FIGURE C3

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS MW05-1A to MW05-1D

WSP GOLDER

002583

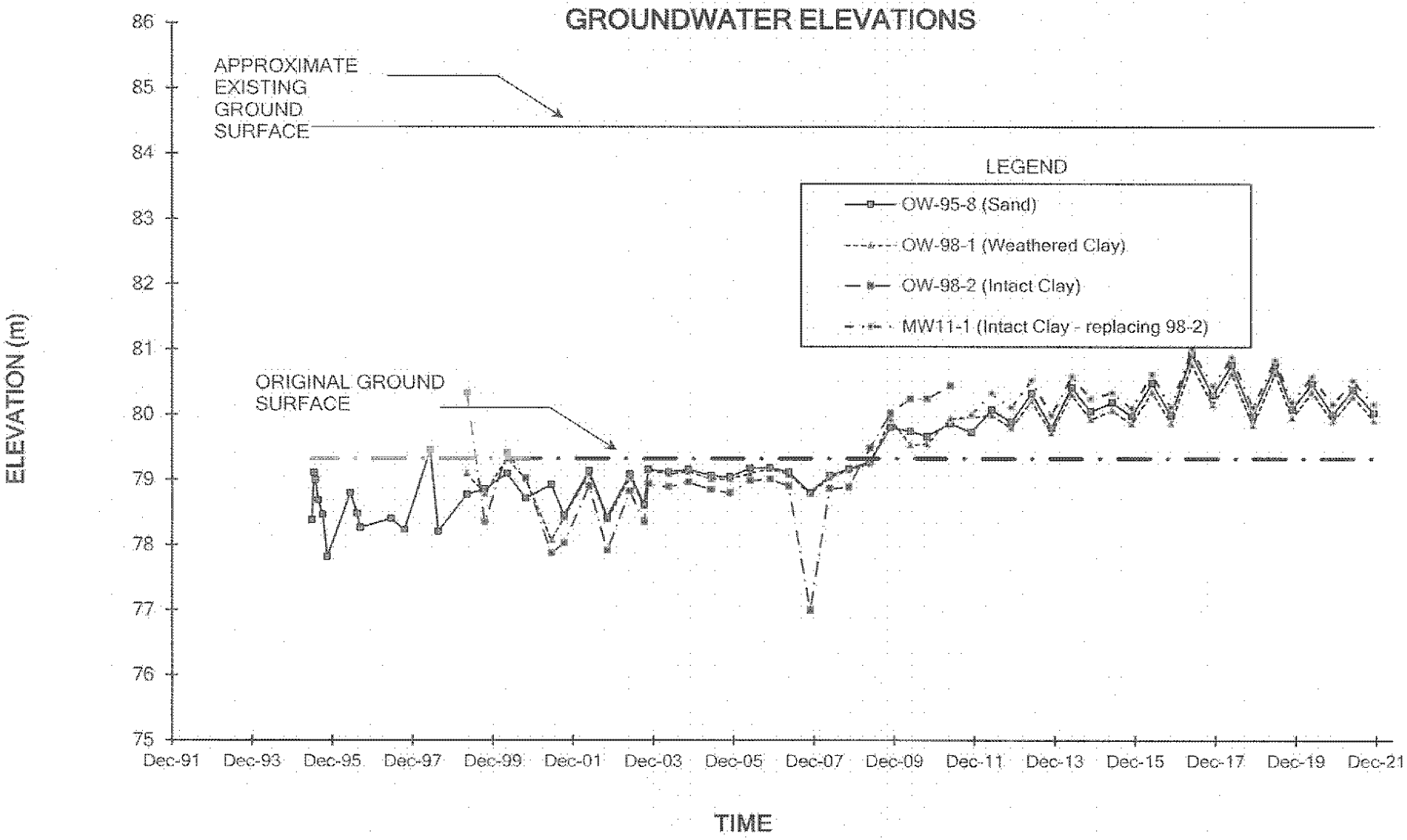

FIGURE C4

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-8, OW-98-1-2 & MW11-1

WSP GOLDER

002584

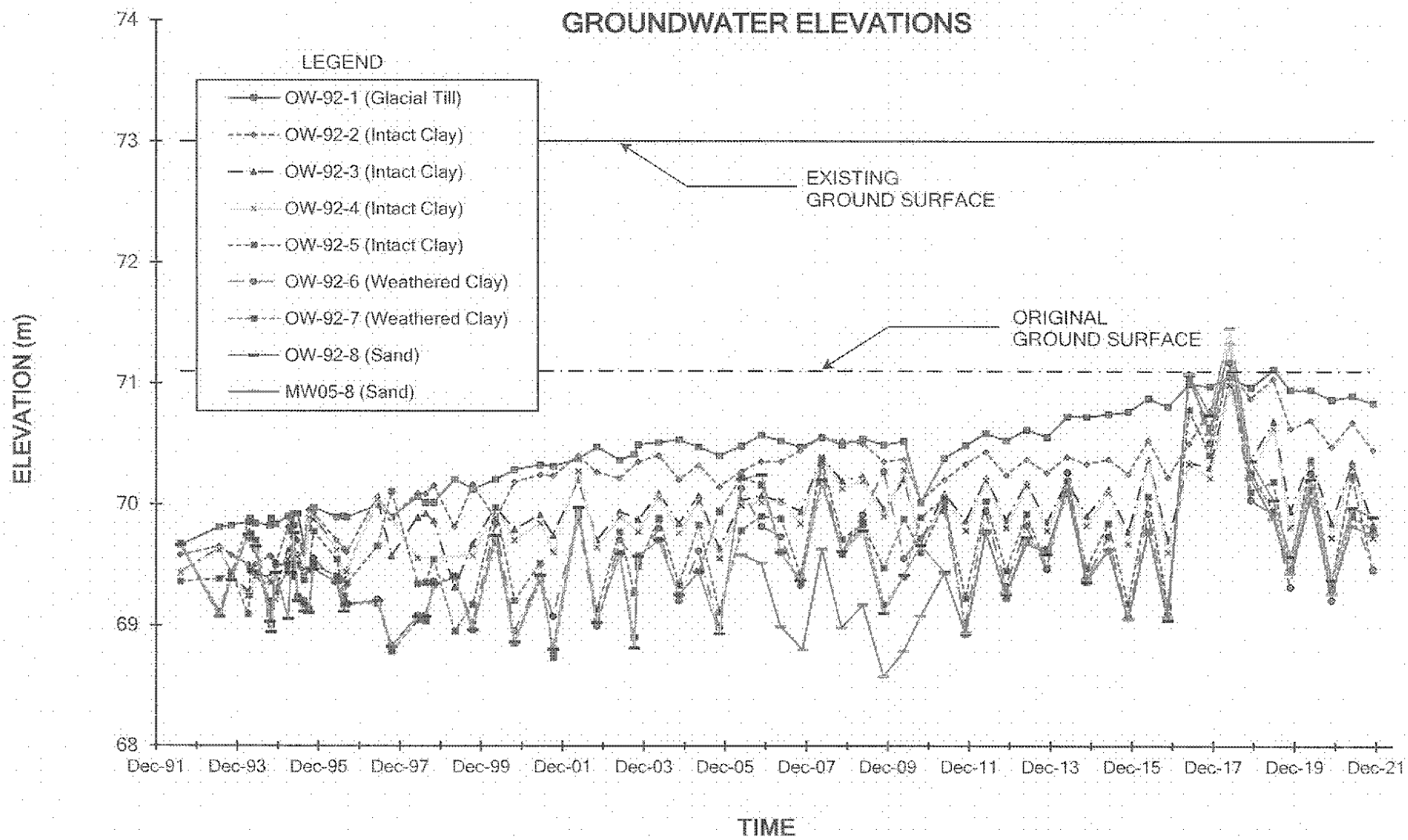

FIGURE C5

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-1 TO 92-8 & MW05-8

WSP GOLDER

002585

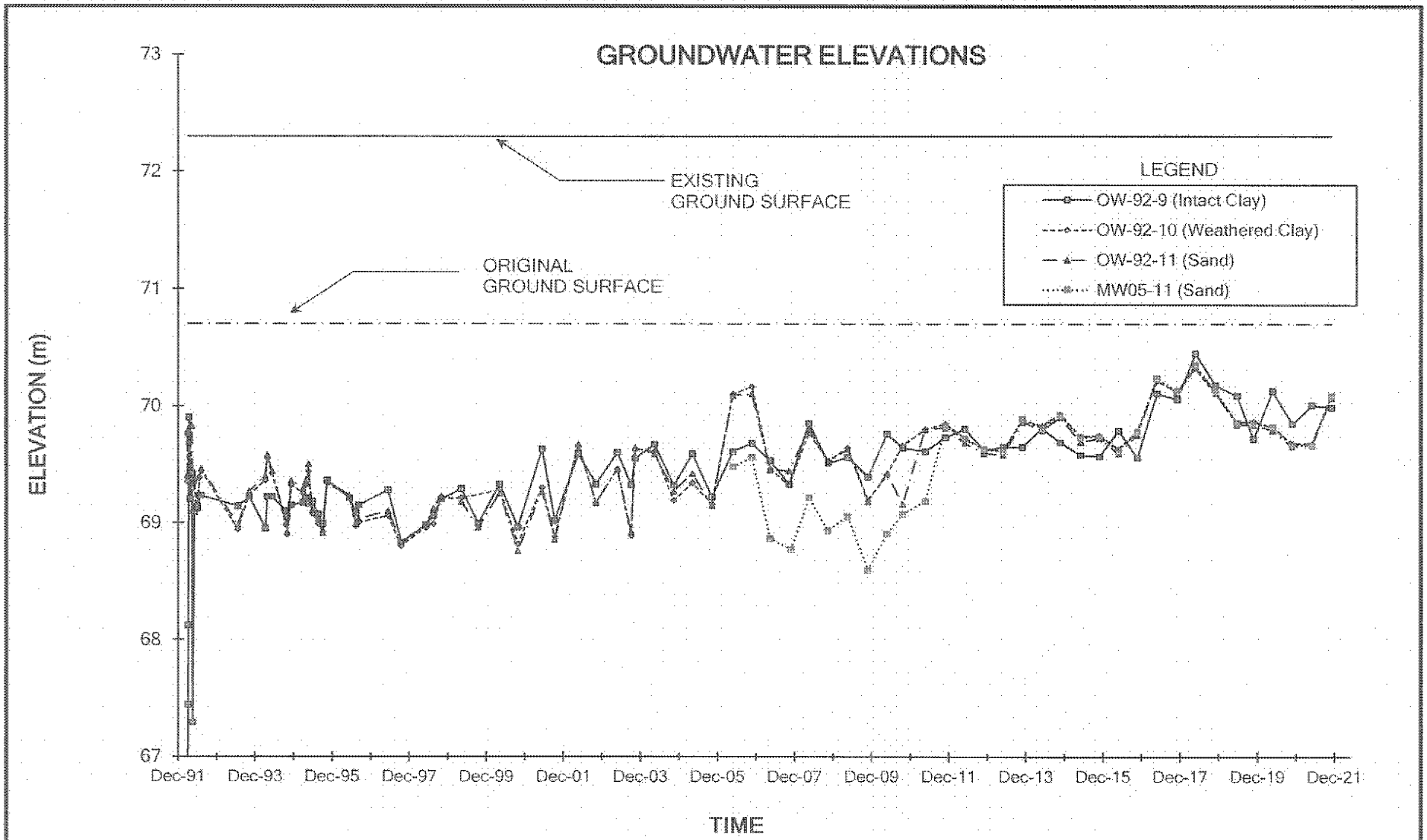

FIGURE C6

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-9 TO 92-11 & MW05-11

WSP GOLDER

002586

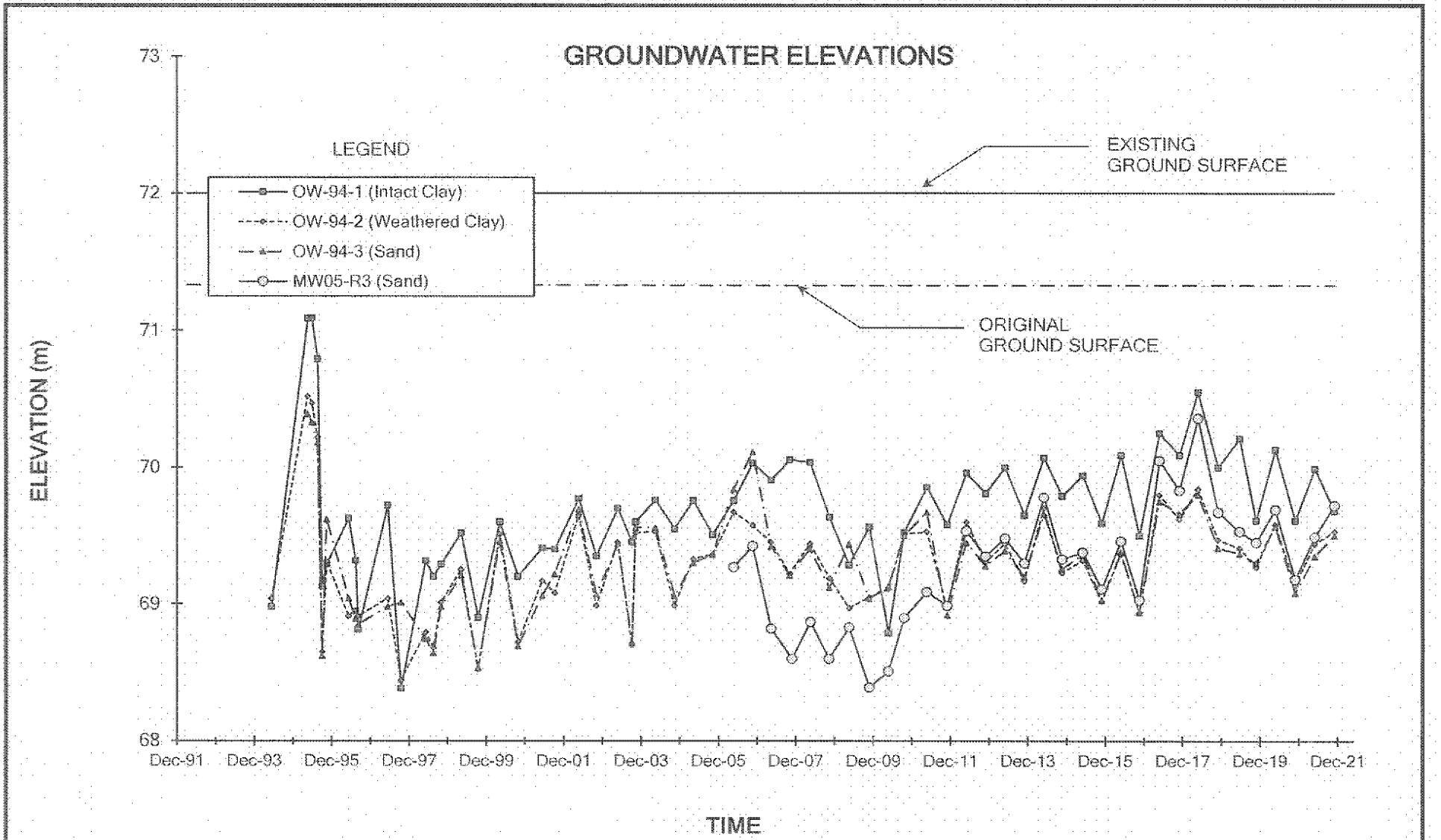

FIGURE C7

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-1 TO 94-3 & MW05-R3

WSP GOLDER

002587

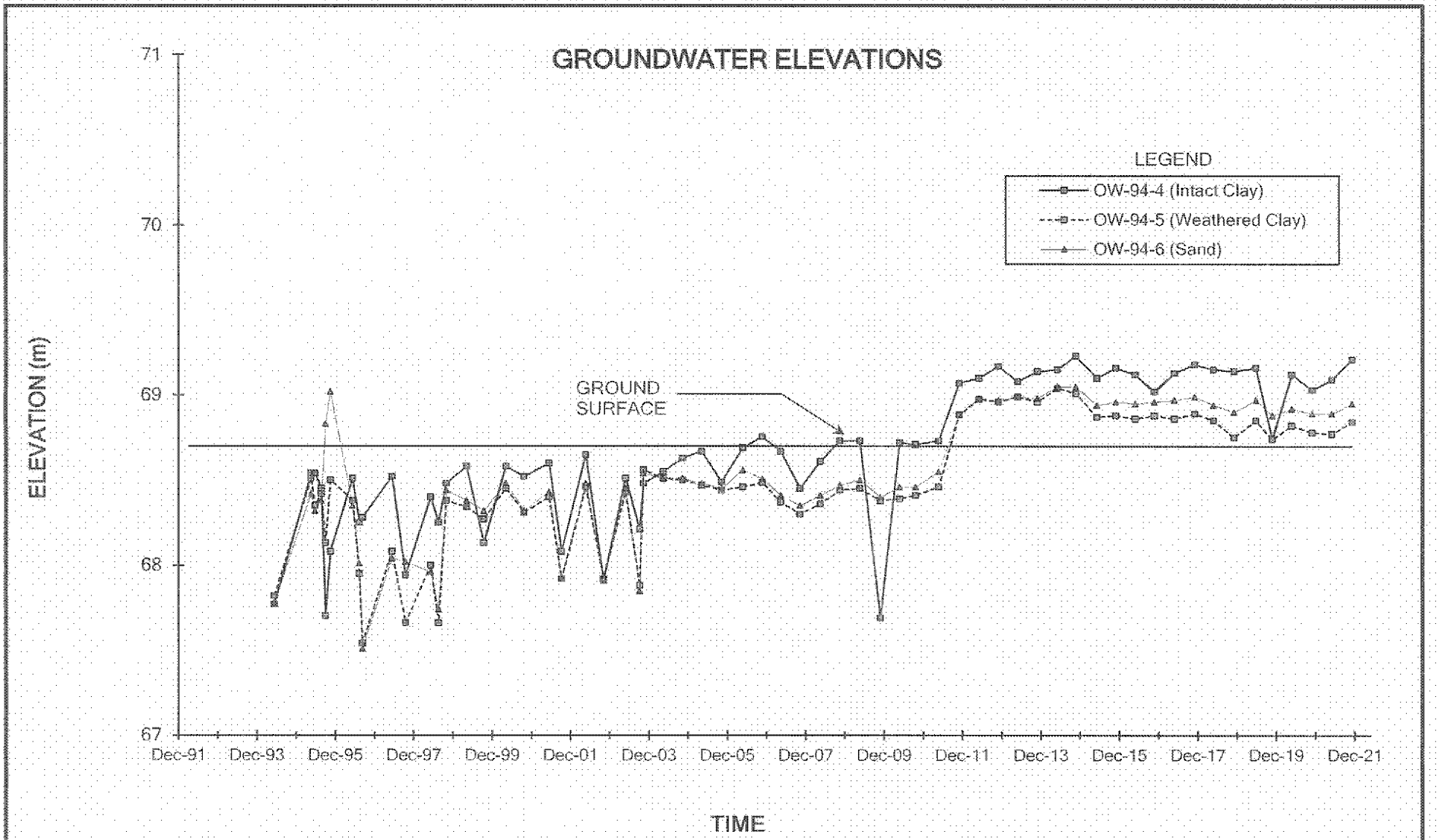

FIGURE C8

Project No. 20412275
Prepared by: ETB
Checked by: YJM June 2021

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-4 TO 94-6

WSP GOLDER

002588

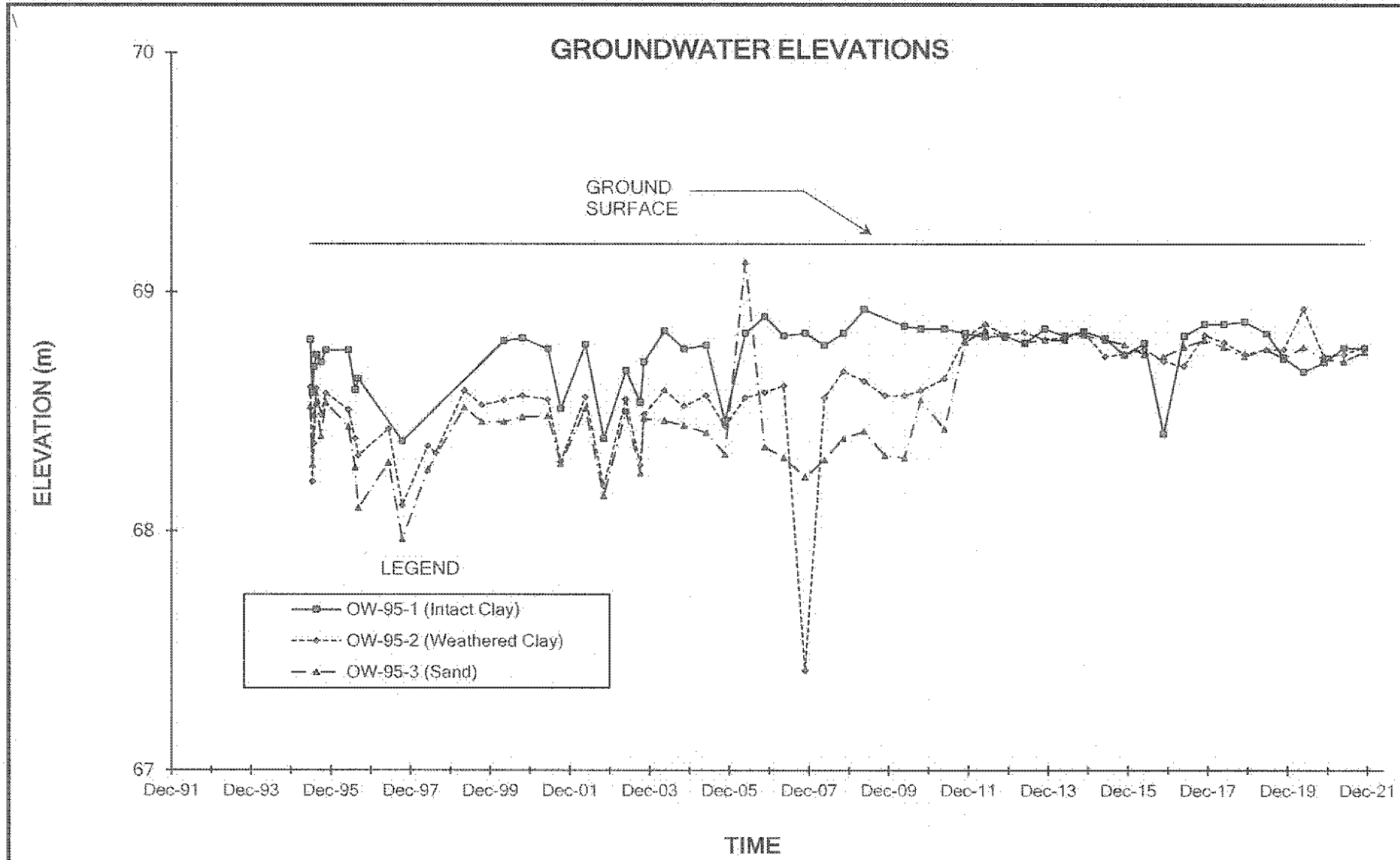

FIGURE C9

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-1 TO 95-3

WSP GOLDER

002589

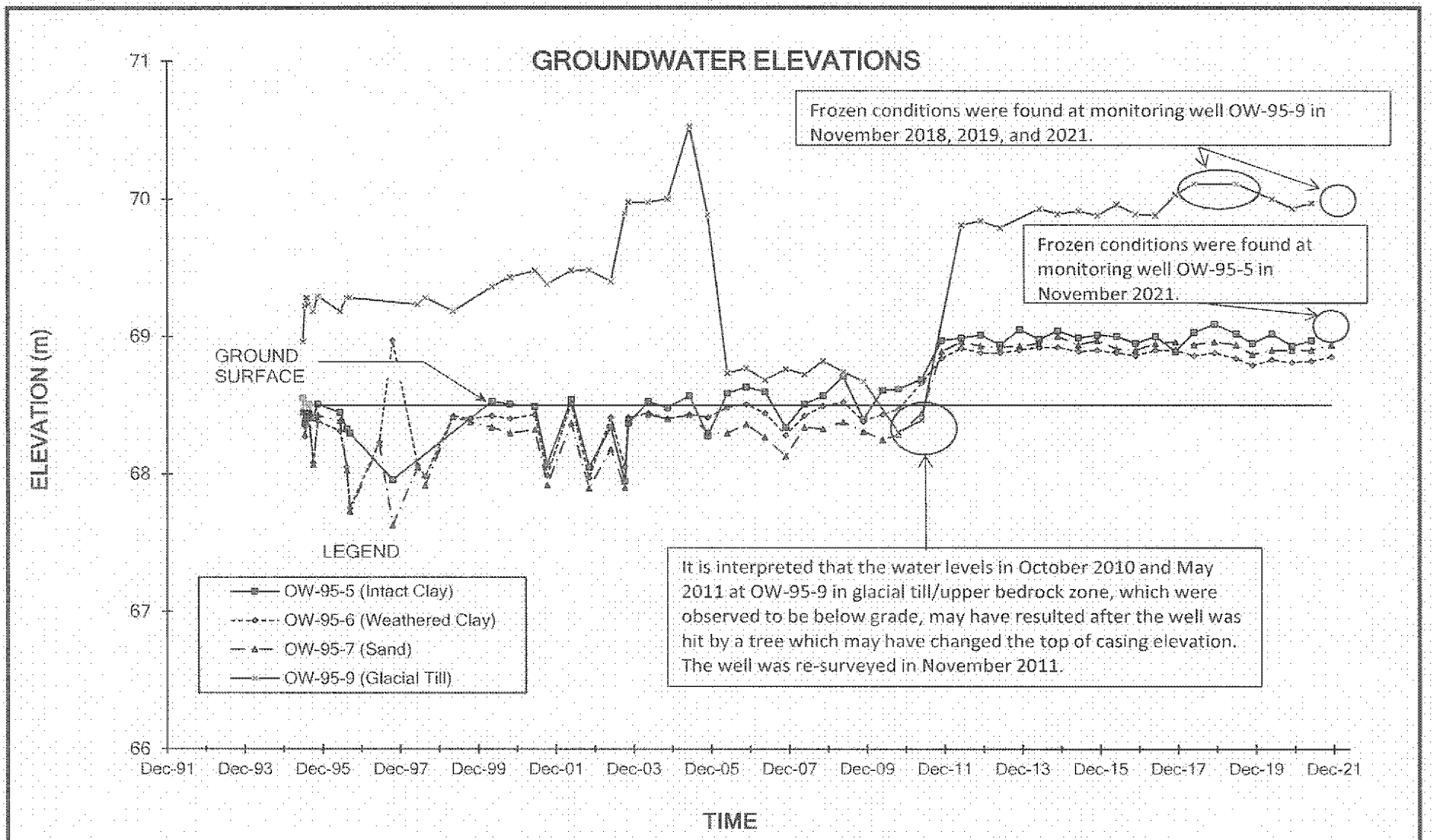

FIGURE C10

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-5 TO 95-7 & 95-9

WSP GOLDER

002590

APPENDIX D

Groundwater Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX E

Leachate Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX F

Groundwater Leachate Indicator Parameter Concentrations

Appendix F-A – Sand Layer

Appendix F-B – Weathered Clay Deposit

Appendix F-C – Intact Clay Deposit

Appendix F-D – Glacial Till/Upper Bedrock Zone

APPENDIX F-A

Sand Layer

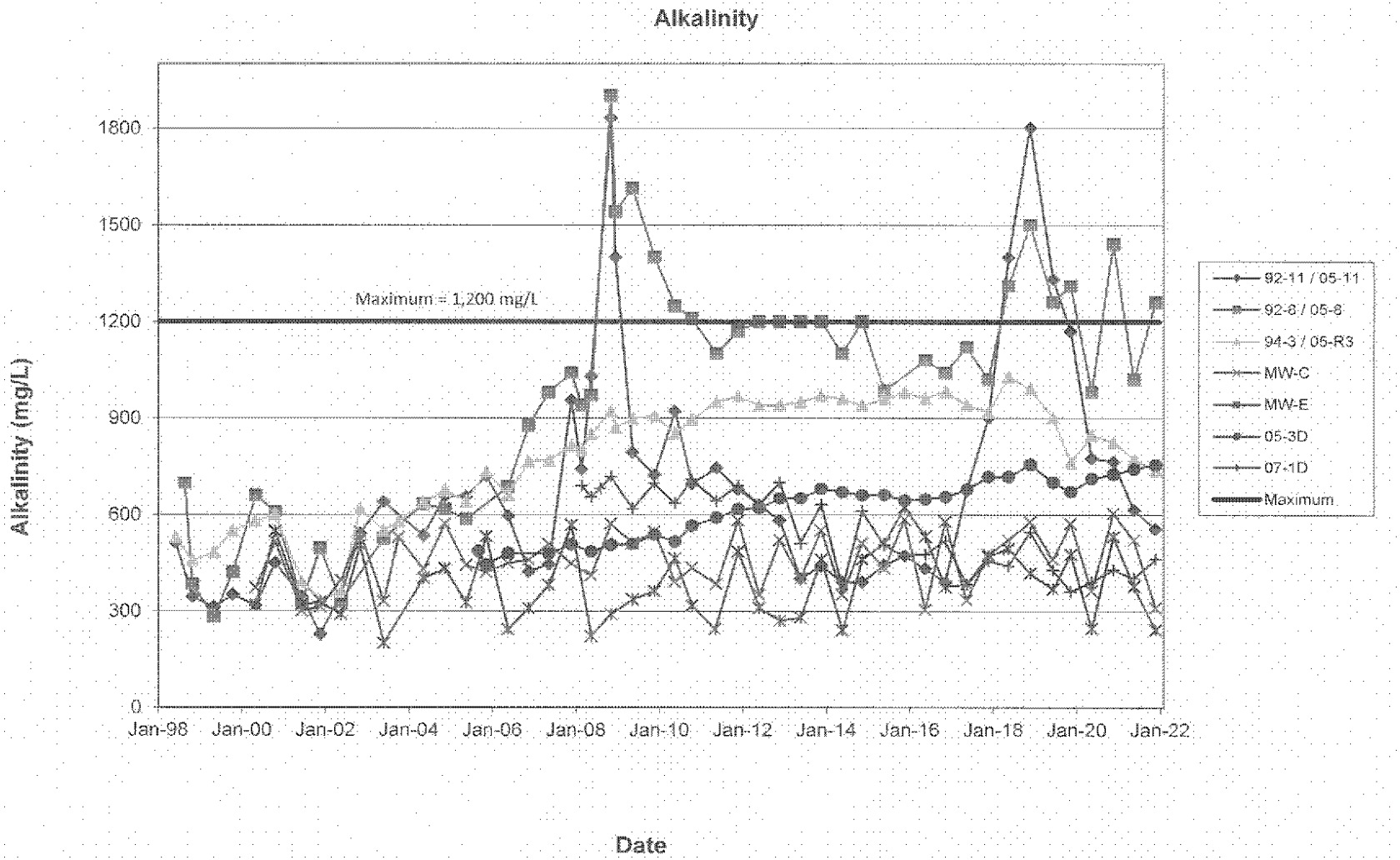

FIGURE FA1

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

002597

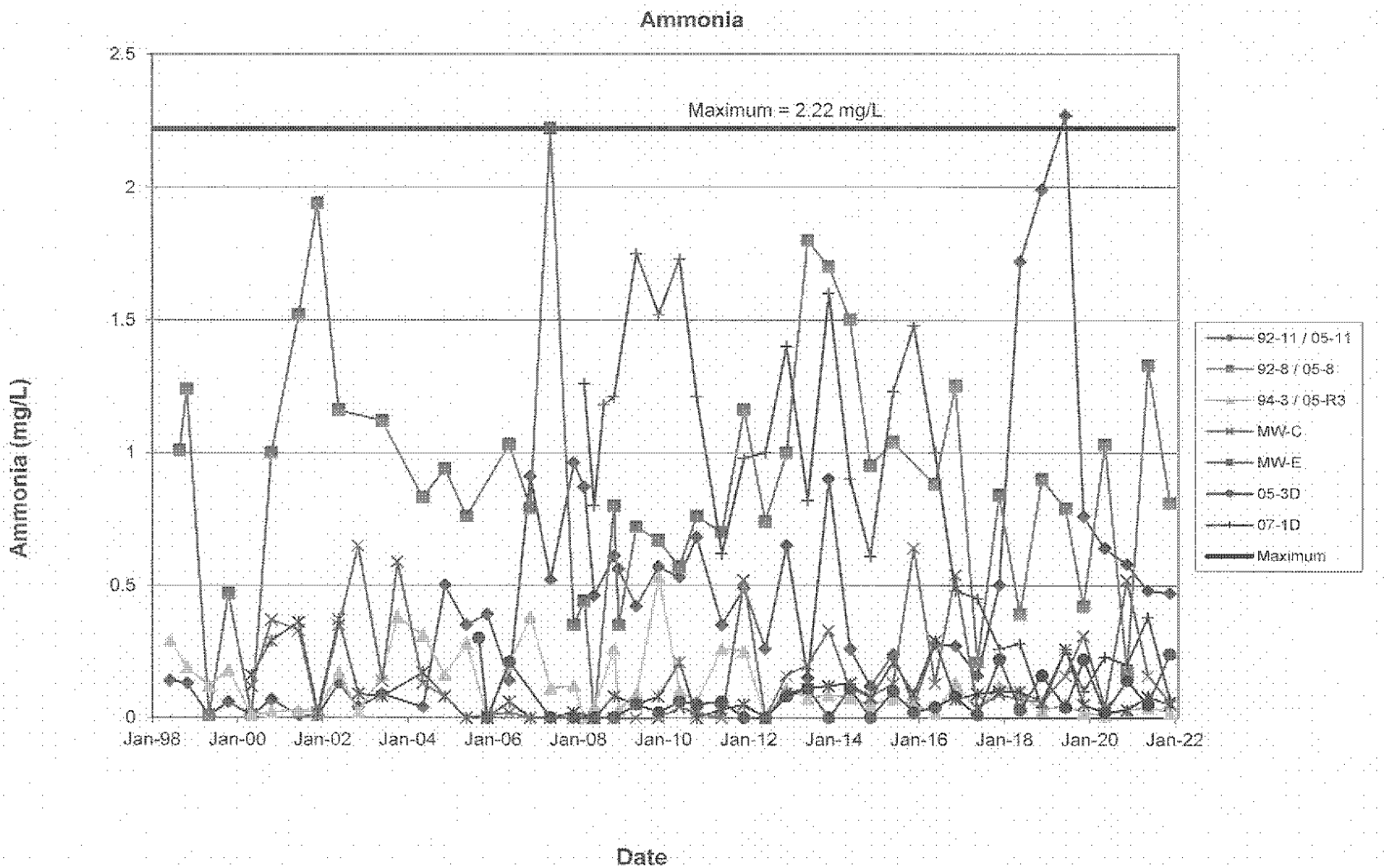

FIGURE FA2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

002598

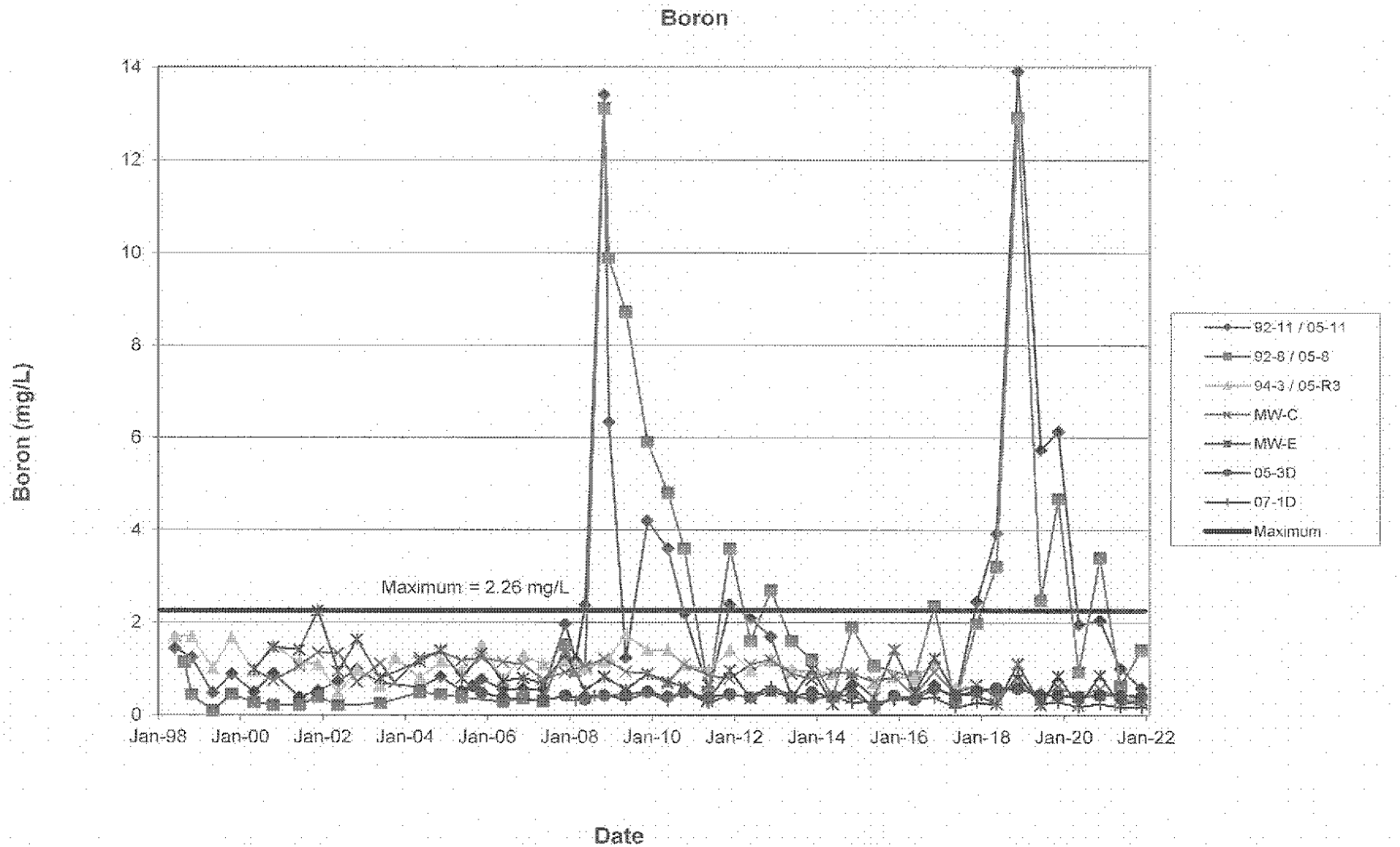

FIGURE FA3

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

002599

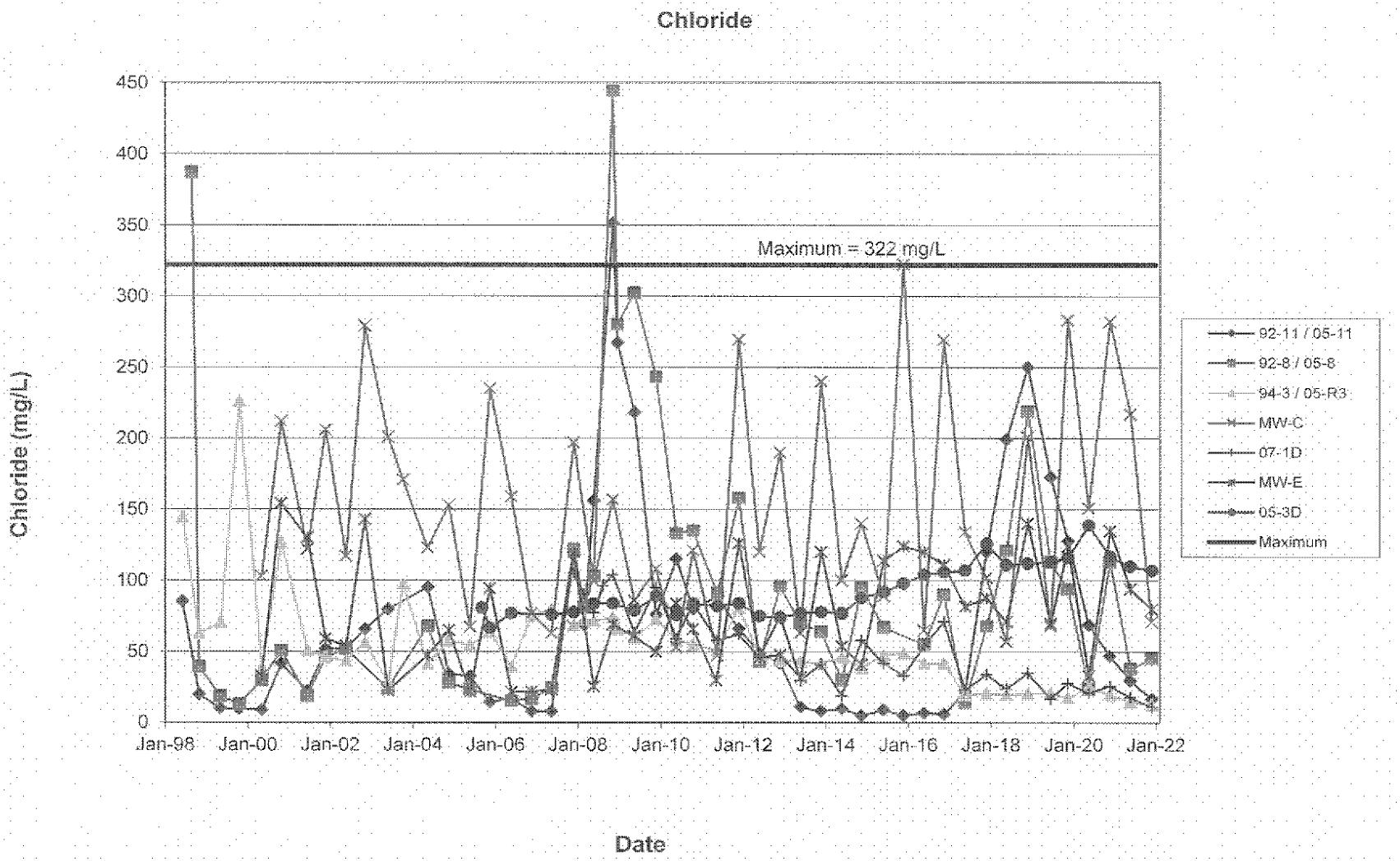

FIGURE FA4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

002600

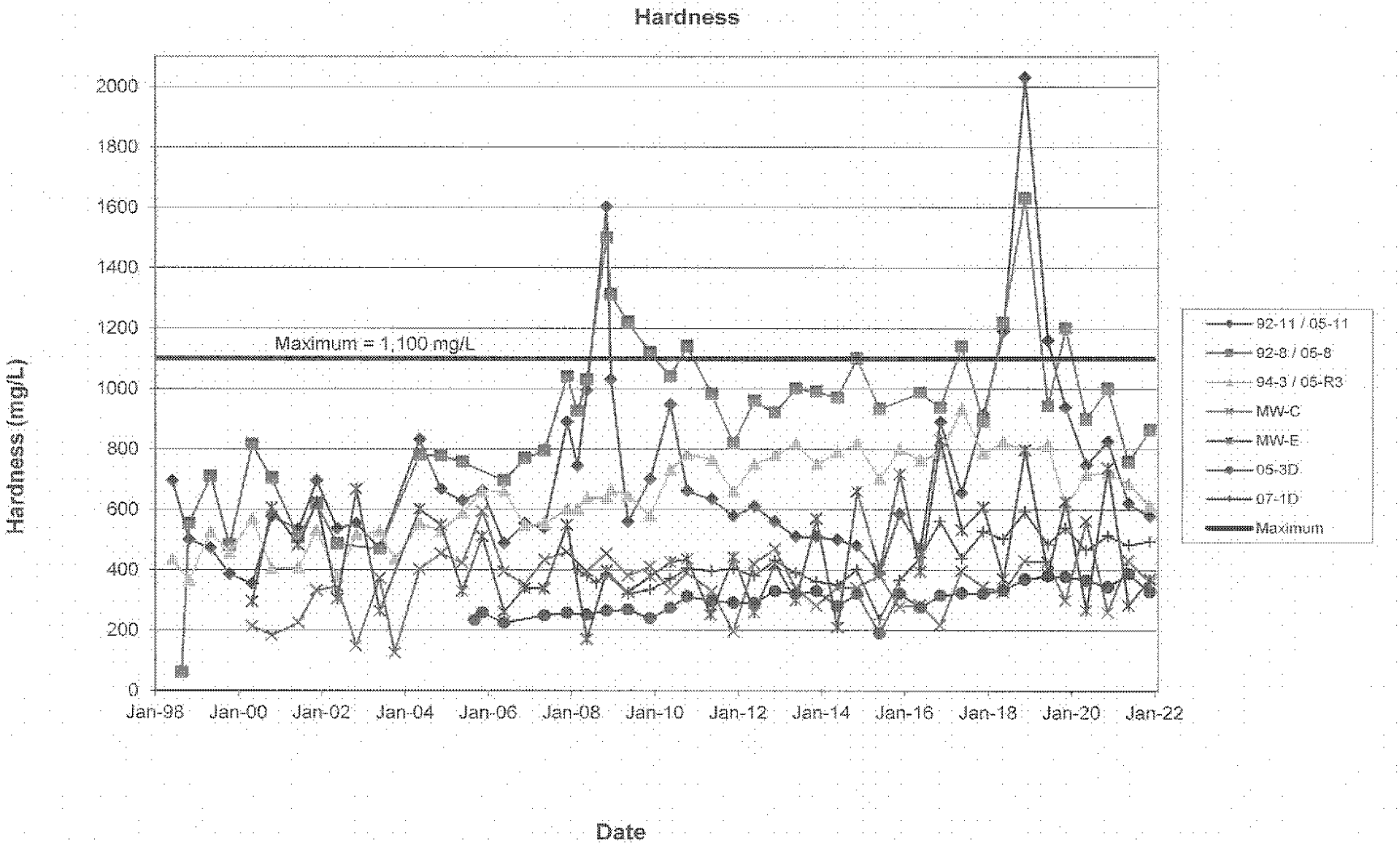

FIGURE FA5

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

002601

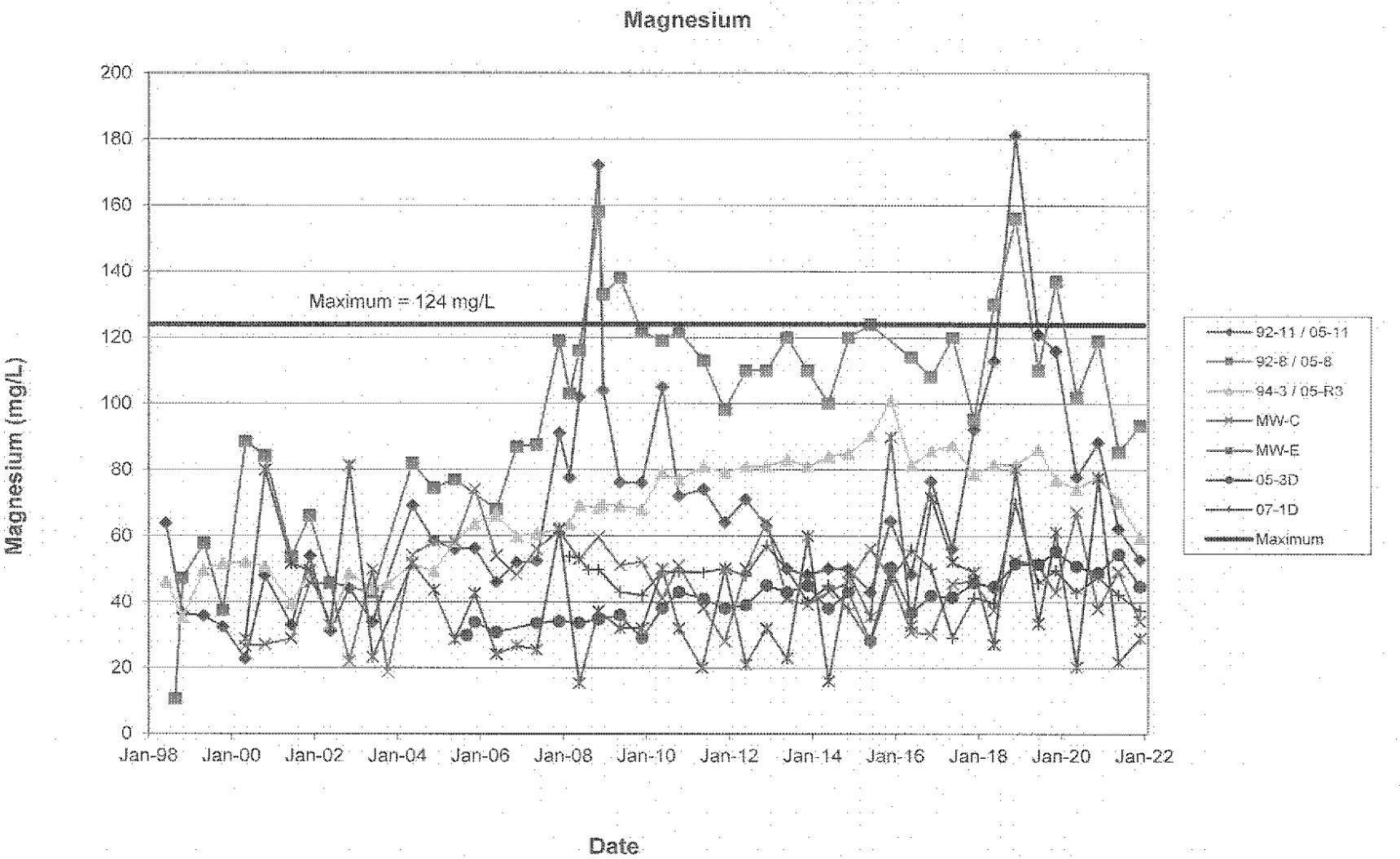

FIGURE FA6

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

002602

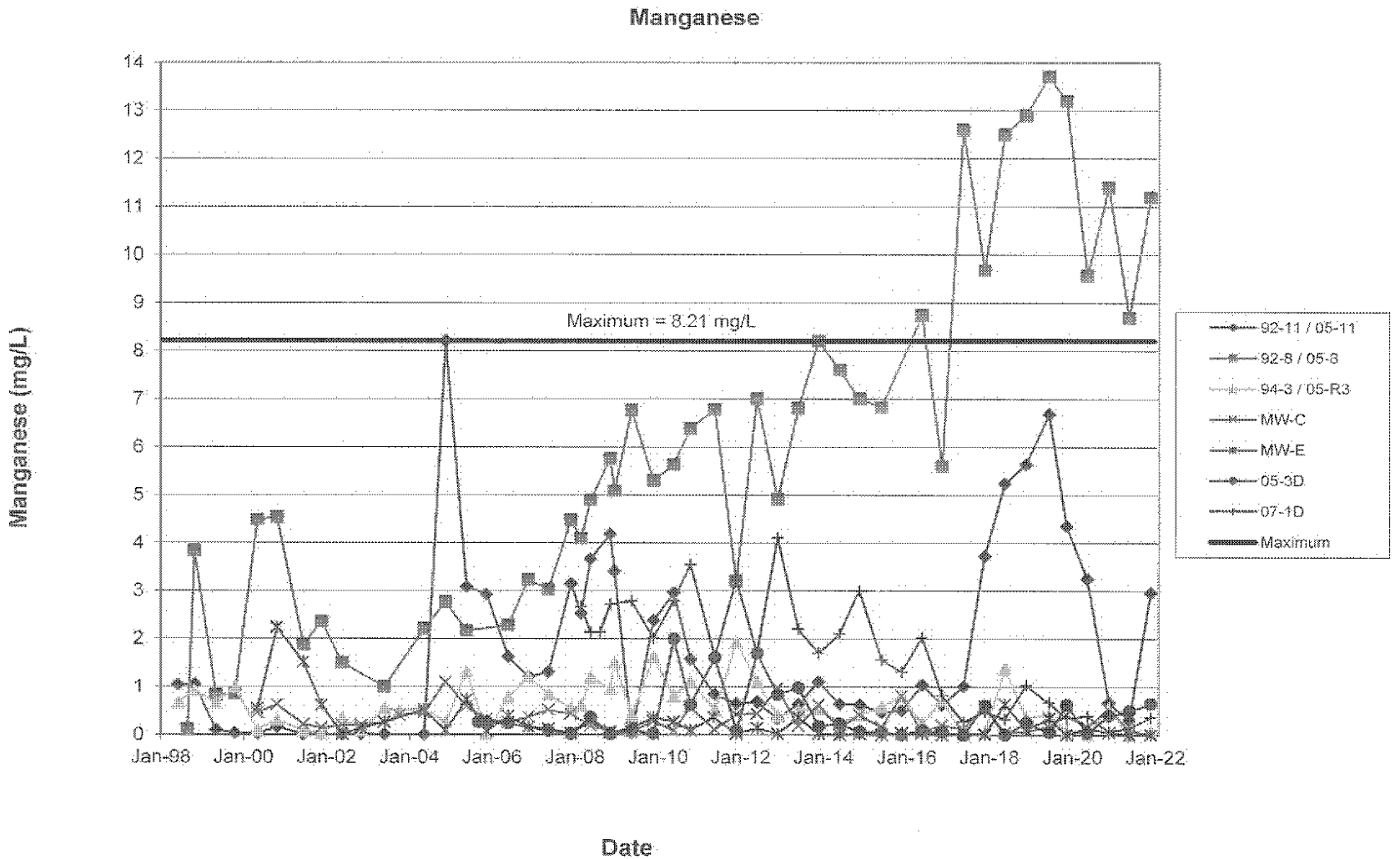

FIGURE FA7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

SAND

WSP GOLDER

002603

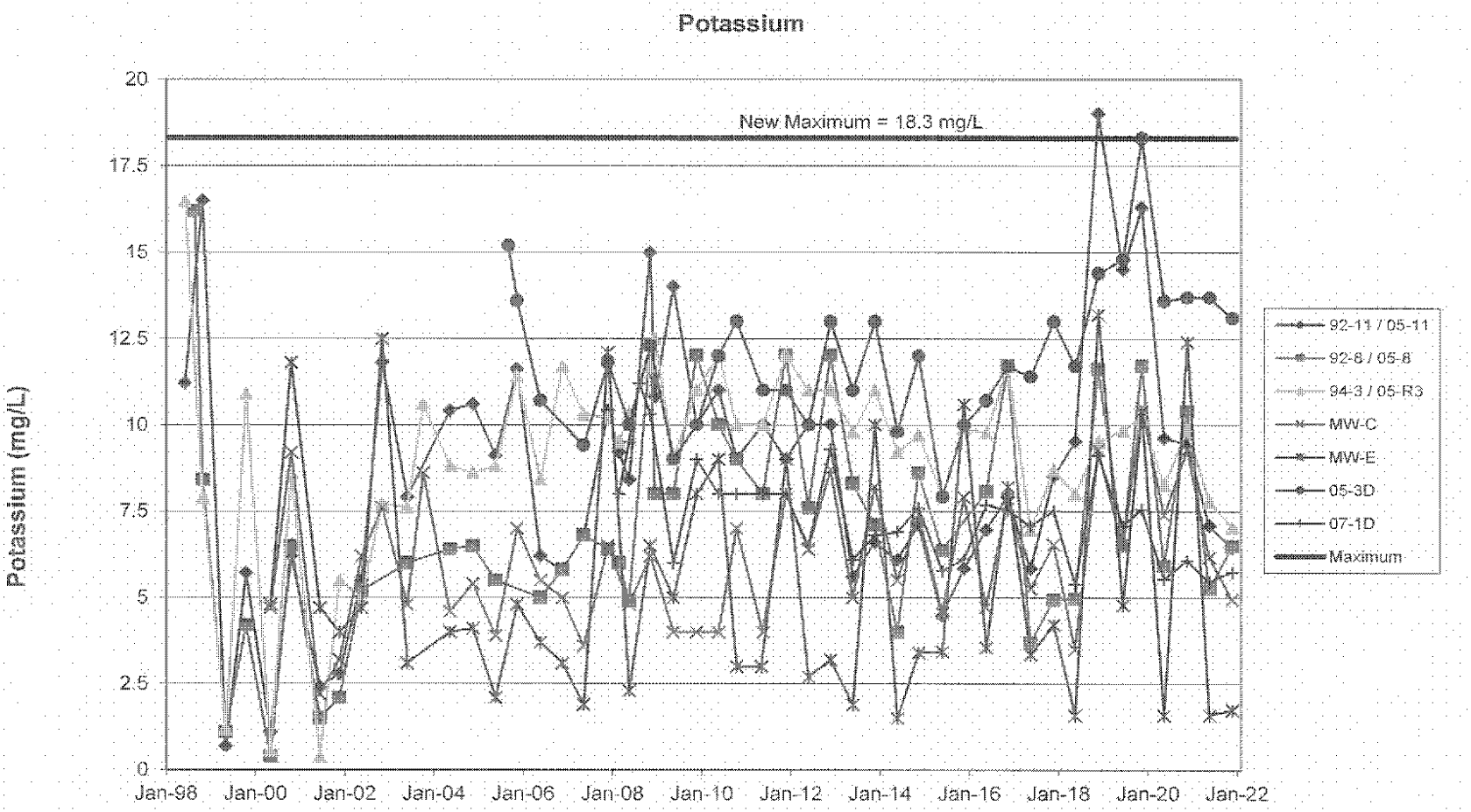

FIGURE FA8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

WSP GOLDER

002604

APPENDIX F-B

Weathered Clay Deposit

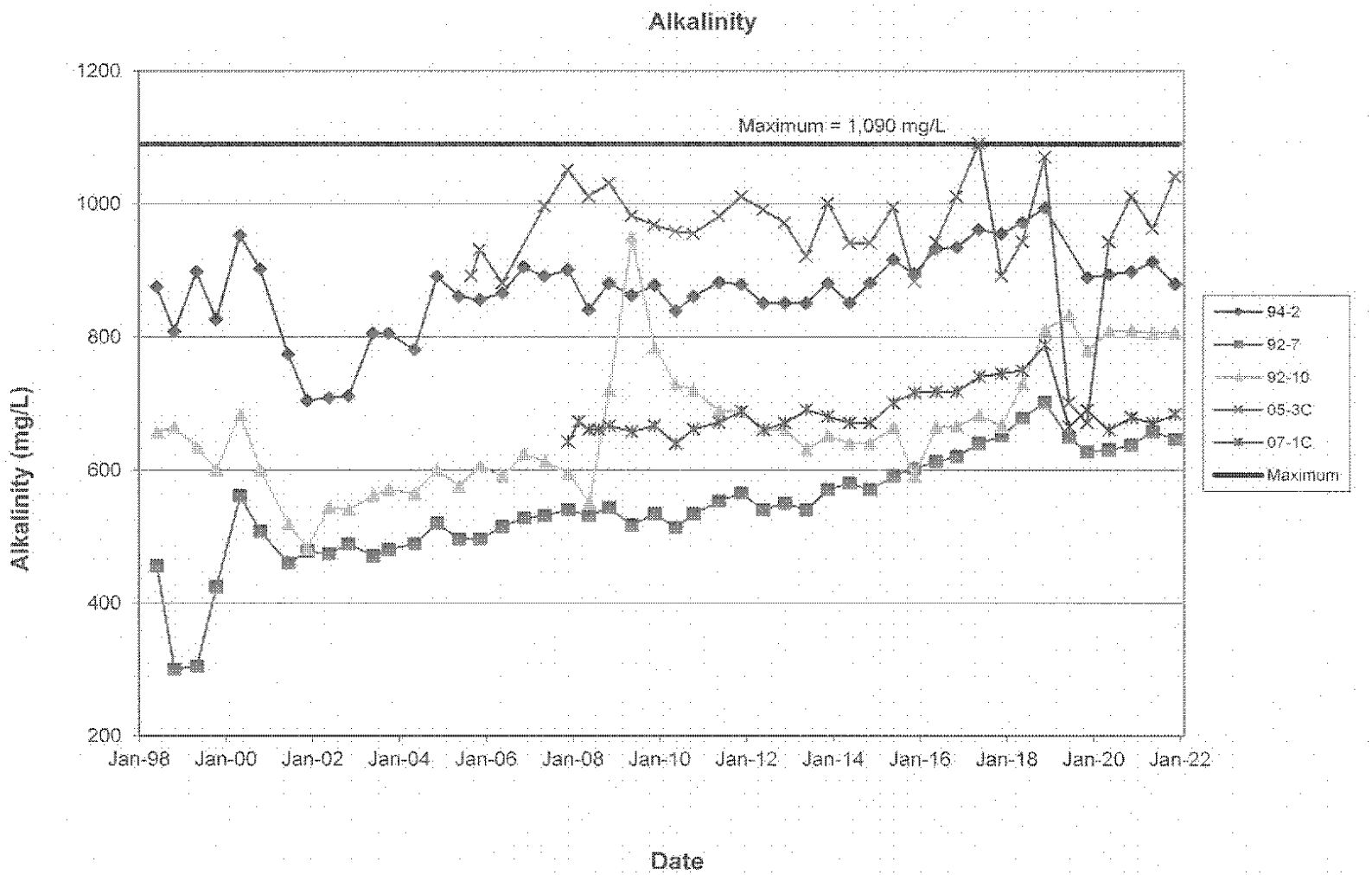

FIGURE FB1

Project No. 21497772
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

WSP GOLDER

002606

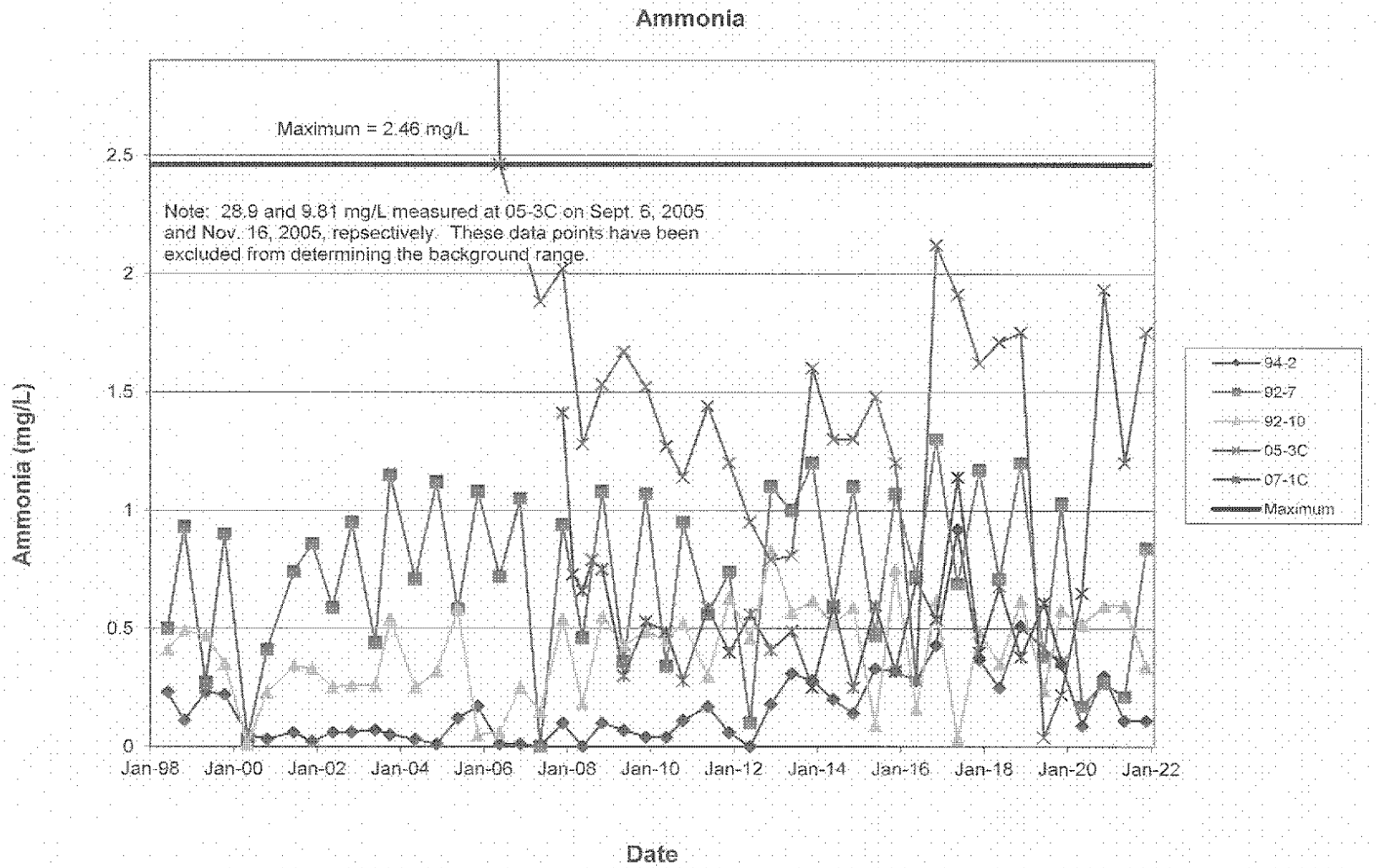

FIGURE FB2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002607

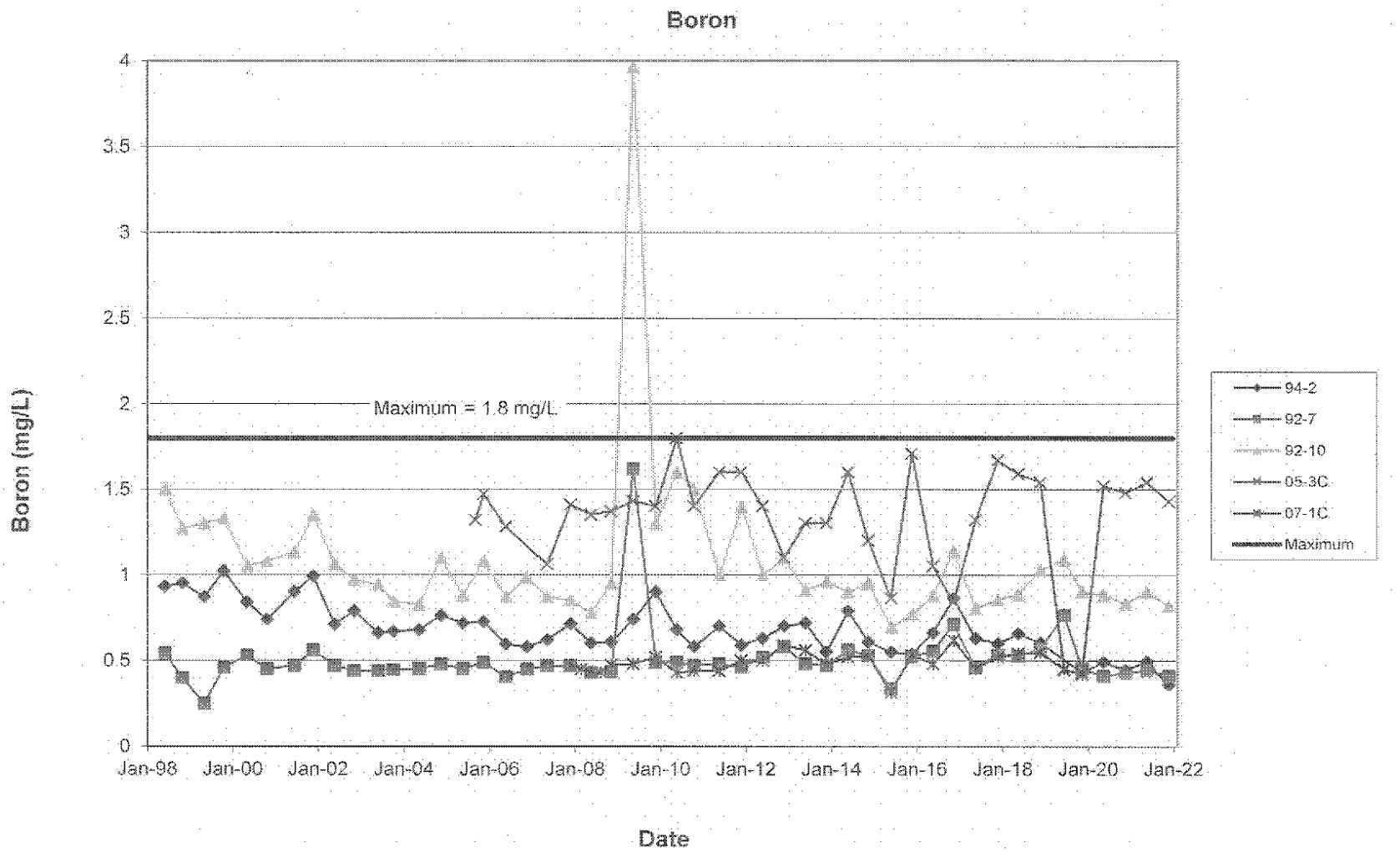

FIGURE FB3

Project No. 21497772
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002608

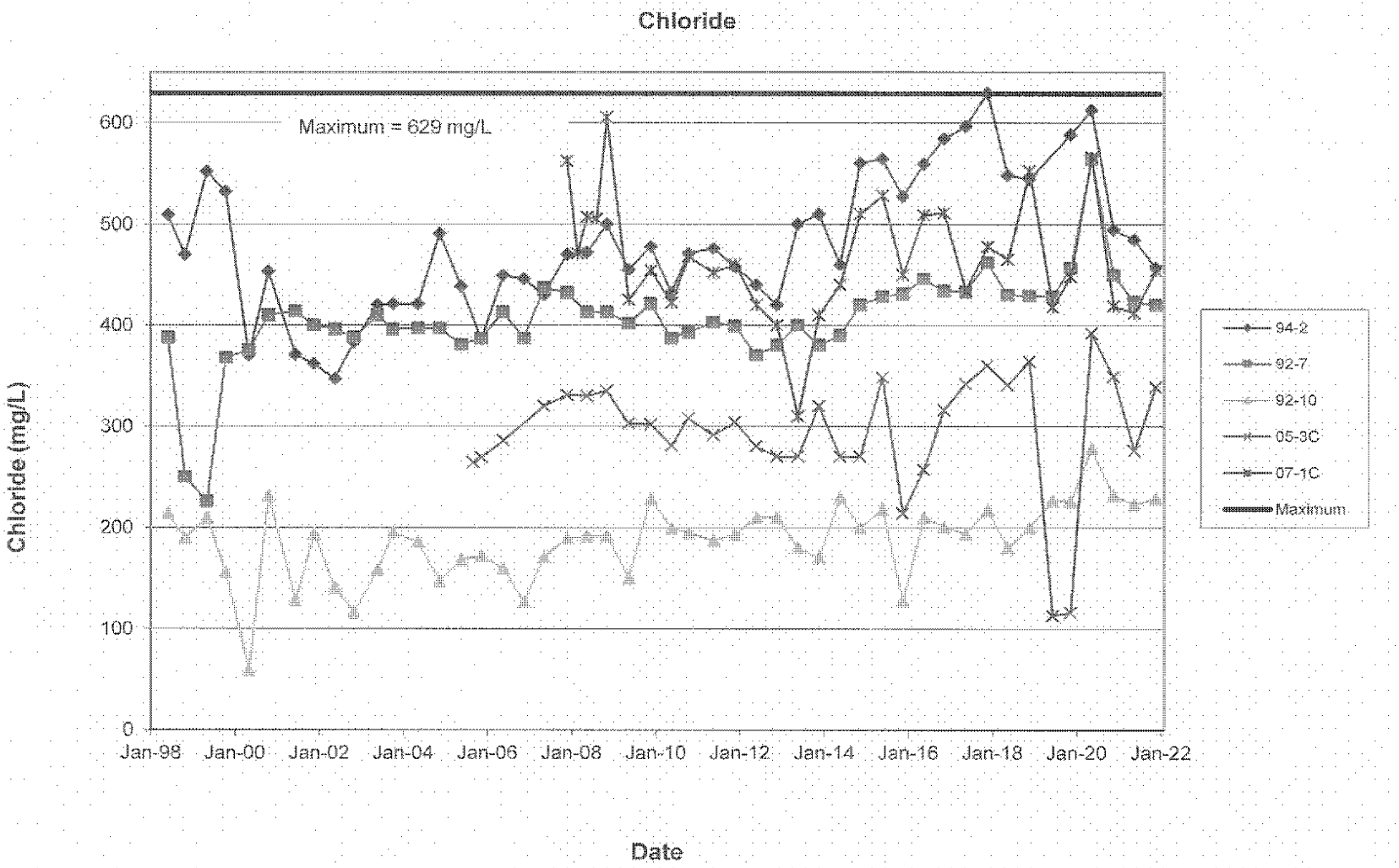

FIGURE FB4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

WEATHERED CLAY

GOLDER

002609

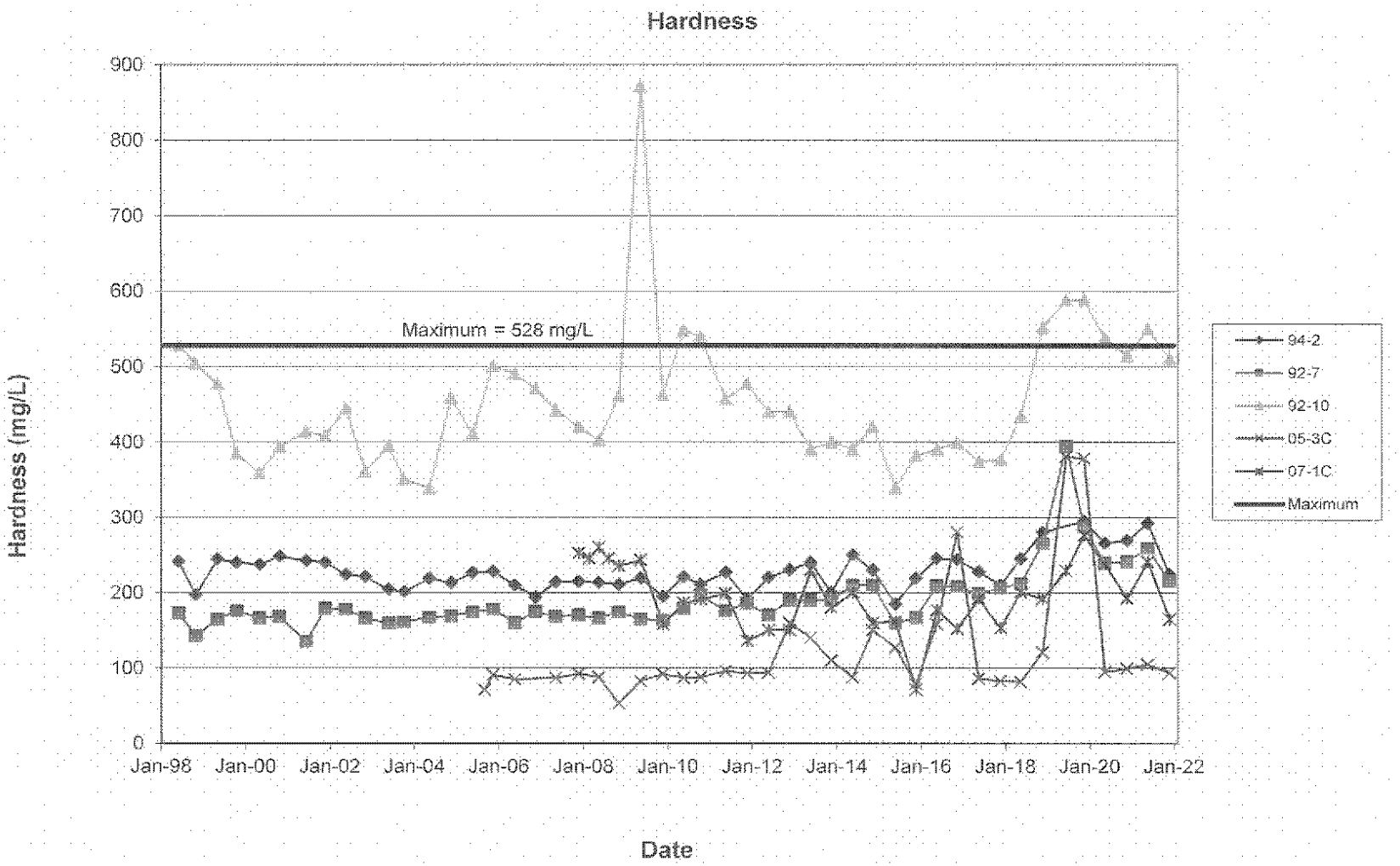

FIGURE FB5

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002610

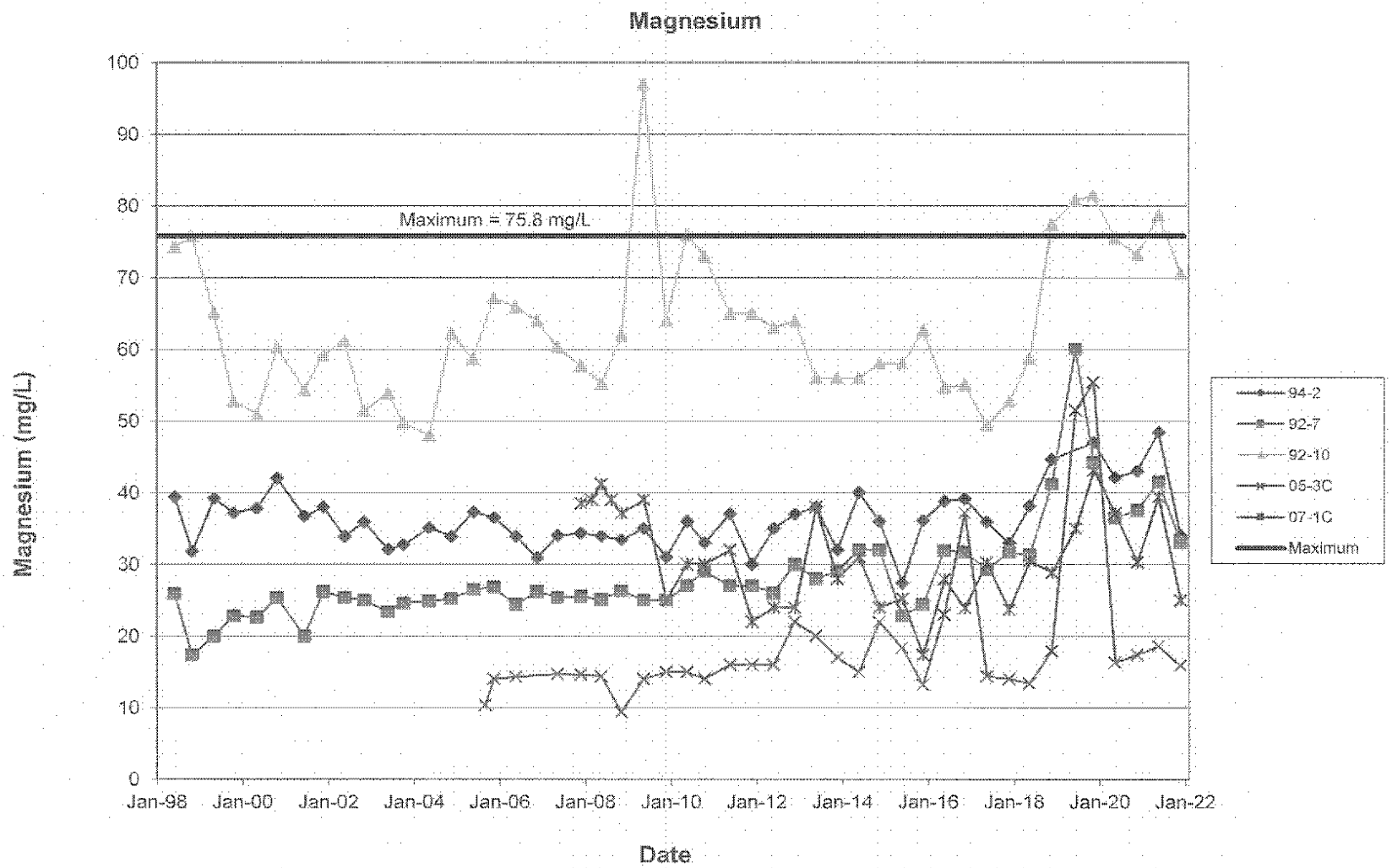

FIGURE FB6

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

WSP GOLDER

002611

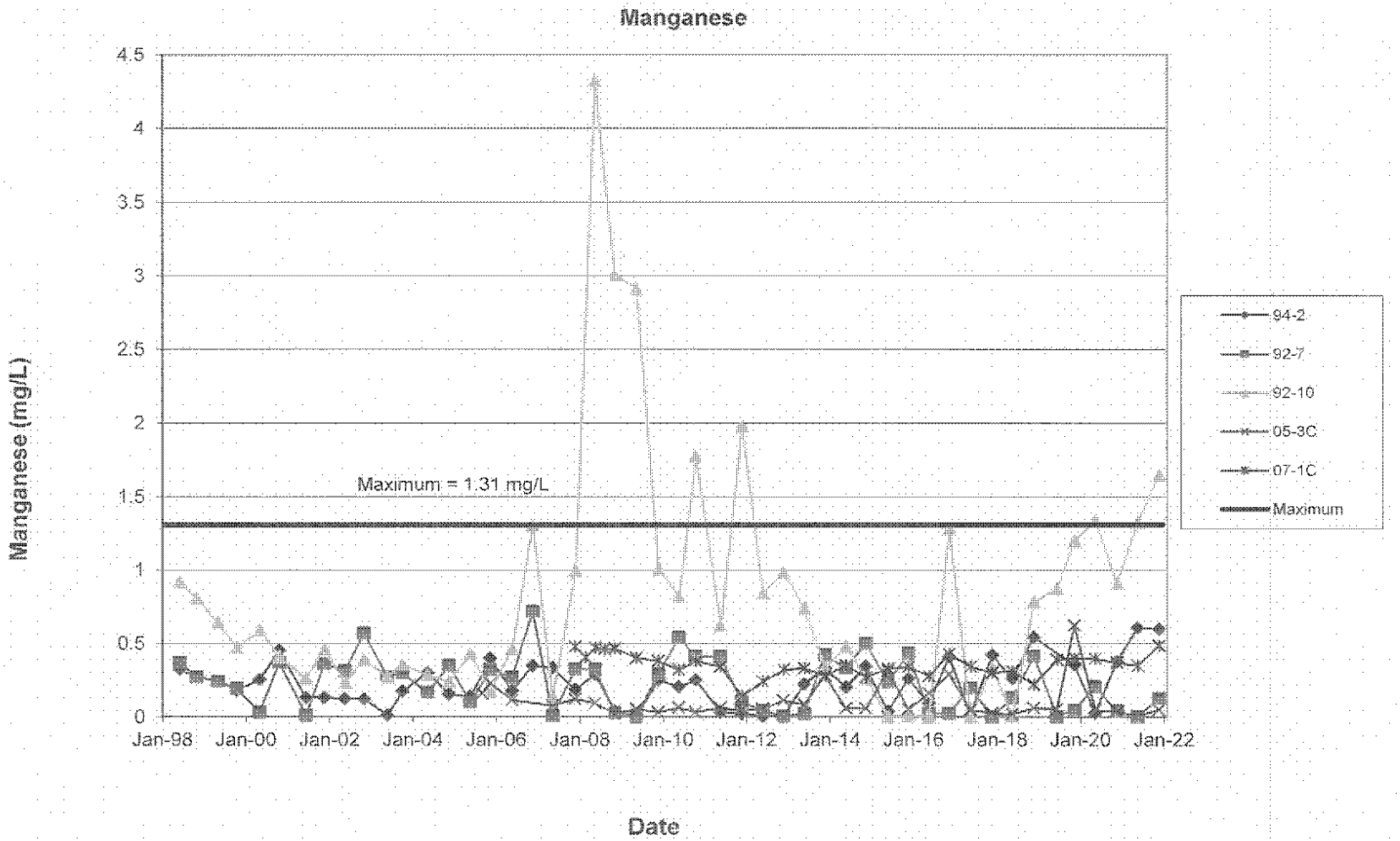

FIGURE FB7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002612

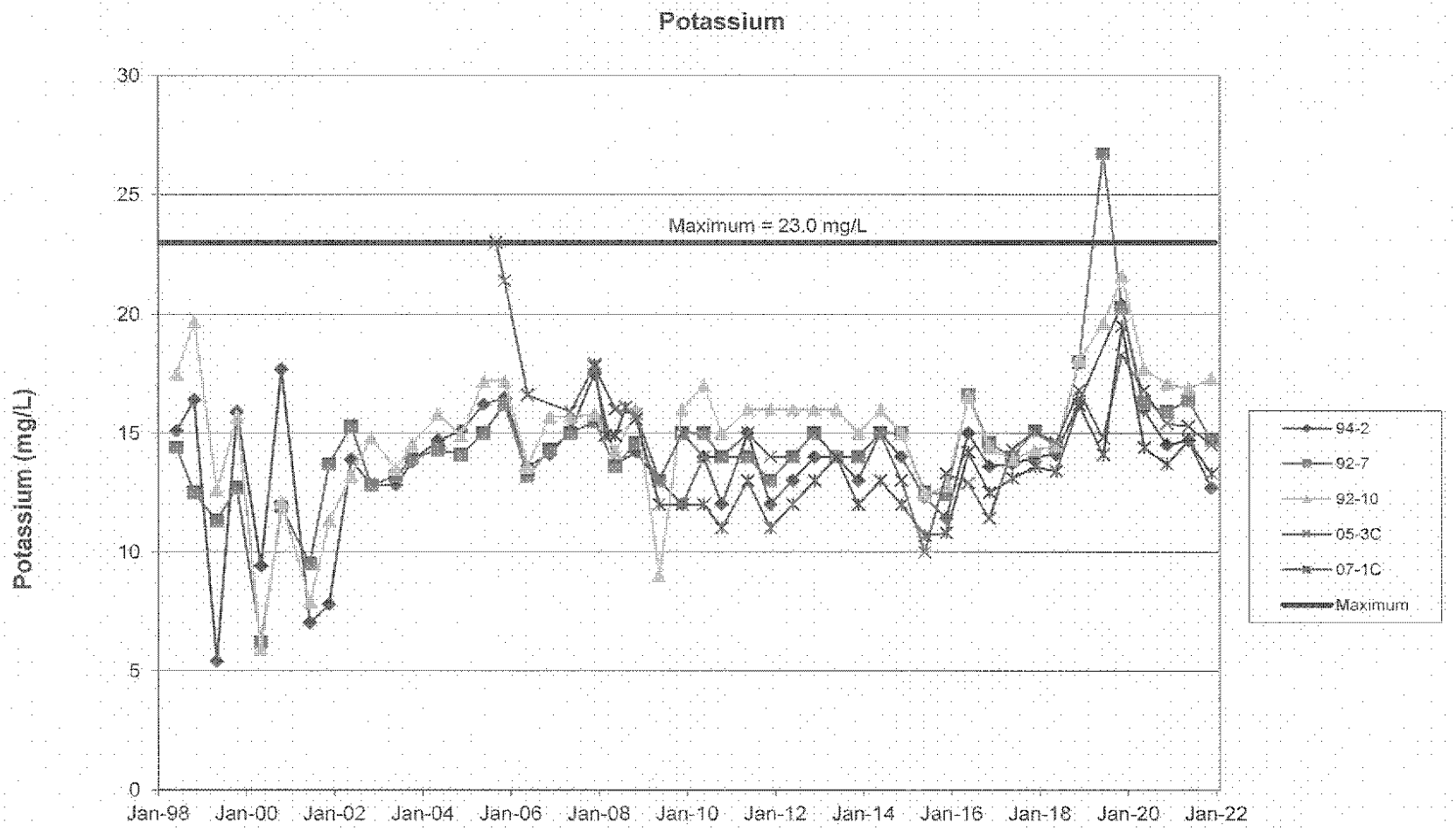

FIGURE FB8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002613

APPENDIX F-C

Intact Clay Deposit

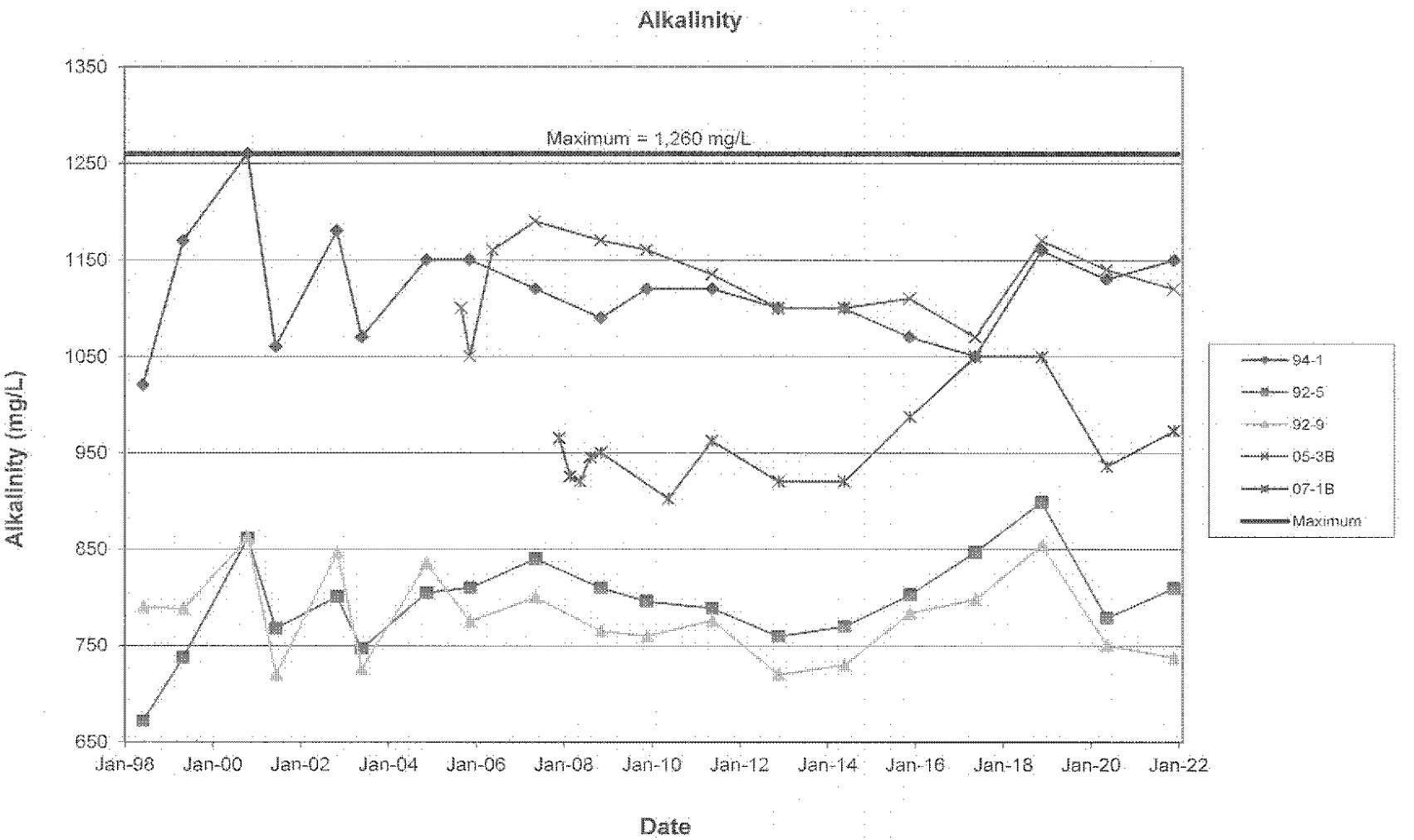

FIGURE FC1

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

INTACT CLAY

WSP GOLDER

002615

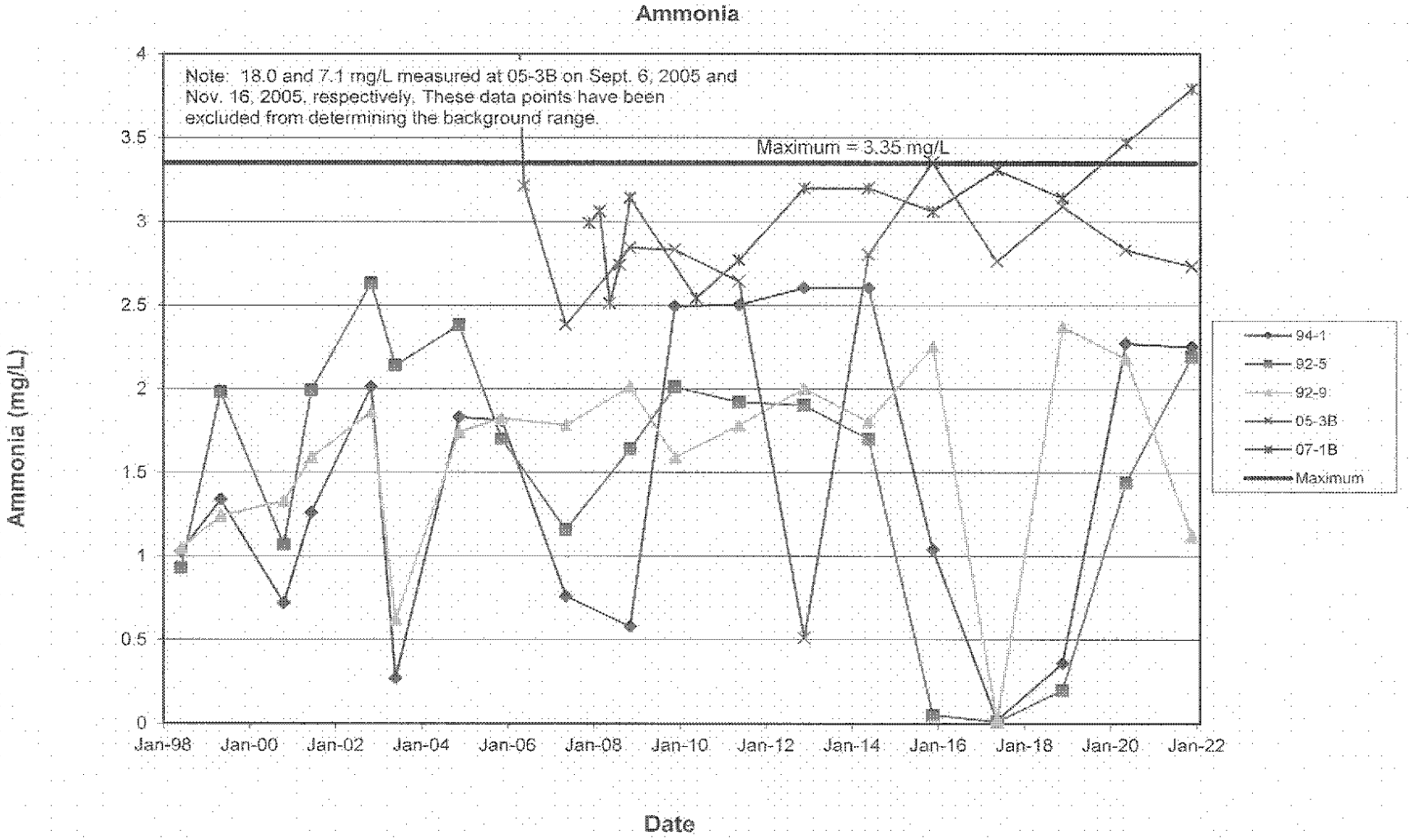

FIGURE FC2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002616

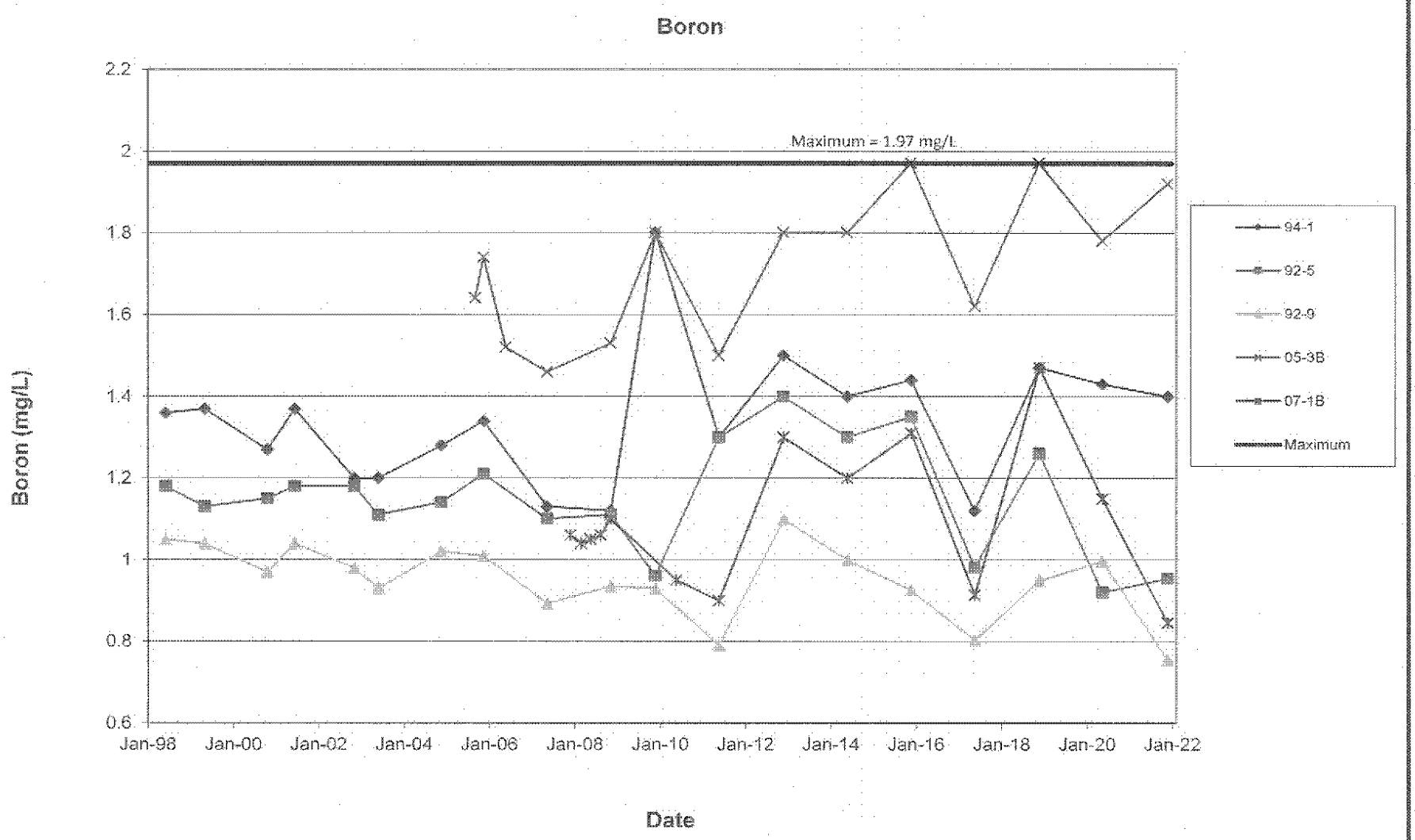

FIGURE FC3

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

WSP GOLDER

002617

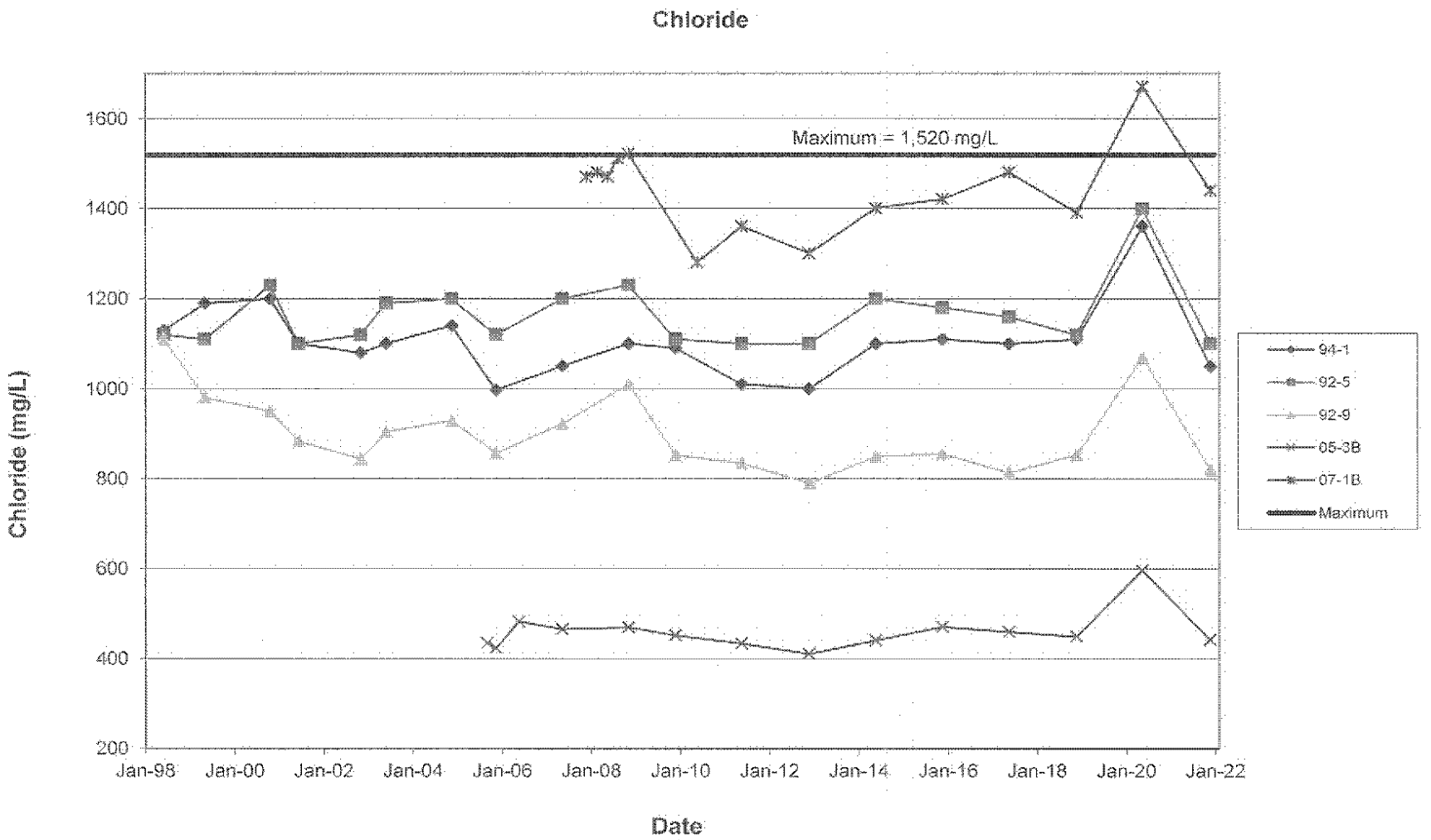

FIGURE FC4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

WSP GOLDER

002618

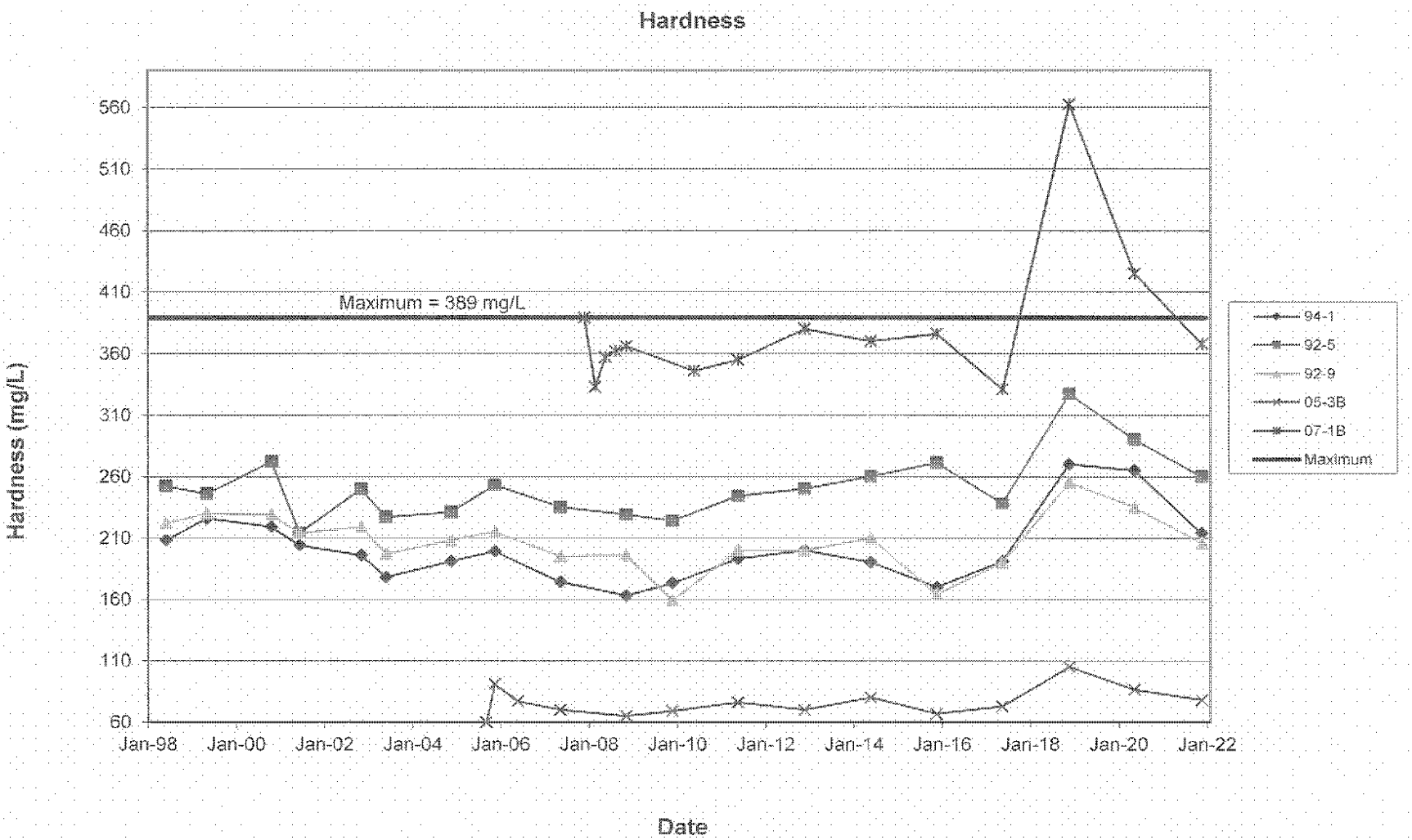

FIGURE FC5

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002619

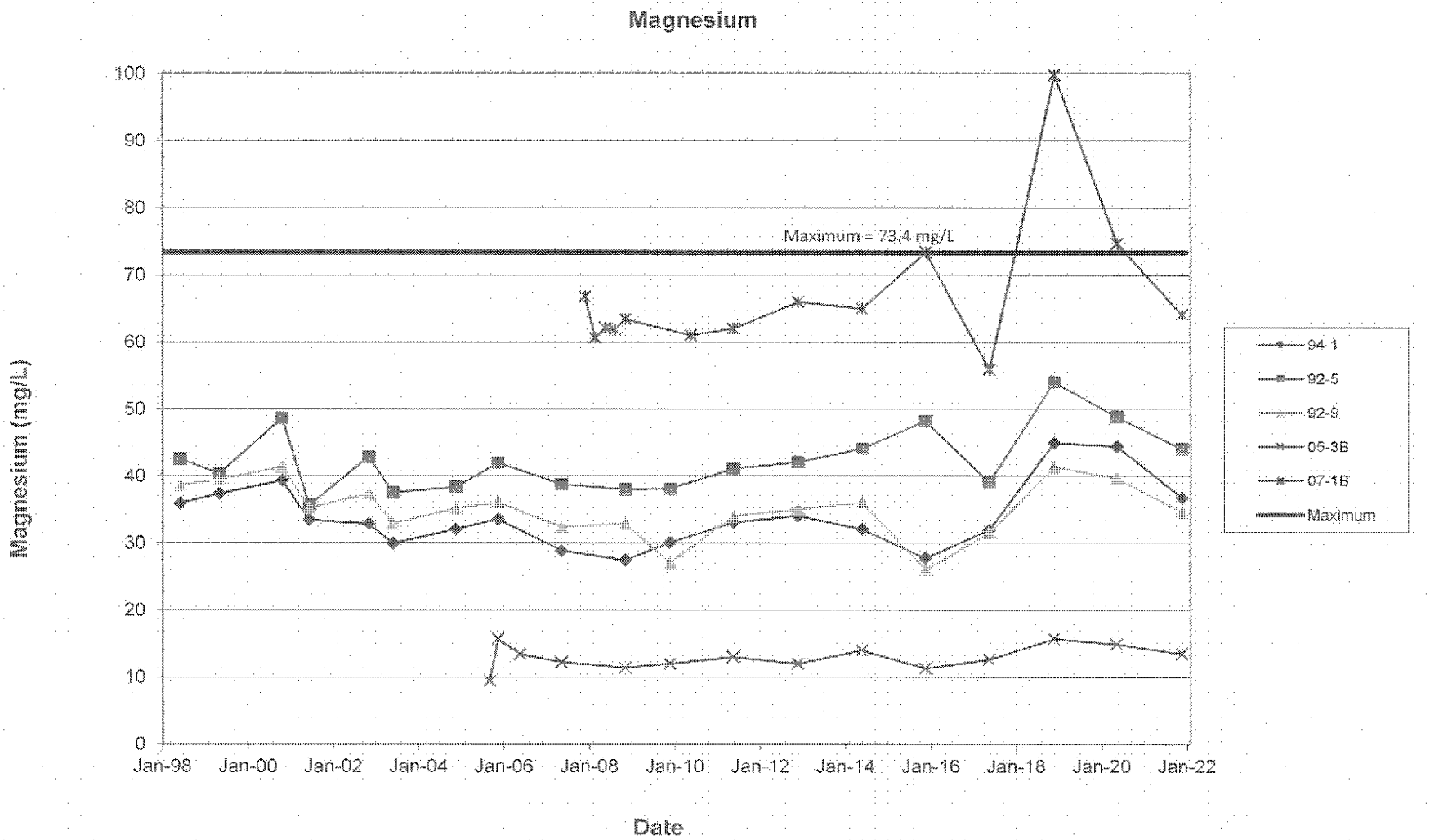

FIGURE FC6

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002620

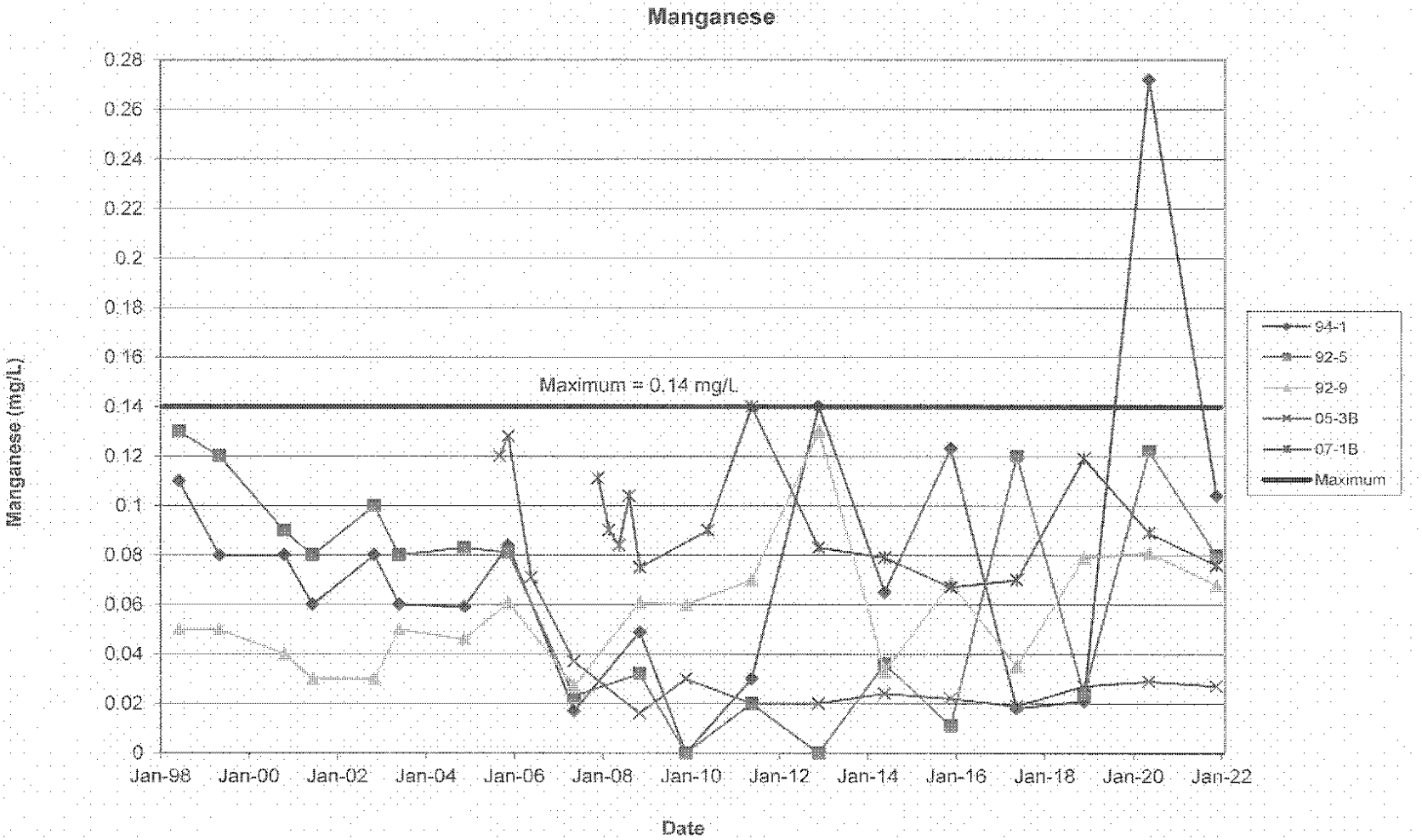

FIGURE FC7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002621

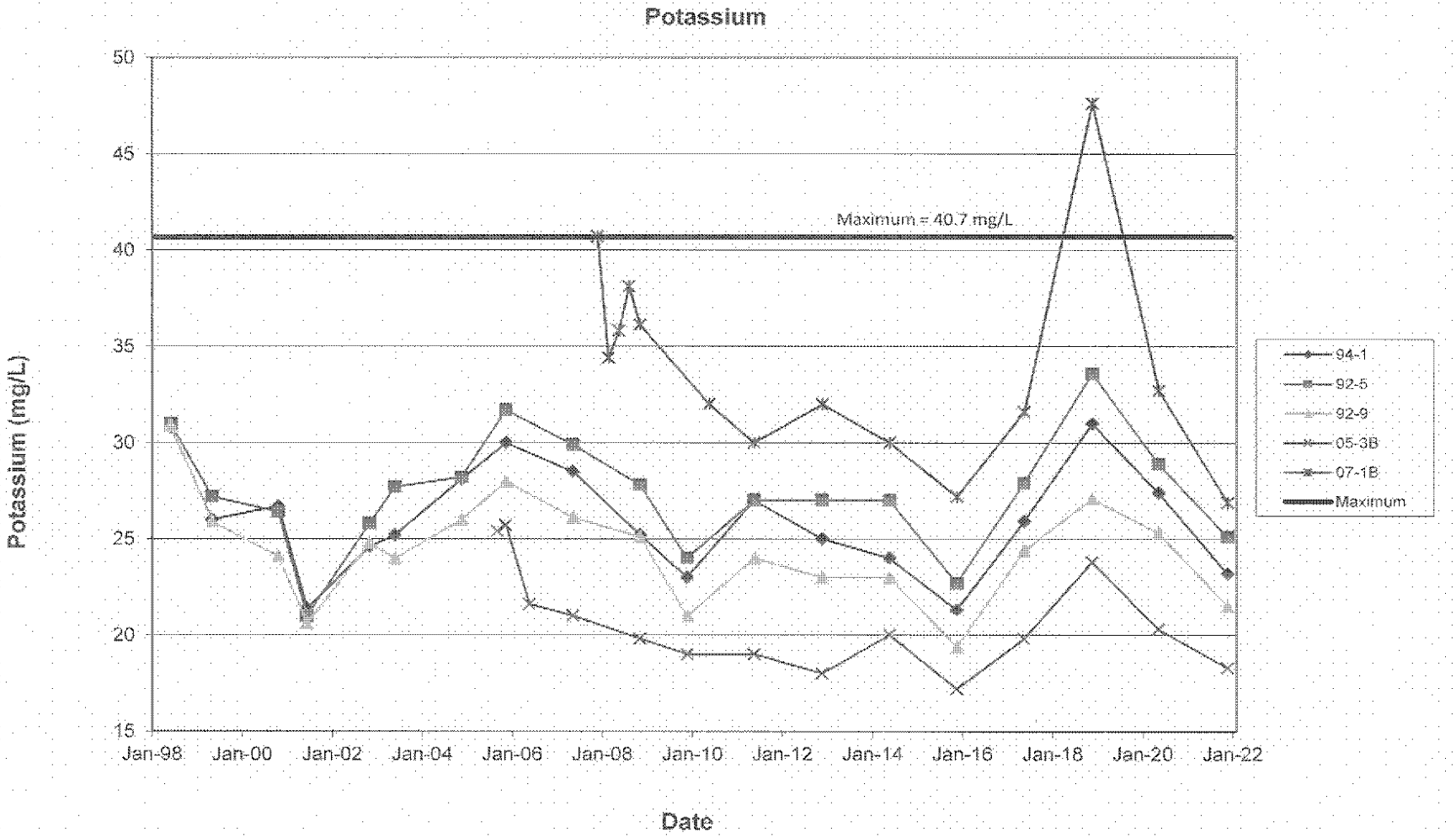

FIGURE FC8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002622

APPENDIX F-D

Glacial Till/Upper Bedrock Zone

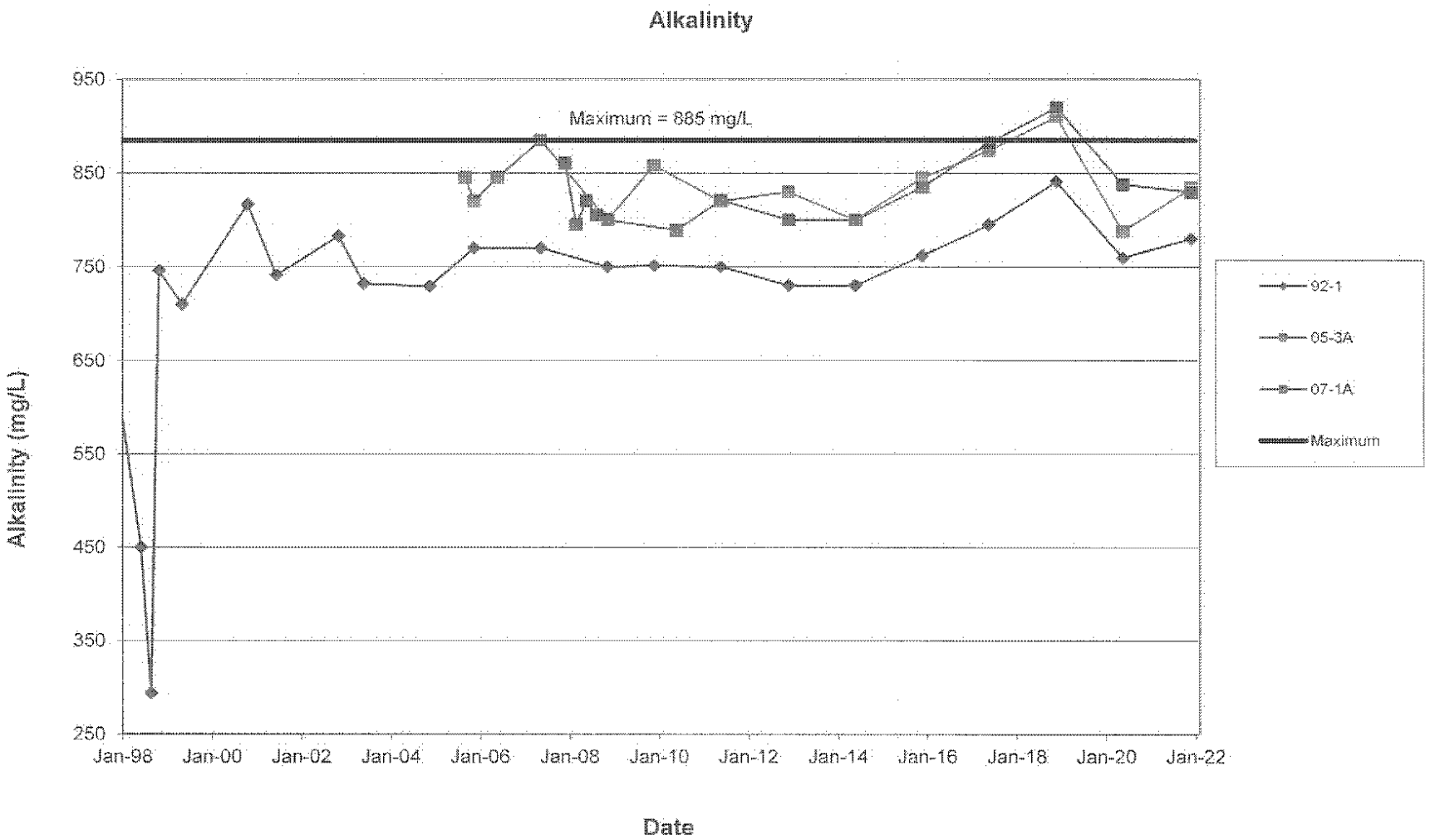

FIGURE FD1

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002624

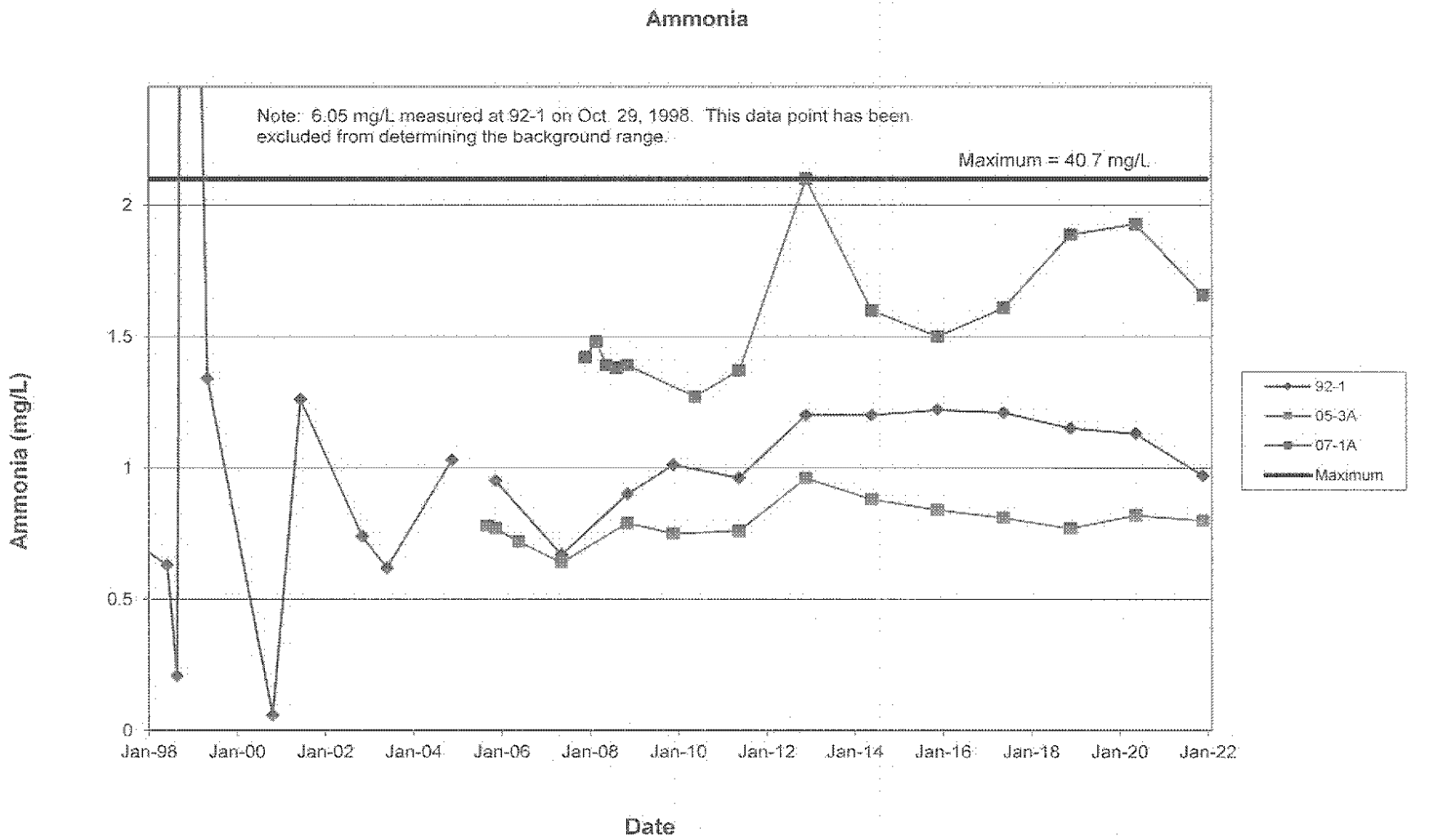

FIGURE FD2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002625

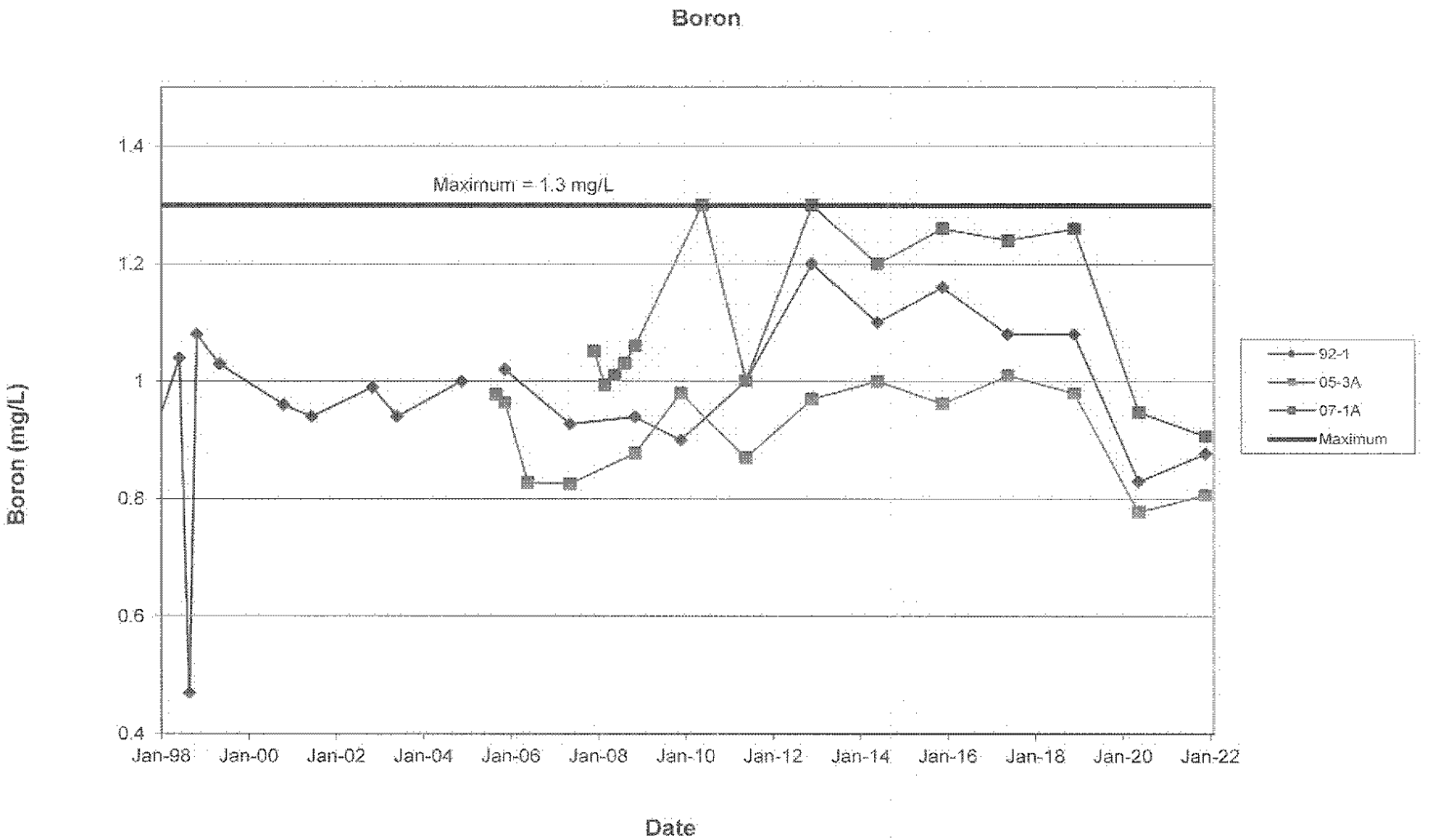

FIGURE FD3

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002626

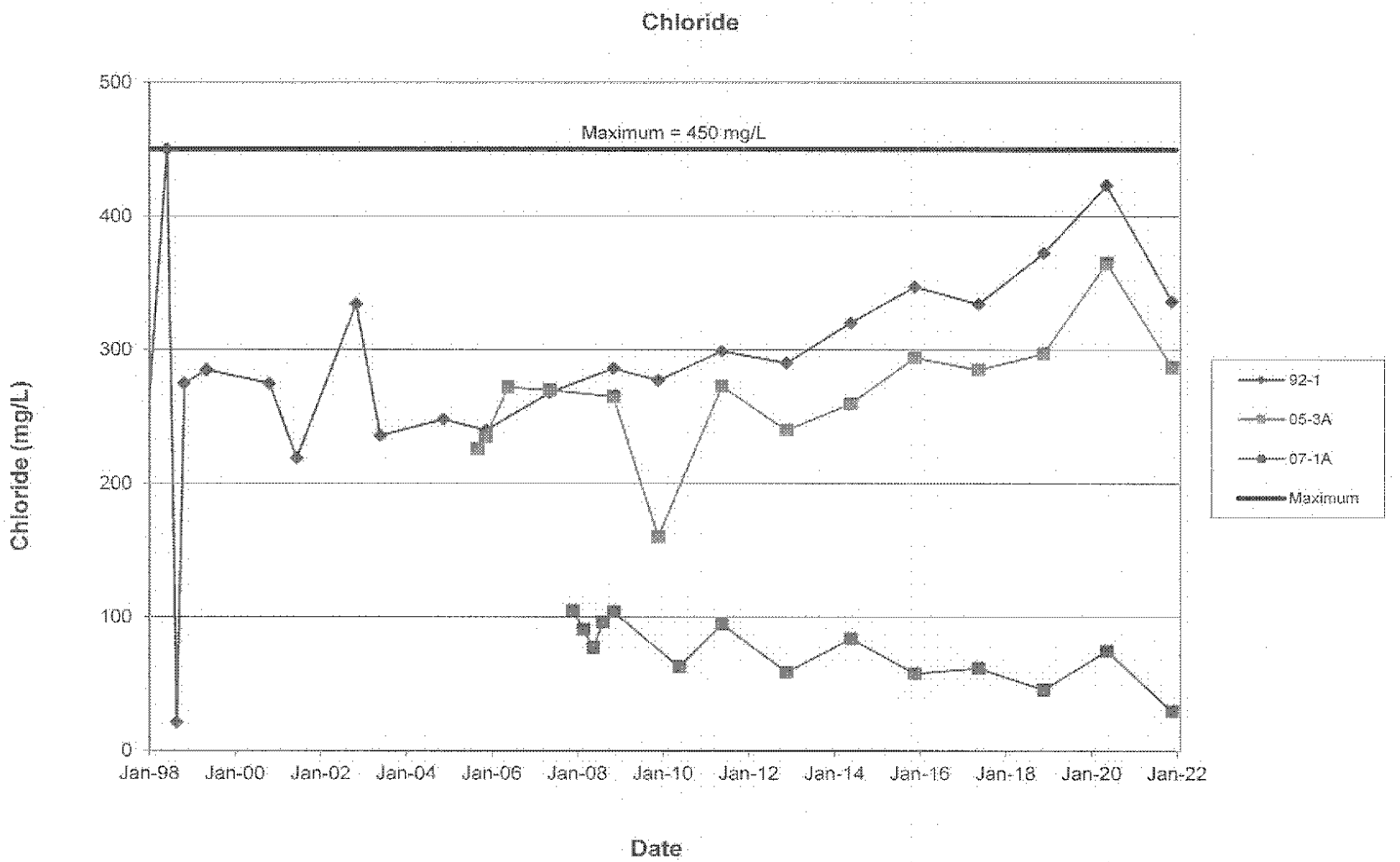

FIGURE FD4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002627

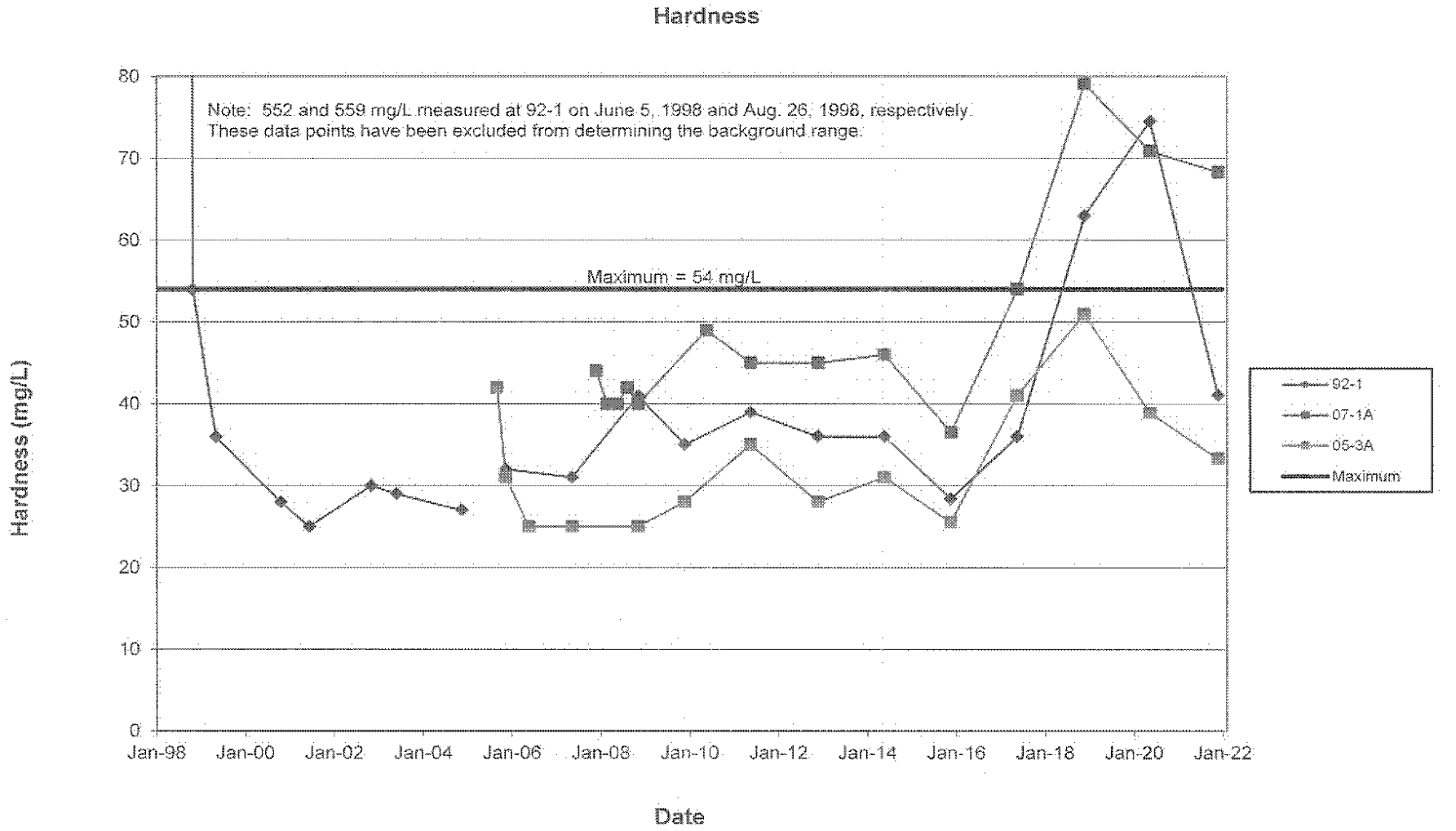

FIGURE FD5

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

GOLDER

002628

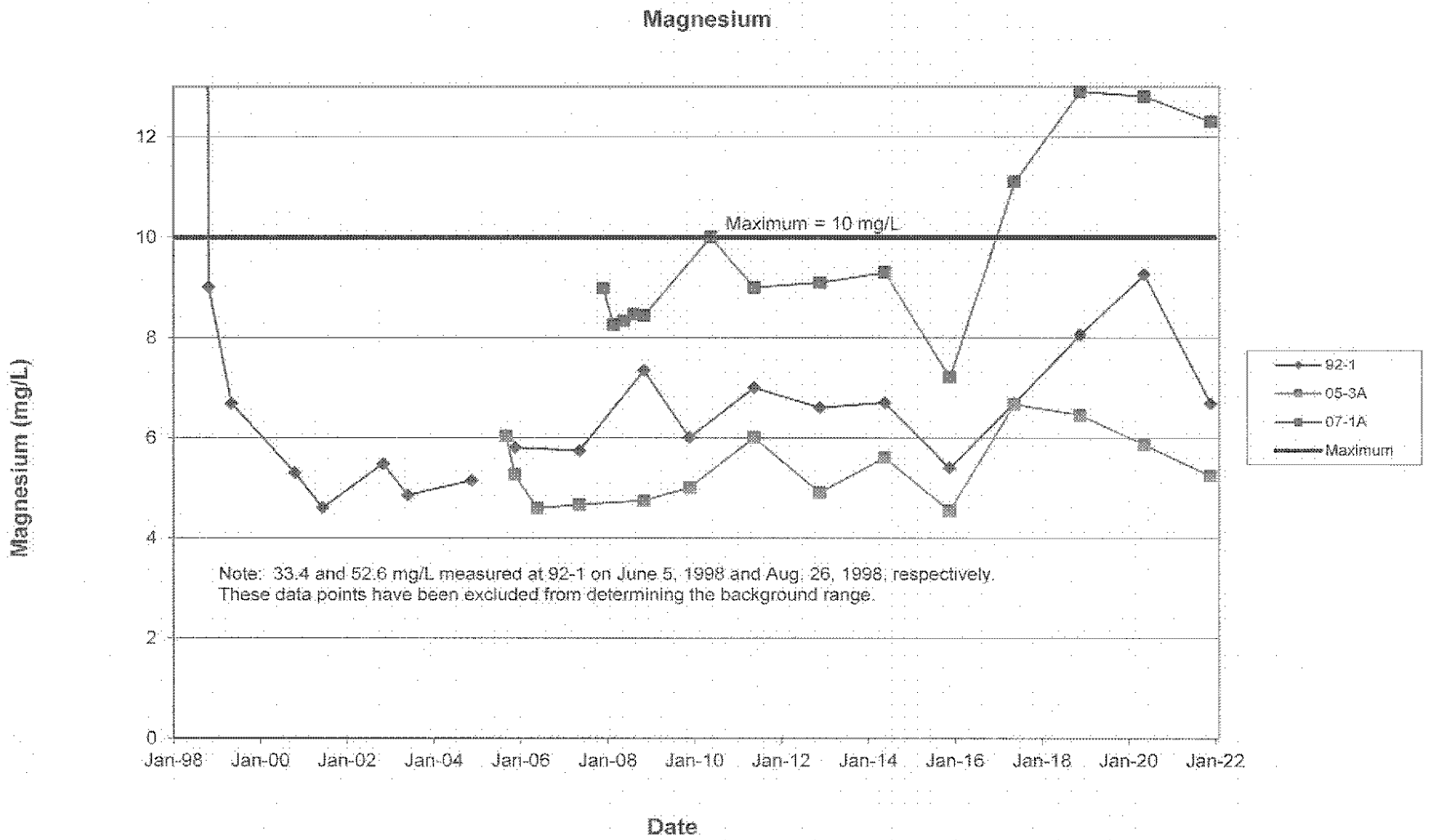

FIGURE FD6

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002629

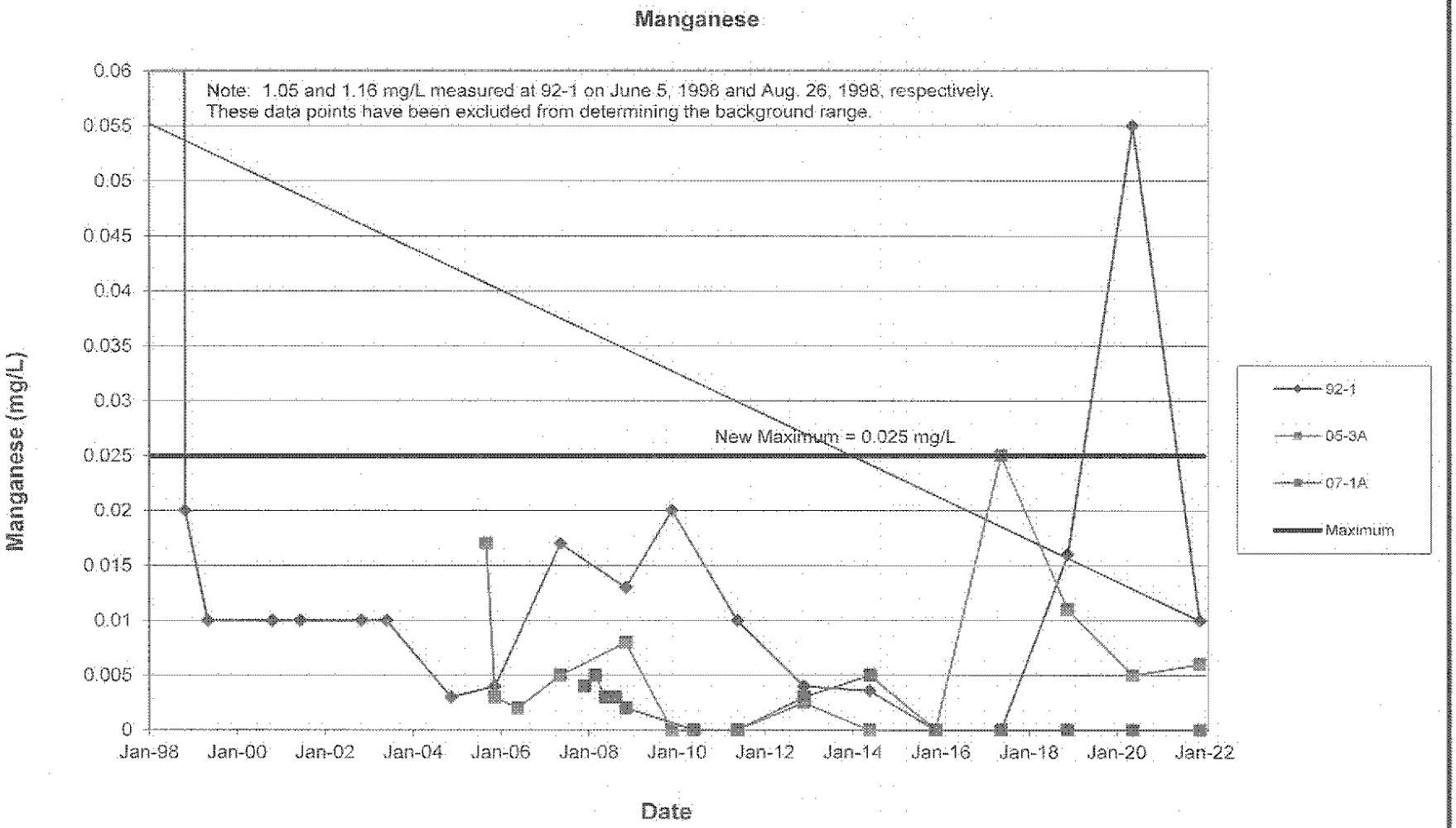

FIGURE FD7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002630

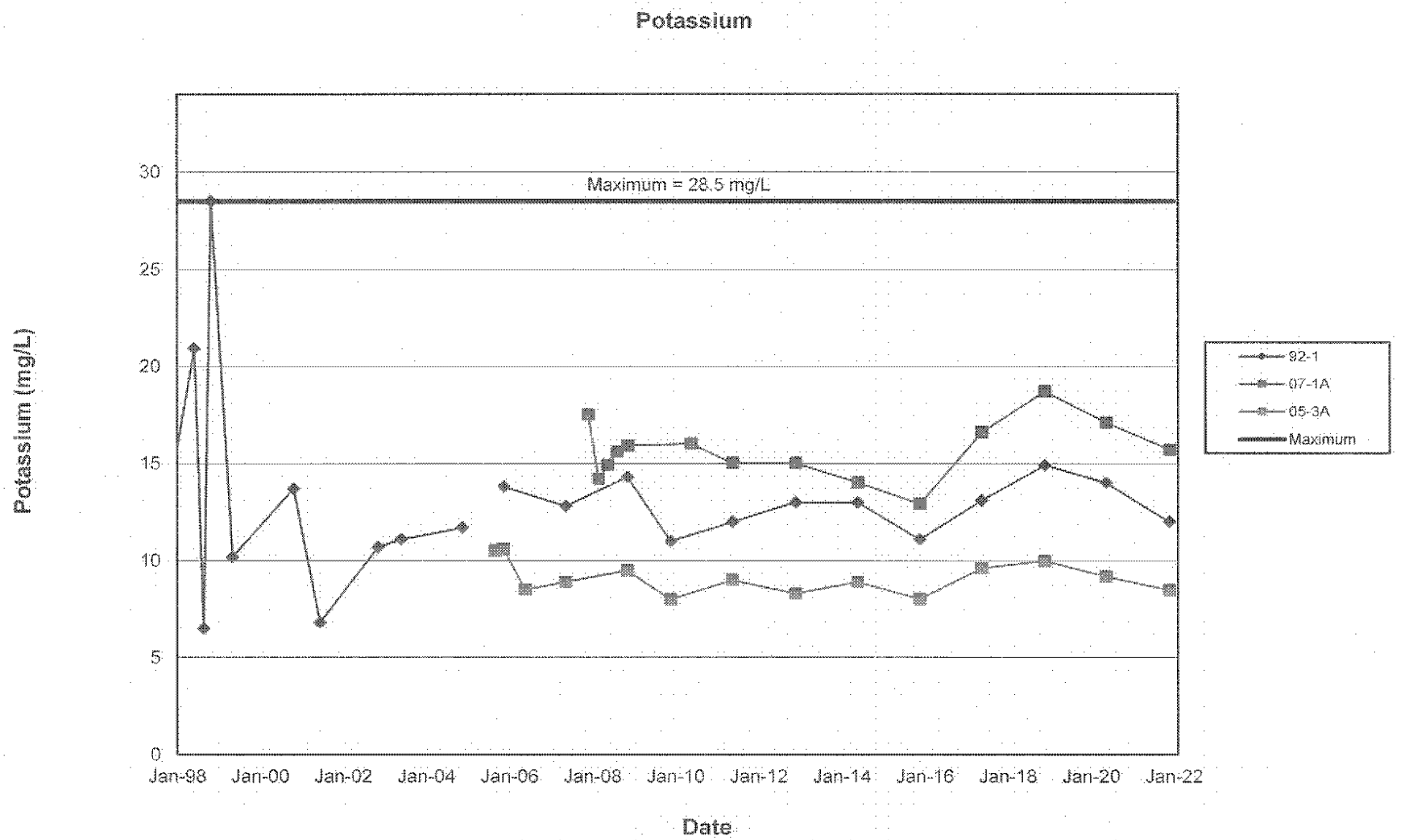

FIGURE FD8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002631

APPENDIX G

Surface Water Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report

Pages 2634 to / à 2636

are not relevant

sont non pertinentes

Appendix '2'

Golder 2021 Landfill Gas Monitoring Report

WSP GOLDER

REPORT

2021 Landfill Gas Monitoring Report

Waste Connections of Canada
Navan Waste Recycling and Disposal Facility
Ottawa, Ontario

Submitted to:

Waste Connections of Canada
3354 Navan Road
Ottawa, Ontario
K4B 1H9

Submitted by:

Golder Associates Ltd.
1931 Robertson Road, Ottawa, Ontario, K2H 5B7, Canada

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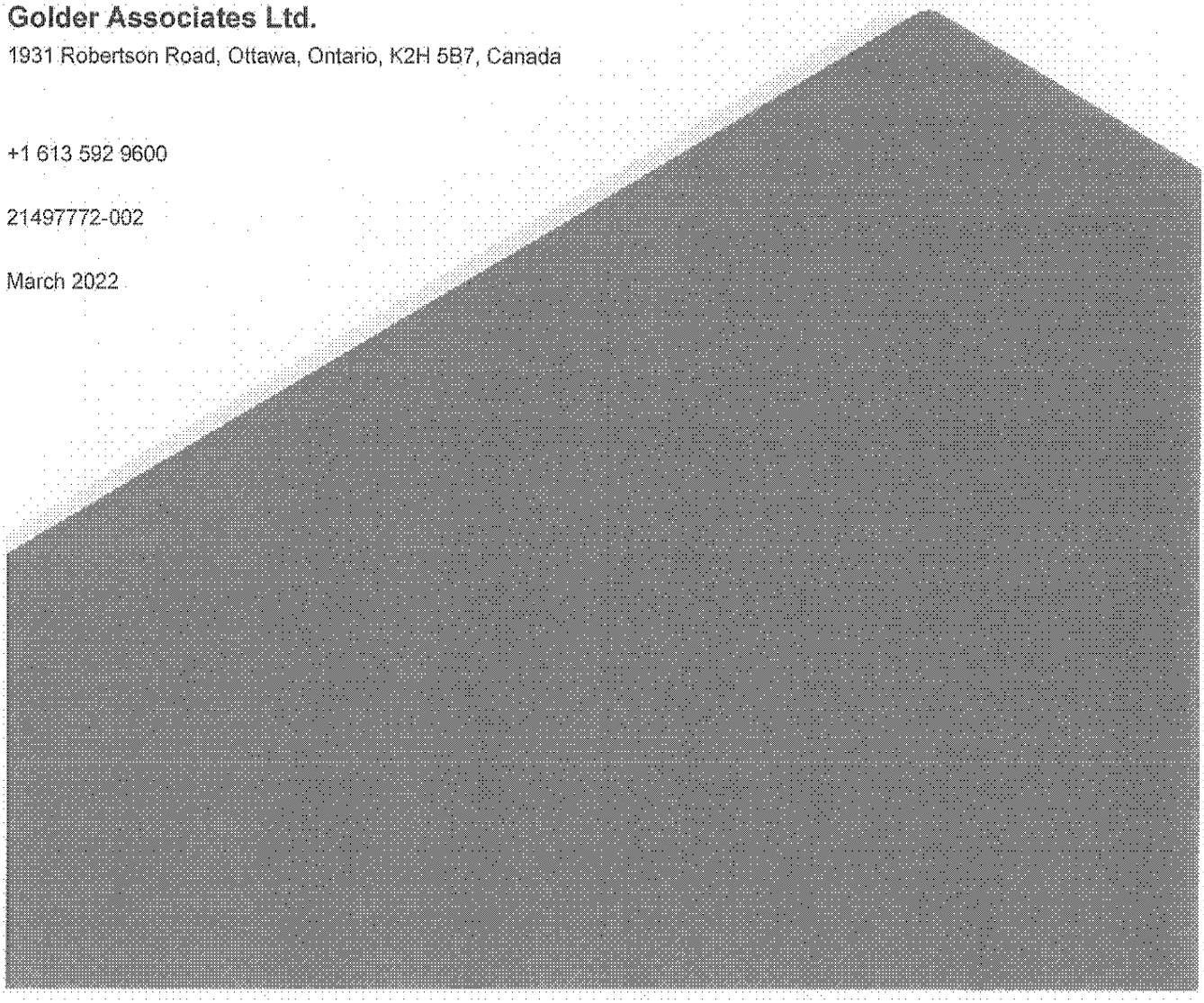
21497772-002

March 2022



Distribution List

10 copies	Waste Connections of Canada
1 e-copy	Golder Associates Ltd.

Executive Summary

This report serves as the landfill gas (LFG) monitoring portion of the 2021 site operations and monitoring report and presents the results of LFG monitoring activities carried out during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility). This report has been prepared to fulfill the reporting requirements outlined in Condition 110 of Environmental Compliance Approval No. A460702 dated April 16, 2009.

The following executive summary highlights key points only; for complete information and findings it is necessary for the reader to examine the complete report.

LFG monitoring was undertaken in May, August and December 2021. At most locations monitored, methane gas was detected at concentrations lower than 1.25% by volume. Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 1.25% by volume at the following locations:

- MH-2 (G18a), MH-3 (G13a), MH-4 (G12a), and MH-5 (G11a) in August 2021
- MH-7 (G5a), MH-9 (G3a), and MH-10 (G2a) in December 2021

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the WCC Navan Facility based on the 2021 monitoring results. Although no monitoring locations are available below surface at the property boundary, it is anticipated that the WCC Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events, with the exception of the following location, which reported a relatively low detection (1 part per million or ppm):

MH-6 (G6a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), all in May 2021.It is noted that an interim LFG odour control system (refer to Section 3.4) was installed in 2011 and commissioned in April 2012. The system was extended in 2016, 2017, 2019, and 2020. The purpose of this system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells.

Construction of the permanent LFG collection and treatment system continued in 2021 and the new flare and extraction plant are expected to be commissioned in 2022.

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Figure 2: Landfill Gas Monitoring Locations

APPENDICES

APPENDIX A
2009 Landfill Gas Characterization

1.0 INTRODUCTION

This report serves as the landfill gas (LFG) monitoring portion of the 2021 site operations and monitoring report and presents the results of LFG monitoring activities carried out by Golder Associates Ltd. (Golder) during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility).

The WCC Navan Facility is located at 3354 Navan Road on part of Lots 2, 3, and 4, Concession IV, Ottawa Front, in the City of Ottawa as shown in Figure 1. This site is operated under Environmental Compliance Approval (ECA) No. A460702 (dated April 16, 2009) and ECA (air) No. 6141-59XKF9 (dated May 10, 2002, authorizing the use of a mobile wood grinder to process wood waste), No. 6733-7BYS9A (dated April 16, 2009, authorizing the permanent LFG Collection and Treatment System) and No. 3536-8APNZD (dated November 24, 2010, authorizing the Interim Landfill Gas Odour Control System).

This report has been prepared to fulfill the reporting requirements outlined in Condition 110 of ECA No. A460702.

2.0 CHARACTERISTICS OF LANDFILL GAS AT THE WCC NAVAN FACILITY

The presence of typical LFG is indicated by a reduction in nitrogen (N_2) and oxygen (O_2) and elevated concentrations of carbon dioxide (CO_2), methane (CH_4) and hydrogen sulfide (H_2S) when compared to atmospheric air as described in the table below. The main constituents of typical LFG are CO_2, CH_4 and H_2S. Other parameters such as mercaptans and volatile organic compounds can be present in LFG but at lower concentrations. LFG at the WCC Navan Facility was characterized in 1994, in 2002 and in 2009. The average composition of WCC LFG at the monitored locations is provided in the table below. It is noted that the LFG composition presented herein is not representative of the composition in the LFG collection and flaring system. The raw data from the 1994 and 2002 characterizations is provided in Table 1 and the data from the 2009 characterization is provided in Appendix A.

Select Gases	Sea-Level Composition of Air[1] (15°C and 101 kPa) (% by Volume)	Average WCC LFG Composition November 1994 (% by Volume)	Average WCC LFG Composition June 2002 (% by Volume)	Average WCC LFG Composition 2009* (% by Volume)
Nitrogen, N_2	78.1	77.5	78.4	NM
Oxygen, O_2	20.9	19	20.6	14.6
Carbon Dioxide, CO_2	0.03	2.7	0.5	12.6
Methane, CH_4	0.0002	1.3	0.2	14.1
Trace Elements	<0.01	NM	NM	NM

Notes:
[1] Source: CRC Handbook of Chemistry and Physics by David R. Lide, Editor-in-Chief, 1997 Edition.
* The averages were calculated using data from all Maintenance Holes and cleanouts (both measured with tubing) over the six monitoring sessions.
NM – not monitored

002643

3.0 ENGINEERING SYSTEMS

From a hydrogeological perspective, the WCC Navan Facility is favourably situated on a thick deposit of low permeability, Champlain Sea clay (Leda Clay). The site is characterized by a shallow groundwater table. This is overlain by a thin sand cover, through which gas migration can occur. The west and south perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends to the water table. This drainage system, combined with the natural subsoil conditions, a perimeter buffer area and constructed low permeability barrier systems are considered to have significantly reduced the potential for off-site migration of LFG. The engineering systems in place at the WCC Navan Facility to safeguard against off-site migration of methane gas are discussed below.

3.1 Buffer Area and Natural Barrier System

The WCC Navan Facility is designed with a buffer area and natural barriers. The site has a favourable hydrogeological setting whereby the site is underlain and surrounded by a thick clay deposit of low permeability. The depth below grade to the water table at the perimeter of the site is shallow. The depth of the landfill between the ground surface and the water table is less than 2.5 metres. The Ministry of the Environment, Conservation and Parks (MECP) *Guideline for Assessing Methane Hazards from Landfill Sites* (Ministry of Environment, 1987) considers that methane gas migration of any significance may extend for a distance of ten times the depth of the landfill between the ground surface and the water table. Based on site conditions, this 10:1 general rule would suggest that methane migration could extend for a distance of 25 metres. The north, west, south and east sides of the landfill footprint are surrounded by buffer zones of 30 to 70 metres, 100 metres, 10 metres and 140 metres, respectively. Note that on the south side of the landfill a 10-metre buffer zone exists between the south limits of the waste mound and the VIA Rail right-of-way (ROW) and an additional buffer strip with a width of 100 metres exists to the south of the VIA Rail ROW. These buffers would therefore provide adequate natural venting. The natural barriers and the provision of adequate buffer area present at the WCC Navan Facility are the preferred method of dealing with potential LFG migration.

3.2 Constructed Barrier System

In addition to natural barriers and buffer area, WCC has constructed low permeability clay cut-off walls, clay berms and intervening drainage trenches at the perimeter of the waste footprint. At the edge of the fill area, native sand and other pervious materials have been removed and replaced with less permeable compacted clay. These clay barriers, designed to minimize and contain the flow of leachate, also act as a barrier against the lateral migration of LFG. Presently, the constructed clay barriers exist along the northeast, northwest, west, southwest and southeast perimeters of the fill area. As development of the landfill progresses, clay barriers will be constructed along the east perimeters. In 2020, WCC continued to construct the east buffer adjacent to the waste limit and WCC constructed the north clay buffer wall. An intervening trench or excavated drainage ditch with its base at an elevation lower than the base of the waste pile and/or water table is also present at the perimeter of the waste footprint and will intercept and force any methane to the atmosphere. Construction of the leachate drainage layer on the north and northeast slope in Phase 6 was completed in 2020 (refer to Section 3.3) and landfilling operations were generally located in the northeast corner of the approved waste footprint in 2021.

3.3 Passive Ventilation System

The leachate collection system constructed along the west, south and east limits of the existing waste area, also serves as a passive ventilation system. A passive ventilation system is a system that prevents the subsurface migration of LFGs beyond the landfill property by altering the path of flow without the use of mechanical components.

It can be used as a general barrier to gas movement or as a protective measure for structures and/or vegetation. Maintenance Holes (MHs), installed at intervals of approximately 100 metres are effective in venting LFG as indicated by the results of the field monitoring (as discussed in Sections 4.4 and 5.0).

3.4 Interim Landfill Gas Odour Control System

As part of their commitment to control potential odorous emissions from the site, WCC has installed an interim LFG odour control system which will operate until the full-scale LFG collection system is installed at the site in the near future.

The interim LFG odour control system, which has been constructed within the existing landfill footprint, includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells, as well as the installation of lateral and header piping, condensate management facilities, an outdoor skid-mounted abstraction plant, and a candlestick flare. During construction, some 15 leachate collection system cleanouts were excavated and the perforated pipe replaced with solid pipe and air tight connections. Tees were installed in the header pipe to allow for expansion of the interim odour control system, if required.

The interim LFG odour control system was installed in 2011 and has been operating since April 2012. Extensions to the LFG odour control system were installed in 2016, 2017, 2019 and 2020. The additional vertical wells installed in 2017 and 2019 are intended to be part of the future permanent LFG collection system. In 2020, one horizontal well was added at the north-west corner of Phase 1.

To date, these systems have performed satisfactorily and have assisted in minimizing potential LFG problems related to the landfill operations. A permanent LFG collection system is being installed as part of the expansion of the WCC Navan Facility as the landfill cells are completed to their final elevation.

4.0 LANDFILL GAS ASSESSMENTS

4.1 Olfactive Assessment

The WCC Navan Facility is a dry waste facility and wet organic waste is not permitted for processing or disposal. Consequently, few odours are emitted from the waste pile at this site. Odours from the waste pile, when detected, are in isolated locations occurring generally from fugitive emissions at ground surface in areas of recent landfilling activity, i.e. three to ten months following waste placement. Clay cover material is regularly placed over areas where the final fill heights have been reached. The waste and daily/interim cover materials in areas where no clay cover has been placed are sufficiently pervious to provide good ventilation at the surface thereby preventing the accumulation of LFG. The leachate collection system constructed at the south and west perimeters of the waste footprint behave as a passive gas ventilation system. Odours resulting from LFG are, on occasion, noticeable at some of the MH openings located along the leachate collection system. These odours dissipate rapidly and are barely noticeable only a short distance from the source of the odours.

002645

It is important to note that in compliance with the amended ECA dated April 16, 2009, the WCC Navan Facility is no longer receiving materials for composting.

Evaluation of odour is based on the subjective interpretations of WCC's on-site personnel and observations by Golder and WCC staff during site visits as well as documentation of odour complaints received from the public nearby. The site practice, when odour complaints are received at the time of the occurrence, is to carry out an investigation of the source of odour regardless of the source of origin and to follow up with the caller with the corrective measures taken or to notify them of the potential source of odour if it is deemed to be originating from an off-site source.

4.2 Visual Assessment

There are no discernible impacts on vegetation at the surface of the landfill resulting from LFG. WCC has undertaken a landscaping program at the site including seeding berms and planting trees and significant efforts have been made at the site to preserve and relocate existing vegetation. The top surface of the waste pile has not been seeded.

In the past, venting of LFG could be observed at ground surface along the west side of the landfill between MHs. The LFG venting was only noticeable once the ground surface was covered with snow. In 2021, venting of LFG at ground surface was not noticeable to Golder technicians.

4.3 Ongoing Gas Monitoring in On-Site Buildings

Gas monitors have been installed in three on-site buildings. The monitors, that are calibrated annually, measure carbon monoxide (CO), nitrogen dioxide (NO_2) and CH_4 in the main site building, H_2S and CH_4 in the scale house, and H_2S and CH_4 in the pump station building. To date, the monitors have not detected any of these gases in the buildings.

4.4 Field Monitoring

Field monitoring with the use of portable field instruments was carried out on May 20, 2021, on August 25, 2021 and on December 16, 2021. The locations where monitoring of LFG and air quality was conducted during the last monitoring session are indicated on Figure 2. Shallow monitoring wells located along the south and north boundaries of the site were included in the monitoring program. Monitoring was also carried out at site facilities such as the leachate pump station, the maintenance garage, the weigh scale station and the leachate collection system. Other on-site locations were selected based on an olfactive and visual inspection of the site, and active landfilling operations. Some locations were selected at random. MHs that are part of the leachate collection system were included.

Monitoring for LFG was also carried out in buildings within close proximity to the landfill. These buildings are the following:

- The on-site maintenance garage
- The on-site pump station
- The on-site scale house
- WCC office at 3354 Navan Road

The ambient air at six addresses along Navan Road and two other off-site locations near the new subdivision adjacent to the site was also included in the LFG monitoring program.

002646

Weather data was obtained from the Ottawa Airport (OTTAWA INTL A, climate ID 6106001) in Ottawa, Ontario located 17 kilometres southwest of the WCC Navan Facility for the monitoring periods of May 20, 2021; August 22, 2021 and December 16, 2021. This weather data is summarized in the table below:

Date	Temperature (°C)			Relative Humidity (%)		Precipitation* (mm)			Station Pressure (kPa)			Wind During Working Hours	
	Max.	Min.	Mean	Max.	Min.	Rain	Snow	Total Precip.	Max.	Min.	Variability During Working Hours	Max Speed (km/h)	Prevail. Direct.
May 20, 2021	29.1	15.8	22.3	76	34	0.0	0.0	0.0	101.51	101.27	↓	17	NW
Aug. 25, 2021	32.6	18.3	25.3	97	42	0.0	0.0	0.0	100.46	100.2	↓	19	SW
Dec.16, 2021	15.2	-0.3	7.7	99	48	2.1	0.0	2.1	100.16	98.4	↓	41	S/SW

Notes: * Precipitation data obtained from the Experimental Farm in Ottawa (CDA RCS, climate ID 6105978)

Entered by: ETB
Checked by: RPM/YJM

Field observations from the Golder technician are provided in Tables 2 to 4 for hours while he was on-site.

The instrument used to detect and measure LFG concentrations during the various sampling events was a LANDTEC GEM-5000 Infrared Gas Analyzer.

The LANDTEC GEM-5000 is designed for analyzing LFG composition and calculating flow. It is a handheld device which can measure percentages of CH_4, CO_2, CO, H_2S and O_2, relative and atmospheric pressure. Methane and carbon dioxide concentrations are measured by infrared gas analyzer and oxygen is measured by the galvanic cell principle. The LANDTEC GEM-2000 Plus, which has historically been used at the site to measure LFG composition, can measure combustible methane Lower Explosive Limit (LEL, equivalent to 5 percent (%) by volume in air for methane gas). Since the LANDTEC GEM-2000 Plus is being phased out and replaced with the LANDTEC GEM-5000, the LEL for all locations were not reported during this monitoring year (see Tables 2 through 4). Interpretation related to LEL is therefore not possible for the 2021 results. Concentrations of CH_4 greater than 1.25% by volume are instead discussed in the next Section.

5.0 LANDFILL GAS FIELD MONITORING RESULTS

Results of the monitoring program undertaken in 2021 are presented in Table 2 for May, Table 3 for August and Table 4 for December. Non-Methane Organic Compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 1.25% at the following locations:

- MH-3 (G13a), MH-2 (G18a), MH-4 (G12a), and MH-5 (G11a)in August 2021
- MH-7 (G5a), MH-9 (G3a), and MH-10 (G2a) in December 2021.

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met at the WCC Navan Facility based on the 2021 monitoring results. Although no monitoring locations are available below surface at the property boundary, based on the discussion in Section 3.1 of this report it is anticipated that the WCC Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events, with the exception of the following locations, which reported a relatively low concentration (at the detection limit of 1 part per million or ppm):

MH-6 (G6a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), all in May 2021. During the May 2021 monitoring session, faint odours were noted at the site, while no odours were noted during the August and December monitoring sessions by the Golder field technician. As previously mentioned, gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2021, WCC personnel responded to one odour related complaint (received on October 14, 2021 from a resident west of the landfill).

6.0 ODOUR CONTROL

To ensure the WCC Navan Facility is operated in a manner that minimizes the impact from odour on the public and the natural environment, the following program is in place at the WCC Navan Facility to deal with odour issues.

6.1 Odour Monitoring

WCC has a comprehensive program for monitoring odours and for taking remedial action in the event that odours become at all problematic in the operation of the WCC Navan Facility. Any unusual odour events and any measures taken to deal with odour at the site are recorded and filed on-site.

There are no Ontario Government standards for odour. There are no agreed-upon, empirical measurement protocols or odour thresholds that may be used in the operation of a landfill or processing facility. Consequently, the ultimate test of an effective odour-control strategy for any facility can only be that it produces no odour complaints from the surrounding community over an extended period of operation. The operators of the facility need to take preventative and other control measures to ensure that odours never reach a threshold where they can generate complaints. The best odour monitoring program available is to give responsibility to all staff working at the site to use their own senses to constantly monitor for excessive levels of odour on-site. While some level of on-site odour is normal and acceptable, it can become a problem when these same odours register off the property. As well, the character of the odour is significant. Many 'aerobic' odours may be very inoffensive, even at a significant concentration, while even very low levels of the types of odour associated with anaerobic activity may be deeply offensive.

It is normal practice at the site to monitor odours in the following way. Every morning, when staff first arrives on the site, a general inspection is undertaken of the facility. While the site manager is looking for anything untoward, the presence of any odours likely to extend beyond the perimeter of the site will be of special concern. In addition, whenever any material at the site is being disturbed by the equipment used at the facility, staff on-site periodically stand downwind of the work that is being done and assure themselves that any odours being created are mild, indicative of fully aerobic activity, and are not likely to be carried off the property.

In the event that staff on-site believe any odours may have some potential for off-site impact, they will drive to a location off-site and downwind from the work at the facility to determine at that moment if any off-site impact can be detected. If there is a detectable off-site impact, work on the site will be stopped immediately and remedial measures will be taken (see below). If no off-site impacts are detectable, work at the site will proceed with caution, with further periodic inspections off-site. Remedial measures will again be taken as appropriate.

The key to this approach is that all staff are constantly vigilant for even mild odours produced on-site and will take actions to deal with those odours well before they become evident off-site.

A windsock and flag are installed on the site. This provides a strong visual reminder to site staff of existing wind conditions, such that they can make judgments as to the potential for off-site odours, given that day's planned activities.

No odour monitoring program is of much value unless there is a companion program to control those same odours, once they are detected. What follows is a stepped program, capable of dealing effectively with everything from the mildest odours to the most offensive. It should be noted that all of the measures described below can and are just as likely to be applied to only sections of a site, rather than to the entire site. The source of odour problems can commonly be quite localized.

6.2 Prevention

The best odour control strategy is odour prevention. If experienced staff early in the process makes the correct, preventative decisions, odour will not be an issue. Although mild odours are experienced on-site from time to time, they are mild in nature and should not be noticeable off-site.

A perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends below the water table. This drainage system has significantly reduced, if not eliminated, the potential for off-site migration of LFG.

Monitoring of methane gas at the landfill site is performed on three occasions per year generally during the spring, summer and late fall or winter. Results of the monitoring programs and interpretation of the data are presented in the annual Operations & Monitoring report.

A leachate pumping station has been constructed in the southeast corner of the landfill site and a forcemain connection to the municipal sewage treatment plant commenced in 2007. Presently, the disposal method of choice for leachate generated by the WCC Navan Facility is treatment at the Robert O. Pickard Environmental Centre, a wastewater treatment plant. The use of leachate retention ponds has been discontinued. This eliminates the possibility of odours emanating from on-site treatment and leachate retention ponds.

As discussed in Section 3.4, an interim LFG odour control system was installed in 2011 and commissioned in April 2012. The purpose of the interim LFG odour control system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical

LFG extraction wells. The system was extended in 2016, 2017, and 2019. In 2020, one horizontal well was added at the north-west corner of Phase 1. In 2021, a portion of the header pipe for the permanent landfill gas collection and treatment system was installed and construction of the structural pad and compound area for the new flare and extraction plant were completed. Commissioning of the new flare and extraction plant is expected in 2022.

6.3 Masking the Odour

Principally, these additional measures will consist of using physical, biological and/or chemical methods to mask the odours on the surface of the odour source, so that none of the odours contained within are released to the environment. A number of proven masking techniques are available and can be used at the discretion of the site manager:

- Physically covering the surface of the odour source with a 15 centimetre layer of bulking material is often enough to block the release of most odours for a period of a day or more while remedial work is done;
- A number of biological inoculants are available commercially. These substances, when applied to the surface in a water solution, are felt to effectively reinforce aggressive aerobic activity on the surface by out-competing any anaerobic colonies that may be present in the near surface area. In effect, this creates a bio-filter, and biologically processes anaerobic gases as they are released; and/or,
- A number of chemical/nutrient mixtures are also available commercially. These substances, when applied to the odour source in much the same manner used with the biological inoculants, can have a very similar or even stronger effect. Manufacturers of these products claim that their compounds rapidly stimulate the growth of one desirable family of microorganisms or another, again to create a bio-filter effect.

Whatever the actual mechanism, these products have been proven effective in the field. In all cases, odour control strategies used at this level can be applied within minutes of the decision to use them, and the effects will be largely felt within 10-15 minutes of that application, if not sooner.

6.4 Isolating an Odour Source

The last strategy will consist of using additional measures to isolate and neutralize the offending odour source material. The offensive material may be removed from the problem area, landfilled and covered immediately. This isolation strategy will be used at the discretion of the site manager.

6.5 Complaints Response

In the event that an odour complaint is received, either by the City of Ottawa or the MECP, it is expected that those parties will immediately contact WCC site staff and notify them of the problem. WCC staff will take immediate steps to determine the extent of the problem and whether or not it is caused by the facility. If the source of the odour is deemed to be originating from the WCC Navan Facility, appropriate measures as described above will be taken to mitigate the odour problem and to stop the detection of odours off-site. Again, all such measures taken will be documented and a record kept on-site. If the identity of the complainant is made known to WCC staff, staff will contact the complainant that day, listen to their description of the problem, advise them in detail of the measures taken to rectify the problem, and invite them to visit the facility at some point to see for themselves how the site is operated. WCC will also call them back in a week's time to determine whether or not they have been aware of any other odours at their location.

WCC staff has found in the past that this kind of immediate and personal attention goes a long way to building community support for a facility and builds community confidence in the management of the site.

7.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Waste Connections of Canada. The report, which specifically includes all tables and figures, is based on data and information collected by Golder Associates Ltd. and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder Associates Ltd. as described in this report.

Golder Associates Ltd. has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Air quality conditions may vary from these sampled locations.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

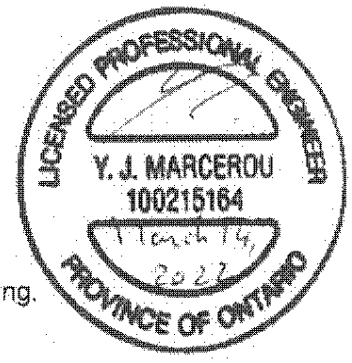
Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

Signature Page

We trust this report satisfies your current requirements. If you have any further questions regarding this report, please contact the undersigned.

Golder Associates Ltd.



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PARAMETER	November 29, 1994					June 13, 2002				
	MDL	MH-12	G.L. Q-7	MH-7	MH-0	MDL	Ambient (Parking)	Passive Vent F-4	MH-9	Pump Station
		SMP1	SMP2	SMP3	SMP4		SMP1	SMP2	SMP3	SMP4
Nitrogen, N_2 (%)	0.1	77	75	79	79	0.1	77.6	80.1	77.7	78.2
Oxygen, O_2 (%)	0.1	20	15	20	21	0.1	21.6	17.6	21.4	21.7
Carbon Dioxide,CO_2 (%)	0.1	1.8	7.8	1	ND	0.1	ND	1.5	0.3	ND
Methane, CH_4 (%)	0.1	0.7	3.8	0.6	ND	0.1	ND	ND	0.5	ND
Carbon Monoxide, CO (%)	0.1	ND	ND	ND	ND	0.1	ND	ND	ND	ND
Carbon Disulfide (PPM)	0.02	*	ND	-	-	0.04	ND	ND	ND	ND
Dimethyl Disulfide (PPM)	0.03	ND	ND	-	-	0.05	ND	ND	ND	ND
Ethyl Mercaptan / Dimethyl Sulfide (PPM)	0.03	0.4	ND	-	-	0.1	ND	ND	ND	ND
Hydrogen Sulfide / Carbonyl Sulfide (PPM)	0.02	120	0.4	-	-	0.05	ND	ND	ND	-
						2.1	-	-	-	2.2*
Methyl Mercaptan (PPM)	0.03	1	ND	-	-	0.05	ND	ND	ND	ND
Propyl Mercaptan / Ethyl Methyl Sulfide (PPM)	0.03	ND	ND	-	-	0.1	ND	ND	ND	ND
Sulfur Dioxide (PPM)	0.1	ND	ND	-	-	0.4	ND	ND	ND	ND
1,1,1-Trichloroethane (ppb)	0.2	0.1	ND	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene (ppb)	-	-	-	-	-	1	8	ND	9	ND
1,4-Dichlorobenzene	-	-	-	-	-	1	ND	5	6	<1
Benzene (ppb)	0.1	0.1	ND	-	-	1	ND	ND	ND	7
Cyclohexane (ppb)	0.1	0.1	0.1	-	-	-	-	-	-	-
Ethylbenzene (ppb)	-	-	-	-	-	1	ND	3	2	15
Hexane (ppb)	0.1	ND	0.2	-	-	-	-	-	-	-
m,p-Xylene (ppb)	-	-	-	-	-	2	ND	9	2	35
Naphthalene (ppb)	-	-	-	-	-	10	40	ND	48	ND
Other VOC parameters analysed (refer to lab report)	-	-	-	-	-		ND	ND	ND	ND
o-Xylene (ppb)	-	-	-	-	-	1	<1	4	3	11
Styrene (ppb)	-	-	-	-	-	1	11	5	3	6
Toluene (ppb)	0.1	0.7	0.1	-	-	1	15	29	19	170
Total VOCs - EPA 624 (ppb)		4.1	0.4	-	-	-	-	-	-	-
Total Volatile Organics (ppb)	-	-	-	-	-	0.1	0.43	0.24	0.46	0.51
Trichloroethene (ppb)	-	-	-	-	-	1	ND	ND	ND	7
Trichlorofluoromethane (ppb)	0.5	3.1	ND	-	-	-	-	-	-	-

MDL - Method Detection Limit
ND - Not Detected

Created by: BLB
Checked by: PLE

Table 2: Field Monitoring Results - May 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Spring Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.0	0.1	21.7	0	0	30.18	1022
		b	OW-95-8 Ambient Air	0.0	0.1	21.8	0	0	30.17	1022
	G2	a	MH-10	0.0	0.2	21.9	0	0	30.17	1022
		b	MH-10 Ambient Air	0.0	0.1	22.1	0	0	30.15	1021
	G3	a	MH-9	0.0	0.1	22.1	0	0	30.16	1021
		b	MH-9 Ambient Air	0.0	0.1	22.1	0	0	30.16	1021
	G4	a	MH-8	0.0	0.1	22.2	0	0	30.16	1021
		b	MH-8 Ambient Air	0.0	0.1	22.2	0	0	30.16	1021
	G5	a	MH-7	0.0	0.1	22.2	0	0	30.17	1022
		b	MH-7 Ambient Air	0.0	0.1	22.2	0	0	30.16	1021
	G6	a	MH-6	0.2	1.4	19.7	1	1	30.1	1019
		b	MH-6 Ambient Air	0.0	0.1	20.3	1	0	30.1	1019
	G7		OW-94-1	0.0	0.2	20.2	0	0	30.1	1019
	G8		OW-94-2	0.0	0.2	20.1	1	1	30.1	1019
	G9		05-R3	0.0	0.5	20.2	0	0	30.1	1019
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.1	20.2	0	0	30.1	1019
	G11	a	MH-5	0.0	0.7	20.0	8	0	30.1	1019
		b	MH-5 Ambient Air	0.0	0.1	20.0	9	0	30.1	1019
	G12	a	MH-4	0.7	0.8	20.6	0	0	30.19	1022
		b	MH-4 Ambient Air	0.0	0.1	20.9	0	0	30.19	1022
	G13	a	MH-3	0.9	1.8	19.9	0	0	30.2	1023
		b	MH-3 Ambient Air	0.0	0.1	20.9	0	0	30.19	1022
	G14		OW-92-7	0.0	0.1	20.8	0	0	30.2	1023
	G15		OW-92-8	0.0	0.3	20.5	0	1	30.2	1023
	G16		05-8	0.3	0.0	20.7	0	0	30.2	1023
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.1	20.8	0	0	30.2	1023
	G18	a	MH-2	0.0	0.9	20.5	3	0	30.21	1023
		b	MH-2 Ambient Air	0.0	0.1	20.8	4	0	30.14	1021
	G19	a	MH-1	Sealed						
		b	MH-1 Ambient Air	0.0	0.1	20.6	0	0	30.19	1022
	G20		05-11	0.0	0.4	20.3	0	0	30.21	1023
	G21		OW-92-9	0.0	0.1	20.5	1	0	30.21	1023
	G22		OW-92-10	0.0	0.2	20.4	0	0	30.21	1023
	G23		OW-92-11	0.0	0.6	19.6	0	0	30.2	1023
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.1	20.6	0	0	30.19	1022
	G25	a	Pump House Ambient	0.0	0.1	20.5	2	0	30.21	1023
		b	Air Vent Along Pump House	0.0	0.1	21.3	0	0	30.21	1023
		c	pump House (inside)	0.0	0.1	21.4	0	0	30.22	1023
	G26	a	Wet Well MH	0.0	0.1	21.3	0	0	30.21	1023
		b	Blower Shed	0.0	0.1	21.4	0	0	30	1023
		c	Sea can (blue trailer - inside)	0.0	0.1	21.4	0	0	30.21	1023
		d	Primary Tank #1	0.0	1.6	25.0	0	1	30.21	1023
		e	Primary Tank #2	N/A						
		f	Secondary Tank #1	0.0	0.2	22.2	0	0	30.22	1023
		g	Secondary Tank #2	0.0	0.3	22.2	0	0	30.21	1023
		i	Collector MH	0.0	0.8	22.1	0	0	30	1023
	G27		Grid Line (R-19)	0.0	0.1	22.5	0	0	30.19	1022
	G81	a	Pipeline Ambient Air	0.0	0.1	22.0	0	0	30.17	1022
		b	Pipeline Clean Out	0.0	0.1	22.0	0	0	30.17	1022
	G82	a	Pipeline Clean Out	0.0	0.1	22.2	0	0	30.17	1022
		b	Pipeline Ambient Air	0.0	0.1	22.2	0	0	30.15	1021
	G83	a	Pipeline Ambient Air	0.0	0.1	22.2	0	0	30.15	1021
		b	Pipeline Clean Out MH	Sealed						
	G84	a	Tank Truck loading station MH	0.0	0.1	22.1	0	0	30.17	1022
		b	Ambient Air Tank Truck loading station MH	0.0	0.1	22.1	0	0	30.16	1021
	G98	a	MH-0	0.0	0.1	22.2	0	0	30.15	1021
		b	MH-0 - Ambient Air	0.0	0.1	22.2	0	0	20.14	682
OFFICE BUILDING AREA	G26	a	Garage	0.0	0.1	20.9	1	0	30.1	1019
		b	Garage (outdoors)	0.0	0.2	20.9	1	0	30.1	1019
	G27		Lunch Room	0.0	0.2	21.0	0	0	30.1	1019
	G31	g	Gate Clerk	Removed						
		c	New Scale (outside)	0.0	0.1	20.8	1	0	30.1	1019
		f	New Gate Clerk (Inside)	0.0	0.1	20.8	1	0	30.1	1019
	G32		Henri's Office	0.0	0.2	21.0	0	0	30.1	1019
	G34		OW-92-18	0.1	0.2	21.1	0	0	30.1	1019
	G35		OW-92-19	0.0	0.2	21.0	0	0	30.1	1019
	G36		Ambient Air (OW92-18, 92-19)	0.0	0.1	21.2	1	0	30.1	1019
	G100		Small Vehicle Drop-Off Area	0.0	0.2	20.5	1	0	30.1	1019

Table 2: Field Monitoring Results - May 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Spring Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
AIR VENTS	G89	a	Passive Air Vent	0.0	0.1	21.9	0	0	30.17	1022
		b	Ambient Air	0.0	0.1	21.9	0	0	30.15	1021
	G90	a	New Passive Air Vent	Could not locate - may have been destroyed						
		b	Ambient Air							
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.1	22.1	0	0	30.14	1021
		c	Manhole	Sealed						
	G102	a	Passive Air Vent	0.0	0.1	22.1	0	0	30.16	1021
		c	Passive Air Vent - Ambient Air	0.0	0.1	22.1	0	0	30.17	1022
FORMER COMPOST AREA	G52		Compost Area East Side	0.0	0.1	22.0	0	0	30.16	1021
	G53		Compost Area North Side	0.0	0.1	22.1	0	0	30.15	1021
	G54		Compost Area South Side	0.0	0.1	22.1	0	0	30.15	1021
	G55		Compost Area West Side	0.0	0.1	22.1	0	0	30.15	1021
AMBIENT AIR COLLECTOR PIPES	G58	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.1	0.1	27.3	0	0	30.11	1020
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.1	0.1	23.3	0	0	30.11	1020
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	0.1	0.1	23.3	0	0	30.11	1020
	G62	a	Pipe E-10	Sealed						
		c	Ambient Air Collector Pipe E-10	0.0	0.1	23.2	0	0	30.11	1020
	G63	a	Pipe E-11	Sealed						
		c	Ambient Air Collector Pipe E-11	0.0	0.1	23.1	0	0	30.11	1020
EAST AND NORTH FACES	G85	a	E-12 Ambient Air	0.0	0.1	22.1	0	0	30.11	1020
		b	E-12 Passive Air Vent	Sealed						
	G86	a	E-13 Ambient Air	0.0	0.1	23.1	0	0	30.11	1020
		b	E-13 Passive Air Vent	Sealed						
	G91	a	G-17 Ambient Air	N/A						
		b	G-17 Passive Air Vent	Part of new landfill cell						
	G200	a	D/E-14 Ambient Air	0.0	0.1	23.0	0	0	30.11	1020
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.1	22.9	0	0	30.11	1020
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	0.0	0.1	22.9	0	0	30.11	1020
		b	D-15/16 Passive Air Vent	Sealed						
	G203		Pipe Cleanout	0.0	0.1	20.6	1	0	30.1	1019
	G204		Pipe Cleanout	0.0	0.1	20.6	1	0	30.1	1019
	G205		Pipe Cleanout	0.0	0.1	20.6	0	0	30.1	1019
	G206		Pipe Cleanout	0.0	0.1	20.5	0	0	30.1	1019
	G207		Pipe Cleanout	0.0	0.1	20.5	1	0	30.1	1019
	G208		Pipe Cleanout	0.0	0.1	20.4	1	0	30.1	1019
CENTRE AREA / MISCELLANEOUS	G64		New Recycling Area	0.0	0.1	22.1	0	0	30.14	1021
	G65		Cont. Soil @ O-16	0.0	0.1	23.2	0	0	30.13	1020
	G66		Cont. Soil @ M-6	0.0	0.1	22.0	0	0	30.15	1021
	G67	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.1	22.1	0	0	30.13	1020
	G68		Active Face (location=K-17)	0.0	0.1	22.5	0	0	30.10	1019
	G69		Recycling Area (old)	0.0	0.1	22.1	0	0	30.13	1020
	G70		Grid Line Location G-2	0.0	0.1	21.7	0	0	30.15	1021
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.1	23.2	0	0	30.11	1020
	G74		NEAR MONTE BLUE	0.0	0.2	22.7	0	0	30.11	1020
NAVAN ROAD	G75		3516 Navan Road	0.0	0.2	22.5	0	0	30.11	1020
	G76		3546 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G77		Between 3550 and 3588 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G78		3602 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G79		3626 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G80		3650 Navan Road	0.0	0.1	22.7	0	0	30.11	1020
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	30.14	1021
	GW-2		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	30.15	1021
	GW-3		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	30.10	1019
	GW-4		Gas Extraction Well - Ambient Air	0.0	0.1	22.2	0	0	30.10	1019

Notes

The day was: here during the ✓ morning; ✓ afternoon
Temperatures ranged from: 20 to 29 degrees Celsius.
Winds were from: ✓ North; ___East; ___ West; ___ South and ✓ Mild; ___Moderate; ___Strong
Odours were: ___ not noticeable; ✓ faint but noticeable; __ moderate but not offensive; _ strong

Prepared by: ETB
Checked by: RPM

Date: May 20, 2021

https://golderassociates.sharepoint.com/sites/15462/Project Files/6 Deliverables/1000 2021 AMR/RPT 02 - LFG Monitoring/Tables/LFG monitoring data_2021

Table 3: Field Monitoring Results - August 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Summer Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.0	0.2	20.9	1	0	29.77	1008
		b	OW-95-8 Ambient Air	0.0	0.0	21.1	1	0	29.77	1008
	G2	a	MH-10	1.1	1.3	20.2	0	0	29.77	1008
		b	MH-10 Ambient Air	0.0	0.0	21.1	0	0	29.77	1008
	G3	a	MH-9	0.4	0.3	20.9	1	0	29.77	1008
		b	MH-9 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
	G4	a	MH-8	0.4	0.3	21.1	0	0	29.77	1008
		b	MH-8 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
	G5	a	MH-7	0.0	0.1	21.2	1	0	29.77	1008
		b	MH-7 Ambient Air	0.0	0.0	21.3	1	0	29.77	1008
	G6	a	MH-6	0.1	1.8	19.8	0	0	29.77	1008
		b	MH-6 Ambient Air	0.0	0.1	20.9	0	0	29.77	1008
	G7		OW-94-1	0.0	0.5	20.6	1	0	29.77	1008
	G8		OW-94-2	0.0	0.4	20.6	1	0	29.77	1008
	G9		05-R3	0.0	1.2	20.9	1	0	29.77	1008
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.1	20.8	1	0	29.77	1008
	G11	a	MH-5	6.9	9.4	15.7	1	0	29.77	1008
		b	MH-5 Ambient Air	0.0	0.1	20.8	0	0	29.77	1008
	G12	a	MH-4	1.7	1.6	20.2	0	0	29.77	1008
		b	MH-4 Ambient Air	0.0	0.1	20.8	1	0	29.77	1008
	G13	a	MH-3	17.8	10.8	15.8	1	0	29.77	1008
		b	MH-3 Ambient Air	0.0	0.1	20.9	1	0	29.77	1008
	G14		OW-92-7	0.0	0.1	20.9	1	0	29.77	1008
	G15		OW-92-8	0.9	2.2	20.2	0	0	29.77	1008
	G16		05-6	0.1	0.4	20.8	1	0	29.77	1008
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.1	20.9	1	0	29.77	1008
	G18	a	MH-2	9.5	7.2	17.0	1	0	29.77	1008
		b	MH-2 Ambient Air	0.0	0.1	20.9	1	0	29.77	1008
	G19	a	MH-1 (sealed)	Sealed						
		b	MH-1 Ambient Air	0.0	0.1	21.0	0	0	29.77	1008
	G20		05-11	0.0	1.3	20.4	1	0	29.77	1008
	G21		OW-92-9	0.0	0.5	20.4	1	0	29.77	1008
	G22		OW-92-10	0.0	0.3	20.6	1	0	29.77	1008
	G23		OW-92-11	0.0	2.6	20.9	1	0	29.77	1008
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.0	20.9	1	0	29.77	1008
	G25	a	Pump House Ambient	0.0	0.0	20.8	1	0	29.77	1008
		b	Air Vent Along Pump House	0.0	0.0	20.8	1	0	29.77	1008
		c	pump House (inside)	0.0	0.0	20.9	1	0	29.77	1008
	G26	a	Wet Well MH	0.0	0.5	20.8	1	0	29.77	1008
		b	Blower Shed	0.0	0.0	20.8	1	0	29.77	1008
		c	Sea can (blue trailer - inside)	0.0	0.0	20.9	0	0	29.77	1008
		d	Primary Tank #1	0.0	3.0	20.5	1	0	29.77	1008
		e	Primary Tank #2	0.0	2.3	20.6	2	0	29.77	1008
		f	Secondary Tank #1	0.0	0.3	20.8	2	0	29.77	1008
		g	Secondary Tank #2	0.0	0.3	20.8	2	0	29.77	1008
		i	Collector MH	0.1	0.4	20.7	1	0	29.77	1008
	G27		Grid Line (R-19)	0.0	0.0	20.9	1	0	29.77	1008
	G31	a	Pipeline Ambient Air	0.0	0.0	21.1	0	0	29.77	1008
		b	Pipeline Clean Out	0.0	0.0	21.1	0	0	29.77	1008
	G32	a	Pipeline Clean Out	0.0	0.0	21.2	1	0	29.77	1008
		b	Pipeline Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
	G33	a	Pipeline Ambient Air	Not found						
		b	Pipeline Clean Out MH	Not found						
	G34	a	Tank Truck loading station MH	0.0	0.0	21.3	1	0	29.77	1008
		b	Ambient Air Tank Truck loading station MH	0.0	0.0	20.8	1	0	29.77	1008
	G98	a	MH-0	0.0	0.1	21.7	1	0	29.77	1008
		b	MH-0 Ambient Air	0.0	0.0	21.8	1	0	29.77	1008
OFFICE/BUILDING AREA	G28	a	Garage	0.0	0.1	20.9	1	0	29.77	1008
		b	Garage (outdoors)	0.0	0.1	20.7	1	0	29.77	1008
	G29		Lunch Room	0.0	0.1	20.9	1	0	29.77	1008
	G31	a	Gate Clerk	Removed						
		b	New Scale (outside)	0.0	0.1	20.9	0	0	29.77	1008
		c	New Gate Clerk (Inside)	0.0	0.1	20.9	1	0	29.77	1008
	G32		Henri's Office	0.0	0.1	20.9	1	0	29.77	1008
	G34		OW-92-18	0.0	0.1	21.1	1	0	29.77	1008
	G35		OW-92-19	0.0	0.2	21.0	1	0	29.77	1008
	G36		Ambient Air (OW92-18, 92-19)	0.0	0.1	21.2	1	0	29.77	1008
	G100		Small Vehicle Drop-Off Area	0.0	0.1	20.9	1	0	29.77	1008

Table 3: Field Monitoring Results - August 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Summer Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
AIR VENTS	G99	a	Passive Air Vent	0.0	0.0	21.1	1	0	29.77	1008
		b	Ambient Air	0.0	0.0	21.1	1	0	29.77	1008
	G98	a	New Passive Air Vent	0.0	0.0	21.5	1	0	29.77	1008
		b	Ambient Air	0.0	0.0	21.8	0	0	29.77	1008
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.0	21.3	1	0	29.77	1008
		b	Manhole	Sealed						
	G102	a	Passive Air Vent	No passive air vent						
		b	Passive Air Vent - Ambient Air	0.0	0	21.4	1	0	29.77	1008
FORMER COMPOST AREA	G62		Compost Area East Side	0.0	0.0	21.4	0	0	29.77	1008
	G63		Compost Area North Side	0.0	0.0	21.4	1	0	29.77	1008
	G64		Compost Area South Side	0.0	0.0	21.4	1	0	29.77	1008
	G65		Compost Area West Side	0.0	0.0	21.4	1	0	29.77	1008
AMBIENT AIR COLLECTOR PIPES	G59	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.0	0.0	21.3	1	0	29.77	1008
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.0	0.0	21.3	1	0	29.77	1008
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	Not found						
	G62	a	Pipe E-10	Sealed						
		b	Ambient Air Collector Pipe E-10	0.0	0.0	21.3	1	0	29.77	1008
	G63	a	Pipe E-11	Sealed						
		b	Ambient Air Collector Pipe E-11	0.0	0.0	21.3	1	0	29.77	1008
EAST AND NORTH FACES	G95	a	E-12 Ambient Air	Not found						
		b	E-12 Passive Air Vent	Sealed						
	G96	a	E-13 Ambient Air	Not found						
		b	E-13 Passive Air Vent	Sealed						
	G91	a	G-17 Ambient Air	Part of new landfill cell						
		b	G-17 Passive Air Vent							
	G200	a	D/E-14 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	Inadvertently missed during this monitoring session.						
		b	D-15/16 Passive Air Vent	Sealed						
	G203		Pipe Cleanout	No longer present						
	G204		Pipe Cleanout							
	G205		Pipe Cleanout							
	G206		Pipe Cleanout							
	G207		Pipe Cleanout							
	G208		Pipe Cleanout							
CENTRE AREA - MISCELLANEOUS	G92		New Recycling Area	0.0	0.1	21.2	1	0	29.77	1008
	G66		Cont. Soil @ L-16	0.0	0.0	21.4	1	0	29.77	1008
	G68		Cont. Soil @ M-6	0.0	0.0	21.3	1	0	29.77	1008
	G97	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.0	21.4	1	0	29.77	1008
	G69		Active Face (location=JK-20/21)	0.0	0.0	21.6	1	0	29.77	1008
	G09		Recycling Area (old)	0.0	0.0	21.4	0	0	29.77	1008
	G70		Grid Line Location G-2	0.0	0.0	21.0	1	0	29.77	1008
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.0	21.5	1	0	29.78	1008
	G74		NEAR MONTE BLUE	0.0	0.0	21.3	1	0	29.78	1008
NAVAN ROAD	G75		3518 Navan Road	0.0	0.1	21.1	0	0	29.78	1008
	G76		3546 Navan Road	0.0	0.0	21.2	0	0	29.78	1008
	G77		Between 3550 and 3588 Navan Road	0.0	0.0	21.2	1	0	29.78	1008
	G78		3602 Navan Road	0.0	0.0	21.2	0	0	29.78	1008
	G79		3626 Navan Road	0.0	0.0	21.2	1	0	29.78	1008
	G80		3650 Navan Road	0.0	0.1	21.2	1	0	29.78	1008
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.0	21.4	0	0	29.77	1008
	GW-2		Gas Extraction Well - Ambient Air	0.0	0.0	21.4	1	0	29.77	1008
	GW-3		Gas Extraction Well	0.0	0.0	21.5	1	0	29.77	1008
	GW-4		Ambient Air	0.0	0.0	21.5	1	0	29.77	1008

Notes:	The day was:	__overcast; ✓ sunny; ___ cloudy; __ wet; during the ✓morning; ✓afternoon
	Temperatures ranged from:	18 to 32 degrees Celsius
	Winds were from the:	___North; ___ East; ✓ West; ✓ South and: ✓ Mild; __ Moderate; __ Strong
	Odours were:	✓ not noticeable; faint but noticeable; __ moderate but not offensive; ___ strong.
	Date: August 25, 2021	Prepared by: ETB Checked by: RPM

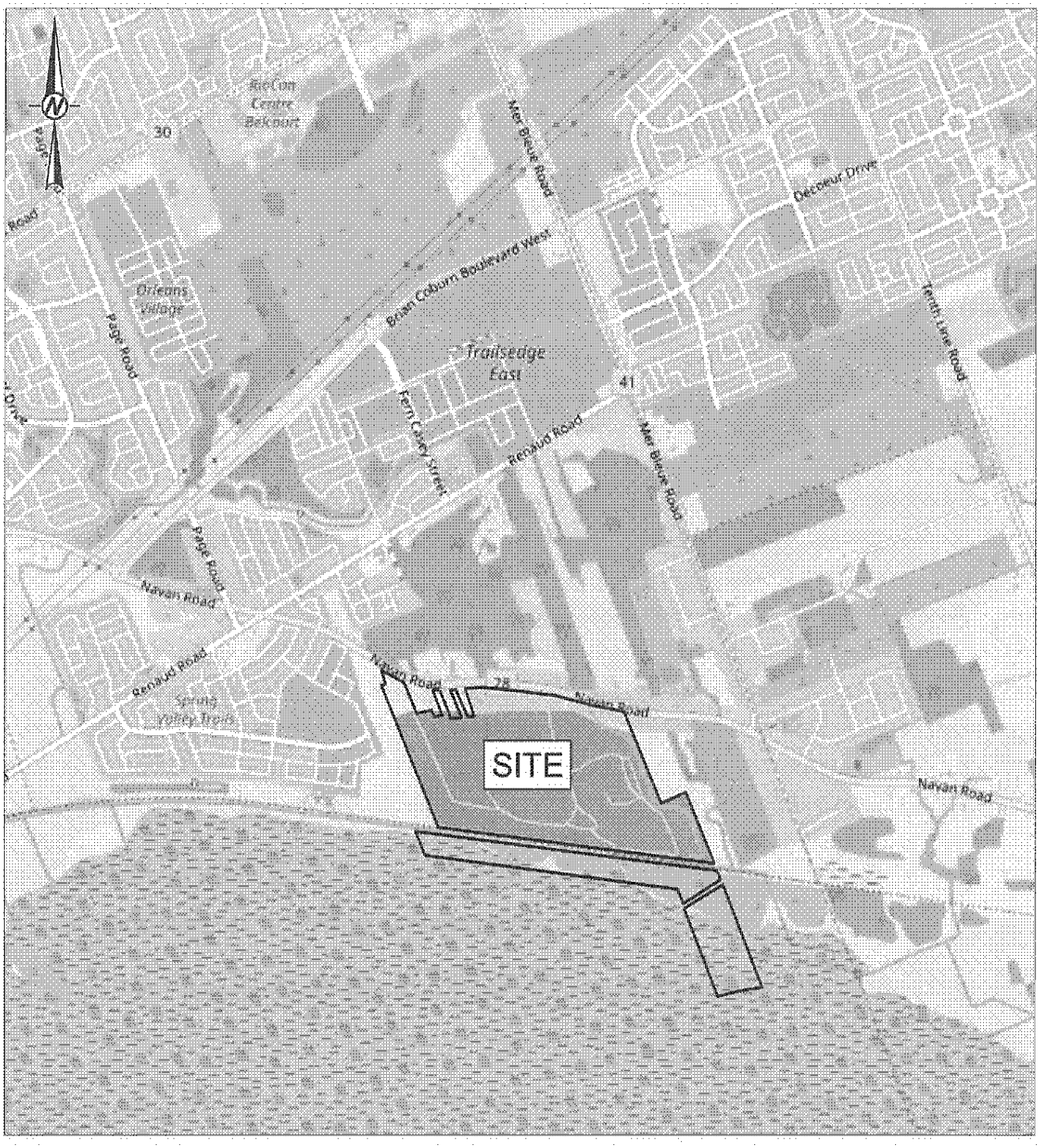
Table 4: Field Monitoring Results - December 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Winter Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.0	0.2	22.2	0	0	29.47	998
		b	OW-95-8 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G2	a	MH-10	2.1	1.3	21.4	0	0	29.47	998
		b	MH-10 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G3	a	MH-9	3.8	2.2	21.8	0	0	29.47	998
		b	MH-9 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G4	a	MH-8	0.0	0.1	22.3	0	0	29.47	998
		b	MH-8 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G5	a	MH-7	2.1	1.5	21.6	0	0	29.47	998
		b	MH-7 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G6	a	MH-6	0.0	0.6	22.2	0	0	29.47	998
		b	MH-6 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G7		OW-94-1	0.0	0.2	22.2	0	0	29.47	998
	G8		OW-94-2	0.0	0.4	22.2	1	0	29.47	998
	G9		05-R3	0.0	0.7	22.3	0	0	29.47	998
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.1	22.3	0	0	29.47	998
	G11	a	MH-5	0.0	0.2	22.3	0	0	29.47	998
		b	MH-5 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G12	a	MH-4	0.0	0.2	22.3	0	0	29.47	998
		b	MH-4 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G13	a	MH-3	0.1	0.8	22.2	0	0	29.47	998
		b	MH-3 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G14		OW-92-7	0.0	0.2	22.2	0	0	29.47	998
	G15		OW-92-8	0.1	9.7	21.1	0	0	29.47	998
	G16		05-8	0.0	0.2	22.2	0	0	29.47	998
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.1	22.3	0	0	29.47	998
	G18	a	MH-2	0.0	0.2	22.3	0	0	29.47	998
		b	MH-2 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G19	a	MH-1 (sealed)	Sealed						
		b	MH-1 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G20		05-11	0.0	0.5	22.2	0	0	29.47	998
	G21		OW-92-9	0.1	0.4	22.2	0	0	29.47	998
	G22		OW-92-10	0.0	0.8	22.2	0	0	29.47	998
	G23		OW-92-11	0.0	1.3	22.2	0	0	29.47	998
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.1	22.2	0	0	29.47	998
	G25	a	Pump House Ambient	0.0	0.1	22.3	0	0	29.47	998
		b	Air Vent Along Pump House	0.0	0.1	22.2	0	0	29.47	998
		c	pump House (inside)	0.0	0.1	22.3	0	0	29.47	998
	G26	a	Wet Well MH	0.0	0.1	22.3	0	0	29.47	998
		b	Blower Shed	0.0	0.1	22.3	0	0	29.47	998
		c	Sea can (blue trailer - inside)	0.0	0.1	22.3	0	0	29.47	998
		d	Primary Tank #1	0.0	0.2	22.2	1	0	29.47	998
		e	Primary Tank #2	0.0	0.2	22.2	0	0	29.47	998
		f	Secondary Tank #1	0.0	0.2	22.2	0	0	29.47	998
		g	Secondary Tank #2	0.0	0.2	22.2	0	0	29.47	998
		i	Collector MH	0.0	0.1	22.3	0	0	29.47	998
	G27		Grid Line (R-19)	0.0	0.1	22.3	0	0	29.47	998
	G81	a	Pipeline Ambient Air	0.0	0.1	22.2	0	0	29.47	998
		b	Pipeline Clean Out	0.0	0.1	22.2	0	0	29.47	998
	G82	a	Pipeline Clean Out	0.0	0.1	22.2	0	0	29.47	998
		b	Pipeline Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G83	a	Pipeline Ambient Air	0.0	0.1	21.7	0	0	29.47	998
		b	Pipeline Clean Out MH	Sealed						
	G84	a	Tank Truck loading station MH	0.1	0.2	21.7	0	0	29.47	998
		b	Ambient Air Tank Truck loading station MH	0.0	0.1	21.8	0	0	29.47	998
	G98	a	MH-0	Sealed						
		b	MH-0 Ambient Air	0.0	0.1	21.7	0	0	29.47	998
OFFICE/BUILDING AREA	G28	a	Garage	0.0	0.1	22.0	0	0	29.47	998
		b	Garage (outdoors)	0.0	0.1	22.0	0	0	29.47	998
	G29		Lunch Room	0.0	0.2	22.0	0	0	29.47	998
	G31	a	Gate Clerk	Removed						
		b	New Scale (outside)	0.0	0.1	22.0	0	0	29.47	998
		c	New Gate Clerk (Inside)	0.0	0.1	22.0	0	0	29.47	998
	G32		Henri's Office	0.0	0.2	22.0	0	0	29.47	998
	G34		OW-92-18	0.0	0.1	22.0	0	0	29.47	998
	G35		OW-92-19	0.1	3.0	21.8	0	0	29.47	998
	G36		Ambient Air (OW92-18, 92-19)	0.1	0.1	22.0	0	0	29.47	998
	G100		Small Vehicle Drop-Off Area	0.0	0.1	22.0	0	0	29.47	998

Table 4: Field Monitoring Results - December 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Winter Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
AIR VENTS	G39	a	Passive Air Vent	0.0	0.1	22.1	0	0	29.47	998
		b	Ambient Air	0.0	0.1	22.1	0	0	29.47	998
	G56	a	New Passive Air Vent	0.0	0.1	21.7	0	0	29.47	998
		b	Ambient Air	0.0	0.1	21.7	0	0	29.47	998
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.1	22.9	0	0	29.47	998
		b	Manhole	Sealed						
	G102	a	Passive Air Vent	0.0	0.1	21.8	0	0	29.47	998
		b	Passive Air Vent - Ambient Air	0.0	0.1	21.8	0	0	29.47	998
FORMER COMPOST AREA	G52		Compost Area East Side	0.0	0.1	21.8	0	0	29.47	998
	G53		Compost Area North Side	0.0	0.1	21.8	0	0	29.47	998
	G54		Compost Area South Side	0.0	0.1	21.9	0	0	29.47	998
	G55		Compost Area West Side	0.0	0.1	21.8	0	0	29.47	998
AMBIENT AIR COLLECTOR PIPES	G59	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.0	0.1	21.7	0	0	29.47	998
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.0	0.1	21.7	0	0	29.47	998
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	0.0	0.1	21.6	0	0	29.47	998
	G62	a	Pipe E-10	Sealed						
		b	Ambient Air Collector Pipe E-10	0.0	0.1	21.5	0	0	29.47	998
	G63	a	Pipe E-11	Sealed						
		b	Ambient Air Collector Pipe E-11	0.0	0.1	21.5	0	0	29.47	998
EAST AND NORTH FACES	G85	a	E-12 Ambient Air	0.0	0.1	21.4	0	0	29.47	998
		b	E-12 Passive Air Vent	Sealed						
	G86	a	E-13 Ambient Air	0.0	0.1	21.4	0	0	29.47	998
		b	E-13 Passive Air Vent	Sealed						
	G91	a	G-17 Ambient Air	0.0	0.1	21.3	0	0	29.47	998
		b	G-17 Passive Air Vent	Part of new landfill cell						
	G200	a	D/E-14 Ambient Air	0.0	0.1	21.3	0	0	29.47	998
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.1	21.2	0	0	29.47	998
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	Abandoned Well						
		b	D-15/16 Passive Air Vent							
	G203		Pipe Cleanout	0.0	0.1	22.2	0	0	29.47	998
	G204		Pipe Cleanout	0.0	0.1	22.1	0	0	29.47	998
	G205		Pipe Cleanout	0.0	0.1	22.1	0	0	29.47	998
	G206		Pipe Cleanout	0.0	0.1	22.0	0	0	29.47	998
	G207		Pipe Cleanout	0.0	0.1	22.0	0	0	29.47	998
	G208		Pipe Cleanout	0.0	0.1	22.0	0	0	29.47	998
CENTRE AREA - MISCELLANEOUS	G84		New Recycling Area	0.0	0.1	22.1	0	0	29.47	998
	G85		Cont. Soil @ L-16	0.0	0.1	21.8	0	0	29.47	998
	G86		Cont. Soil @ M-6	0.0	0.1	22.0	0	0	29.47	998
	G87	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.1	22.0	0	0	29.47	998
	G88		Active Face (location=G19)	0.0	0.1	22.4	0	0	29.47	998
	G89		Recycling Area (old)	0.0	0.1	22.2	0	0	29.47	998
	G70		Grid Line Location G-2	0.0	0.1	22.1	0	0	29.47	998
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.1	21.6	0	0	29.47	998
	G74		NEAR MONTE BLUE	0.0	0.1	21.8	0	0	29.47	998
NAVAN ROAD	G75		3516 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G76		3546 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G77		Between 3550 and 3588 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G78		3602 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G79		3626 Navan Road	0.0	0.1	21.8	0	0	29.47	998
	G80		3650 Navan Road	0.0	0.1	21.8	0	0	29.47	998
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.1	22.0	0	0	29.47	998
	GW-2		Gas Extraction Well - Ambient Air	Location was inadvertently missed in monitoring session						
	GW-3		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	29.47	998
	GW-4		Ambient Air	0.0	0.1	22.0	0	0	29.47	998

Notes:	The day was:	✓overcast; ✓sunny; __cloudy; __wet; during the ✓morning; ✓afternoon
	Temperatures ranged from:	3 to 15 degrees Celsius
	Winds were from the:	__North; __East; ✓West; ✓South and: __Mild; ✓Moderate; ✓Strong
	Odours were:	✓ not noticeable; __faint but noticeable; __ moderate but not offensive; strong
		Prepared by: ETB
	Date: December 15, 2021	Checked by: RPM



WASTE CONNECTIONS OF CANADA

0 500 1,000
1:25,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

CLIENT
WASTE CONNECTIONS OF CANADA

PROJECT
REPORT ON 2021 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-01-05
DESIGNED	YJM
PREPARED	ABD
REVIEWED	YJM
APPROVED	PLE

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
21497772	0001	0	1

25 mm

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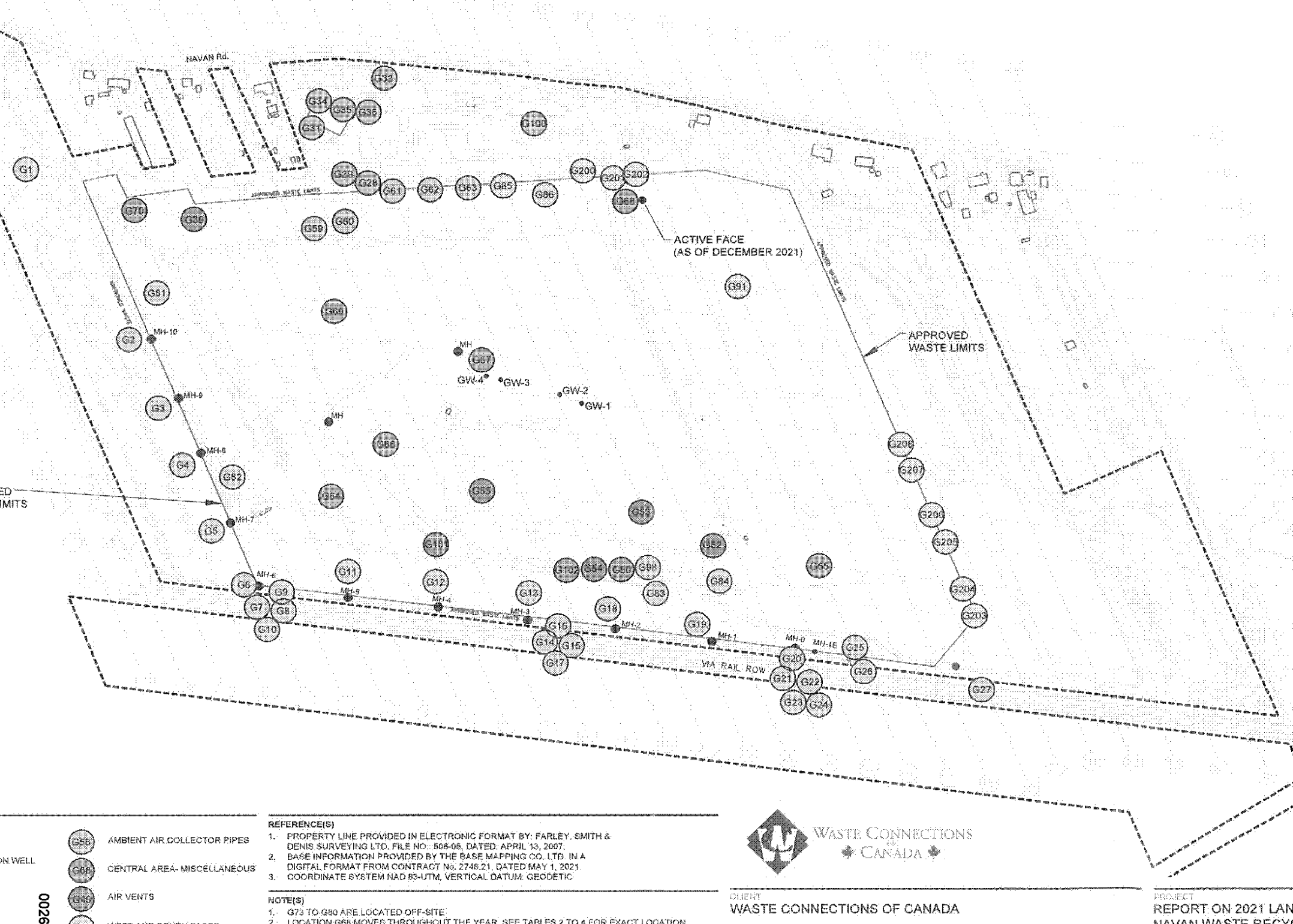

G56 AMBIENT AIR COLLECTOR PIPES

G68 CENTRAL AREA- MISCELLANEOUS

G45 AIR VENTS

G5 WEST AND SOUTH FACES

G30 OFFICE/BUILDING AREA

002661

REFERENCE(S)

1. PROPERTY LINE PROVIDED IN ELECTRONIC FORMAT BY: FARLEY, SMITH & DENIS SURVEYING LTD., FILE NO.: 506-05, DATED: APRIL 13, 2007.
2. BASE INFORMATION PROVIDED BY THE BASE MAPPING CO. LTD. IN A DIGITAL FORMAT FROM CONTRACT No. 2748.21, DATED MAY 1, 2021.
3. COORDINATE SYSTEM NAD 83-UTM, VERTICAL DATUM: GEODETIC

NOTE(S)

1. G73 TO G80 ARE LOCATED OFF-SITE.
2. LOCATION G68 MOVES THROUGHOUT THE YEAR, SEE TABLES 2 TO 4 FOR EXACT LOCATION

WASTE CONNECTIONS OF CANADA

CLIENT
WASTE CONNECTIONS OF CANADA

PROJECT
REPORT ON 2021 LAN
NAVAN WASTE RECY
3354 NAVAN ROAD, O

DESIGN & DRAFT

YYYY-MM-DD 2022-01-05

TITLE

APPENDIX A

2009 Landfill Gas Characterization

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Re-[illegible] Gas
			QRAE	GEM-2000			QRAE	GEM-2000			
MH-6 (tubing inside manhole)	0.1	1.1	20.5	22.6	2	0	3	1	984	76.2	
hole MH-6 (ambient air)	0.0	0.1	20.9	22.1	0	0	0	0	984	77.8	
MH-5 (tubing inside manhole)	0.1	1.1	20.9	22.1	2	0	3	0	984	76.7	
hole MH-5 (ambient air)	0.0	0.1	20.5	21.6	0	0	0	0	984	78.3	
MH-4 (tubing inside manhole)	0.9	2.3	19.5	20.7	1	0	21	18	985	76.1	
hole MH-4 (ambient air)	0.0	0.1	20.7	22.1	1	0	0	0	984	77.8	
MH-3 (tubing inside manhole)	0.1	0.7	20.5	21.7	0	0	0	2	984	77.5	
hole MH-3 (ambient air)	0.1	0.1	20.9	22.3	0	0	0	0	984	77.5	
MH-2 (tubing inside manhole)	0.7	0.9	20.4	21.9	1	0	30	0	984	76.5	
hole MH-2 (ambient air)	0.0	0.0	20.9	22.2	0	0	0	0	984	77.8	
MH-1 (tubing inside manhole)	10.7	8.2	17.5	18.0	0	0	>100	>60	984	63.1	
hole MH-1 (ambient air)	0.0	0.0	20.9	22.3	0	0	0	0	984	77.7	
anout E-12 (ambient air)	0.1	0.1	20.9	22.3	0	0	2	1	983	77.5	
E-12 (tubing inside cleanout)	53.5	47.3	2.2	0.2	39	169	43	>60	983	-1.0	
anout E-13 (ambient air)	0.0	0.1	20.9	22.4	0	0	0	0	983	77.5	
E-13 (tubing inside cleanout)	55.0	48.2	20.9*	0.5	7	161	>100	>60	983	-3.7	
anout I-17 (ambient air)	0.0	0.1	20.9	22.4	0	0	0	0	984	77.5	
I-17 (tubing inside cleanout)	0.8	3.6	17.8	18.5	0	0	32	16	983	77.1	
anout K-17 (ambient air)	0.0	0.0	20.9	22.4	0	0	0	0	984	77.6	
K-17 (tubing inside cleanout)	48.7	34.3	5.7	2.8	12	15	>100	>60	983	14.2	
anout L-17 (ambient air)	0.0	0.0	20.9	22.4	0	0	0	0	983	77.6	
L-17 (tubing inside cleanout)	20.4	20.1	11.4	11.1	2	0	>100	>60	983	48.4	
anout M-17 (ambient air)	0.0	0.0	20.9	22.5	0	0	0	0	983	77.5	
M-17 (tubing inside cleanout)	0*	0.0	18.0	19.0	0	168	>100	>60	983	81.0	
anout G-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	983	77.4	
G-17 (tubing inside cleanout)	0.2	0.4	20.3	22.1	0	0	5	3	984	77.3	
anout N-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	983	77.4	
N-17 (tubing inside cleanout)	N/A (monitoring location blocked/clogged)										
anout H-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	992	77.4	
H-17 (tubing inside cleanout)	N/A (monitoring location blocked/clogged)										
anout E-16 (ambient air)	0.0	0.1	20.9	22.5	0	0	0	0	1000	77.4	
E-16 (tubing inside cleanout)	51.3	50.8	2.4	0.6	68	169	>100	>60	1000	-2.7	
anout F-16 (ambient air)	0.0	0.3	20.9	22.3	0	0	1	0	1000	77.4	
F-16 (tubing inside cleanout)	8.2	11.1	12.9	13.1	0	0	>100	>60	1000	67.6	
anout F-17 (ambient air)	0.0	0.1	20.9	22.5	0	0	0	0	999	77.4	
F-17 (tubing inside cleanout)	0.0	3.1	18.6	20.1	0	0	0	0	999	76.8	
nout G-16 (ambient air)	0.0	0.1	20.9	22.6	0	0	0	0	999	77.3	
G-16 (tubing inside cleanout)	0.0	1.8	19.5	21.1	0	0	0	0	999	77.1	
al Manhole (tubing inside)	54.6	38.4	2.4	1.8	19	168	>100	>60	983	5.2	
al M ole (ambient air)	0.0	0.0	20.9	22.5	0	0	0	0	983	77.5	

ble ieous reading based on other measurement at this monitoring location

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	10.5	4.6	17.7	16.9	0	0	>100	>60	997	68.0	4.6
Manhole MH-10 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	997	79.4	2.5
Manhole MH-9 (tubing inside manhole)	15.1	6.6	16.2	15.4	56	0	>100	>60	996	62.9	5.2
Manhole MH-9 (ambient air)	0.0	0.1	20.9	20.3	0	0	0	0	996	79.6	3.5
Manhole MH-8 (tubing inside manhole)	18.6	9.8	14.5	13.5	12	0	>100	>60	997	58.1	7.5
Manhole MH-8 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	997	79.5	3.0
Manhole MH-7 (tubing inside manhole)	0.7	0.5	20.9	20.1	0	0	33	15	997	78.7	3.3
Manhole MH-7 (ambient air)	0.1	0.2	20.9	20.3	0	0	0	1	997	79.4	3.3
Manhole MH-6 (tubing inside manhole)	0.0	0.8	20.3	19.7	22	0	0	1	1001	79.5	5.6
Manhole MH-6 (ambient air)	0.0	0.1	20.9	20.2	0	0	0	0	1001	79.7	4.0
Manhole MH-5 (tubing inside manhole)	1.1	4.0	18.3	17.7	0	0	47	22	1001	77.2	10.8
Manhole MH-5 (ambient air)	0.0	0.1	20.9	20.2	0	0	0	0	1001	79.7	4.0
Manhole MH-4 (tubing inside manhole)	0.0	0.9	20.5	19.9	28	0	7	2	1001	79.2	4.6
Manhole MH-4 (ambient air)	0.0	0.1	20.9	20.3	0	0	0	0	1001	79.6	3.5
Manhole MH-3 (tubing inside manhole)	0.6	1.4	20.2	19.7	0	0	26	13	1001	78.3	4.4
Manhole MH-3 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	1001	79.5	3.0
Manhole MH-2 (tubing inside manhole)	10.3	9.3	16.7	15.7	20	0	>100	>60	1001	64.7	5.8
Manhole MH-2 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	1001	79.4	2.5
Manhole MH-1 (tubing inside manhole)	0.0	0.8	20.5	20.2	0	0	0	1	1001	79.0	3.3
Manhole MH-1 (ambient air)	0.0	0.1	20.9	20.6	0	0	0	0	1001	79.3	2.1
Cleanout E-12 (ambient air)	46.0	3.2	20.9	18.6	0	28	>100	>60	996	32.2	-37.6
Cleanout E-12 (tubing inside cleanout)	N/A (gas odours too strong; measurements not recorded due to safety)										
Cleanout E-13 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	996	79.5	3.0
Cleanout E-13 (tubing inside cleanout)	>60	53.0	2.4	0.4	30	157	>100	>60	996		
Cleanout I-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	999	79.5	3.0
Cleanout I-17 (tubing inside cleanout)	1.1	6.1	13.9	13.6	8	0	54	23	999	79.2	28.2
Cleanout K-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	1	999	79.5	3.0
Cleanout K-17 (tubing inside cleanout)	59.3	39.3	3.4	0.1	9	1	>100	>60	999	1.3	0.9
Cleanout L-17 (ambient air)	0.0	0.1	20.9	20.0	0	0	0	1	999	79.9	4.9
Cleanout L-17 (tubing inside cleanout)	9.6	10.6	14.8	13.6	25	0	>100	>60	999	66.2	15.2
Cleanout M-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	999	79.5	3.0
Cleanout M-17 (tubing inside cleanout)	9.0	6.0	17.2	16.5	1	160	>100	>60	999	68.5	6.6
Cleanout G-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	1	998	79.5	3.0
Cleanout G-17 (tubing inside cleanout)	0.4	1.6	19.0	18.6	0	0	0	9	998	79.4	9.7
Cleanout N-17 (ambient air)	N/A										
Cleanout N-17 (tubing inside cleanout)	N/A										
Cleanout H-17 (ambient air)	N/A										
Cleanout H-17 (tubing inside cleanout)	N/A										
Cleanout E-16 (ambient air)	0.2	0.2	20.9	20.4	0	0	0	1	996	79.2	2.7
Cleanout E-16 (tubing inside cleanout)	> max. limit	52.4	2.4	0.5	51	59	>60	>60	996		
Cleanout F-16 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	1	996	79.4	2.5
Cleanout F-16 (tubing inside cleanout)	0.0	5.6	15.3	14.8	0	0	9	2	996	79.6	24.1
Cleanout F-17 (ambient air)	0.0	0.1	20.9	20.4	4	0	0	0	996	79.5	3.0
Cleanout F-17 (tubing inside cleanout)	18.6	20.7	2.4	3.1	35	0	>100	>60	996	57.6	46.0
Cleanout G-16 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	996	79.4	2.5
eanout G-16 (tubing inside cleanout)	0.0	7.2	3.0	14.5	0	0	14	0	996	78.3	23.9
Central Manhole (tubing inside)	56.2	43.0	2.7	0.3	26	160	>100	>60	999	0.5	-0.6
Central Manhole (ambient air)											

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	4.0	2.0	19.9	20.0	13	0	>100	>60	1003	74.0	-1.0
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	12.1	5.3	17.5	17.4	23	0	>100	>60	1003	65.2	0.0
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	2.8	1.5	19.8	20.3	41	0	>100	>60	1003	75.4	-0.7
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.2	0.3	20.9	21.2	57	0	0	4	1003	78.3	-1.2
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.0	0.5	20.9	20.4	0	1	0	0	1005	79.1	2.6
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	0.5	1.8	19.6	19.9	83	0	14	11	1005	77.8	3.2
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	0.0	0.4	20.9	21.2	178	4	0	0	1005	78.4	-1.1
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	1.2	2.1	19.9	20.8	37	70	27	24	1005	75.9	-2.1
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	29.8	22.5	10.4	10.3	78	0	>100	>60	1005	37.4	-1.2
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	0.2	20.1	21.9	23	0	10	1	1005	77.9	-4.2
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	50.5	46.1	1.8	1.8	28	1	>100	>60	1003	1.6	-5.2
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	50.9	42.5	8.1	1.9	7	1	>100	>100	1003	4.7	-2.4
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.2	0.9	20.9	20.8	3	0	6	4	1005	78.1	0.1
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	33.8	24.1	10.8	8.8	65	7	>100	1	1005	33.3	0.3
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	0.7	1.2	19.5	20.7	40	0	41	15	1004	77.4	-0.2
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	1.2	1.3	20.2	20.6	33	3	38	25	1004	76.9	-0.3
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	45.7	50.3	5.9	7.7	45	196	>100	>60	1004	-3.7	-32.6
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	13.8	13.7	3.7	15.6	78	0	>100	>100	1003	56.9	-1.6
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	0.0	0.1	20.9	20.1	0	0	0	0	1003	79.8	4.4
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	8.6	10.8	11.6	13.0	44	0	>100	>100	1003	67.6	18.9
Cleanout G-16 (ambient air)											
leanout G-16 (tubing inside cleanout)	0.0	0.2	20.1	21.1	46	0	0	0	1003	78.7	-0.4
Central Manhole (tubing inside)	59.4	40.1	3.6	0.3	4	208	>100	>60	1002	9.2	-0.9
Central Manhole (ambient air)											

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)											
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	10.2	5.2		12.1						72.5	27.1
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	12.2	6.8		16.1						64.9	4.5
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)											
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)											
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)											
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)											
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)											
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)											
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)											
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)											
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)											
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)											
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)											
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)											
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)											
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)											
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)											
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)											
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)											
Cleanout G-16 (ambient air)											
leanout G-16 (tubing inside cleanout)											
Central Manhole (tubing inside)											
Central Manhole (ambient air)											

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	0.4	0.5		21.0				8	1017	78.1	-0.7
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	0.2	1.2		20.9				4		77.7	-0.7
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	1.1	2.5		20.3				21		76.1	0.0
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.0	0.1		21.2				1		78.7	-0.8
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.1	2.4		20.3				2		77.2	1.1
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	2.1	6.5		18.6				42		72.8	3.1
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	0.0	0.0		21.3				0		78.7	-1.2
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	11.2	9.9		15.6				>100		63.3	4.8
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	2.5	3.9		19.6				51		74.0	0.5
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	0.8		21.0				0		78.2	-0.5
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	49.6	45.9		2.4				>100		2.1	-6.9
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	55.5	43.2		1.0				>100		0.3	-3.5
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.2	2.4		18.4				5		79.0	10.0
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	46.5	32.6		2.8				>100		18.1	7.6
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	3.2	1.0		13.1				64		82.7	33.6
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	2.6	2.5		19.6				53		75.3	1.8
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	0.0	0.9		20.0				0		79.1	4.1
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	52.8	46.3		0.9				>100		0.0	-3.4
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	12.5	17.5		4.7				>100		65.3	47.7
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	0.0	4.9		16.3				0		78.8	17.7
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	2.0		19.0				0		79.0	7.8
Central Manhole (tubing inside)	7.8	8.8		16.4				>100		67.0	5.5
Central Manhole (ambient air)											

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Notes: (1) Pressure previously recorded as 30 mmHg. Assumed error and has been corrected to inHg. Received client confirmation March 8, 2019

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	0.7	0.7		21.3					1017	77.3	-2.6
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	0.5	1.8		21.1		0				76.6	-2.5
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	0.3	1.4		21.2		0				77.1	-2.4
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.0	0.2		21.7		0				78.1	-3.3
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.0	1.8		21.1		0				77.1	-2.0
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	2.0	6.6		18.7		0				72.7	2.6
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	12.8	9.7		15.7		0				61.8	2.9
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	24.0	19.3		10.0		0				46.7	9.2
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	2.6	5.0		19.5		0				72.9	-0.2
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	1.3		21.1		0					
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	48.9	45.4		2.8		204		>100		2.9	-7.6
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	54.2	45.5		0.2		204		>100	1024	0.1	-0.7
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.4	3.2		17.8		0				78.6	11.9
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	47.7	33.0		2.9		2				16.4	5.5
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	4.8	11.2		12.0		0				72.0	27.0
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	2.0	2.1		19.9		0				76.0	1.4
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	0.0	0.9		20.0		0				79.1	4.1
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	52.0	46.8		0.5		54		>100		0.7	-1.2
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	10.6	16.5		5.5		5		>100		67.4	46.8
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	0.0	4.5		17.1		0		0		78.4	14.3
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	2.0		19.5		0		0		78.5	5.4
Central Manhole (tubing inside)	6.6	7.6		17.2		0				68.6	4.1
Central Manhole (ambient air)											

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Notes: (1) Pressure previously recorded as 30 mmHg. Assumed error and has been corrected to inHg. Received client confirmation March 8, 2019

Appendix '3'

Golder 2021 Noise Monitoring Memorandum

GOLDER
MEMBER OF WSP

TECHNICAL MEMORANDUM

DATE February 16, 2022 **Project No.** 20412275

TO Henri Huneault, Landfill Site Manager
Waste Connections of Canada

CC joe_tomaselli@golder.com

FROM Yanqing Zeng **EMAIL** yanqing_zeng@Golder.com

WASTE CONNECTIONS OF CANADA NAVAN FACILITY NOISE MONITORING 2021

Dear Mr. Huneault:

Golder Associates Ltd. (Golder) was retained to carry out annual noise monitoring for the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (WCC Navan Facility) in the eastern portion of Ottawa, Ontario. Noise monitoring was carried out to fulfill the requirements as outlined in Section 9.5 of the Design & Operations Report Navan Landfill Site Expansion Approvals (January 2008). This memorandum provides a summary of the noise monitoring results for 2021.

Site Operations

The WCC Navan Facility is a waste management facility that handles solid, non-hazardous industrial and commercial waste (including construction and demolition waste), asbestos waste, dry non-putrescible (i.e., non-organic) domestic waste and impacted soil. The facility operates six days a week, from 7:00 am to 5:00 pm on weekdays and 8:00 am to 1:00 pm on Saturday. The existing operations allow for a maximum of 234,750 tonnes of waste per year to be landfilled with an average daily maximum of 1,500 tonnes. Figure 1 (attached) shows a key plan of the site and surrounding area.

Methodology

An annual noise monitoring program was completed in 2021 using two Larson Davis 820 sound level meters located at the nearest residential receptors (i.e., points of reception (POR(s))) to the WCC Navan Facility. Noise data was logged every hour for the duration of the monitoring period. The monitoring was carried out from November 1 to November 9, 2021. Monitoring locations are shown in Figure 1 (attached). All monitoring data is summarized in Appendix A. Weather data during the monitoring program is provided in Appendix B.

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Results

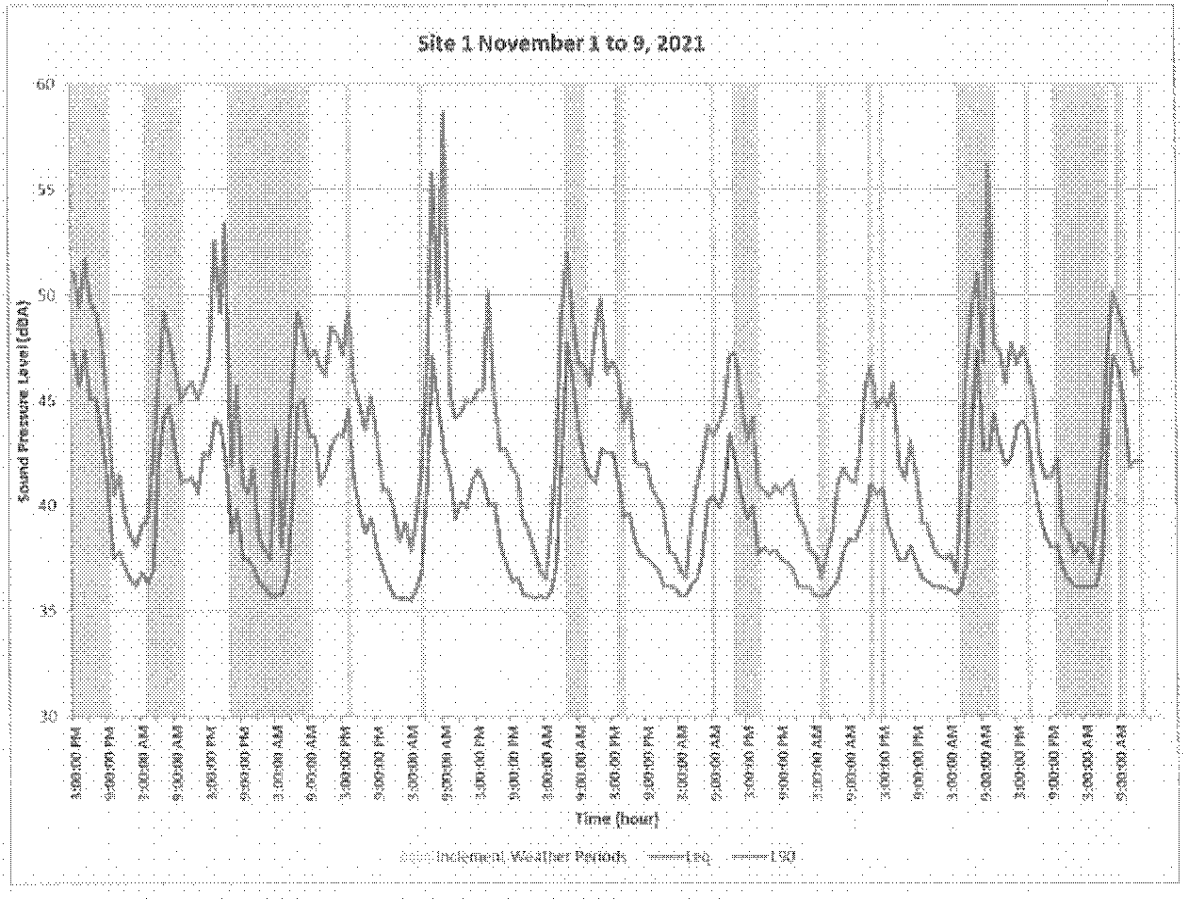
Table 1 summarizes the noise monitoring results for the 2021 monitoring program.

Table 1: Summary of Daytime Noise Levels

Monitoring Site	Minimum Daytime Hourly L_{eq} (dBA)	Minimum Daytime Hourly L_{90} (dBA)	Average Daytime Hourly L_{eq} (dBA)	Average Daytime Hourly L_{90} (dBA)
Monitoring Site 1	41	37	48	42
Monitoring Site 2	48	30	57	49

Notes: Data represents monitored levels over the entire monitoring period

Data collected during periods of inclement weather (i.e., rain and/or high wind speeds, in excess of 18 km/h, the limit described in International Standards Organization (ISO) 1996-2 (2007) Standard *Acoustics – Description, measurement and assessment of environmental Noise – Part 2: Determination of environmental noise levels for favourable sound propagation conditions*) were excluded from the calculated levels provided in Table 1.
The periods of monitoring for which data was excluded from the calculation are shown in Plots 1 and 2 as shaded regions.



Plot 1: November 2021 Noise Monitoring Results – Monitoring Site 1

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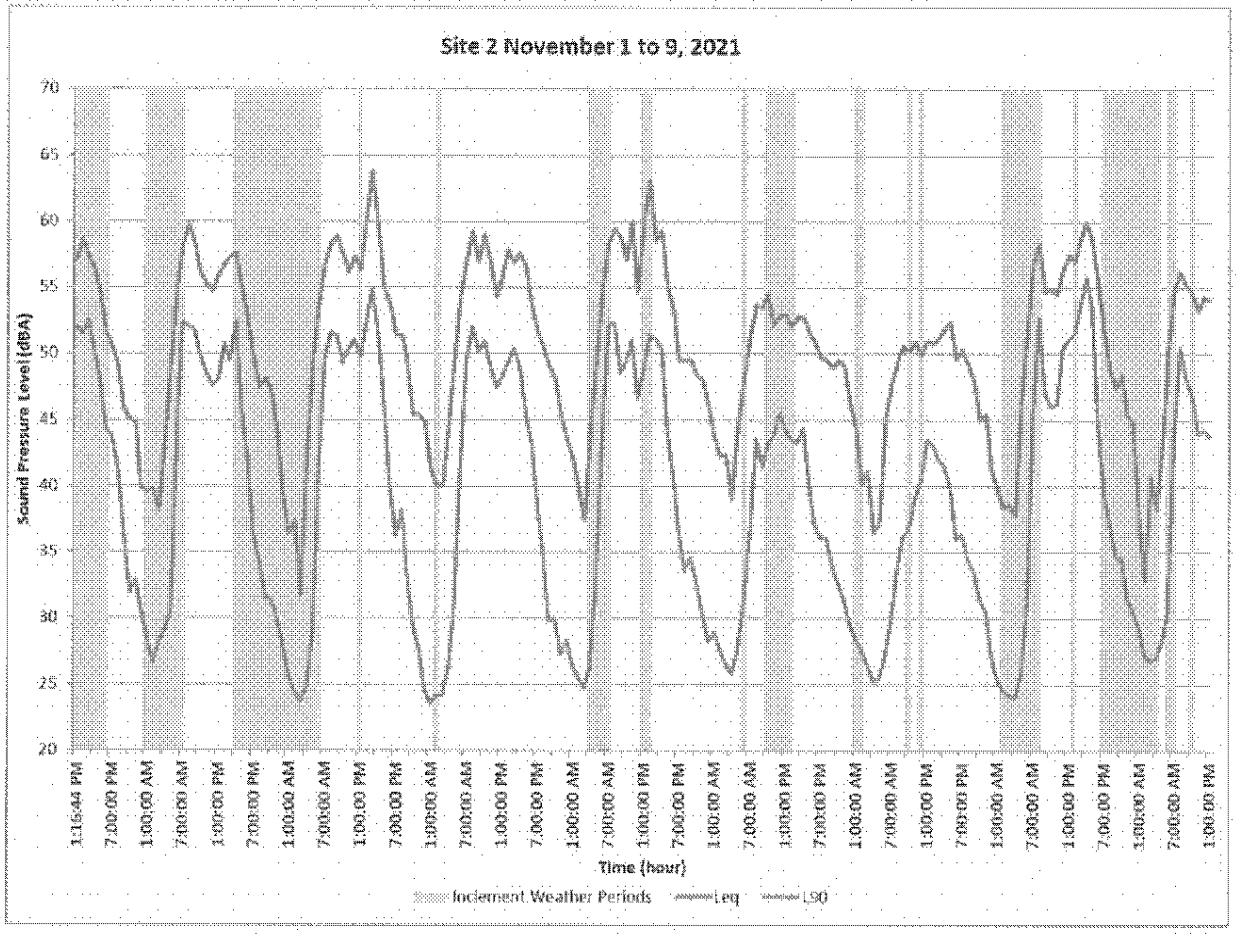

Plot 2: November 2021 Noise Monitoring Results – Monitoring Site 2

Criteria and Guidelines

The WCC Navan Facility and PORs are located on Parts of Lots 2, 3 and 4, Concession 4, Ottawa Front (formerly the City of Gloucester). The noise criteria for the WCC Navan Facility are based on the Ministry of Environment, Conservation and Parks (MECP) (formerly known as the Ministry of the Environment and Climate Change (MOECC)) Noise Guidelines for Landfill Sites (October 1998) and Noise Pollution Control (NPC) publication NPC 300 (August 2013). The Landfill Guideline outlines the sound level limit criteria for evaluating landfill site operations (i.e., landfilling activities) and NPC 300 provides the criteria for on-site stationary noise sources (i.e., non-landfilling activities). Table 2 summarizes the sound level limits at a POR due to landfill site operations.

Table 2: Applicable Noise Limits

	Daytime (07:00 – 19:00)	Night-time (19:00 – 07:00)
Landfilling Operations – 1-Hour Equivalent Sound Level – L_{eq} (dBA)	55	45
Stationary Sources – 1-Hour Equivalent Sound Level – L_{eq} (dBA)	50	45

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Discussion

Based on site observations, the noise levels at the two PORs are dominated by road traffic noise along Navan Road and with audible noise from landfilling operations of the WCC Navan Facility, as confirmed during Golder staff visits (i.e., deployment and collection of the monitoring equipment). Golder's January 2008 report predicted a noise impact level for the existing site operations of the WCC Navan Facility on the surrounding PORs to be between 27 and 37 dBA due to site operations. The measured average hourly noise levels were equal to 48 dBA and 57 dBA at Monitoring Location 1 and Monitoring Location 2, respectively. The noise level at Monitoring Location 1 was below the applicable MECP Landfill Guidelines for landfilling operations noise limit, whereas at Monitoring Location 2 the average cumulative (i.e. ambient plus landfill) hourly noise level was 2 dB above the noise limit. During the site visit it was observed that noise levels at Monitoring Location 1 were predominantly influenced by traffic on the adjacent road with lesser contributions from the landfill. The noise level at Monitoring Location 2 was dominated by both; activities at the landfill and contributions from traffic on the adjacent road. In 2021 and into the near future there was and continues to be construction works in the vicinity of the landfill. These activities are expected to include increased traffic from the construction of residential and infrastructure projects in the area.

Monitor Location 2 has historically been used to represent the area due to the ease of gaining access to the property as WCC owns the property. This monitoring site is not actually the nearest point of reception (POR) in the vicinity of the Facility as this residence is located within the Facility property line. The closest POR relevant to the Monitoring Location 2 would be located approximately 100 m northeast of the Monitoring Location 2 site. It is expected that the Facility noise contributions measured at the actual nearest off-site noise POR would be lower due to the increased distance between the Facility noise sources and the POR. Based on the above, it is expected that the noise emissions from the Facility operations could be meeting the applicable noise limit at the noise receptors located north of the Monitoring Location 2 site. Therefore, the Facility is expected to be able to operate within compliance with the relevant noise limits based on the results of 2021 noise monitoring.

It should be noted that it is understood the Facility is not a source of noise complaints from area residents.

Proposed Future Noise Monitoring

As discussed above, the noise levels in the area are dominated by traffic along Navan Road as well as current operations of the Facility (i.e., within the northeast area of the Landfill). Based on the findings from the 2021 and previous monitoring programs, Golder recommends that the noise monitoring at the WCC Navan Facility continue to be conducted on an annual basis with one monitoring session per year. In addition, if a noise complaint is received, it is recommended that additional noise investigations be completed to determine whether noise control (e.g., administrative or engineering) will be required.

Closure

Golder Associates Ltd. was retained to carry out noise monitoring for Waste Connections Canada (WCC) at the WCC Navan Facility in the eastern portion of Ottawa, Ontario. The monitoring results and site observations indicate that the landfilling noise levels, expressed in average 1-hour Leq is observed to be below the noise limit at Monitoring Location 1 and slightly above the noise limit at the Monitoring Location 2. With the understanding that the current Monitoring Location 2 site is located within the property line of the landfill, and the actual nearest offsite POR is located further from the landfill equipment, it is expected that the noise levels from the Facility operations at the nearest off-site PORs would be within the applicable noise limit. Based on these results, the operations of the WCC Navan Facility are expected to be operating in compliance with the MECP Landfill Guideline and NPC 300 limits as summarized in Table 2, where applicable.

If you have any further questions or concerns, please do not hesitate to contact the undersigned at your earliest convenience.

Golder Associates Ltd.

Yanqing Zeng, M.A.E.
Acoustics, Noise and Vibration Specialist

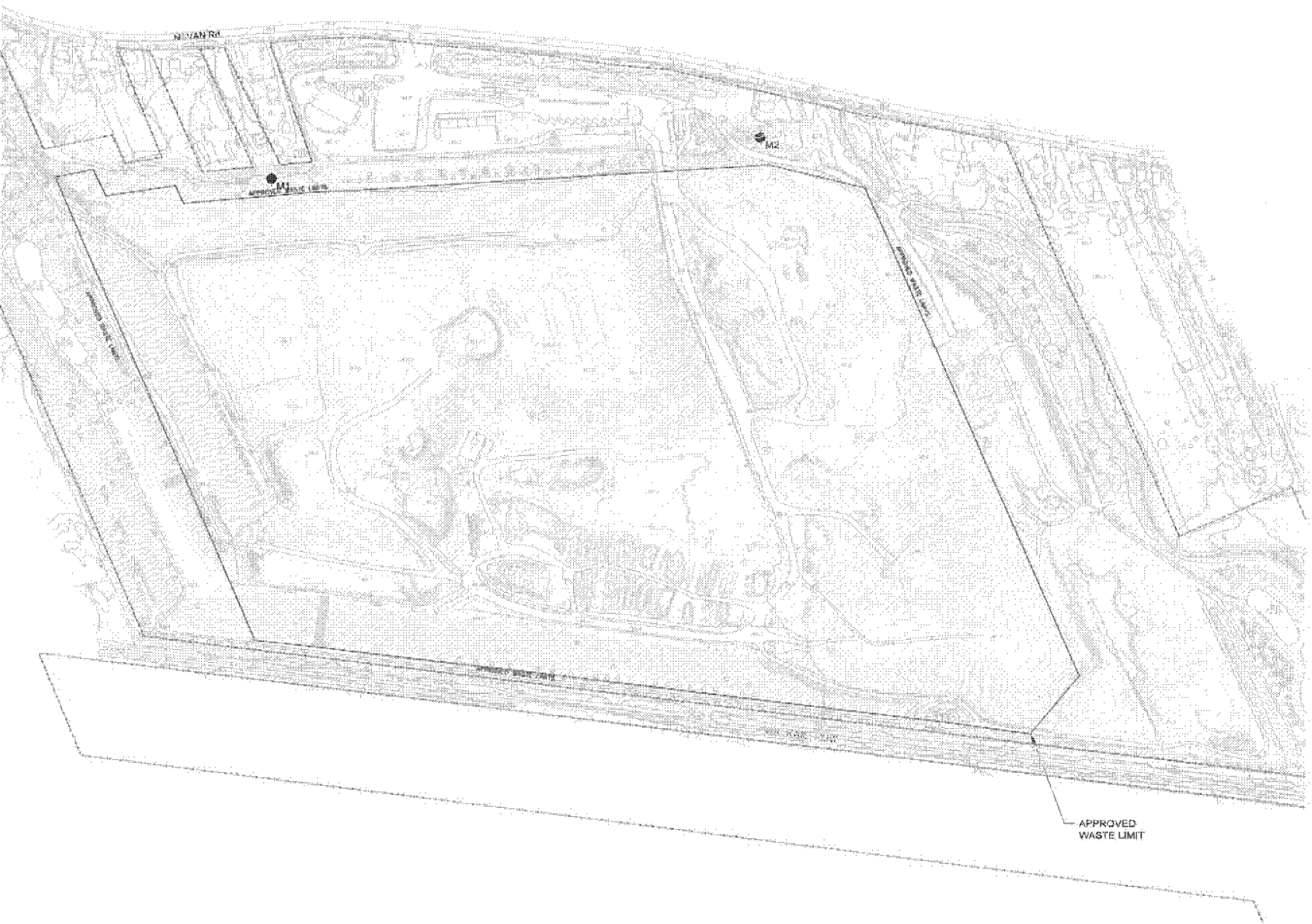
Joe Tomaselli, M.Eng., P.Eng.
Associate/Senior Acoustics, Noise and Vibration Engineer

YZ/TN/JT/sg
https://golderassociates.sharepoint.com/sites/136820/project files/6 deliverables/1200_2021 noise memo/20412275-tm-rev0 waste connections of canada navan_16feb2022.docx

Attachments: Figure1 – Noise Monitoring Locations
Appendix A – Noise Data
Appendix B – Weather Data November 1 to 9, 2021

002674

FIGURE



SITE

LEGEND

- MONITORING
- VERTICAL / H
- INDEX / INTE
- SPOT ELEVA
- HEDGE LINE
- GUARD RAIL
- RETAINING W
- FENCE LINE
- WOODED AR
- SINGLE TRE
- SHORELINE A
- DITCH / STRE
- MARCH
- BUILDING
- POST
- AREA OUTLI
- PAVED / LOO
- PROPERTY B

REFERENCE(S)

1. PROPERTY LINE PROVIDED I
   DENIS SURVEYING LTD. FILE
2. BASE INFORMATION PROVIDE
   FORMAT FROM CONTRACT No
3. COORDINATE SYSTEM NAD 8

0

1:5,000

CLIENT

WASTE CONNECTIONS CANADA

CONSULTANT

YYYY-MM-DD 2021-12-10

PROJECT

NAVAN WASTE RECYC
3354 NAVAN ROAD, OT

TITLE

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APPENDIX A

Noise Data

Table A1 summarizes noise levels measured at Monitoring Site 1 and Monitoring Site 2.

Table A1: Measured Noise Levels [dBA]

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-1-21	15:00	51.1	47.3	57.3	52.5
11-1-21	16:00	49.4	45.7	56.5	50.3
11-1-21	17:00	51.7	47.4	54.7	48
11-1-21	18:00	49.7	45.1	51.7	44.4
11-1-21	19:00	49.2	45.1	50.6	43.7
11-1-21	20:00	47.8	43.3	49.2	41.4
11-1-21	21:00	44.6	41	45.8	36.6
11-1-21	22:00	40.5	37.5	45.1	32
11-1-21	23:00	41.5	37.8	44.8	32.9
11-2-21	0:00	39.5	37.1	39.9	30.8
11-2-21	1:00	38.6	36.5	39.6	28.6
11-2-21	2:00	38.1	36.2	39.8	26.7
11-2-21	3:00	39.1	36.8	38.2	28.1
11-2-21	4:00	39.3	36.3	43.6	29.2
11-2-21	5:00	42.2	36.9	49.5	30.5
11-2-21	6:00	45.8	42.2	55.2	45.1
11-2-21	7:00	49.2	44.2	58	52.4
11-2-21	8:00	47.9	44.7	59.8	52.1
11-2-21	9:00	46.5	42.5	58.4	51.8
11-2-21	10:00	45	41.1	56.1	49.8
11-2-21	11:00	45.6	41.2	55.3	48.5
11-2-21	12:00	45.9	41.3	54.7	47.6
11-2-21	13:00	45.1	40.6	55.9	48
11-2-21	14:00	45.9	42.5	56.7	50.7
11-2-21	15:00	46.9	42.3	57.3	49.5
11-2-21	16:00	52.6	44.1	57.6	52.4
11-2-21	17:00	49.2	43.8	55	45.7
11-2-21	18:00	53.4	42.2	52.7	42
11-2-21	19:00	41.9	38.7	49.6	36.3
11-2-21	20:00	45.7	39.8	47.4	34.3
11-2-21	21:00	41	37.5	48.2	31.6
11-2-21	22:00	40.6	37.4	47.1	31.3
11-2-21	23:00	41.9	37.1	44.3	30.1
11-3-21	0:00	38.4	36.3	39.5	28.1

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-3-21	1:00	37.9	36.1	36.4	25.7
11-3-21	2:00	37.4	35.7	37.3	24.4
11-3-21	3:00	43.7	35.7	31.8	23.7
11-3-21	4:00	38	35.8	42.5	24.7
11-3-21	5:00	41.6	36.6	49.8	29.1
11-3-21	6:00	45.5	40.2	53.6	40.9
11-3-21	7:00	49.2	44.8	56.7	49.7
11-3-21	8:00	48.2	45	58.3	51.6
11-3-21	9:00	47	43.3	58.9	51.4
11-3-21	10:00	47.4	43.3	57.6	49.4
11-3-21	11:00	46.6	41	56.2	50.4
11-3-21	12:00	46.2	41.7	57.3	51
11-3-21	13:00	48.5	42.8	56.4	49.8
11-3-21	14:00	48.1	43.4	60	52.2
11-3-21	15:00	47.2	43.3	63.8	54.8
11-3-21	16:00	49.2	44.5	59.6	51.5
11-3-21	17:00	45.9	41.3	55	46.3
11-3-21	18:00	44.8	39.7	53.8	40
11-3-21	19:00	43.6	38.7	51.4	36.3
11-3-21	20:00	45.2	39.4	51.4	38.2
11-3-21	21:00	43.2	37.9	49.4	33.5
11-3-21	22:00	40.7	37	45.4	29.6
11-3-21	23:00	40.8	36.3	45.4	27.8
11-4-21	0:00	39.8	35.7	44.8	24.6
11-4-21	1:00	38.3	35.6	41.2	23.6
11-4-21	2:00	39.2	35.6	40	24.1
11-4-21	3:00	37.9	35.5	40	24.2
11-4-21	4:00	39.6	36.1	44.8	26.3
11-4-21	5:00	41.8	36.8	49.3	30.6
11-4-21	6:00	46.2	40.9	54.2	41.6
11-4-21	7:00	55.8	47.1	57	49.6
11-4-21	8:00	49.6	44.7	59.3	52
11-4-21	9:00	58.7	42.5	56.9	50.2
11-4-21	10:00	45.3	41.4	59	50.9
11-4-21	11:00	44.2	39.4	56.9	49
11-4-21	12:00	44.3	40.2	54.3	47.5
11-4-21	13:00	45	39.9	55.7	48.2

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-4-21	14:00	44.9	41.2	57.8	49.3
11-4-21	15:00	45.5	41.7	56.9	50.4
11-4-21	16:00	45.5	41.1	57.6	49
11-4-21	17:00	50.2	40	56.6	45.4
11-4-21	18:00	45.3	40.1	53.5	43.1
11-4-21	19:00	42.6	38.1	51.6	38.4
11-4-21	20:00	42.7	37.2	50.6	35.2
11-4-21	21:00	41.8	36.4	49.1	29.8
11-4-21	22:00	41.4	36.5	48.2	30
11-4-21	23:00	39.4	35.8	45.4	27.3
11-5-21	0:00	38.8	35.7	43.5	28.3
11-5-21	1:00	37.9	35.6	42.2	26.4
11-5-21	2:00	36.9	35.7	39.7	25.5
11-5-21	3:00	36.5	35.6	37.4	24.7
11-5-21	4:00	39.2	36	44.2	26.4
11-5-21	5:00	42.1	37.2	49.5	32.9
11-5-21	6:00	48.9	42.7	55	44.2
11-5-21	7:00	52	47.7	58.5	52.2
11-5-21	8:00	49	45.8	59.4	52.3
11-5-21	9:00	46.7	43.4	58.8	48.6
11-5-21	10:00	46.7	42	57.1	49.5
11-5-21	11:00	45.7	41.4	60	51
11-5-21	12:00	48.1	41.1	54.7	46.7
11-5-21	13:00	49.8	42.7	60.1	48.9
11-5-21	14:00	46.3	42.5	63.1	51.4
11-5-21	15:00	46.8	42.5	58.5	51.1
11-5-21	16:00	46.3	41.1	59.3	50.4
11-5-21	17:00	44	39.5	55	43.9
11-5-21	18:00	45	39.6	53.3	40.6
11-5-21	19:00	42.1	38.3	49.5	36.7
11-5-21	20:00	41.9	37.6	49.5	33.6
11-5-21	21:00	42	37.5	49.6	34.6
11-5-21	22:00	40.7	37.2	48.4	32.7
11-5-21	23:00	40.4	37	48	30.4
11-6-21	0:00	39.8	36.2	46	28.2
11-6-21	1:00	37.8	36.2	43.6	28.9
11-6-21	2:00	37.7	36.1	42.4	27.7

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-6-21	3:00	36.9	35.7	42.4	26.6
11-6-21	4:00	36.6	35.7	39.1	25.8
11-6-21	5:00	39.2	36.2	44.6	27.6
11-6-21	6:00	40.9	36.5	48.2	31.3
11-6-21	7:00	42.1	37.6	51.3	36.4
11-6-21	8:00	43.8	40.2	53.7	43.6
11-6-21	9:00	43.3	40.4	53.5	41.5
11-6-21	10:00	43.9	39.9	54.5	43.2
11-6-21	11:00	44.6	40.7	52.2	43.8
11-6-21	12:00	47.2	43.4	52.9	45.5
11-6-21	13:00	47.2	42	53	44.3
11-6-21	14:00	45.1	40.4	52	43.5
11-6-21	15:00	43.1	39.4	52.8	43.3
11-6-21	16:00	44.2	40	52.8	44.4
11-6-21	17:00	41	37.7	51.6	39.9
11-6-21	18:00	40.7	38	50.9	37.1
11-6-21	19:00	40.4	37.7	49.8	36.1
11-6-21	20:00	40.9	37.9	49.6	36.1
11-6-21	21:00	40.6	37.4	49	33.9
11-6-21	22:00	41	37.3	49.5	32.6
11-6-21	23:00	41.2	37	49.1	31.4
11-7-21	0:00	39.5	36.2	46.1	29.4
11-7-21	1:00	39	36.1	44.6	28.5
11-7-21	2:00	37.9	36.1	40.1	27.6
11-7-21	3:00	37.7	35.7	41.1	26.5
11-7-21	4:00	36.6	35.7	36.5	25.3
11-7-21	5:00	37.6	35.7	37.2	25.5
11-7-21	6:00	38.6	36.1	45.2	27.3
11-7-21	7:00	41	36.5	47.7	30.1
11-7-21	8:00	41.8	37.8	49.5	34
11-7-21	9:00	41.3	38.4	50.6	36.1
11-7-21	10:00	41.1	38.3	50.2	36.7
11-7-21	11:00	42.5	39	51	39.1
11-7-21	12:00	45.6	39.6	50	40.4
11-7-21	13:00	46.6	41	51	43.5
11-7-21	14:00	44.6	40.5	50.8	43.1
11-7-21	15:00	45.1	40.8	51.2	42

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-7-21	16:00	44.7	39	51.9	41.6
11-7-21	17:00	45.8	38.3	52.4	39.9
11-7-21	18:00	41.9	37.4	49.6	36
11-7-21	19:00	41.3	37.4	50.3	36.3
11-7-21	20:00	43.1	38.1	49.2	34.4
11-7-21	21:00	41.4	37.2	47.9	33.5
11-7-21	22:00	39.2	36.5	45	31.3
11-7-21	23:00	39.1	36.4	45.4	30.5
11-8-21	0:00	38	36.2	41.3	27.2
11-8-21	1:00	37.6	36.1	39.8	25.4
11-8-21	2:00	37.5	36.1	38.4	24.5
11-8-21	3:00	37.7	36	38.6	24.2
11-8-21	4:00	36.8	35.8	37.7	24
11-8-21	5:00	40.5	36.1	46.6	25.7
11-8-21	6:00	46.5	37.2	51.9	31.1
11-8-21	7:00	49.3	44	56.7	45.3
11-8-21	8:00	51.1	47.4	58.4	52.7
11-8-21	9:00	46.8	42.6	54.7	47.1
11-8-21	10:00	56.2	42.6	54.9	46
11-8-21	11:00	47.6	44.3	54.5	46.2
11-8-21	12:00	47.4	42.9	56.3	50.5
11-8-21	13:00	45.8	41.9	57.5	51.1
11-8-21	14:00	47.7	42.3	57	51.6
11-8-21	15:00	46.7	43.7	58.6	53.6
11-8-21	16:00	47.5	44	60	55.8
11-8-21	17:00	46.7	43.5	58.6	53.4
11-8-21	18:00	45.3	41.1	55.4	44.5
11-8-21	19:00	42.2	39.6	51.8	39.6
11-8-21	20:00	41.3	38.5	48.8	37
11-8-21	21:00	41.4	38	47.4	34.7
11-8-21	22:00	42.2	38.1	48.4	34.5
11-8-21	23:00	39	37.1	45.4	31.6
11-9-21	0:00	38.7	36.5	44.7	30.5
11-9-21	1:00	37.6	36.2	37.6	29.3
11-9-21	2:00	38.2	36.1	32.9	27.2
11-9-21	3:00	38	36.1	40.7	26.8
11-9-21	4:00	37.3	36.1	38.3	27.1

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-9-21	5:00	39.5	36.2	43.6	28.4
11-9-21	6:00	42.6	37.5	50.1	30.5
11-9-21	7:00	47	43.1	55	44
11-9-21	8:00	50.1	47.1	56.2	50.5
11-9-21	9:00	49.3	46.5	55.2	48.1
11-9-21	10:00	48.3	44.6	54.6	46.9
11-9-21	11:00	47.4	41.8	53.3	44
11-9-21	12:00	46.2	42.1	54.3	44.2
11-9-21	13:00	46.5	42.1	54.1	43.8

Notes: Rows highlighted in yellow represent data monitored during the Facility daytime period of operations.
[a] Noise data not available for this period of measurement

APPENDIX B

Weather Data November 1 to 9, 2021

Station Name	OTTAWA INT'L
Province	ONTARIO
Latitude	45.32
Longitude	-75.67
Elevation	114
Climate Identifier	6106001
WMO Identifier	71628
TC Identifier	YOW

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Table B1: Weather Data November 1 to November 9, 2021

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-01 13:00	10.6	-2.5	40	25	32	99.98	Mainly Clear
2021-11-01 14:00	11.1	-1.6	41	24	27	100	NA
2021-11-01 15:00	9.6	-2.2	43	24	22	100.02	NA
2021-11-01 16:00	9	-0.6	51	25	29	100.06	Mostly Cloudy
2021-11-01 17:00	6.7	1	67	26	29	100.14	NA
2021-11-01 18:00	5.5	0.7	71	23	21	100.19	NA
2021-11-01 19:00	4.6	0.9	77	23	20	100.25	Clear
2021-11-01 20:00	3.9	0.7	80	23	17	100.29	NA
2021-11-01 21:00	3.3	0.5	82	24	13	100.36	NA
2021-11-01 22:00	2.5	0.4	86	25	8	100.39	Clear
2021-11-01 23:00	1.7	-0.9	83	24	10	100.4	NA
2021-11-02 0:00	1.6	-0.1	89	24	4	100.41	NA
2021-11-02 1:00	1.1	-0.6	89	25	5	100.38	Clear
2021-11-02 2:00	-1	-1.9	94	18	4	100.4	NA
2021-11-02 3:00	0.1	-0.4	96	19	7	100.39	NA
2021-11-02 4:00	0.7	0.2	96	25	8	100.39	Mostly Cloudy
2021-11-02 5:00	0.5	-0.2	95	21	8	100.41	NA
2021-11-02 6:00	-0.1	-0.7	96	19	8	100.41	NA
2021-11-02 7:00	-0.2	-0.9	95	19	8	100.45	Mainly Clear
2021-11-02 8:00	1.1	0	93	20	9	100.48	NA
2021-11-02 9:00	3.4	1.4	86	22	10	100.48	NA
2021-11-02 10:00	4.1	1.5	83	21	11	100.5	Mostly Cloudy
2021-11-02 11:00	5.6	1.6	76	23	10	100.48	NA
2021-11-02 12:00	7.9	1.7	65	22	13	100.41	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-02 13:00	9.2	0.7	55	22	18	100.36	Mostly Cloudy
2021-11-02 14:00	6.8	2.6	74	15	5	100.35	NA
2021-11-02 15:00	7.5	0.9	63	19	10	100.34	NA
2021-11-02 16:00	6.1	2.1	75	32	14	100.38	Mostly Cloudy
2021-11-02 17:00	3.3	2.1	92	32	20	100.43	Rain Showers
2021-11-02 18:00	3.3	2.1	92	24	8	100.5	Rain Showers
2021-11-02 19:00	3.1	2.4	95	26	8	100.55	Rain Showers
2021-11-02 20:00	1.8	1.2	96	23	8	100.55	NA
2021-11-02 21:00	1.2	0.8	97	25	3	100.58	NA
2021-11-02 22:00	1.4	1.2	99	22	7	100.6	Mostly Cloudy
2021-11-02 23:00	0.9	0.8	99	22	8	100.62	NA
2021-11-03 0:00	0.8	0.6	99	25	5	100.63	NA
2021-11-03 1:00	0.9	0.8	99	25	5	100.66	Cloudy
2021-11-03 2:00	1.1	1	99	29	7	100.68	NA
2021-11-03 3:00	1.3	1.2	99	36	8	100.67	NA
2021-11-03 4:00	1	0.7	98	2	7	100.68	Cloudy
2021-11-03 5:00	1	0.3	95	29	4	100.72	NA
2021-11-03 6:00	1.3	0.3	93	33	11	100.78	NA
2021-11-03 7:00	1.1	-0.2	91	32	10	100.82	Mostly Cloudy
2021-11-03 8:00	1.6	-0.3	88	33	13	100.91	NA
2021-11-03 9:00	2.2	-0.8	80	32	10	100.96	NA
2021-11-03 10:00	2.8	-1.6	73	33	9	101	Clear
2021-11-03 11:00	3.2	-3.8	60	33	9	101.05	NA
2021-11-03 12:00	4.1	-4	56	34	14	101.02	NA
2021-11-03 13:00	4.9	-5.6	47	28	15	100.98	Mostly Cloudy
2021-11-03 14:00	5.2	-5.4	46	29	24	101.01	NA
2021-11-03 15:00	4.8	-5.6	47	28	18	101.03	NA
2021-11-03 16:00	4.4	-6.2	46	27	16	101.05	Mostly Cloudy
2021-11-03 17:00	0.7	-6	61	25	12	101.09	NA
2021-11-03 18:00	0.5	-5.7	63	25	9	101.13	NA
2021-11-03 19:00	-0.1	-6.3	63	27	11	101.16	Mainly Clear
2021-11-03 20:00	-0.9	-6.5	66	25	8	101.17	NA
2021-11-03 21:00	-3	-5.4	83	23	4	101.22	NA
2021-11-03 22:00	-1.6	-6.2	71	24	7	101.25	Mainly Clear
2021-11-03 23:00	-2	-5.4	78	24	5	101.27	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-04 0:00	-2.7	-5.1	83	24	3	101.28	NA
2021-11-04 1:00	-3.5	-5.7	85	32	4	101.27	Mainly Clear
2021-11-04 2:00	-2.7	-4.8	86	29	4	101.28	NA
2021-11-04 3:00	-3.1	-4.3	91	36	5	101.28	NA
2021-11-04 4:00	-2.3	-4.3	86	3	6	101.27	Mostly Cloudy
2021-11-04 5:00	-1.3	-4	82	1	6	101.29	NA
2021-11-04 6:00	-3	-5.3	84	1	8	101.27	NA
2021-11-04 7:00	-3	-4.8	87	1	4	101.31	Mostly Cloudy
2021-11-04 8:00	-0.9	-2.6	88	6	4	101.33	NA
2021-11-04 9:00	0.9	-3	75	34	4	101.35	NA
2021-11-04 10:00	2.7	-3	66	10	4	101.34	Mainly Clear
2021-11-04 11:00	4.2	-4.3	54	20	11	101.35	NA
2021-11-04 12:00	3.7	-3.6	59	28	7	101.3	NA
2021-11-04 13:00	4.8	-5.3	48	25	4	101.19	Mostly Cloudy
2021-11-04 14:00	3.9	-4.1	56	30	10	101.17	NA
2021-11-04 15:00	5.2	-5.4	46	27	15	101.15	NA
2021-11-04 16:00	4.3	-5.2	50	25	15	101.14	Mainly Clear
2021-11-04 17:00	2.2	-6.3	53	30	9	101.15	NA
2021-11-04 18:00	2.6	-6.3	52	34	7	101.21	NA
2021-11-04 19:00	-0.9	-6.5	66	18	3	101.21	Clear
2021-11-04 20:00	-2	-6.6	71	13	3	101.17	NA
2021-11-04 21:00	-2.5	-5.8	78	16	7	101.18	NA
2021-11-04 22:00	-1.7	-6.6	69	16	5	101.23	Clear
2021-11-04 23:00	-2.4	-6.1	76	13	7	101.21	NA
2021-11-05 0:00	-2.2	-5.7	77	17	10	101.21	NA
2021-11-05 1:00	-1.5	-4.4	81	15	8	101.18	Mostly Cloudy
2021-11-05 2:00	-1.8	-4.1	84	10	3	101.18	NA
2021-11-05 3:00	-1.9	-4.3	83	16	6	101.18	NA
2021-11-05 4:00	-1.7	-3.7	86	36	1	101.21	Mostly Cloudy
2021-11-05 5:00	-3	-4.2	91	21	4	101.24	NA
2021-11-05 6:00	-2.1	-3.3	92	23	5	101.28	NA
2021-11-05 7:00	-4.2	-4.9	95	23	7	101.35	Clear
2021-11-05 8:00	-1.1	-1.9	95	24	8	101.41	NA
2021-11-05 9:00	1.6	-0.5	86	26	12	101.45	NA
2021-11-05 10:00	3.6	-0.3	76	24	13	101.46	Clear

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-05 11:00	5.8	-2	57	28	10	101.46	NA
2021-11-05 12:00	6.9	-3.1	49	23	9	101.44	NA
2021-11-05 13:00	7.9	-5.9	37	30	17	101.37	Clear
2021-11-05 14:00	8.5	-5.8	36	26	19	101.31	NA
2021-11-05 15:00	8.3	-6.4	35	26	19	101.28	NA
2021-11-05 16:00	6.9	-6.1	39	22	15	101.24	Mainly Clear
2021-11-05 17:00	4.9	-5	49	23	11	101.25	NA
2021-11-05 18:00	6	-4.2	48	23	13	101.3	NA
2021-11-05 19:00	4.3	-2.8	60	23	13	101.31	Mainly Clear
2021-11-05 20:00	3.3	-2.9	64	22	12	101.34	NA
2021-11-05 21:00	2.9	-2.8	66	21	9	101.35	NA
2021-11-05 22:00	2.2	-2.9	69	21	7	101.35	Mainly Clear
2021-11-05 23:00	1.7	-2.9	72	21	6	101.33	NA
2021-11-06 0:00	1.2	-3	74	22	8	101.33	NA
2021-11-06 1:00	0.5	-2.8	79	23	6	101.36	Clear
2021-11-06 2:00	-0.7	-3.6	81	20	9	101.36	NA
2021-11-06 3:00	-0.3	-3.2	81	19	8	101.37	NA
2021-11-06 4:00	-0.5	-3.2	82	19	10	101.38	Mainly Clear
2021-11-06 5:00	-1.2	-3.6	84	19	10	101.41	NA
2021-11-06 6:00	-1.2	-2.9	88	18	10	101.4	NA
2021-11-06 7:00	-1.2	-2.5	91	20	7	101.44	Mainly Clear
2021-11-06 8:00	0.7	-1.1	88	21	9	101.44	NA
2021-11-06 9:00	3.8	0.1	77	18	9	101.4	NA
2021-11-06 10:00	6.7	1.3	68	20	16	101.35	Mainly Clear
2021-11-06 11:00	8.6	1.2	60	21	25	101.32	NA
2021-11-06 12:00	9.5	0.3	52	20	23	101.23	NA
2021-11-06 13:00	9.8	-0.1	50	21	22	101.12	Mostly Cloudy
2021-11-06 14:00	10.2	0.7	52	18	21	101.03	NA
2021-11-06 15:00	9.7	1.2	55	20	21	100.98	NA
2021-11-06 16:00	8.8	0.9	58	19	17	100.93	Mainly Clear
2021-11-06 17:00	6.7	0.8	66	18	10	100.92	NA
2021-11-06 18:00	5.1	0.8	74	16	10	100.95	NA
2021-11-06 19:00	4.9	0	71	19	11	100.93	Mainly Clear
2021-11-06 20:00	3.8	-0.4	74	21	13	100.91	NA
2021-11-06 21:00	2.8	-0.8	77	21	9	100.89	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-06 22:00	2.4	-0.4	82	21	13	100.89	Clear
2021-11-06 23:00	2.5	-0.6	80	19	7	100.85	NA
2021-11-07 0:00	1.8	-0.9	82	17	7	100.82	NA
2021-11-07 1:00	0.9	-0.9	88	10	4	100.8	Mostly Cloudy
2021-11-07 2:00	-1	-2	93	10	6	100.78	NA
2021-11-07 3:00	-2.7	-3.7	93	11	8	100.74	NA
2021-11-07 4:00	0.8	-1.5	84	19	8	100.73	Mostly Cloudy
2021-11-07 5:00	1.2	-1.4	83	19	6	100.73	NA
2021-11-07 6:00	0.9	-1.6	84	18	8	100.68	NA
2021-11-07 7:00	-0.4	-2.9	84	14	5	100.67	Mainly Clear
2021-11-07 8:00	2	-0.5	83	18	9	100.69	NA
2021-11-07 9:00	5.4	2.1	80	21	14	100.68	NA
2021-11-07 10:00	8.2	3.7	73	19	16	100.63	Mainly Clear
2021-11-07 11:00	10.9	4	62	22	26	100.6	NA
2021-11-07 12:00	12.4	4.5	58	22	18	100.54	NA
2021-11-07 13:00	13	3.8	54	23	22	100.46	Mainly Clear
2021-11-07 14:00	13.4	4.8	56	18	16	100.42	NA
2021-11-07 15:00	13.6	5.1	56	20	14	100.38	NA
2021-11-07 16:00	12.5	5.2	61	19	14	100.38	Mainly Clear
2021-11-07 17:00	10.6	5	68	16	9	100.4	NA
2021-11-07 18:00	9.7	4.8	72	17	9	100.47	NA
2021-11-07 19:00	8.8	4.8	76	19	11	100.51	Mainly Clear
2021-11-07 20:00	7.4	4.5	81	17	10	100.51	NA
2021-11-07 21:00	7.3	5.1	86	28	10	100.58	NA
2021-11-07 22:00	7.4	5.1	85	19	9	100.56	Mostly Cloudy
2021-11-07 23:00	7.3	5.4	87	20	8	100.54	NA
2021-11-08 0:00	7.4	5.5	88	22	7	100.57	NA
2021-11-08 1:00	6.8	5	88	26	7	100.57	Mostly Cloudy
2021-11-08 2:00	7	5.4	90	26	6	100.59	NA
2021-11-08 3:00	5.6	4.5	93	24	4	100.6	NA
2021-11-08 4:00	5.1	4.5	96	25	6	100.65	Mainly Clear
2021-11-08 5:00	4.5	4.3	98	30	4	100.64	NA
2021-11-08 6:00	2	1.6	97	21	7	100.7	NA
2021-11-08 7:00	1.7	1.6	99	36	2	100.75	Mainly Clear
2021-11-08 8:00	3.8	3.8	100	17	7	100.76	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-08 9:00	7.3	6	92	17	4	100.77	NA
2021-11-08 10:00	10.7	6.4	75	13	8	100.72	Clear
2021-11-08 11:00	12.8	6.6	66	18	13	100.73	NA
2021-11-08 12:00	13.8	6.9	63	19	15	100.67	NA
2021-11-08 13:00	14.3	7.3	62	18	15	100.58	Mainly Clear
2021-11-08 14:00	14	7.5	65	17	13	100.51	NA
2021-11-08 15:00	13.6	7.9	68	16	19	100.41	NA
2021-11-08 16:00	12.7	7.9	73	17	12	100.38	Mainly Clear
2021-11-08 17:00	11.3	7.6	78	18	14	100.3	NA
2021-11-08 18:00	10.1	7.6	84	21	10	100.35	NA
2021-11-08 19:00	9.1	7.5	90	20	13	100.31	Mainly Clear
2021-11-08 20:00	8.4	7.5	94	19	8	100.3	NA
2021-11-08 21:00	7.2	6.3	94	23	6	100.3	NA
2021-11-08 22:00	7.7	7.5	99	20	8	100.27	Fog
2021-11-08 23:00	7	6.7	98	20	9	100.23	Fog
2021-11-09 0:00	6.6	6.3	98	20	12	100.21	Fog
2021-11-09 1:00	6.3	6.1	99	19	10	100.18	Fog
2021-11-09 2:00	5.6	5.5	99	21	8	100.21	Fog
2021-11-09 3:00	6.2	6.1	99	22	11	100.3	Fog
2021-11-09 4:00	6.9	6.7	99	22	8	100.31	Fog
2021-11-09 5:00	7.4	7.1	98	26	10	100.36	Fog
2021-11-09 6:00	8.4	6.8	90	30	15	100.4	NA
2021-11-09 7:00	7.6	6.5	93	29	12	100.4	Mostly Cloudy
2021-11-09 8:00	8.9	7.6	91	31	22	100.54	NA
2021-11-09 9:00	9.3	7.7	90	30	13	100.55	NA
2021-11-09 10:00	11.6	8.3	80	32	13	100.53	Mostly Cloudy
2021-11-09 11:00	13.2	7.8	70	32	19	100.55	NA
2021-11-09 12:00	13.6	6.5	62	29	12	100.51	NA
2021-11-09 13:00	14	4.9	54	31	13	100.49	Mostly Cloudy

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Appendix '4'

Schedule 'A' – 2021 Complaints Summary
Schedule 'B' – 2021 Material Tonnage Summary
Schedule 'C' – Brief Site History
Schedule 'D" – Amendment to Environmental Compliance Approval Number A460702 Notice No. 13

Schedule 'A'

Complaints Summary

Schedule 'A'
2021 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	14/10/2021	1 complaint Received an e-mail complaint from a neighbor (RC) about odours @ 11:30 pm	Odour! It stinks outside (and consequently in my home) quite badly right now. Also, it seems in the last month there has been an increase in stink/smell from the dump. Winds SE, 18 °C, Overcast HH drove to the address and throughout the neighbourhood at 7:00 am the next morning. Winds were from the east. Resident resides west of the landfill. No odours were observed at the time of inspection.

Schedule 'A'
2021 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	14/10/2021	1 complaint Received an e-mail complaint from a neighbor (RC) about odours @ 11:30 pm	Odour! It stinks outside (and consequently in my home) quite badly right now. Also, it seems in the last month there has been an increase in stink/smell from the dump. Winds SE, 18 °C, Overcast HH drove to the address and throughout the neighbourhood at 7:00 am the next morning. Winds were from the east. Resident resides west of the landfill. No odours were observed at the time of inspection.

Schedule 'A'
2021 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	14/10/2021	1 complaint Received an e-mail complaint from a neighbor (RC) about odours @ 11:30 pm	Odour! It stinks outside (and consequently in my home) quite badly right now. Also, it seems in the last month there has been an increase in stink/smell from the dump. Winds SE, 18 °C, Overcast HH drove to the address and throughout the neighbourhood at 7:00 am the next morning. Winds were from the east. Resident resides west of the landfill. No odours were observed at the time of inspection.

Schedule 'B'

2021 Tonnage Summary

SCHEDULE "B"

Month	Total Inbound Monthly Tonnage	2021 Outbound and Re-Used Monthly Tonnage														Total Outbound and Re-Used Monthly Tonnage	Total Tonnage Landfilled
		Cardboard	Tires	Glass	Drywall	E-Waste	Shingles	Wood	Metals&WG	Aggregate	Asphalt	Rock/Concrete	Cont Soil (cover/treated/re-used)	Clean Fill	Wet Waste		
Jan-21	32,535.70	-	-	-	-	-	(54.70)	(236.57)	(95.68)	(523.50)	(18.42)	(75.00)	(19,400.26)	(5.28)	(3.00)	(20,412.41)	12,123.29
Feb-21	24,771.80	-	(1.12)	-	-	-	(14.03)	(281.18)	(51.73)	(683.49)	-	(50.00)	(13,964.44)	(3.99)	(3.00)	(15,042.98)	9,728.82
Mar-21	28,486.50	(0.45)	-	-	-	(2.95)	(101.68)	(569.60)	(41.54)	(957.93)	(54.86)	(5,275.00)	(9,492.00)	(18.57)	(3.00)	(16,517.58)	11,968.92
Q1	85,794.00	(0.45)	(1.12)	-	-	(2.95)	(170.41)	(1,087.35)	(188.95)	(2,164.92)	(73.28)	(5,400.00)	(42,846.70)	(27.84)	(9.00)	(51,972.97)	33,821.03
Apr-21	48,485.90	-	-	-	(5.87)	-	(413.01)	-	(40.20)	(639.11)	(2,729.89)	(3,048.28)	(26,850.51)	(160.81)	(3.00)	(33,890.68)	14,595.22
May-21	45,869.90	-	(1.86)	-	-	(2.70)	(545.86)	(67.10)	(63.48)	(542.30)	(2,185.70)	(1,650.00)	(25,565.59)	(367.91)	(3.00)	(30,995.50)	14,874.40
Jun-21	81,876.00	-	(2.44)	-	-	(2.60)	(531.44)	(86.77)	(60.69)	(1,011.10)	(842.47)	(1,147.78)	(60,871.65)	(313.56)	(3.00)	(64,873.50)	17,002.50
Q2	176,031.80	-	(4.30)	-	(5.87)	(5.30)	(1,490.31)	(153.87)	(164.37)	(2,192.51)	(5,758.06)	(5,846.06)	(113,287.75)	(842.28)	(9.00)	(129,759.68)	46,272.12
Jul-21	54,442.60	-	-	-	-	-	(479.38)	(257.81)	(44.28)	(617.53)	(156.07)	(6,550.00)	(31,795.67)	(330.06)	(3.00)	(40,233.80)	14,208.80
Aug-21	39,536.90	(0.77)	-	-	-	-	(411.38)	(410.94)	(37.61)	(541.40)	(8.48)	(200.00)	(3,812.08)	(268.16)	(3.00)	(5,693.82)	33,843.08
Sep-21	29,099.60	(0.98)	-	(32.27)	-	-	(530.45)	(20.05)	(44.99)	(725.89)	-	(3,080.00)	(20,651.90)	(253.62)	(3.00)	(25,343.15)	3,756.45
Q3	123,079.10	(1.75)	-	(32.27)	-	-	(1,421.21)	(688.80)	(126.88)	(1,884.82)	(164.55)	(9,830.00)	(56,259.65)	(851.84)	(9.00)	(71,270.77)	51,808.33
Oct-21	44,604.50	-	(2.53)	-	-	(2.26)	(552.57)	(675.53)	(34.47)	(804.96)	(2.70)	(2,125.54)	(22,444.38)	(220.18)	(3.00)	(26,868.12)	17,736.38
Nov-21	57,753.80	-	(2.73)	-	-	(0.14)	(510.80)	(1,257.71)	(47.10)	(483.16)	-	(2,395.03)	(32,122.02)	(159.37)	(3.00)	(36,981.06)	20,772.74
Dec-21	25,815.10	(0.30)	(1.58)	-	-	-	(159.82)	(563.48)	(22.18)	(403.20)	-	(2,206.10)	(2,430.87)	(19.74)	(3.00)	(5,810.27)	20,004.83
Q4	128,173.40	(0.30)	(6.84)	-	-	(2.40)	(1,223.19)	(2,496.72)	(103.75)	(1,691.32)	(2.70)	(6,726.67)	(56,997.27)	(399.29)	(9.00)	(69,659.45)	58,513.95
Total:	513,078.30	(2.50)	(12.26)	(32.27)	(5.87)	(10.65)	(4,305.12)	(4,426.74)	(583.95)	(7,933.57)	(5,998.59)	(27,802.73)	(269,391.37)	(2,121.25)	(36.00)	(322,662.87)	190,415.43

Schedule 'C'

Brief Site History

Schedule 'C'
BRIEF SITE HISTORY

Landfilling at the Site started in the early 1960s and served, at the time, as a rural dump operation for local residents. In 1971, the Ministry of Environment and Climate Change (MOECC), formerly the MOE, issued a Provisional Certificate of Approval (CofA No. 460702) to Mr. D. J. Huneault for disposal of industrial waste including construction and demolition waste. Currently the site receives all types of solid, non-hazardous waste for disposal excluding putrescible waste. In 1995, the CofA was amended for the operation of waste processing and composting facilities at the site. Composting operations were suspended with the issuance of the CofA amendments in April 2009. In 2016, the CofA, now an Environmental Compliance Approval (ECA) was amended to permit the treatment of contaminated soils.

Annual monitoring of groundwater and surface water was initiated in 1987 and has evolved into a comprehensive monitoring program that is reported to the MOECC on an annual basis. In 1992, a leachate collection system was constructed along the down-gradient toe of the landfill and surface water diversion ditches were constructed up-gradient within the north buffer zone. Leachate was initially collected in retention ponds and re-circulated onto and into the landfill following treatment through a peat filter and constructed wetland system. Transport of leachate by tanker truck to the municipal wastewater treatment plant was initiated in 1997 and used for 11 years. Construction of the existing leachate pre-treatment/pumping station and forcemain connection to the City of Ottawa sanitary sewer system was completed in 2007 and commissioned in early 2008.

In 2001, a landfill gas collection and flaring system was constructed as an interim odour control system. This system was commissioned in April of 2012 and has remained operational since then.

Construction for the last landfill cell was completed in 2019.

A detailed record of milestones in the site's history is presented as follows:

1960s The site was established to serve the local resident population, operating as a rural dump operation.

1971 The first Ministry of Environment (MOE) Provisional Certificate of Approval (CofA No. A460702) was issued to D.J. Huneault and revised in 1980.

1981 Detailed inspections, surveys and water samplings were undertaken. Monitoring wells were installed. Ownership of the site was transferred to Huneault Waste Management (474299 Ontario Ltd.). An application was submitted to update the CofA.

1983 The CofA was re-issued to 474299 Ontario Ltd. for a 100-acre landfill site limited to construction rubble and inert materials.

1984 Following an Ontario Municipal Board hearing, the site was re-zoned to permit landfilling.

1987 An annual monitoring program for groundwater and surface water was initiated.

1989 Four groundwater-monitoring stations were installed along the south property boundary.

1991 A land use agreement was entered into between the City of Gloucester (now City of Ottawa) and 474299 Ontario Ltd. Monitoring of surface water, groundwater and leachate was increased from annual to semi-annual monitoring events.

1992 A leachate collection system was constructed along the down-gradient toe of the landfill. Surface water diversion ditches were constructed up gradient within the north buffer zone. A leachate retention pond was constructed in the southeast corner of the landfill area. The first of two large cells was excavated in the northwest quadrant.

1993 A second leachate retention pond was constructed in the southeast corner of the landfill area. The CofA was re-issued. Waste types were limited to construction and demolition debris, asbestos; non-hazardous solid industrial waste including impacted soil. The second of two large cells was excavated in the northwest quadrant.

1994 The company changed its name from 474299 Ontario Ltd. to Huneault Waste Management Ltd.

1995 Landfilling continued in the west half of the landfill. Landfill gas monitoring was carried out and passive ventilation trenches were constructed. A large peat filter for leachate treatment was constructed east of the leachate retention ponds. The CofA was amended to permit the processing (recycling) and composting of waste materials (leaf and yard waste).

1996 The CofA was amended to allow for the receipt and composting of wet waste. Constructed wetlands were used for on-site treatment of leachate. A compost pad was constructed within the landfill area with recycled asphalt. In the fall, composting of leaf and yard waste as well as composting of mixed organics began.

1997 Due to complaints from neighbouring residents related to odour issues at the Site during the spring and summer, the use of leachate retention ponds and the composting of wet waste were suspended. Leachate was trucked by tanker to the municipal wastewater treatment plant (ROPEC) in compliance with a field order issued by the MOE. Updates to the 1994 Water Management Systems Report were submitted to the MOE for approval and included a design for a long-term leachate pumping station.

1998 Leachate continued to be trucked by tanker to the municipal wastewater treatment plant (ROPEC). The CofA was amended to insure the company submit a revised compost management plan for approval by the MOE prior to receiving mixed organics at the composting site.

1999 In July of 1999, ownership of the landfill changed. Leachate continued to be trucked by tanker to the municipal wastewater treatment plant (ROPEC). The 1994 Water Management Systems Report (1998 Revisions – Leachate Management) and the Huneault Landfill Leachate/Effluent Pumping Station

Design prepared by Totten Sims Hubicki Associates Ltd., both dated December 1998, were approved by the MOE and the CofA was amended.

2000 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Construction of a new leachate wet well and pump station was completed. The leachate loading station was relocated to the top of the waste pile near Grid Line P-13 following the construction of the pump station. In September 2000 the corporation changed its name from Huneault Waste Management Ltd. to Waste Services Inc. (WSI).

2001 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). A second scale house was added at the entrance to the site to better serve WSI clients and to improve inbound and outbound traffic control. Active landfilling was being carried out in the southeast quadrant of the Site.

2002 Waste Services Inc. (WSI) was acquired by Capital Environmental Services Inc. (CERI), a publicly traded company. An amendment to the CofA was approved to allow foundry sand, wood chips and contaminated soil to be used as alternative daily cover, to allow recycled asphalt and inert granular materials to be used as road base, and to increase the service area to include the Province of Ontario. A CofA (Air) No. 6141-XKF9 was approved to permit the use of a tub grinder on site. A new scale and scale house were constructed at the entrance to the landfill to ease traffic congestion on Navan Road. Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Active landfilling was being carried out in the southeast quadrant of the Site.

2003 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Ainley Graham and Associates, a municipal engineering firm, completed a preliminary design for a leachate forcemain connection to the City of Ottawa sanitary sewer system. A small parcel of land referred to as the Larivière property and running the length of the Site's east property line was acquired in late 2003.

2004 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). A land exchange agreement was completed with the National Capital Commission giving WSI ownership of a 6.91 hectare parcel of land being a 100 metre strip south of the VIA right of way (ROW) in exchange for an 8.43 hectare parcel south of land owned by WSI (Plan 4R-19707). This brings its total land mass in and around the landfill Site to 69.05 hectares.

2005 Leachate continued to be trucked by tanker to ROPEC. A compliance order was received from the City of Ottawa to pre-treat the leachate and reduce the concentrations of hydrogen sulphide discharged at the wastewater treatment plant. The engineering firm Ainley Graham and Associates completed a Stage 1 Detailed Design for the Leachate Pre-Treatment/Pump Station and Forcemain with connection to the City of Ottawa sanitary sewer system. A small parcel of land referred to as the Robert property, running along the landfill Site's east property line, and a residential property located at 3516 Navan Road were acquired. Golder Associates Ltd. was retained to undertake geotechnical and slope stability analysis for the Site as well as monitoring for landfill gas, groundwater, surface water, leachate and sediment. Golder was also retained to undertake a leachate pre-treatment study. In November, WSI announced to the public that it was undertaking

a project to expand the capacity of the landfill and extend its operational life by at least 10 years beyond 2011. The first public Open House was held on December 8, 2005.

2006 In May 2006, the MOE issued an amended CofA No. A460702 consolidating previous Certificates of Approval and associated notices and updating the CofA to the current standards. An updated Design and Operations Report prepared by Gartner Lee Ltd. was adopted. Also in May, a proposed Terms of Reference for the expansion of the landfill in accordance with the Environmental Assessment Act was submitted to the MOE and these were approved in October 2006. Leachate continued to be trucked by tanker to ROPEC. Chemical treatment of leachate to reduce H_2S concentrations began in the spring. An approval for the Leachate Pre-Treatment/Pumping Station and another to install a leachate forcemain within the Navan and Renaud Road allowances were obtained from city council with construction commencing in early December. Additional property to the east of the landfill located at 3326, 3548, 3560 and 3578 Navan Road were acquired by WSI bringing its total land mass in and around the landfill site to 90 ha.

2007 WSI considered and used the results of an environmental assessment (EA) to identify a preferred landfill expansion alternative for the Site thereby extending its operational life. The expansion of the WSI Navan Waste Recycling and Disposal Facility received approval under the Ontario Environmental Assessment Act (EAA) on August 3, 2007. Construction of the leachate forcemain and associated site modifications were completed in August. At the request of the City of Ottawa, modifications to the leachate pre-treatment and sampling system were undertaken with design and construction completed during the later part of 2007.

2008 A revised D&O Report was prepared by Golder Associates Ltd. (January, 2008) to meet the regulatory requirements described in the Landfill Standards (MOE, 1998) and the associated Ontario Regulation 232/98 to address the related Conditions of Approval for the proposed landfill expansion under the EAA. The proposed expansion of the Navan Waste Recycling and Disposal Facility required approval under the Ontario *Environmental Protection Act* (EPA) as well as other legislation. In early 2008, WSI presented submissions to the MOE to satisfy both the conditions of the approved EA and the requirements of the EPA and OWRA. Commissioning of the leachate pre-treatment/pump station was completed in February with leachate being pumped via forcemain to the City of Ottawa sewer system. Construction of new weigh scales, scale house and access roads began in the fall.

2009 Expansion of the Navan Landfill under the Ontario Environmental Protection Act (EPA) received approval with the issuance of the revised CofA No. A460702 (Waste Disposal Site) on April 16, 2009 along with CofA No. 4816-7C7M6C (Industrial Sewage Works) and CofA No. 6733-7BYS9A (Air). CofA No. A460702 was subsequently amended by Notice 1 on October 9th 2009. Significant facility improvements were completed at the entrance to the Site consisting of new scales and scale house, new Site entrance, new office/maintenance facilities, a new small vehicle unloading area and a new wheel wash station. An east diversion ditch c/w fish habitat features was constructed along the east edge of the property and commissioned in the fall following South Nation Conservation Authority approval. A 963 m^2 segment of property bordering Navan Road and west of the new site entrance was severed and transferred to the City of Ottawa for the future

widening of Navan Road. Leachate continued to be pre-treated and discharged via forcemain to the City of Ottawa sewer system.

2010 In July, Waste Services Inc (WSI) merged with BFI Canada Inc., a Progressive Waste Solutions company, to become the third largest provider of waste services in North America. This merger had no impacts on the operations of the Navan Waste Recycling and Disposal Facility. Facility improvements continued to be made throughout 2010 and included completing the pavement structure for the main entrance and access to the site, the small vehicle unloading area and office/maintenance facility parking area and fire route. Berm construction and landscaping east of the wheel wash station and west of the site entrance were also completed. The design for modifications to the leachate pre-treatment/pumping station was approved by the MOE and, the Certificate of Approval (Industrial Sewage Works) was amended (CofA # 5616-86NKNW). The design for an interim odour control system at the site was approved by the MOE and the Certificate of Approval (Air) was amended (CofA # 3536-8APNZD). Construction of the landfill gas forcemain and flaring system was started in November. Cell development continued in the Phase 2 area of the site with active landfilling being carried out in Phases 3 and 4.

2011 Construction of the landfill gas forcemain and flaring system was completed and awaiting approval by the Technical Standards and Safety Authority (TSSA). Construction of the leachate pre-treatment and pumping station improvements were completed. Monitoring well MW11-1 was installed to replace monitoring well OW92-8. E-waste recycling services were introduced for the benefit of the local community. The east storm water management pond was completed in the fall. Cell development was completed in the area of Phase 2. Landfill was carried out in Phases 2, 3, and 4.

2012 An interim odour control system comprising of a landfill gas collection and flaring system was commissioned and approval by the Technical Standards and Safety Authority (TSSA) was received in April. The west stormwater management pond and east diversion ditch were completed in the fall. A new access road to the recycling facility and active landfill areas was constructed along the top of the existing waste mound just west of the East Cell expansion area. Landfilling was carried out in the area of Phases 3 and 4.

2013 An interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation. Leachate collection and pre-treatment was continued throughout 2013. A forcemain obstruction causing a cleanout flange failure resulting in a spill along Navan Road was experienced in December. The event was reported to the MOE and the City. The spill was cleaned up and the system repaired and returned to regular operations. Efforts were concentrated in completing the north facing waste slope west of the site access and the west facing waste slope. Landfilling was carried out in the area of Phases 3 and 4. In 2013, BFI collaborated with a third party to develop a market for recycled drywall. Other materials recycled and re-used consist of glass, tires, cardboard, e-waste, shingles, wood, metals and white goods, aggregate, asphalt, rock and concrete, clean fill and impacted soils for re-use as cover material.

2014 An interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells. Leachate collection and pre-treatment was continued throughout 2014. Construction of the east expansion cell (Phase 1) drainage system was started in 2014 with completion anticipated in early 2015. Waste placement efforts were concentrated in completing the west-facing slope (Phase 3). In 2014 BFI continued to recycle and re-use materials such as glass, tires, cardboard, e-waste, shingles, wood, metals and white goods, aggregate, asphalt, rock and concrete, clean fill as well as impacted soils re-used as cover material.

2015 In 2015, the company changed its operating name from BFI Canada Inc. to Progressive Waste Solutions Canada Inc. Leachate collection and pre-treatment was continued throughout 2015. Construction of the east expansion cell (Phase 1), drainage system started in 2014 was completed in 2015, and landfilling within the cell began in mid December. Waste placement efforts focused on completing the Phase 3 fill area and the west end of Phases 4 and 5 prior to starting waste placement in the new east cell. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells. In addition to recycling various waste materials, PWS in 2015 received MOECC approval for the treatment of contaminated soils.

2016 Leachate collection and pre-treatment was continued throughout 2016. Waste placement efforts continued in the new east cell (Phase 1). Contaminated soil placement to raise the grades to final elevations continued in the Phase 3 fill area and the west end of Phases 4 and 5. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells at the west end of Phase 5. Recycling and treatment of hydrocarbon impacted soils were on-going operations throughout 2016. Treated soils were used as final cover and to raise the grades in the east buffer adjacent the waste column. Cell construction continued in the north half of the east cell (Phase 6) and consisted of excavation work. A screening plant was added to the processing operations for the screening of oversize materials and rock. Amended Environmental Compliance Approval number 2427-AETKQ5 issued by the MOECC dated November 2016 was received for the construction and operation of an enclosed flare.

2017 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2017. In 2017, two Notices of Violation were issued by the City. One for over strength parameters in the leachate that were later addressed and the second for elevated volatile organic readings in a sampling manhole, that was also addressed. Waste placement efforts continued in the east cell (Phase 1). The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of a horizontal collection well in the active fill area and seven permanent vertical wells. Recycling and treatment of hydrocarbon-impacted soils were on-going operations throughout 2017. Treated soils were used as final cover and to raise the grades in the east buffer adjacent the waste column. Cell construction continued in the north half of the east cell (Phase 6) and consisted of excavation work. Design of the final and permanent landfill gas flaring system was completed and submitted in December by Golder Associates Ltd. to the Technical Standards and Safety Authority (TSSA) for review and approval. In the spring of 2017, the company changed its name to Waste Connections of Canada Inc.

2018 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2018. In 2018, one Notice of Violation was issued by the City for a leachate spill along Renaud Road. An obstruction to the discharge pipe inside the sampling manhole located on Renaud Road caused the manhole to fill and overflow onto Renaud Road. The event was reported to the MOE and the City. The spill was cleaned up and the system cleaned out and returned to regular operations. Waste placement efforts continued in the east cell (Phase 1) and in October resumed in the Phase 4 area of the landfill. Excavation of the northeast cell in Phase 6 was continued and construction of the leachate collection and drainage system was substantially completed. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the connection of three vertical wells installed in late 2017. Recycling and treatment of hydrocarbon-impacted soils were on-going operations throughout 2018. Treated soils were used as fill to raise the grades in the east buffer adjacent the waste column in the Phase 6 area..

2019 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2019. Construction of a new cell in Phase 6 was completed and an as-built report prepared by Golder Associates Ltd. was submitted to the Ministry of the Environment, Conservation and Parks. Waste placement efforts continued in Phase 1, in the area of Phase 4 and then in the new cell (Phase 6) for the last quarter of the year. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of four permanent vertical wells in the area of Phase 4. Recycling and treatment of hydrocarbon-impacted soils were on-going operations throughout 2019. Treated soils were used to raise the grades in the east buffer adjacent the waste column. An existing stormwater ditch along the north edge and the northwest edge of the new cell in Phase 6 was replaced by a large diameter culvert complete with concrete headwalls.

2020 WCC continued discharging pre-treated leachate to the City of Ottawa sewer system via a forcemain located on the south shoulder of Navan Road and the east shoulder of Renaud Road connecting at the intersection of Page Road and Renaud Road. The interim landfill gas flaring system continued to be operational and effective in reducing odour causing fugitive gas emissions. In 2020, waste placement was concentrated on the east side of the waste footprint in the Phase 6 cell area. A ditch diversion culvert constructed along the north and east perimeter of the waste cell was located in the Phase 6 area by S.W. Farrell and Sons (1979) Ltd. The drainage layer on the sloped north and east walls of the waste cell in the Phase 6 area was also completed. Recycling, re-use and treatment of hydrocarbon-impacted soils were on-going operations throughout 2020.

2021 WCC continued discharging pre-treated leachate to the City of Ottawa sewer system via a forcemain. The interim landfill gas flaring system continued to be operational and effective in reducing odour causing fugitive gas emissions. In 2021, waste placement was concentrated on the east side of the waste footprint in the Phase 6 cell area. A 300 mm diameter HDPE landfill gas header pipe was installed along the north, west and south edges of the waste footprint by Les Entreprises Forlam Inc. to accommodate the long-term gas collection system. A concrete flare pad and gas extraction plant pad was constructed at the southeast corner of the landfill by S.W. Farrell and Sons (1979) Ltd. A new access road running along the east edge of the waste footprint was 90% completed in 2021. Recycling, rock screening, re-use and treatment of hydrocarbon-impacted soils were on-going

operations throughout 2021. An ECA amendment was issued by the Ministry of the Environment, Conservation and Park, permitting a temporary tonnage exemption for contaminated soils.

Schedule 'D'

Amendment to Environmental Compliance Approval Number A460702 Notice No. 13

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A460702
Notice No. 13
Issue Date: September 29, 2021

Waste Connections of Canada Inc.
6220 Highway 7, No. 600
Vaughan, Ontario
L4G 4H3

Site Location: 3354 Navan Road
Lot Part of Lots 2,3,4, Concession 4
Ottawa City,
K4B 1H9

You are hereby notified that I have amended Approval No. A460702 issued on April 16, 2009, and subsequently amended for a 40 hectare landfill and processing site within a total site area of 92.85 hectares, , as follows:

I. The following conditions are hereby added to this ECA:

Temporary Tonnage Exemption for Contaminated Soil

50.1 Notwithstanding Condition 48, up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021.

50.2 Notwithstanding Condition 50, contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1.

50.3 Conditions 50.1 and 50.2 expire on January 1, 2022.

II. The following items are hereby added to Schedule "A"

63. Letter dated August 19, 2021 to Mohsen Keyvani from Waste Connections Canada and the enclosed Environmental Compliance Approval Application for an emergency amendment to the ECA to temporary increase the annual tonnage limit for contaminated soil.

64. Email dated September 22, 2021 from Brian Forrestal, Waste Connections of Canada to Mohsen Keyvani, MECP regarding the revised additional tonnage for contaminated soil.

The reason for this amendment to the Approval is to allow the Site to temporarily accept additional contaminated soil in 2021 for waste cover to accommodate the extra soil generated from construction sites.

This Notice shall constitute part of the approval issued under Approval No. A460702 dated November 17, 1993

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

* **Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 29th day of September, 2021

Mohsen Keyvani, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

RL/

c: District Manager, MECP Ottawa
Brian Forrestal, P.Eng., Waste Connections of Canada Inc.

APPENDIX 5

EACMR

1.0 INTRODUCTION

1.1 Background

In August 2007, Waste Services (Canada) Inc. (WSI) now Waste Connections of Canada Inc. (WCC) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Condition 4 of that approval required that WSI (WCC) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WSI's (WCC's) compliance monitoring program. In accordance with Condition 3 of the EA approval, WSI previously submitted a separate document proposing an EA Compliance Monitoring Program.

In October 2008 WSI (WCC) submitted the first Environmental Assessment Compliance Monitoring Report (EACMR), which was intended to fulfill condition 4 of the EA approval conditions. The report addressed the period August 3, 2007 to August 2, 2008. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of the EACMR with submission of the Annual Operations and Monitoring Report, which is submitted annually by March 31st. Accordingly, this EACMR is submitted as an Appendix to the Annual Report and covers the period January 1st to Dec. 31st, 2021.

The Ministry's EAAB File # is EA 02 08 02.

1.2 Report Organization

- The EACMR comprises six sections as follows:
- Introduction – provides an overview of the purpose, context of submission and structure of the report as well as the proponent's contact information and an overview of significant activities at the Navan Landfill during the reporting period;
- Physical Works/Mitigation Measures – are presented in Table A, which lists WCC's commitments to make physical improvements to the site and in-design mitigation measures made during the EA and subsequent review, and provides a discussion on WCC's progress in meeting the commitments;
- Studies and Other Commitments – during the EA and review of the EA, WCC made commitments to other studies or activities, such as developing an end use plan and property value protection plan. These and other commitments are listed in Table B and WCC's progress in meeting these requirements is assessed;

- Public Consultation – is presented in Table C, which lists commitments and conditions of approval involving public consultation. A discussion is provided summarizing consultation activities during the reporting period and assessing WCC's fulfillment of these requirements;
- EA Conditions of Approval – the conditions of EA approval contained in the Minister's letter are listed in Table D and WCC's progress in meeting these conditions is described.
- Compliance Status – the final section of the report summarizes the findings in Tables A – D and provides concluding remarks on the overall status of compliance with the EA. Potential non-compliance issues, if any, are discussed in this section.

1.3 Proponent Contact Information

Waste Connections of Canada Inc. (WCC) is a multi-regional, integrated solid waste services company providing collection, transfer, recycling, composting, and disposal services to its customers. WCC is committed to excellence in environmental management and to conducting its business in a manner that protects the environment, health and safety of its employees, customers and communities in which it operates. Waste Connections of Canada Inc. is the owner and operator of the Navan Waste Recycling and Disposal Facility. WCC's contact information is as follows:

Waste Connections of Canada Inc.

3354 Navan Road

Ottawa, ON

K4B 1M9

Attn: Mr. Henri Huneault, Landfill Manager

2.0 PHYSICAL WORKS/MITIGATION MEASURES

There were thirteen (13) commitments made by WSI (WCC) during the EA and subsequent review process. These commitments relate to installation of physical works and/or implementation of mitigation measures. WSI (WCC) made the majority of the commitments during the EA as documented in the EA Study Report (EASR). Table A provides a listing of the outstanding commitments during the current reporting period. For each commitment a reference is provided regarding the documented source of the commitment, the time frame in which it is expected to be implemented and comments on WCC's progress in fulfilling the commitment such as 'completed', 'in progress', 'ongoing' etc.

WCC has now completed nine (9) of the original thirteen (13) commitments in Table A and the remaining four (4) are ongoing. There are no non-compliance issues.

Table A: EA Compliance Status for Physical Works and Mitigation Measures

Commitments	Where Commitment Made	Implementation Schedule	Status
A-5: WCC will install an active gas management system consistent with the requirements of Ontario Regulation 232/98.	▪ Section 8.3 of the EASR.	Landfill gas/odour control system will begin construction in 2010 and the remainder phased in as the landfill is developed.	**Ongoing** Studies for landfill gas completed in 2009. Approved interim LFG odour control system header pipe and connections abstraction plant and candlestick flare equipment was completed in 2011 and commissioned in early 2012. The operation and expansion of the system as required is on-going. Final Design of the permanent enclosed flaring system was completed by Golder Associates Ltd. in 2017 and modified in 2020. In 2020 WCC retained Perennial Energy Inc. to fabricate the enclosed flare and extraction plant for the permanent system to be installed at the site. In 2021, Forlam Construction installed the permanent header pipe on the north, west and south sides of the landfill and are awaiting the flare and extraction plant delivery from Perennial for connection.
A-6: WSI will undertake best management practices (BMP) for dust control.	▪ Section 8.3 of the EASR.	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and ongoing during operations.	**Ongoing** Best management practices for dust control were implemented in 2009 and will continue over the operating life of the landfill. A wheel wash system was constructed and commissioned in late 2009 and operated from April to November 2020 to reduce dirt and mud drag out onto paved roads (internal roads and Navan Road). A Best Management Practices Plan for Fugitive Dust Control was completed by

Table A: EA Compliance Status for Physical Works and Mitigation Measures

Commitments	Where Commitment Made	Implementation Schedule	Status
			Dillon Consulting dated October 2015 and submitted to the MECP in accordance with the requirement of an amendment for the treatment of contaminated soils.
A-7: WSI will vegetate side slopes and berms in order for the landfill to blend in as much as possible with the environment. Species native to Site area will be used wherever possible.	▪ Section 9.1 of the EASR	Following receipt of all necessary approvals to allow expansion of the Navan Landfill. Vegetation planting will be ongoing during operations. Details of vegetation planting will be refined during the EPA approval process.	**Ongoing** Approvals have been received. In 2021 vegetation was maintained and preserved where possible. The south, north and west facing waste slopes have been covered with final cover and seeded. As closure progresses, additional tree planting at the top of the landfill is on-going.

Commitments	Where Commitment Made	Implementation Schedule	Status
A-12: Best management practices (BMP) will be used to mitigate dust from activities at the Navan landfill.	▪ Response to MOE GRT Comments, p. 24 ▪ MOE EA Approval Condition # 10.5	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and ongoing during operations.	**Ongoing** Approvals received.

3.0 STUDIES AND OTHER COMMITMENTS

WSI (WCC) agreed to undertake a total of thirty one (31) studies and additional tasks/commitments during the course of the EA and subsequent review. Table B lists the outstanding commitments during the reporting period along with a brief description of their status. Of the thirty one (31) original commitments listed in Table B, WCC has completed all but three (3) with one (1) not yet started, one (1) ongoing and one (1) in progress. Most of the completed commitments relate to providing additional information and detail during the EPA approval process.

There are no issues with non-compliance associated with any of the Table B commitments.

Table B: EA Compliance Status for Studies and Other Communication

Commitments	Where Commitment Made	Implementation Schedule	Status
B-1: WSI will undertake an evaluation of end-use alternatives.	▪ EASR Table 8.3-1, p. 120d	Three years prior to the landfill closure.	**Not yet started** The evaluation of end use alternatives will be undertaken and documented as part of a closure plan to the MECP as required by Regulation 232/98. Status of the development of the end use plan will be reported in the EACMR section of the annual O&M Report to the MECP starting three years prior to site closure.
B-3: WSI will continue to pursue further waste diversion programs as appropriate.	▪ EASR p.120e	Schedule is based on economic and technical viability and approvals.	**Ongoing** Treatment of hydrocarbon contaminated soils along with the recycling and re-use of other landfill materials such as glass, wood, metals, roofing shingles, aggregates, tires and other materials was on-going throughout 2021.
B-11: WSI will maintain sufficient financial assurance for proper decommissioning of the site in keeping with MOE requirements, community plans and input from the PAC.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**In Progress** Financial assurance plan is in place and will be maintained throughout the life of the landfill site.

4.0 PUBLIC CONSULTATION

WSI (WCC) agreed to seven (7) commitments regarding public consultation during the EA, including the formation of a Public Advisory Committee (PAC). The status of these commitments is provided in Table C. All four (4) of the commitments remaining are ongoing.

Table C: EA Compliance Status for Public Consultations

Commitments	Where Commitment Made	Implementation Schedule	Status
C-3: WSI will work with the PAC on an ongoing basis to consider enhanced opportunities to improve re-cycling and diversion at the Navan Road Landfill to work towards the diversion goals articulated by the City of Ottawa and the province.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and completion of the City's study.	**Ongoing** Treatment of hydrocarbon contaminated soils along with the recycling and re-use of other landfill materials such as glass, wood, metals, roofing shingles, aggregates, tires and other materials was on-going throughout 2021. WCC continues to add marketable materials to its recycling efforts.
C-4: WSI will work with the PAC on an ongoing basis to consider other opportunities to reduce odour, dust and road dirt.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**Ongoing** A wheel wash station was constructed and commissioned at the end of 2009. Construction of an interim odour control system was completed in 2011 and commissioned in early 2012. Final design of a permanent landfill gas system was completed in 2017 and modified in 2020. WCC, in 2020, retained Perennial Energy Inc. to fabricate the flare and extraction plant. In 2021, Forlam Construction installed the permanent header pipe on the north, west and south sides of the landfill and are awaiting delivery of the flare and abstraction plant from Perennial for connection.

Table C: EA Compliance Status for Public Consultations

Commitments	Where Commitment Made	Implementation Schedule	Status
C-5: WSI is prepared to address new issues arising from the EA or detailed EPA assessment work and will work with the PAC on these issues.	▪ WSI – Friends of Mer Bleue Agreement	As these issues become known.	**Ongoing**
C-7: WSI will work with the City of Ottawa, the Friends of the Mer Bleue and the PAC to identify and develop community projects to enhance and improve the community and its public spaces.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**Ongoing** An agreement for a funding mechanism by WCC for community projects was included in the Terms of Reference for the PAC. A number of community projects were funded in 2021 by the WCC-PAC fund.

5.0 EA CONDITIONS OF APPROVAL

In the Notice of Approval to Proceed with the Undertaking, the Minister of the Environment listed forty three (43) conditions grouped into ten (10) categories of which sixteen (16) remain, as listed in Table D. Many of these conditions result from commitments made by WSI (WCC) during the EA review and are listed in Tables A, B or C. For convenience to the reader, cross-references have been provided to the corresponding WSI (WCC) commitment listed in Tables A, B or C. Where no cross-reference is available (i.e., this is a new condition), "not applicable" (n/a) is recorded in Table D. It should be noted that many of the conditions are the same as WSI (WCC) commitments contained in Tables A, B and C.

No non-compliance issues have been identified.

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
1. General Requirements			
1.1 The proponent shall comply with the provisions in the EA which are hereby incorporated in this approval by reference except as provided in these conditions and as provided in any other approval or permit that may be issued for the site.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	Ongoing
1.2 The proponent shall implement any additional commitments made by them and recorded in their response and attachments as noted above, except as provided for in these conditions or as provided for under other approvals, authorizations or permits required for the undertaking.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	Ongoing
1.3 These conditions do not prevent more restrictive conditions being imposed under other statutes.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	Ongoing

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
2. Public Record			
2.1 Where a document is required for the public record, the proponent shall provide two copies of the document to the Director, one copy for filing within the specific public record file maintained for the undertaking and one copy for staff use.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.2 The proponent shall provide additional copies of such documents at the request of the: • Regional Director; • Clerk of the City of Ottawa; and, • PAC.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.3 The proponent shall quote EAAB file number EA 02 08 02 on the documents.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.4 The proponent may also provide these documents through other means as it considers appropriate.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
3. Compliance Monitoring Program			
3.6 The proponent shall carry out the monitoring program as amended by the Director.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing**
3.7 The proponent shall make the documentation available to the ministry or it's designate upon request in a timely manner when so requested by the ministry during an on-site inspection, audit, or response to a pollution incident report or when information concerning compliance is requested by the ministry.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing**
4. Compliance Reporting			
4.1 The proponent shall prepare an annual compliance report which describes compliance with the conditions of approval set out in this notice and which describes the results of the proponent's EA compliance monitoring program.	n/a	The EACMR is required annually, until all conditions have been met.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
4.2 The proponent shall issue the first compliance report no later than one year following the date of this approval, and in each subsequent year shall issue a compliance report covering the previous year, on the date that is the anniversary of this approval or the proponent can coordinate the timing of its reporting with its annual Design and Operations report required under the EPA.	n/a	MOE has agreed for the EACMR to be submitted annually April 1 with the Annual O & M Report	**Ongoing**
4.3 The proponent shall submit the annual compliance report to the Director for placement on the public record.			**Ongoing**
4.4 The proponent shall submit annual compliance reports until all conditions of this approval are satisfied.	n/a	Beginning in 2008 and annually during the operation of the landfill until all conditions have been satisfied.	**Ongoing** The first annual EACMR was submitted in 2008 and are provided annually attached to the Operations and Monitoring Report.
4.5 When all conditions have been satisfied, the proponent shall indicate in the annual compliance report that this is its final submission.	n/a		**Ongoing**
4.6 The proponent shall retain, either on site or in another location approved by the Director, copies of the annual compliance reports for each reporting year and any associated documentation of compliance monitoring activities.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing** In 2008, WSI established a library on site where EACMR and associated documentation is available for viewing by the public.

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
4.7 The proponent shall make the documentation available to the ministry or it's designate upon request in a timely manner when so requested by the ministry during an on-site inspection, audit, or in response to a pollution incident report or when information concerning compliance is requested by the ministry.	n/a		**Ongoing**
5. Public Advisory Committee			
5.4 The proponent may dispense with the PAC if, after a period of time and after giving sufficient notice, there is no interest from the public in continuing with it. The proponent shall review the need for such a PAC yearly.	n/a	Ongoing throughout operational life of landfill expansion	**Ongoing**
6. Planting Plan			
6.3 The proponent shall make best efforts to protect existing mature trees and vegetation on site that could be used to screen the construction of the landfill berms, where appropriate.			**Ongoing** On-going throughout life of the landfill.

6.0 COMPLIANCE STATUS

WSI (WCC) made a total of 51 commitments during the EA and subsequent review as listed in Tables A, B and C. Eleven (11) commitments remain "ongoing" or "in progress". In other words, about 78% of the original commitments have now been fulfilled and some will remain in ongoing throughout the operating life of the Site.

The Minister listed fourty three (43) conditions in her Notice of Approval to Proceed with the undertaking, which are listed in Table D. Several conditions (13) were derived from WSI (WCC) commitments made during the EA and subsequent review. Eighteen (18) conditions remain at the end of the reporting period and will remain ongoing throughout the operating life of the landfill. WCC continues to make progress in all of the remaining conditions.

No non-compliance issues were identified during the report period.

Normand G Castonguay

LIST OF ABBREVIATIONS

The abbreviations commonly employed on Records of Boreholes, on figures, and in the text of the report are as follows:

I. SAMPLE TYPE

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO or DP	Seamless open-ended, driven or pushed tube samplers
DS	Denison type sample
FS	Foil sample
RC	Rock core
SC	Soil core
SS	Split spoon sampler
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample
DT	Dual tube sample
DD	Diamond drilling

II. PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg. (140 lb.) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split spoon sampler for a distance of 300 mm (12 in.).

Dynamic Cone Penetration Resistance (DCPT); N_d:

The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) to drive an uncased 50 mm (2 in.) diameter, 60^0 cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH:	Sampler advanced by hydraulic pressure
PM:	Sampler advanced by manual pressure
WH:	Sampler advanced by static weight of hammer
WR:	Sampler advanced by weight of sampler and rod

Cone Penetration Test (CPT):

An electronic cone penetrometer with a 60^0 conical tip and a projected end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and friction along a sleeve are recorded electronically at 25 mm penetration intervals.

III. SOIL DESCRIPTION

(a) Cohesionless Soils

Density Index (Relative Density)	**N** Blows/300 mm Or Blows/ft.
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very dense	over 50

(b) Cohesive Soils

C_u or S_u

Consistency	kPa	Psf
Very soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1,000
Stiff	50 to 100	1,000 to 2,000
Very stiff	100 to 200	2,000 to 4,000
Hard	Over 200	Over 4,000

IV. SOIL TESTS

w	Water content
w_p or PL	Plastic limited
w_1 or LL	Liquid limit
C	Consolidaiton (oedometer) test
CHEM	Chemical analysis (refer to text)
CID	Consolidated isotropically drained triaxial test[1]
CIU	Consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	Relative density
DS	Direct shear test
Gs	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	Organic content test
SO_4	Concentration of water-soluble sulphates
UC	Unconfined compression test
UU	Unconsolidated undrained triaxial test
V	Field vane test (LV-laboratory vane test)
γ	Unit weight

Note: [1] Tests which are anisotropically consolidated prior shear are shown as CAD, CAU.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$ x or log x	logarithm of x to base 10
g	acceleration due to gravity
t	time
FOS	factor of safety
V	volume
W	weight

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta \sigma'$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
ν	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial vertical effective overburden stress
$\sigma_1\sigma_2\sigma_3$	principal stresses (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3) / 3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) formerly (G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_1 or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity Index = $(w_1 - w_p)$
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_c	consistency index = $(w_1 - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (overconsolidated range)
C_s	swelling index
C_α	coefficient of secondary consolidation
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	overconsolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p or τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c'	effective cohesion
c_u or s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3) / 2$
p'	mean effective stress $(\sigma'_1 + \sigma'_3) / 2$
q	$(\sigma_1 - \sigma_3) / 2$ or $(\sigma'_1 - \sigma'_3) / 2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes:
[1] $\tau = c' + \sigma' \tan \phi'$
[2] shear strength = (compressive strength) / 2

PROJECT: 11-1125-0017

RECORD OF BOREHOLE: BH11-1

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 30, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp W Wl) (20 40 60 80)	ADDITIONAL LAB TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE											
0	Power Auger 200 mm Diam. (Hollow Stem)	Very loose to loose grey brown silty fine sand and silty clay (FILL)		0.00	1	50 DO	1						Bentonite Seal
1					2	50 DO	WH						Native Backfill
2					3	50 DO	4						
3					4	50 DO	5						
3		Grey brown silty clay, some sand (FILL)		3.51									
4		Loose brown SILTY fine SAND, trace gravel, clay and organic matter		3.66	5	50 DO	7						
5					6	50 DO	7						
5		Stiff red brown SILTY CLAY, trace sand (Weathered Crust)		5.18	7	50 DO	8						Bentonite Seal
6		Very soft grey SILTY CLAY		5.94	8	50 DO	1						
7					9	50 DO	PM						
8					10	50 DO	PM						
9													Silica Sand
10					11	50 DO	PM						
10		End of Borehole		10.67	12	50 DO	PM						50 mm Diam. PVC #10 Slot Screen
11													
12													
13													
14													
15													

DEPTH SCALE

1 : 75

LOGGED: DG

CHECKED: LEB

002732

MIS-BHS 001 1111250017-01.GPJ GAL-MIS.GDT 12/23/11 P.G

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1A

SHEET 1 OF 2

LOCATION: N ;E

BORING DATE: 02/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		68.76				SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	WATER CONTENT PERCENT Wp W Wl (20 40 60 80)		
		Black SANDY SILT with organic matter		0.00							Protective casing
				68.23							
		Loose brown fine SANDY SILT		0.53	1	SS DO	6				Bentonite Seal
				67.77							
1		Stiff grey brown SILTY CLAY (Weathered Crust)		0.99	2	SS DO	4				
					3	SS DO	WH				
2				66.17							
		Grey SILTY CLAY		2.59	4	SS DO	WH				
3											
4					5	SS DO	PM				
				63.88							
5		Grey SILTY CLAY, trace of black organic matter		4.88							
6					6	SS DO	PM				
					7	SS DO	PM				
	Power Auger 203mm Diam. (Hollow Stem)			60.84							
8		Grey SILTY CLAY, occasional rust brown layers, traces black organic matter		7.92							Native Backfill
9					8	SS DO	PM				
10				58.48							
		Grey SILTY CLAY, trace black organic matter		10.32	9	SS DO	PM				
11					10	SS DO	PM				
12											
13					11	SS DO	PM				
14											
15		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 75

Golder Associates

LOGGED: D.G.

CHECKED: MKF

002733

MIS-BHS 001 09112532080000.GPJ GAL-MIS.GDT 3/8/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1A

SHEET 2 OF 2

LOCATION: N ;E

BORING DATE: 02/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + ⊡ - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp W Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
15	Power Auger 200mm Diam. (Hollow Stem)	— CONTINUED FROM PREVIOUS PAGE —											
15		Grey SILTY CLAY, trace black organic matter			12	SS DO	PM						
16													
17					13	SS DO	PM						Notfrey Backfill
18				50.78									
18		Grey SILTY CLAY		17.94	14	SS DO	WH						
19													Bentonite Seal
19				49.00	15	SS DO	>50						
20		Very dense grey SANDY SILT, some gravel and clay (GLACIAL TILL)		19.76									Silica Sand
20													32mm diam. PVC #10 slot screen
21				47.65									
21		End of Borehole		21.11	16	SS DO	>50						
22													Well Screen frozen to Elev. 68.67 m on Feb 8, 2010
23													
24													
25													
26													
27													
28													
29													
30													

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.G.

CHECKED: MKF

002734

GINT 9.6.02 - 2010-02-25 - 08:41 - C:\GINT\1125\0008-2010.GPJ - GAL-MIS.GDT

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1B&C

SHEET 1 OF 1

LOCATION: N ;E

BORING DATE: 04/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7})	WATER CONTENT PERCENT (Wp ⊢—○ W —⊣ Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam. (Nominal Size)	GROUND SURFACE		68.72									
		For subsurface stratigraphy refer to record of borehole 09-B2A		0.00									Protective Casing; Bentonite Seal; Native Backfill; Silica Sand; 32mm diam. PVC #10 slot screen C; Silica Sand; Bentonite Seal; Native Backfill and Bentonite; Bentonite Seal; Silica Sand; 32mm diam. PVC #10 slot screen B
10		End of Borehole		58.67 10.05									W.L. in Screen B at Elev. 67.43 m; W.L. in Screen C at Elev. 67.57 m on Feb. 8, 2010

DEPTH SCALE

1 : 75

LOGGED: D.G.

CHECKED: WKF

Golder Associates

002735

M:\2-10 001 GN\1125\0008-2009 BH GA_MS GDT 3/9/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1D

SHEET 1 OF 1

LOCATION: N ;E

BORING DATE: 08/02/2010

DATUM: Geodetic

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		69.58									
0	Hand Auger Open Hole	PEAT		0.00	1	50 DO	WH						Bentonite Seal
1					2	50 DO	1						Silica Sand Backfill; 32mm Dia. PVC # 10 Slot Screen
2				67.60	3	50 DO	WH						
		End of Borehole		1.98									Well Installed Elev. 68.40 m Feb. 8, 2010
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

DEPTH SCALE

1 : 75

Golder Associates

LOGGED: J.D.

CHECKED: MKC

002736

MIS-BHS 001 09112500008-2000.GPJ GAL-MIS.GDT 3/9/10

PROJECT: 07-1122-0203-200

RECORD OF BOREHOLE: BH07-1

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: August 27, 2007

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10⁻⁶ 10⁻⁵ 10⁻⁴ 10⁻³); WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		32.34							
		TOPSOIL (FILL)		32.25							Protective Casing
		Brown SANDY SILTY some gravel trace brick (FILL)		31.95							Bentonite Seal
		Brown SILTY SAND, trace topsoil (FILL)		0.39	1	50 DO	8				Silica Sand
		Dark grey brown SILTY SAND, trace topsoil (FILL)		30.46	2	50 DO	3				50mm Diam. PVC #10 Slot Screen D
		Stiff grey brown SILTY CLAY (Weathered Crust)		29.84	3	50 DO	WH				
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter		2.50	4	50 DO	WH				Bentonite Seal
					5	50 DO	PH				38mm Diam. PVC #10 Slot Screen C
					6	50 DO	PH				Native Backfill
					7	50 DO	PH				Bentonite Seal
		Grey SILTY CLAY, trace black organic matter		23.61							Silica Sand
				8.53	8	50 DO	PH				38mm Diam. PVC #10 Slot Screen B
					9	50 DO	PH				
		Grey SILTY CLAY, trace to some black organic matter		20.56							
				11.58	10	50 DO	PH				
					11	50 DO	PH				Native Backfill
					12	50 DO	PH				
					13	50 DO	PH				
					14	50 DO	PH				
		CONTINUED NEXT PAGE									

Barrel Hydr 105mm Diam. (Rotator Barrel)

DEPTH SCALE

1 : 100

LOGGED: D.J.S

CHECKED: P.L.E

Golder Associates

002737

MISSING 021 07-1122-0203-200 EP1 BLOG 23 NOV 2007

PROJECT: 07-1122-0203-200

RECORD OF BOREHOLE: BH07-1

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: August 27, 2007

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10⁻⁴ 10⁻⁵ 10⁻⁶ 10⁻⁷)	WATER CONTENT PERCENT (Wp — W — Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Power Auger 200mm diam. (Hollow Stem)	— CONTINUED FROM PREVIOUS PAGE —											
		Grey SILTY CLAY, trace to some black organic matter			15	SS DO	PM						Native Backfill
		Grey SILTY CLAY, occasional clayey silt seam		20.70									
22		Compact dark grey SANDY SILT, some gravel and clay, occasional cobbles (GLACIAL TILL)		21.73	16	SS DO	HAM						Bentonite Seal
					17	SS DO	13						Silica Sand
24		End of Borehole Auger Refusal		23.90									38mm Diam. PVC #10 Slot Screen
26													
28													
30													
32													
34													
36													
38													
40													

Note: monitoring well screens A and B are each installed in their own boreholes and monitoring well screens C and D are installed in one borehole.

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: O.J.S.

CHECKED: P.L.E.

002738

GTA-S-GEO_07-1122-0203-200.GPJ GLOBAL_CAN.GDT 9/19/07

PROJECT: 05-1120-732-303

RECORD OF BOREHOLE: 05-11

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Aug. 17, 2005

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (net V. +, Q - ●; rem V. ⊕, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10⁻⁵ 10⁻⁴ 10⁻³ 10⁻²)	WATER CONTENT PERCENT Wp, W, Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		72.81									
		Stone dust (FILL)		0.00									
				72.04									
		Grey brown silty clay, trace sand and organic matter (FILL)		0.77									Protective steel casing set in bentonite
1	Power Auger 200mm Diam. (Hollow Stem)				1	SS	7						
					2	SS	5						Native Backfill
				70.81									
		Dark grey TOPSOIL		2.00									
		Compact brown fine SAND, trace to some silt		70.65	3	SS	10						Bentonite Seal
													Silica Sand
4					4	SS	12						
		Grey SILTY CLAY		68.91 3.90									30mm Diam. PVC #10 Slot Screen
					5	SS	WH/1						
5		End of Borehole		64.03 4.88									
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

002739

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/2/06

PROJECT: 05-1120-732-303

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-8

BORING DATE: Aug. 17, 2005

SHEET 1 OF 1

DATUM:

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		73.16 / 0.00				SHEAR STRENGTH Cu, kPa: net V. + Q - ●; rem V. ⊕ U - ○ (20 40 60 80)	WATER CONTENT PERCENT: Wp W Wl (10 20 30 40)		
		Stone dust (FILL)		72.86 / 0.30							Protective steel casing set in bentonite
1		Asphalt and gravel (FILL)									
		Dark brown and grey brown silty clay and sandy silt, trace organic matter (FILL)		71.84 / 1.32	1	50 DO	7				
2	Power Auger 200mm Diam. (Hollow Stem)	Brown sand with plastic and metal (FILL)		71.00 / 2.07	2	60 DO	27				Native Backfill
		TOPSOIL		69.96 / 3.20	3	50 DO	19				Bentonite Seal
3		Compact brown fine SAND, trace to some silt		3.35							Silica Sand
4					4	50 DO	16				
		Grey SILTY CLAY		68.83 / 4.33							38mm Diam. PVC #10 Slot Screen
5					5	50 DO	1				
		End of Borehole		68.13 / 5.03							
6											
7											
8											
9											
10											

DEPTH SCALE

1:50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/2/06

002740

PROJECT: 05-1120-732-303

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-R3

BORING DATE: Aug. 18, 2005

SHEET 1 OF 1

DATUM:

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7}) / WATER CONTENT PERCENT Wp — W — Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		72.93							
		Grey stone dust (FILL)		0.00							Protective steel casing set in bentonite
		Brown sandy silt; some gravel (FILL)		72.50 / 0.43							
		Grey brown silty clay, trace sand, organic matter and gravel (FILL)		72.08 / 0.85	1	SS DO	8				Native Backfill
					2	SS DO	9				
		Grey brown and red brown SILTY CLAY (Weathered Crust)		69.88 / 3.05	3	SS DO	6				Bentonite Seal
					4	SS DO	7				Silica Sand
		Grey SILTY CLAY		68.60 / 4.33	5	SS DO	WH				38mm Diam. PVC #10 Slot Screen
		End of Borehole		67.75 / 5.18							

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

002741

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/5/08

PROJECT: 04-1120-143-3000

RECORD OF BOREHOLE: 05-4

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 16, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		85.00				SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	WATER CONTENT PERCENT: Wp — W — Wl (20 40 60 80)		
0	Power Auger 200mm Diam. (Hollow Stem)	Brown stratified fine SAND, some silt		0.00							
				84.45							
		Grey brown SILTY CLAY (Weathered Crust)		0.55							
1				83.93	1	50 DO	WH				
		Soft to stiff grey SILTY CLAY		1.07							
					2	50 DO	WH				
2				82.87							
		End of Borehole		2.13							
3	Nilcon Vane										
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15		CONTINUED NEXT PAGE									

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 06-1122-273.GPJ GLDR_CAN.GDT 1/17/07

PROJECT: 04-1120-143-3000

RECORD OF BOREHOLE: 05-4

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 16, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-5} 10^{-6} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
15		*— CONTINUED FROM PREVIOUS PAGE —*											
16	Nilson Vane							+					
17								+					
18								+					
19								+					
20								+					
21								+					
22								+					
23													
24													
25													
26													
27													
28													
29													
30													

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 06-1122-273.GPJ GLDR_CAN.GDT 1/17/07

002743

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-3

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 8, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		69.85							
0	Power Auger 200mm Diam. (Hollow Stem)	Grey and grey brown silty clay (FILL)		0.00							
		Firm to stiff grey brown SILTY CLAY (Weathered Crust)		69.39 / 0.46							
		Grey SILTY CLAY, occasional red brown layer, trace organic matter		68.78 / 1.07	1	50 DO	2				Bentonite Seal; Silica Sand; 38mm Diam. PVC #10 Slot Screen D
2					2	50 DO	WH				
					3	50 DO	PH				Bentonite Seal
					4	50 DO	WH				Silica Sand
4					5	50 DO	WH				38mm Diam. PVC #10 Slot Screen C
6					6	50 DO	PH				Native Backfill
8					7	50 DO	PM				Bentonite Seal; Silica Sand
					8	50 DO	PM				38mm Diam. PVC #10 Slot Screen B
10					9	50 DO	PM				Silica Sand
		Grey SILTY CLAY, trace black organic matter		58.27 / 11.58							
12					10	50 DO	PH				
14					11	50 DO	PM				Native Backfill
					12	50 DO	PM				
16					13	50 DO	PM				
18		Grey SILTY CLAY		51.87 / 17.98							
					14	50 DO	PM				
		Grey layered SILTY CLAY and CLAYEY SILT		50.65 / 19.20							Bentonite Seal
20					15		26				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-3

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 8, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		— CONTINUED FROM PREVIOUS PAGE —						SHEAR STRENGTH Cu, kPa: nat V. + Q- ● rem V. ⊕ U- ○ (20 40 60 80)	WATER CONTENT PERCENT: Wp W Wl (10 20 30 40)		
20	Power Auger 200mm Diam. (Hollow Stem)	Very loose to compact grey to dark grey SANDY SILT, some gravel, trace clay (GLACIAL TILL)		48.78 20.12	15	50 DO	26				Silica Sand
22					16	50 DO	3				38mm Diam. PVC #10 Slot Screen A
		End of Borehole Auger Refusal		47.39 22.46							
24											
26											
28											
30											
32											
34											
36											
38											
40											

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-2

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 10, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		80.08							
0		Brown fine SAND, some silt		0.00							Protective casing set in bentonite Bentonite Seal
				79.50							
		Very stiff to stiff grey brown SILTY CLAY, occasional red brown layer, fine sand and silt seam (Weathered Crust)		0.58	1	50 DO	12				
2					2	50 DO	6				Native Backfill
					3	50 DO	6				Bentonite Seal
					4	50 DO	5				Silica Sand
4					5	50 DO	5				38mm Diam. PVC #10 Slot Screen D
					6	50 DO	2				
				74.84							
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter		5.24	7	50 DO	WH				Bentonite Seal
6					8	50 DO	PH				
											Native Backfill
8					9	50 DO	WH				
											Bentonite Seal
					10	50 DO	PH				Silica Sand
10											38mm Diam. PVC #10 Slot Screen C
					11	50 DO	PM				
12					12	50 DO	PM				
14					13	50 DO	PM				Native Backfill
					14	50 DO	WR				
16					15	50 DO	WR				
											Bentonite Seal
18											Silica Sand
					16	50 DO	PH				
											38mm Diam. PVC #10 Slot Screen B
20					17		WR				

Power Auger 200mm Diam. (Hollow Stem)

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

002746

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-2

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 10, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q- ● rem V. ⊕ U- ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Power Auger 200mm Diam. (Hollow Stem)	--- CONTINUED FROM PREVIOUS PAGE ---									
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter			17	50 DO	WR				
22					18	50 DO	WR				
				57.52							
		Grey SILTY CLAY, slight trace black organic matter		22.58	19	50 DO	WR				Native Backfill
24					20	50 DO	WR				
26					21	50 DO	WR				
				52.60							Bentonite Seal
		Grey layered SILTY CLAY and CLAYEY SILT		27.58	22	50 DO	WR				
28		Compact to dense grey to dark grey SANDY SILT, some gravel and clay with cobbles (GLACIAL TILL)		27.89							Silica Sand
					23	50 DO	41				38mm Diam. PVC #10 Slot Screen A
				50.58							
		Probably weathered SHALE BEDROCK		29.50							
30		End of Borehole Auger Refusal		29.72							
32											
34											
36											
38											
40											

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

002747

PROJECT: 05-1120-732-110

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-1

BORING DATE: Aug. 2, 2005

SHEET 1 OF 2

DATUM: Geodetic

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		85.53							
		Grey crushed stone (FILL)		0.12							Protective casing
		Compact brown stratified fine SAND, trace silt			1	50 DO	15				Silica Sand
				84.01							38mm Diam. PVC #10 Slot Screen D
2		Grey SILTY CLAY, occasional red brown layer with depth		1.52	2	50 DO	WH				Native Backfill
											Bentonite Seal
					3	50 DO	PM				Silica Sand
4					4	50 DO	PH				38mm Diam. PVC #10 Slot Screen C
6					5	50 DO	PM				Native Backfill
8					6	50 DO	PM				Bentonite Seal
					7	50 DO	PM				Silica Sand
10	Power Auger 200mm Diam. (Hollow Stem)										38mm Diam. PVC #10 Slot Screen B
					8	50 DO	PH				
				73.95							
12		Grey SILTY CLAY, occasional red brown layer, scattered trace black organic matter		11.58	9	50 DO	PM				Native Backfill
14					10	50 DO	PM				
					11	50 DO	PM				
16											Bentonite Seal
					12	50 DO	WR				
18					13	50 DO	PM				Native Backfill
20		CONTINUED NEXT PAGE			14		WR				

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 10/19/06

002748

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-1

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 2, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp — W — Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20		— CONTINUED FROM PREVIOUS PAGE —											
	Power Auger 200mm Diam. (Hollow Stem)	Grey SILTY CLAY, occasional red brown layer, scattered trace black organic matter			14	50 DO	WR						
22					15	50 DO	WR						
		Grey SILTY CLAY, occasional red brown layer, trace to some black organic matter		62.97 22.56	16	50 DO	WR						
24					17	50 DO	PM						
26					18	50 DO	WR						Native Backfill
28					19	50 DO	WR						
					20	50 DO	WR						
30					21	50 DO	WR						
32					22	50 DO	WR						
		Layered SILTY CLAY and CLAYEY SILT		52.29 33.24									Bentonite Seal
34					23	50 DO	WR						Silica Sand
		Grey CLAYEY SILT, some gravel		51.53 34.14									
		Compact to dense dark grey SANDY SILT, some gravel and clay (GLACIAL TILL)			24	50 DO	>100						38mm Diam. PVC #10 Slot Screen A
		End of Borehole Auger Refusal		50.33 35.20									
36													
38													
40													

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: D.J.S.

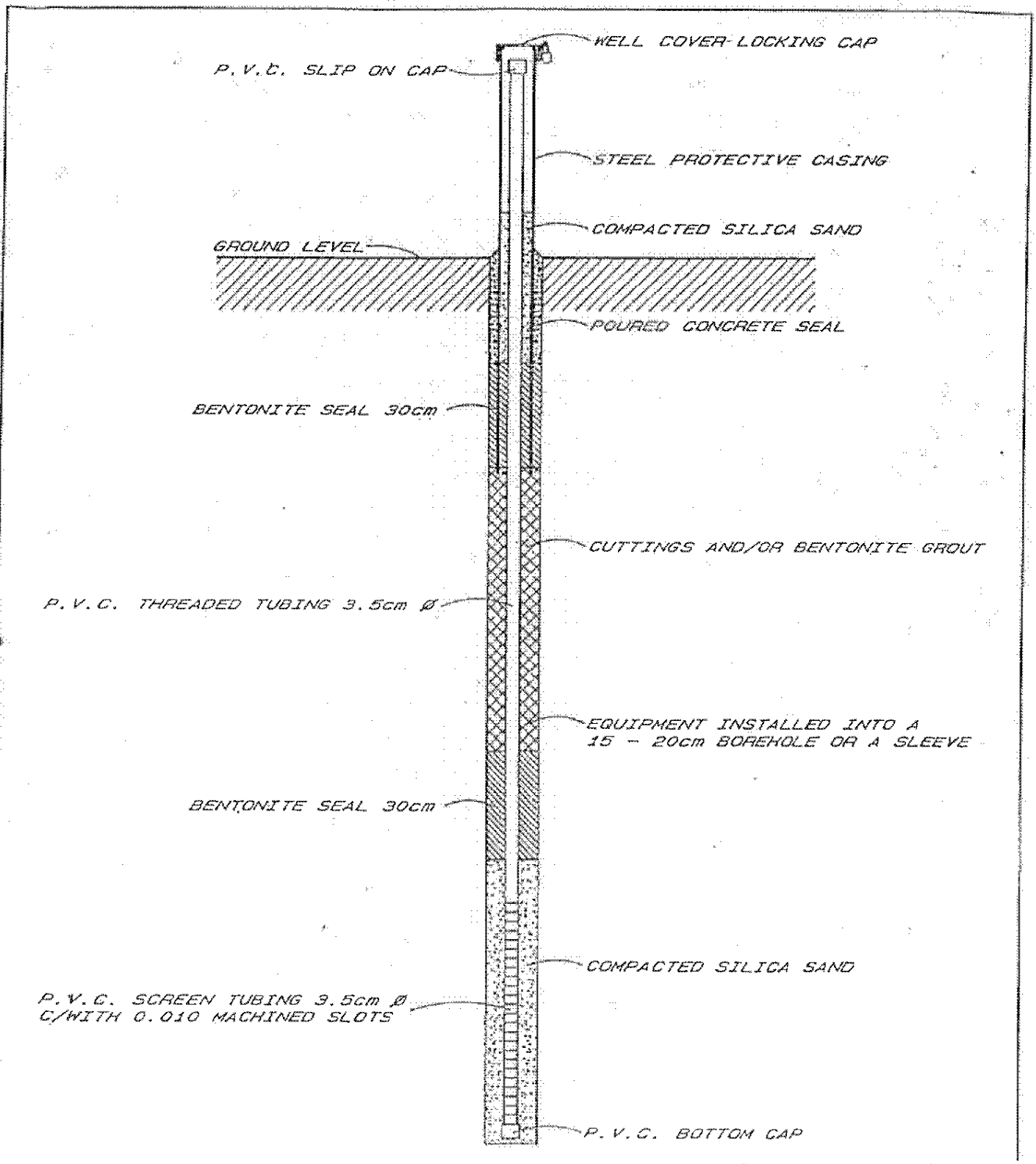
CHECKED: P.L.E.

002749

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 10/19/06

TYPICAL MONITORING WELL INSTALLATION

INSTALLATION TYPIQUE D'UN PUIT D'OBSERVATION



002750

PROJECT NO. WSI006

BOREHOLE NO. MW-4 (MW-4)

PROJECT HUNEAULT LANDFILL

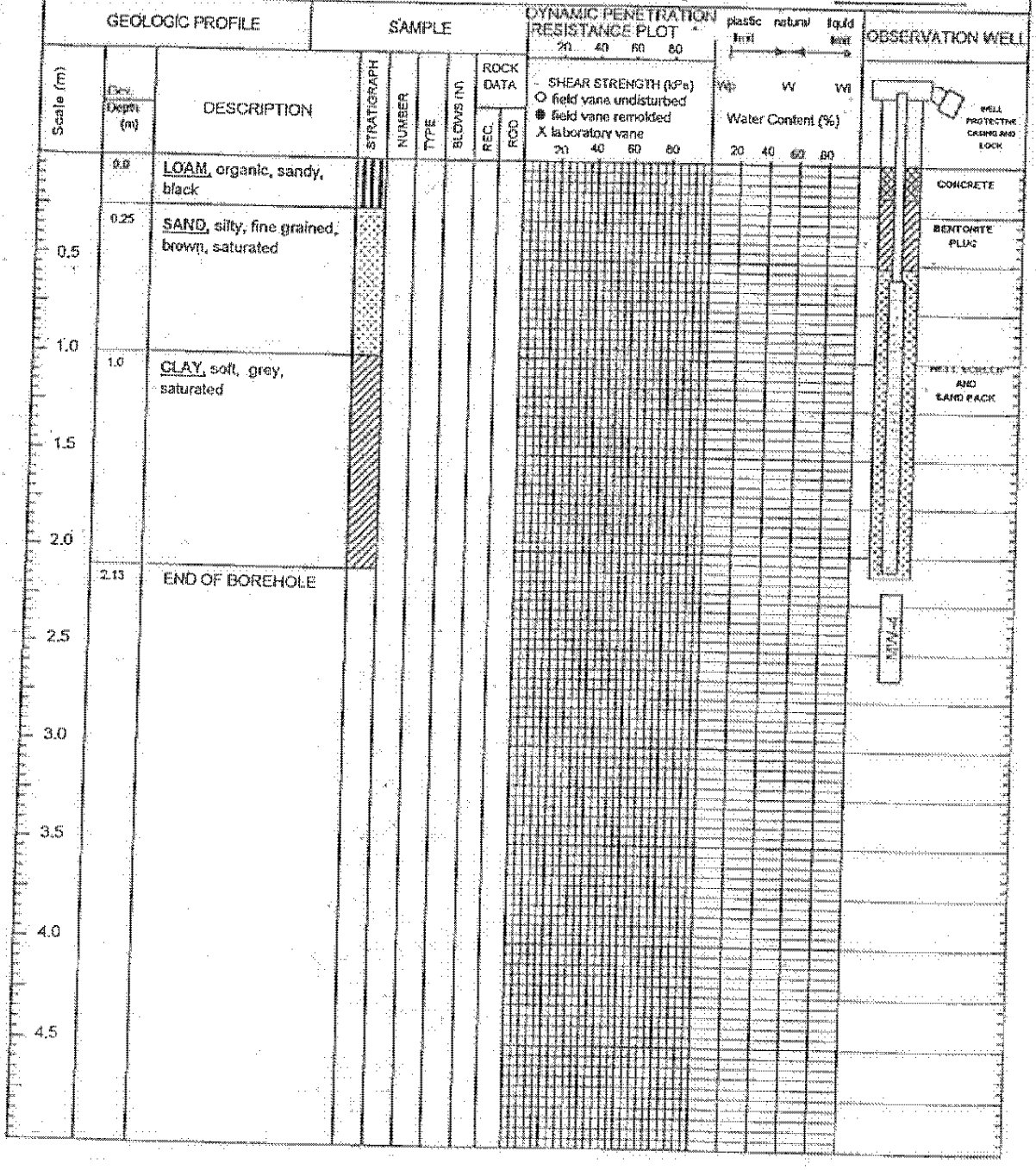
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM Arbitrary BOREHOLE TYPE HAND AUGER

DRILLING DATE 19-May-00

REPORT DATE Sep-00

COMPILED BY N.C.



PROJECT NO. WSI006

BOREHOLE NO. MW-5 (MW-E)

PROJECT HUNEAULT LANDFILL

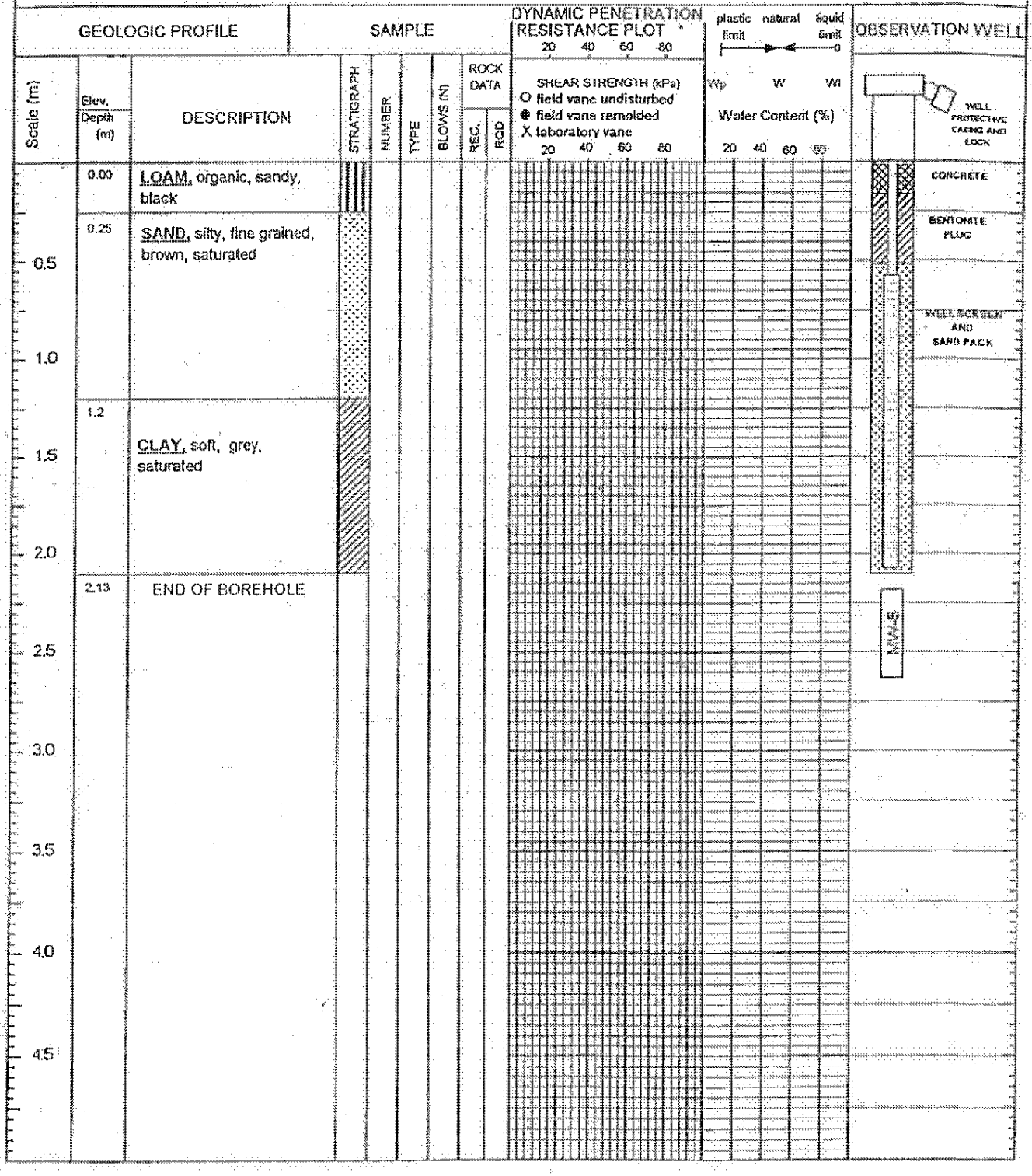
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM Arbitrary BOREHOLE TYPE HAND AUGER

DRILLING DATE 19-May-00

REPORT DATE Sep-00

COMPILED BY N.C.



PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

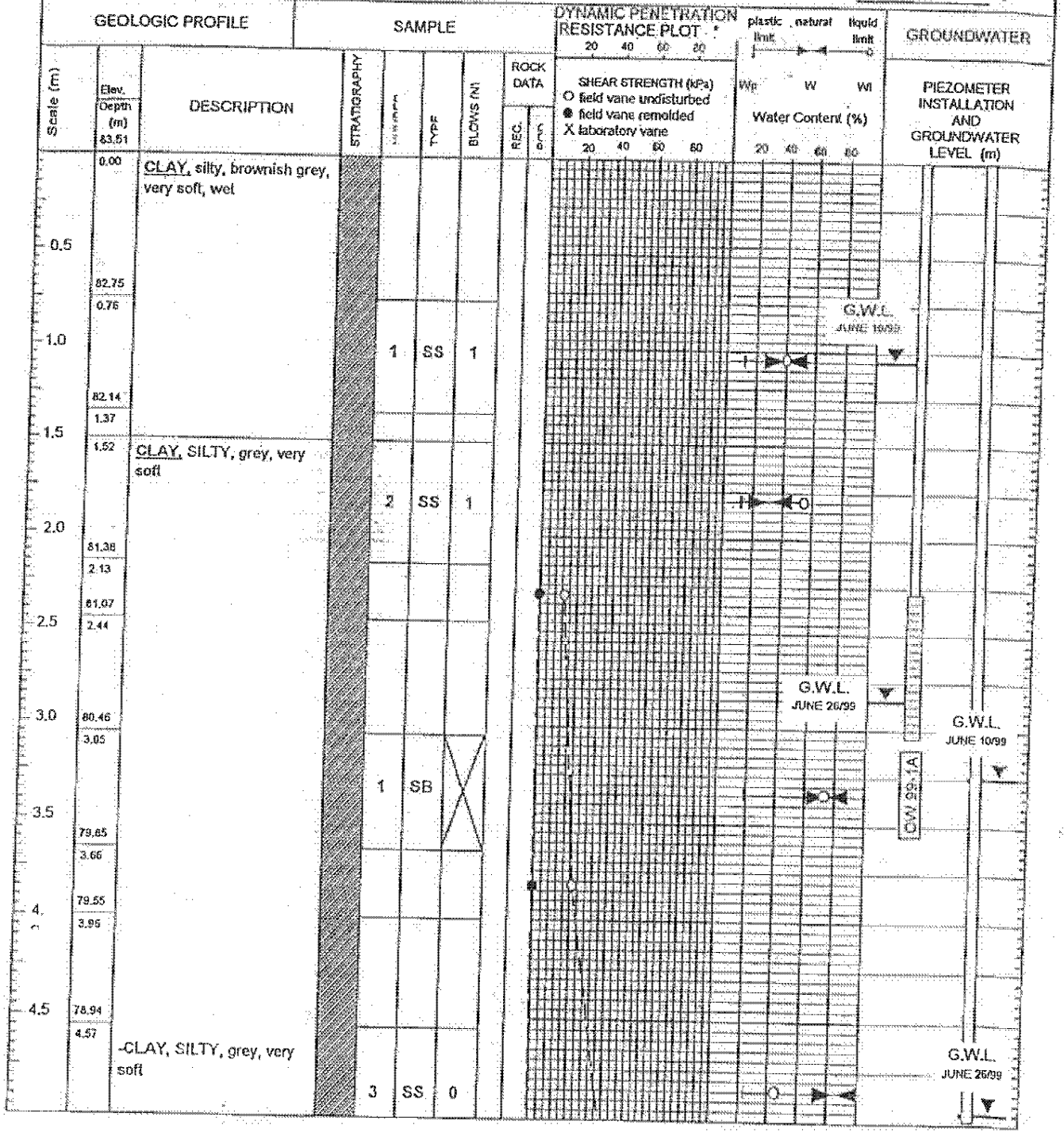
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.

Page1/4



PROJECT NO. E9701 BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL DRILLING DATE Jun-99
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Jan-00
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS COMPILED BY V.G.

GEOLOGIC PROFILE | SAMPLE | DYNAMIC PENETRATION RESISTANCE PLOT | plastic limit | natural | liquid limit | GROUNDWATER

Scale (m)	Elev. / Depth (m) 78.51	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	TYPE	BLOWS (N)	ROCK DATA REC.	ROCK DATA	SHEAR STRENGTH (kPa) O field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	5.00										
	5.18										
	78.02										
5.5	5.49										
	77.41										
6.0	6.10	-CLAY, SILTY, grey, very soft, wet		4	SS	0					
	76.8										
6.5	6.71										
	76.50										
7.0	7.01										
	75.89										
7.5	7.62	-CLAY, SILTY, grey, very soft, wet		5	SS	0					
	75.28										
	6.23										
8.0	74.98										
	8.53										
8.5	74.37										
	9.14										
9.0	73.76			2	SB	X					
	9.75										
9.5											

PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

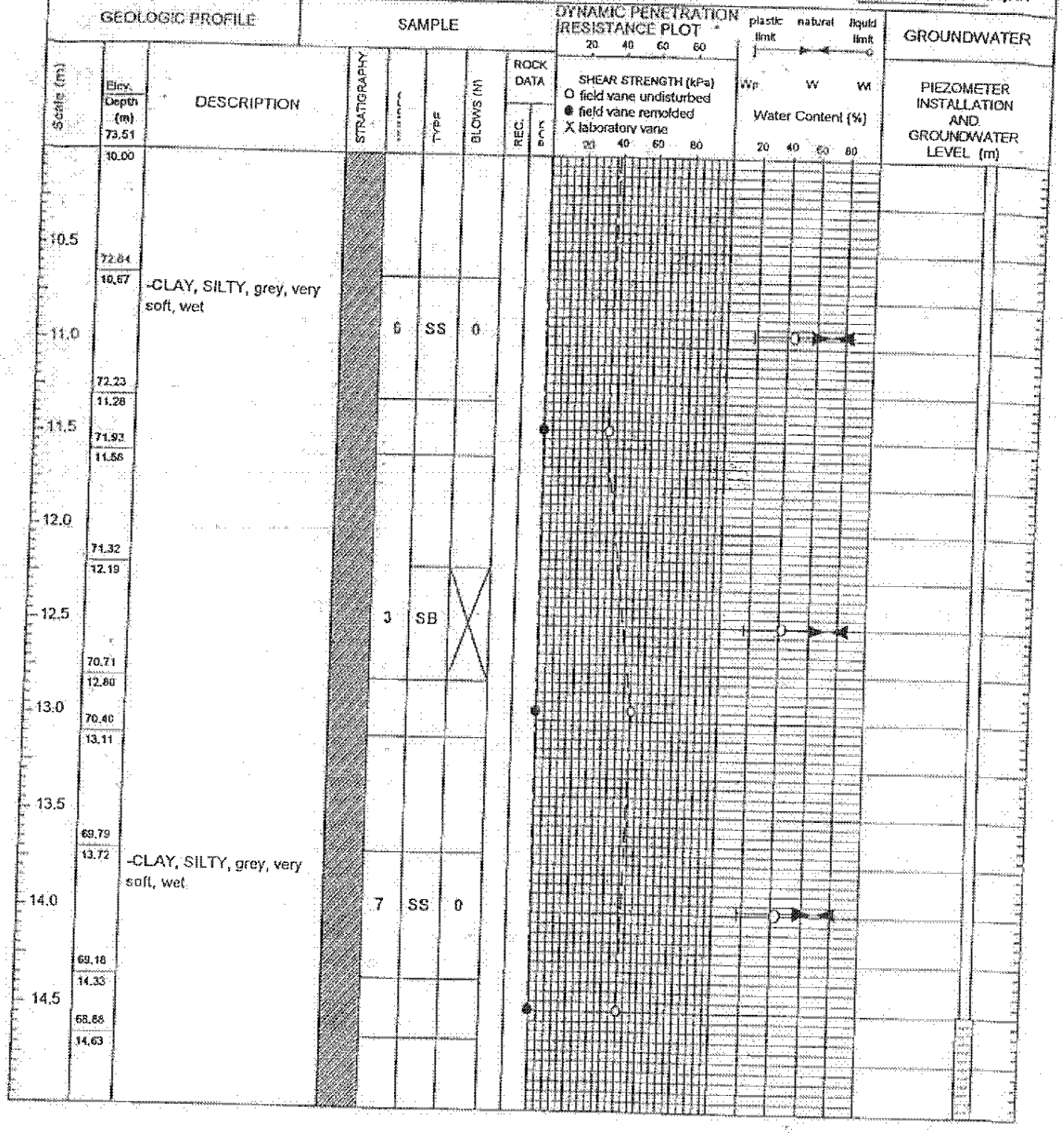
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.



PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

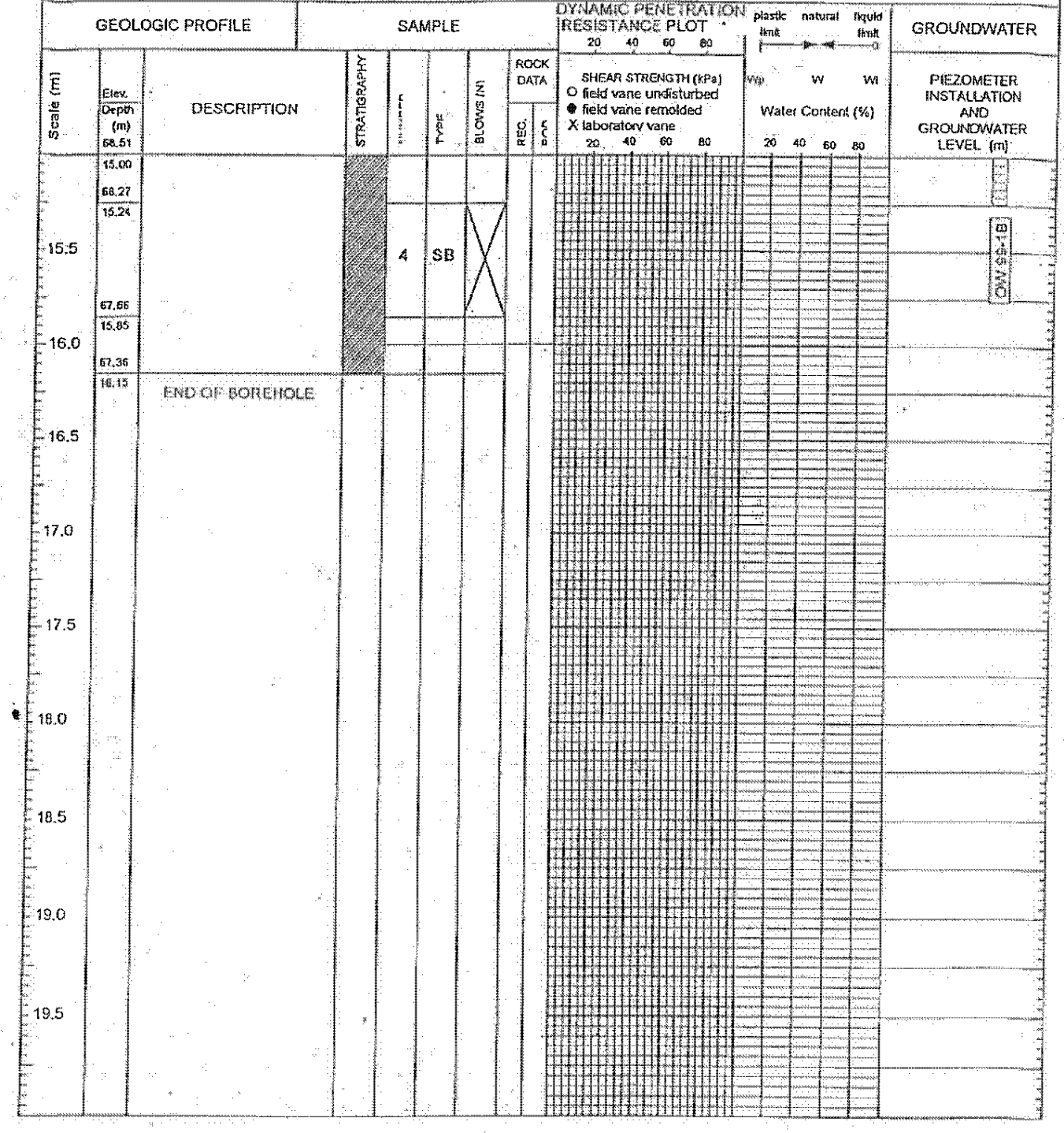
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.



PROJECT NO. E8401

BOREHOLE NO. 98-1

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

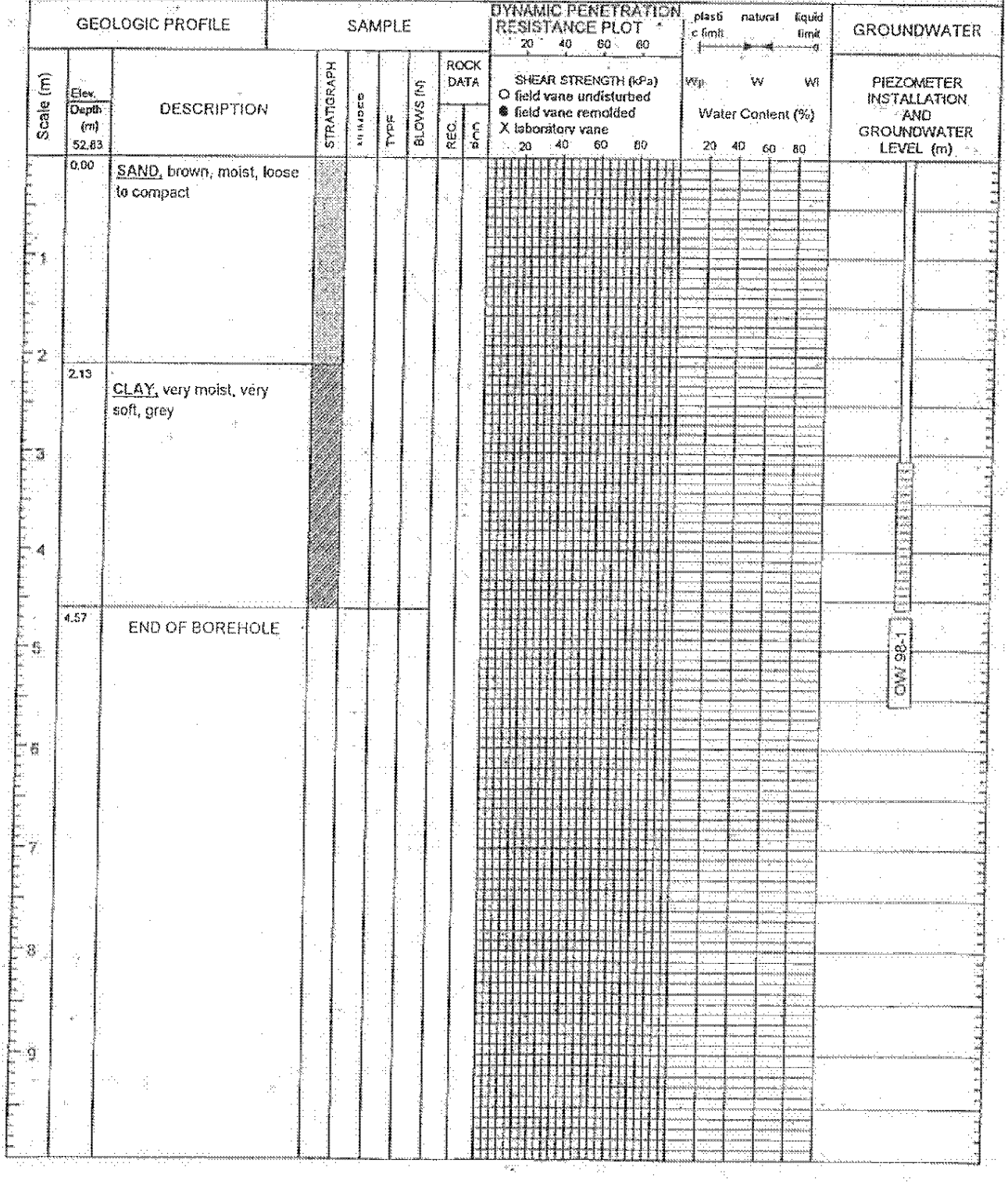
DATUM GEODETIC

BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Oct-98

REPORT DATE Oct-98

COMPILED BY V.G.



PROJECT NO. E8401

BOREHOLE NO. 98-2

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DRILLING DATE Oct-98

REPORT DATE Oct-98

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - 108MM LOW STEM AUGERS

COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE				ROCK DATA		DYNAMIC PENETRATION RESISTANCE PLOT		GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPH	Sequence	TYPE	BLOWS (N)	REC.	RQD	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	plasti c limit / natural / liquid limit; Wp W Wl; Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
1	0.00	SAND, brown, moist, loose to compact		1	S	1					
	1.37			2	S	0					
2	2.13	CLAY, very moist, very soft, grey		3	S	0					
3	2.90			4	S	0					
	3.66			5	S	0					
4	4.42										
5											
6				6	S	0					
	6.71										
7	7.62			7	S	0					
8	8.23	END OF BOREHOLE									OW 98-2
9											

PROJECT NO. E8401

BOREHOLE NO. 98-3

PROJECT HUNEAULT LANDFILL

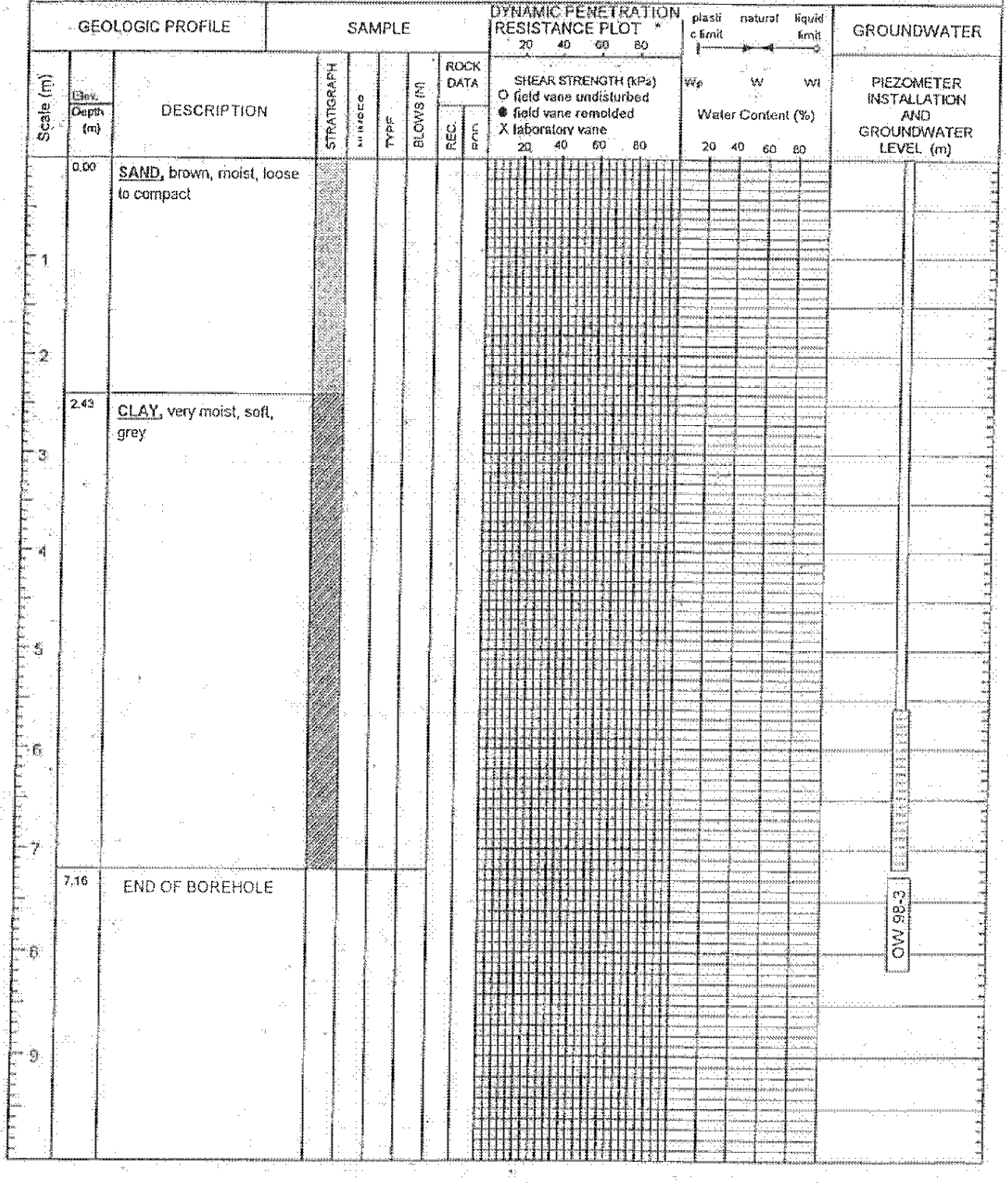
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Oct-98

REPORT DATE Oct-98

COMPILED BY V.G.



PROJECT NO. E8401 BOREHOLE NO. 98-4

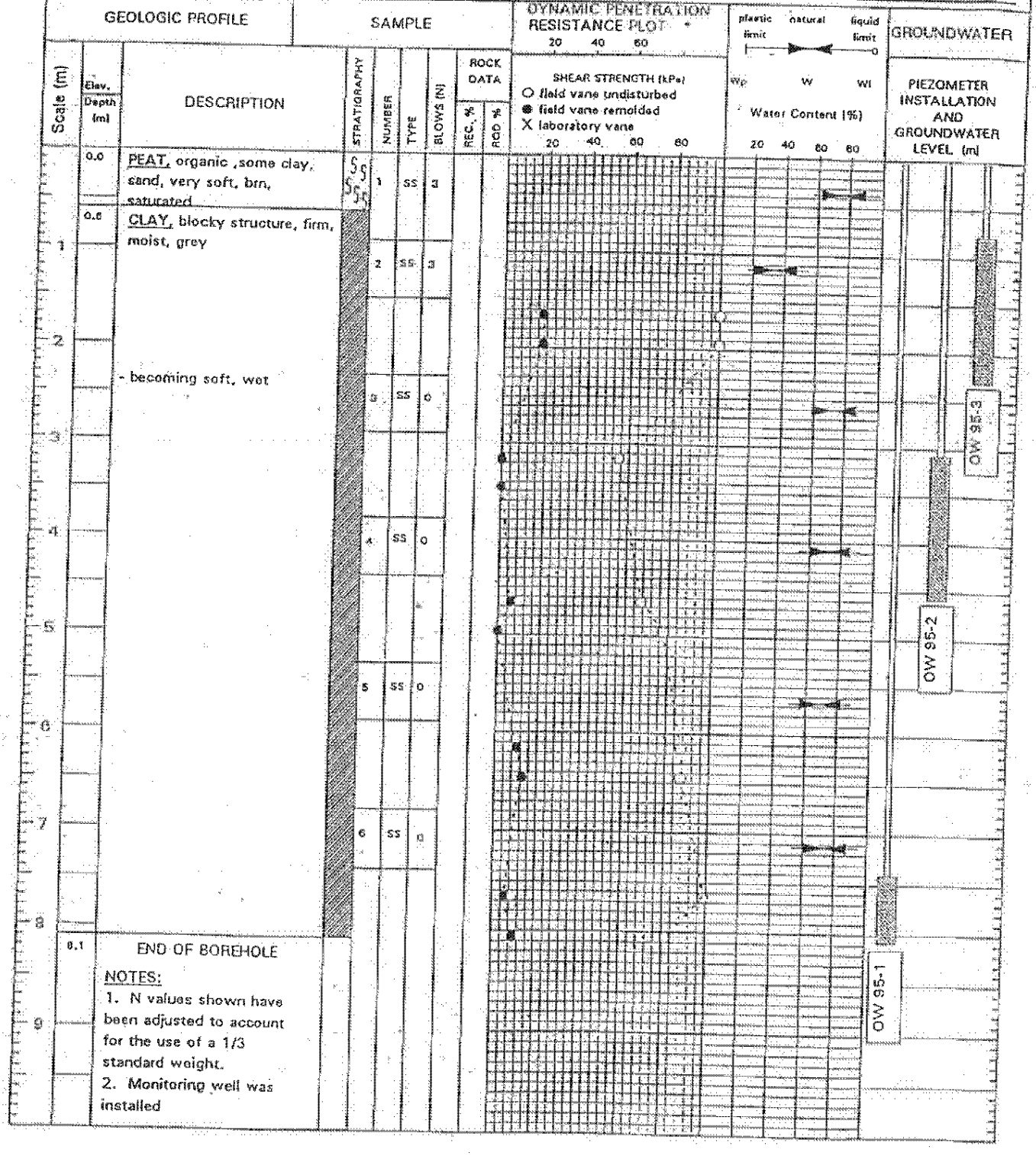
PROJECT HUNEAULT LANDFILL DRILLING DATE Oct-98
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-98
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE					DYNAMIC PENETRATION RESISTANCE PLOT		GROUNDWATER
Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPH	NUMBER	TYPE	BLOWS /0.3m	ROCK DATA REC.	SHEAR STRENGTH (kPa) O field vane undisturbed ● field vane remolded X laboratory vane	plasti c limit — natural — liquid limit; Wp W Wl; Water Content (%)	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	0.00	SAND, brown, dry, loose to compact								
	2.13	CLAY, very moist, soft, grey								
	4.57	END OF BOREHOLE								OW 98-4

002760

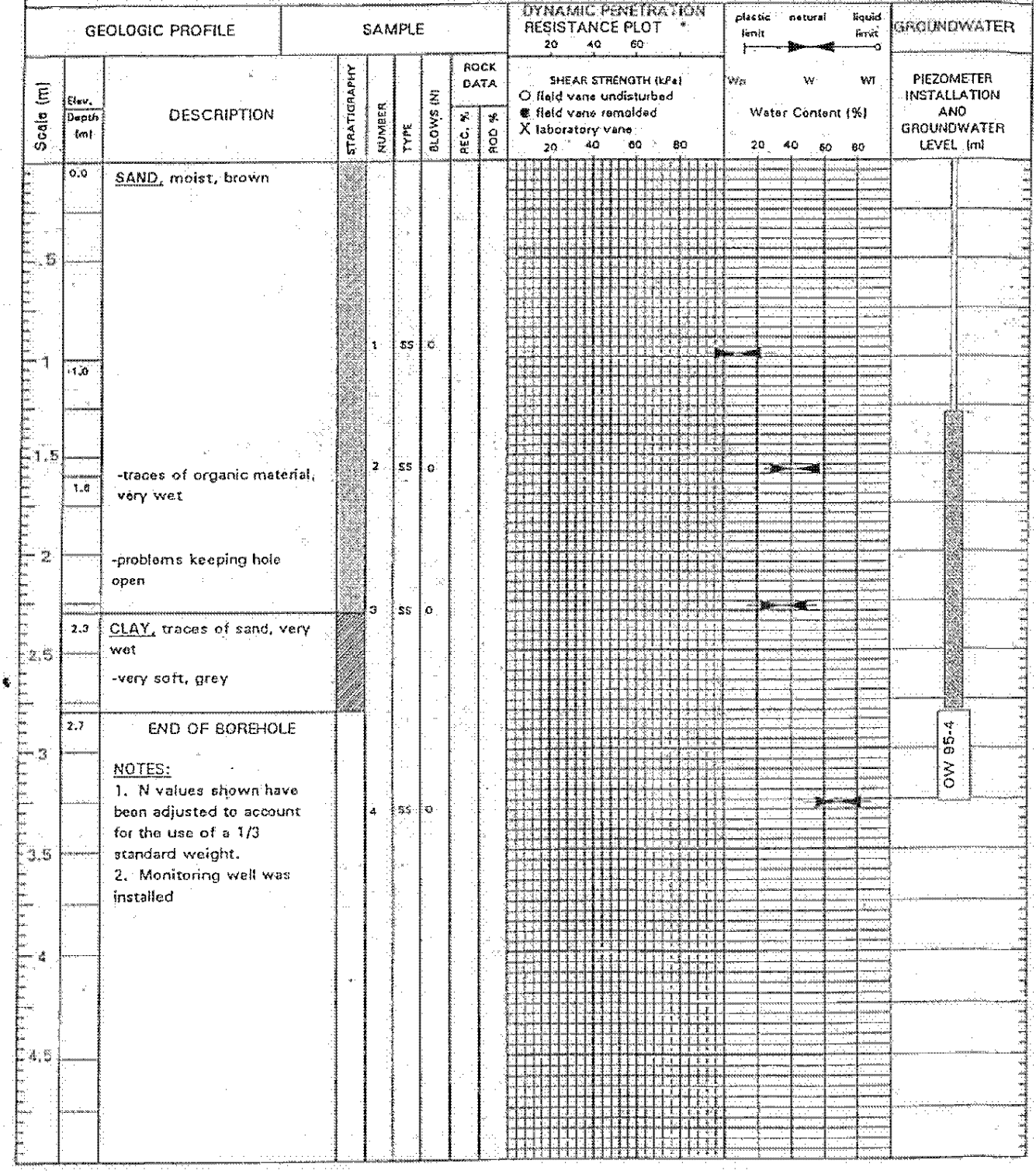
PROJECT NO. E0100 BOREHOLE NO. 95-1

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



PROJECT NO. E0100 BOREHOLE NO. 95-4

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



PROJECT NO. E0100 BOREHOLE NO. 95-5

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.

Soils (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	ROCK DATA: REC. %	ROCK DATA: RQD %
	0.0	PEAT, organic, soft, wet, brn		1	SS	0		
	0.3			2	SS	0		
	0.6	SAND, moist, brown						
1		CLAY, moist, brown		3	SS	7		
		-grey, moist						
2				4	SS	5		
3		-soft, moist		5	SS	0		
4								
5		-becoming stiff, grey, traces of brown and black color		6	SS	0		
6				7	SS	0		
		-stiff, grey, traces of brown and black color						
7								
8				8	SS	0		
	8.25	END OF BOREHOLE						

NOTES:
1. N values shown have been adjusted to account for the use of a 1/3 standard weight.
2. Monitoring well was installed

DYNAMIC PENETRATION RESISTANCE PLOT * (20 40 60)

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER
PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 95-7
OW 95-8
OW 95-9

002763

PROJECT NO. E0100

BOREHOLE NO. 95-8

PROJECT HUNEAULT WASTE MANAGEMENT

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATU GEODETIC

BOREHOLE TYP PORTABLE DRILLING

DRILLING DATE Jun-95

REPORT DATE Aug-95

COMPILED BY V.G.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA RQD %
0	0.0	SAND, moist, brown		1	SS	0		
.5				2	SS	0		
1	1.0			3	SS	0		
1.5	1.55	- CLAY, very soft, very moist, grey		4	SS	0		
2								
2.5	2.3			5	SS	0		
3	2.7	END OF BOREHOLE NOTES: 1. N values shown have been adjusted to account for the use of a 1/3 standard weight. 2. Monitoring well was installed						
3.5								
4								
4.5								

DYNAMIC PENETRATION RESISTANCE PLOT * 20 40 60

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 95-8

002764

PROJECT NO. E0100 BOREHOLE NO. 95-9

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.

Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA ROD %
	0.0							
2.5								
5								
7.5								
10								
12.5		CLAY, very soft, very moist, grey		1	SS	0		
15				2	SS	0		
17.5								
20				3	SS	5		
22.5		TILL,		4	SS	R		
	22.0	END OF BOREHOLE						

NOTE:
1. N values shown have been adjusted to account for the use of a 1/2 standard weight

DYNAMIC PENETRATION RESISTANCE PLOT 20 40 60

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER
PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 95-9

002765

PROJECT NO. E0100 BOREHOLE NO. OW-1A-D

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jul-95

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE

DATU GEODETIC BOREHOLE TYP AUGER TYPE COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE					DYNAMIC PENETRATION RESISTANCE PLOT * 20 40 60	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	ROCK DATA REC. %	ROD %	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	0.0	PEAT, organic, very soft, brn, moist									
1.5	1.7	SAND, med. grained, brn, very moist									
2		END OF BOREHOLE NOTES: 1. Monitoring well was installed									OW 1A OW 1B OW 1C OW 1D

002766

PROJECT NO. E0100 BOREHOLE NO. OW-2A-D

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jul-95

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE

DATU GEODETIC BOREHOLE TYP AUGER TYPE COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE					DYNAMIC PENETRATION RESISTANCE PLOT		GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS/0.3m	ROCK DATA REC. %	ROD %	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Water Content (%) plastic limit Wp, natural W, liquid limit Wl 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
0	0.0	PEAT, organic, very soft, brn, moist									
1	1.7	SAND, med. grained, brn, very moist									
2		END OF BOREHOLE NOTES: 1. Monitoring well was installed									OW 2A OW 2B OW 2C OW 2D

002767

CASTONGUAY Technologies Inc.
Environmental and Geotechnical Engineering

PROJECT NO. E0100 BOREHOLE NO. 94-1

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE May 19/94
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-94
DATU GEODETIC BOREHOLE TYP BOA DRILL - HOLLOW STEM COMPILED BY N.G.C.

GEOLOGIC PROFILE | SAMPLE | DYNAMIC PENETRATION RESISTANCE PLOT | GROUNDWATER

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA RQD %
1	0.0	FILL, mixture: sand, gravel, silt, clay, loose to compact, moist, med. brn						
	0.8	SAND, med. grained, tr. silt, very moist, reddish brn, loose, wet @ 1.1m		1	SS	14		
2	1.5	CLAY, blocky structure, firm, moist, brown to 1.8m becoming grey		2	SS	3		
3		- becoming soft, grey, saturated		3	SS	1		
4				4	SS	1		
5								
6				5	SS	0		
7								
8				6	SS	0		
	8.5	END OF BOREHOLE						
9								

DYNAMIC PENETRATION RESISTANCE PLOT * (20, 40, 60)
SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
(20, 40, 60, 80)

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
(20, 40, 60, 80)

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

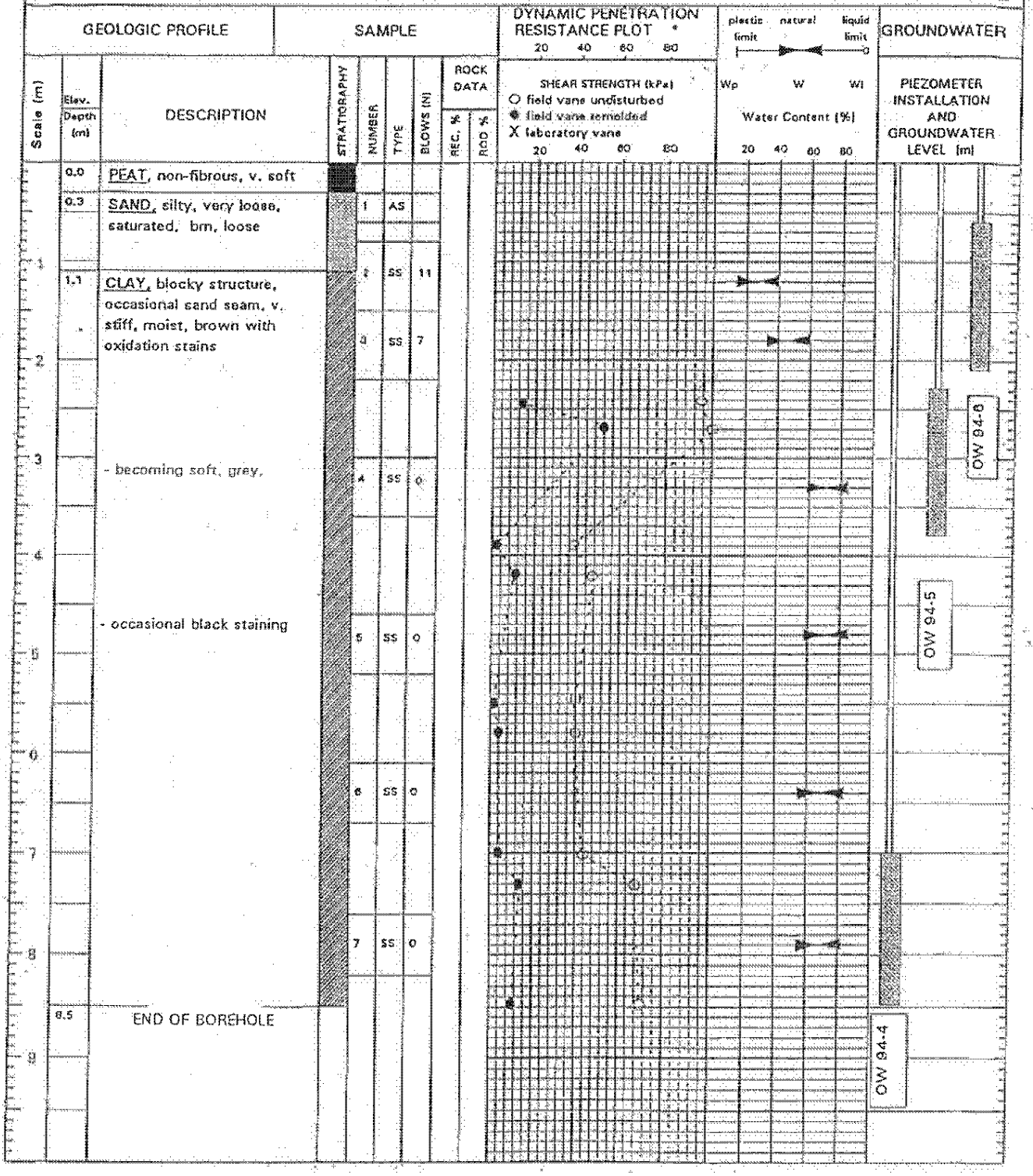
OW 94-3
OW 94-2
OW 94-1

002768

CASTONGUAY Technologies Inc.
Environmental and Geotechnical Engineering

PROJECT NO. E0100 BOREHOLE NO. 94-4

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE May 19/94
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-94
DATU GEODETIC BOREHOLE TYP BOA DRILL - HOLLOW STEM COMPILED BY N.G.C.



002769

O-8550E

FONDEX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %
	71.10							
	0.00	SILTY CLAY (FILL) : SOFT, BLACK, MOIST, ORGANIC ODOUR, PIECES OF ASPHALT.						
1	69.70							
	1.40	SAND : LOOSE, BROWN CHANGING TO GREY AND MOIST.						
2								
	68.10							
3	3.00	CLAY : SOFT, GREY, MOIST, BLOCKY STRUCTURE.						
4				1	ST			
		- BECOMING LAYERED.						
5								
				2	ST			
6								
7				3	ST			
		- WITH ALTERNATING BROWN LAYERS.						
8		- SEA SHELLS VISIBLE AT A DEPTH OF 8.80m.						
		- ALTERNATING GREY AND BLACK LAYERS.						

Dynamic Cone Penetration Resistance Plot — 20 40 60 80

Shear Strength (kPa)
- ° field vane undisturbed
- × field vane remolded
- • laboratory vane

20 40 60 80

plastic limit — natural — liquid limit

Wp W Wl

Water Content (%)

20 40 60 80

GROUNDWATER

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW-92-1

002770

O-8550E

FOND DX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %
	61.10 / 10.00	CLAY : SOFT, WITH ALTERNATING GREY AND BROWN LAYERS.		4	ST			
11								
12								
13								
14		- BECOMING WET.						
15		- BECOMING DARK GREY, VARVED STRUCTURE.						
16								
17								
18								

Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80

Shear Strength (kPa)
- • field vane undisturbed
- × field vane remolded
- • laboratory vane

20 40 60 80

plastic limit — natural — liquid limit

Wp W Wl

Water Content (%)

20 40 60 80

GROUNDWATER

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW-92-1

002771

O-8550E

FONDEX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	51.10 20.00	CLAY : DARK GREY, WET, VARVED STRUCTURE.									OW-92-1
21	49.90 21.20	- BECOMING VERY SOFT, TRACE OF SILT AND GRAVEL AT A DEPTH OF 21.80m.									
22											
23		- BECOMING TILL-LIKE ACCORDING TO SOUND AND DIFFICULTY OF DRILLING.									
24	47.15 23.95	SAND AND GRAVEL TILL : ACCORDING TO SOUND AND DIFFICULTY OF DRILLING.									
25	45.80 25.30	PRACTICAL AUGER REFUSAL END OF BOREHOLE									

NOTE :
THE SOIL PROFILE PRESENTED IS REPRESENTATIVE OF THE PIEZOMETER NEST. CONTINUOUS SAMPLING WAS CARRIED OUT AT OW-92-01 TO A DEPTH OF APPROXIMATELY 21.0m. SHELBY TUBE SAMPLES WERE OBTAINED AT VARIOUS ELEVATIONS AT OTHER BOREHOLES WITHIN THE PIEZOMETER NEST.

O-8550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Dynamic Cone Penetration Resistance Plot 20 40 60 80 / Shear Strength (kPa) ○ field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	plastic limit / natural / liquid limit — Wp W Wl — Water Content (%) 20 40 60 80	GROUNDWATER PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	76.03										
	10.00	CLAY : TRACE OF SILT, SOFT, GREY, WET.		4	ST						OW-92-12
	75.03										
11	1.00	SILTY CLAY : SOFT, GREY, WET.									
12											
13											
14											
15											
16											
17											
18		- BECOMING SATURATED, ORGANIC ODOUR DETECTED.									

002773

O-B550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Shear Strength (kPa) • field vane undisturbed × field vane remolded ▪ laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	0.00	200mm OF GRAVEL OVER SAND : FINE GRAINED, LOOSE, BROWN, WET.									OW-92-12
		- BECOMING GREY.		1	ST						
	1.43										
	4.60	CLAY : TRACE OF SILT, SOFT, GREY, WET.		2	ST						
				3	ST						

002774

O-B530E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Shear Strength (kPa) • field vane undisturbed × field vane remolded ◦ laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	28.03										
	20.00	SILTY CLAY : SOFT, GREY, SATURATED.									OW 92-12
21											
22											
23											
24		- ASSUMED SILTY CLAY BASED ON SOUND AND EASE OF DRILLING									
25											
26											
27											
28											
9											

002775

O-B550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Dynamic Cone Penetration Resistance Plot (20 40 60 80) / Shear Strength (kPa): field vane undisturbed, field vane remolded, laboratory vane (20 40 60 80)	plastic limit / natural / liquid limit; Wp W Wl; Water Content (%) (20 40 60 80)	GROUNDWATER: PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	36.03										
	30.00	SILTY CLAY : (ASSUMED)									OW-92-12
31											
32											
33	52.53										
	33.50	SAND AND GRAVEL TILL :									
34		- ENCOUNTERED COBBLES AND BOULDERS.									
35											
36											
37	48.83										
	37.20	PRACTICAL TRICONE REFUSAL									
		END OF BOREHOLE									

NOTE :
THE SOIL PROFILE PRESENTED IS REPRESENTATIVE OF THE PIEZOMETER NEST. CONTINUOUS SAMPLING WAS CARRIED OUT AT OW-92-12 TO A DEPTH OF APPROXIMATELY 22,0m. SHELBY TUBE SAMPLES WERE OBTAINED AT VARIOUS ELEVATIONS AT OTHER BOREHOLES WITHIN THE PIEZOMETER NEST.

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OW2-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 15, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing.
TOPSOIL fine to medium grained, dark brown, wet, come organic material (FILL).							stick-up 0.90m.
							bentonite grout.
			1		5		50mm Ø sch 40 threaded PVC riser pipe.
SAND fine to medium grained, reddish brown, wet, compact, some red and black staining.			2				
			3		10		bentonite seal.
CLAY grey, wet, cohesive, plastic, laminated compact, weathered							silica sand filter pack.
CLAY grey, wet, very cohesive, plastic, soft, laminated. Frequent black vertical staining (0.5cm thick) from 5m to depth. Red banding (1cm thick) 10-15cm apart from 3.6m to depth.			4		15		50mm Ø continuously wound PVC #8 slot well screen.
			5				
END OF HOLE 5.26m bgl.			6		20		end cap.
			7				
					25		
			8				
			9				

002777

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OW2-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED Noverber 15, 1989

DESCRIPTION	DEPTH metres / feet	SAMPLE no. / type / "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
				lockable steel protective casing. stick-up 0.91m
TOPSOIL fine to medium grained sand, dark brown, wet, some organic material (FILL).	1 / 5			50mm Ø sch 40 threaded PVC riser pipe.
SAND fine to medium grained, reddish brown, wet, compact, some red and black staining.	2			
CLAY grey, wet, cohesive plastic, laminated, compact, weathered.	3 / 10			bentonite grout.
CLAY grey, wet, very cohesive, plastic, soft, laminated. Frequent black vertical staining (0.5cm thick) from 5m to depth. Red banding (1cm thick) 10-15cm apart from 3.6m to depth.	4 / 15			
	5			bentonite seal.
	6 / 20			silica sand filter pack.
	7			50mm Ø continuously wound PVC #8 slot well screen.
	25			
END OF HOLE 7.92m bgl.	8			end cap.
	9 / 30			

WL-040181

002778

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OW3-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 16, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing.
							stick-up 1.08m
TOPSOIL fine to medium sand with some very fine gravel, brown to dark brown with some organic material wet, compact, becoming black (FILL).	1	5					50mmØ sch 40 threaded PVC riser pipe.
SAND fine to medium grained, orangish brown becoming dark brown, saturated, loose	2						bentonite grout.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, weathered.	3	10					bentonite seal.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, some black vertical staining (1cm thick) from 3.5m. Red banding (1-2cm thick) from 5.0m.	4	15					silica sand filter pack.
	5						50mm Ø continuously wound PVC #8 slot well screen.
END OF HOLE 5.15m bgl.	6	20					end cap.
	7						
	8	25					
	9						

WL-040181

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OW3-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 16, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
						lockable steel protective casing, stick-up 0.75m	
TOPSOIL fine to medium sand with some very fine gravel, brown to dark brown with some organic material, wet, compact, becoming black (FILL).							
SAND fine to medium grained, orangish brown becoming dark brown, saturated, loose.	1	5				50mm Ø sch 40 threaded PVC riser pipe.	
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, weathered.	2						
	3	10				bentonite grout.	
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, some black vertical staining (1cm thick) from 3.5m. Red banding (1-2cm thick) from 5.0m.	4	15					
	5					bentonite seal.	
	6	20				silica sand filter pack.	
	7					50mm Ø continuously wound PVC #8 slot well screen.	
		25					
END OF HOLE 7.92m bgl.	8					end cap.	
	9						

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OW4-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 17, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing.
TOPSOIL fine to medium grained sand, brown, moist, loose (FILL).							50mmØ sch40 threaded PVC riser pipe.
SAND fine to medium grained, orangish to greenish brown, wet, loose.		5					bentonite grout.
CLAY grey, moist, compact, cohesive, plastic, laminated, weathered.		2					bentonite seal.
		3			10		
		4					50mmØ continuously wound PVC #8 slot well screen.
CLAY grey, moist, very cohesive, soft (moldable) Black vertical staining (1cm thick) every 4 to 5cm from 5m. Red banding (1cm thick) every 4 to 5cm from 5m.		15					
		5					silica sand filter pack.
END OF HOLE 5.27m bgl.		6			20		end cap.
		7					
		25					
		8					
		9					

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OW4-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 17, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing. stick-up 0.82m.
TOPSOIL fine to medium grained sand, brown, moist, loose (FILL).			1		5		
SAND fine to medium grained, orangish to greenish brown, wet, loose.			2				50mm Ø sch 40 threaded PVC riser pipe.
CLAY grey, moist, compact, cohesive, plastic, laminated, weathered.			3		10		bentointe grout.
			4				
CLAY grey, moist, very cohesive, soft, (moldable) Black vertical staining (1cm thick) every 4 to 5 cm from 5m. Red banding (1cm thick) every 4 to 5cm from 5m.					15		bentonite seal.
			5				
			6		20		silica sand filter pack.
			7				50mm Ø continuously wound PVC #8 slot well screen.
					25		
END OF HOLE 7.92m bgl.			8				end cap.
			9		30		

002782

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 10-Mar-2022
Order Date: 25-Aug-2021

Revised Report

Order #: 2135394

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2135394-01	L-5

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	26-Aug-21	26-Aug-21
Ammonia, as N	EPA 351.2 - Auto Colour	26-Aug-21	27-Aug-21
Anions	EPA 300.1 - IC	26-Aug-21	27-Aug-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	26-Aug-21	26-Aug-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	26-Aug-21	26-Aug-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	26-Aug-21	26-Aug-21
Hardness	Hardness as CaCO3	26-Aug-21	26-Aug-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	26-Aug-21	26-Aug-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	2-Sep-21	2-Sep-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	26-Aug-21	30-Aug-21
Total Dissolved Carbon	MOE 3247B - Combustion IR	26-Aug-21	26-Aug-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	25-Aug-21	26-Aug-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	26-Aug-21	31-Aug-21
Total Suspended Solids	SM 2540D - Gravimetric	25-Aug-21	26-Aug-21
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	27-Aug-21	27-Aug-21

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	L-5	-	-	-
	Sample Date:	24-Aug-21 15:05	-	-	-
	Sample ID:	2135394-01	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	1980	-	-	-
Ammonia as N	0.01 mg/L	91.6 [3]	-	-	-
BOD	2 mg/L	<60 [1]	-	-	-
Chemical Oxygen Demand	10 mg/L	392	-	-	-
Dissolved Inorganic Carbon	5.00 mg/L	468	-	-	-
Dissolved Organic Carbon	0.5 mg/L	103	-	-	-
Total Dissolved Carbon	0.5 mg/L	570	-	-	-
Hardness	mg/L	1110	-	-	-
Phenolics	0.001 mg/L	<0.010 [2]	-	-	-
Phosphorus, total	0.01 mg/L	0.23	-	-	-
Total Dissolved Solids	10 mg/L	2880	-	-	-
Total Suspended Solids	2 mg/L	75	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	86.7	-	-	-
Anions					
Chloride	1 mg/L	542	-	-	-
Nitrate as N	0.1 mg/L	<0.5 [2]	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-
Sulphate	1 mg/L	28	-	-	-
Metals					
Arsenic	1 ug/L	2	-	-	-
Boron	10 ug/L	16400	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	161000	-	-	-
Chromium	1 ug/L	12	-	-	-
Cobalt	0.5 ug/L	4.8	-	-	-
Copper	0.5 ug/L	<0.5	-	-	-
Iron	100 ug/L	3820	-	-	-
Lead	0.1 ug/L	<0.1	-	-	-
Magnesium	200 ug/L	172000	-	-	-
Manganese	5 ug/L	278	-	-	-
Potassium	100 ug/L	115000	-	-	-
Sodium	200 ug/L	645000	-	-	-
Zinc	5 ug/L	<5	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	L-5	-	-	-
	Sample Date:	24-Aug-21 15:05	-	-	-
	Sample ID:	2135394-01	-	-	-
	MDL/Units	Water	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	400	5	mg/L	393			1.8	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	ND	1	mg/L	ND			NC	10	
General Inorganics									
Alkalinity, total	854	5	mg/L	867			1.5	14	
Ammonia as N	ND	0.01	mg/L	ND			NC	18	
BOD	ND	150	mg/L	ND			NC	20	BOD01
Chemical Oxygen Demand	37	10	mg/L	37			0.0	12	
Dissolved Organic Carbon	2.6	0.5	mg/L	3.1			17.0	37	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.117	0.01	mg/L	0.115			1.8	15	
Total Dissolved Solids	702	10	mg/L	746			6.1	10	
Total Suspended Solids	13.0	2	mg/L	12.0			8.0	10	
Total Kjeldahl Nitrogen	0.49	0.1	mg/L	0.48			3.2	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	ND	10	ug/L	ND			NC	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	ND	0.5	ug/L	ND			NC	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	ND	200	ug/L	ND			NC	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	ND	100	ug/L	ND			NC	20	
Sodium	ND	200	ug/L	ND			NC	20	
Zinc	ND	5	ug/L	ND			NC	20	
Volatiles									
Benzene	ND	0.5	ug/L				NC	30	
1,1-Dichloroethane	ND	0.5	ug/L				NC	30	
Ethylbenzene	ND	0.5	ug/L				NC	30	
Methylene Chloride	ND	5.0	ug/L				NC	30	
Toluene	ND	0.5	ug/L				NC	30	
Vinyl chloride	ND	0.5	ug/L				NC	30	
m,p-Xylenes	ND	0.5	ug/L				NC	30	
o-Xylene	ND	0.5	ug/L				NC	30	

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	8.58	1	mg/L	ND	85.8	85-115			
Nitrate as N	1.04	0.1	mg/L	ND	104	79-120			
Nitrite as N	1.02	0.05	mg/L	ND	102	84-117			
Sulphate	8.74	1	mg/L	ND	87.4	74-126			
General Inorganics									
Ammonia as N	0.260	0.01	mg/L	ND	104	81-124			
BOD	222	2	mg/L	ND	111	71-121			
Chemical Oxygen Demand	243	10	mg/L	37	103	85-111			
Dissolved Organic Carbon	13.8	0.5	mg/L	3.1	107	60-133			
Phenolics	0.022	0.001	mg/L	ND	89.3	69-132			
Phosphorus, total	0.629	0.01	mg/L	0.115	103	80-120			
Total Dissolved Solids	102	10	mg/L	ND	102	75-125			
Total Suspended Solids	20.0	2	mg/L	ND	100	75-125			
Total Kjeldahl Nitrogen	2.56	0.1	mg/L	0.48	104	81-126			
Metals									
Arsenic	53.3	1	ug/L	ND	107	80-120			
Boron	48	10	ug/L	ND	95.8	80-120			
Cadmium	51.0	0.1	ug/L	ND	102	80-120			
Chromium	52.9	1	ug/L	ND	105	80-120			
Cobalt	51.5	0.5	ug/L	ND	103	80-120			
Copper	51.1	0.5	ug/L	ND	102	80-120			
Iron	2430	100	ug/L	ND	97.0	80-120			
Lead	52.0	0.1	ug/L	ND	104	80-120			
Magnesium	9620	200	ug/L	ND	96.1	80-120			
Manganese	51.5	5	ug/L	ND	103	80-120			
Potassium	9800	100	ug/L	ND	97.9	80-120			
Sodium	9730	200	ug/L	ND	97.2	80-120			
Zinc	54	5	ug/L	ND	106	80-120			
Volatiles									
Benzene	31.6	0.5	ug/L	ND	79.1	60-130			
1,1-Dichloroethane	33.5	0.5	ug/L	ND	83.6	60-130			
Ethylbenzene	29.4	0.5	ug/L	ND	73.6	60-130			
Methylene Chloride	28.9	5.0	ug/L	ND	72.3	60-130			
Toluene	32.7	0.5	ug/L	ND	81.8	60-130			
Vinyl chloride	31.0	0.5	ug/L	ND	77.6	50-140			
m,p-Xylenes	61.5	0.5	ug/L	ND	76.9	60-130			
o-Xylene	30.3	0.5	ug/L	ND	75.8	60-130			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-21-00015

Report Date: 10-Mar-2022
Order Date: 25-Aug-2021
Project Description: 20412275

Qualifier Notes:

Login Qualifiers :

Container and COC sample IDs don't match - 1 Voc vial reads: "QC"
Applies to samples: L-5

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.
Applies to samples: L-5

Sample Qualifiers :

1 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

2 : Elevated Reporting Limit due to matrix interference.

3 : Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions.

QC Qualifiers :

BOD01 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision-1: This report now includes data for calcium, and an updated calculation for hardness.

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

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Page 1 of 1

Client Name: Golder Associates	Project Reference: 204122275	TAT: ☑ Regular ☐ 1 Day	
Contact Name: Yannick Marcoux	Quote #: 19- 799 Leachate	☐ 2 Day ☐ 3 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-00015	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bacon@golder.com, lanni.hunsault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ S.U.B (Sanitary/ Municipality) ☑ Other: OWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2135394

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote										
1	L-6	WL		9	08/04/21	3:05PM	✓										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-00015 to be sent along with the results

RCo 8 facility code 6253

Method of Delivery: Swift

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Dimitri	Verified By:
Relinquished By (Print): M. MARCOUX	Date/Time:	Date/Time: 08/05/2021 11:50	Date/Time: 08/05/2021 11:50
Date/Time: 08/04/21	Temperature: °C	Temperature: 3.2 °C	pH Verified ☐ By:

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 20412275
Custody:

Report Date: 3-Jun-2021
Order Date: 27-May-2021

Revised Report

Order #: 2122411

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2122411-01	SED-W
2122411-02	SED-C
2122411-03	SED-E

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 03-Jun-2021

Order Date: 27-May-2021

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	31-May-21	31-May-21
Mercury by CVAA	EPA 7471B - CVAA, digestion	2-Jun-21	2-Jun-21
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	2-Jun-21	2-Jun-21
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	31-May-21	1-Jun-21
Solids, %	Gravimetric, calculation	2-Jun-21	2-Jun-21

Certificate of Analysis

Report Date: 03-Jun-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

	Client ID:	SED-W	SED-C	SED-E	-
	Sample Date:	27-May-21 09:20	27-May-21 09:55	27-May-21 10:55	-
	Sample ID:	2122411-01	2122411-02	2122411-03	-
	MDL/Units	Sediment	Sediment	Sediment	-
Physical Characteristics					
% Solids	0.1 % by Wt.	11.0	51.2	13.1	-
Metals					
Arsenic	1.0 ug/g dry	3.4	1.1	9.1	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Boron	5.0 ug/g dry	28.7	<5.0	15.8	-
Boron, available	0.5 ug/g dry	10.6	1.9	4.2	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	30.5	13.3	35.8	-
Cobalt	1.0 ug/g dry	5.4	2.0	7.9	-
Copper	5.0 ug/g dry	23.7	<5.0	17.1	-
Iron	200 ug/g dry	13100	4950	82800	-
Lead	1.0 ug/g dry	10.6	4.2	10.0	-
Manganese	5 ug/g dry	322	88	1260	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	3.9	<1.0	1.3	-
Nickel	5.0 ug/g dry	19.2	6.2	22.5	-
Selenium	1.0 ug/g dry	1.4	<1.0	1.2	-
Zinc	20.0 ug/g dry	72.8	<20.0	76.5	-

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Iron	ND	200	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Manganese	ND	5	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Zinc	ND	20.0	ug/g						

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	2.6	1.0	ug/g dry	2.7			5.0	30	
Beryllium	ND	0.5	ug/g dry	ND			NC	30	
Boron, available	ND	0.5	ug/g dry	ND			NC	35	
Boron	7.3	5.0	ug/g dry	6.2			15.7	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium	13.6	5.0	ug/g dry	13.0			4.1	30	
Cobalt	5.3	1.0	ug/g dry	4.9			8.5	30	
Copper	10.3	5.0	ug/g dry	9.9			3.7	30	
Iron	6350	200	ug/g dry	7350			14.6	30	
Lead	7.8	1.0	ug/g dry	8.1			3.4	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Manganese	182	5	ug/g dry	201			10.1	30	
Molybdenum	ND	1.0	ug/g dry	ND			NC	30	
Nickel	11.4	5.0	ug/g dry	10.6			7.2	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Zinc	61.4	20.0	ug/g dry	54.6			11.7	30	
Physical Characteristics									
% Solids	98.6	0.1	% by Wt.	99.6			1.0	25	

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	50.2	1.0	ug/g	1.1	98.3	70-130			
Beryllium	46.0	0.5	ug/g	ND	91.8	70-130			
Boron, available	4.59	0.5	ug/g	ND	91.8	70-122			
Boron	43.5	5.0	ug/g	ND	82.0	70-130			
Cadmium	46.1	0.5	ug/g	ND	92.1	70-130			
Chromium	54.0	5.0	ug/g	5.2	97.6	70-130			
Cobalt	50.5	1.0	ug/g	2.0	97.0	70-130			
Copper	50.4	5.0	ug/g	ND	92.8	70-130			
Iron	5400	200	ug/g	2940	98.5	70-130			
Lead	46.9	1.0	ug/g	3.2	87.3	70-130			
Mercury	1.64	0.1	ug/g	ND	109	70-130			
Manganese	139	5	ug/g	80.6	117	70-130			
Molybdenum	47.1	1.0	ug/g	ND	93.8	70-130			
Nickel	51.3	5.0	ug/g	ND	94.1	70-130			
Selenium	44.9	1.0	ug/g	ND	89.7	70-130			
Zinc	67.6	20.0	ug/g	21.8	91.5	70-130			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1 - This report includes an updated parameter list.

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Paracel ID: 2122411

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Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412275
Contact Name: Yannick Marceau	Quote #: 19-801
Address: 1931 Robertson Rd, Ottawa, Ontario K2H 5B7	PO #:
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_hiscox@golder.com, henri.hureault@wasteconnections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day

Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ REC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWOS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

	Paracel Order Number: 2122411 / Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	SED-W	SED		1	05/17/21	9:20am	✓
2	SED-C	SED		1	"	9:55am	✓
3	SED-E	SED		1	"	10:55am	✓
4							
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada, with POR to be sent along with the results

EQuIS facility code 8253

Method of Delivery: Fed Ex

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished by (Print):	Date/Time:	Date/Time: 19/05/21 13:00	Date/Time: 19/05/21 13:16
Date/Time:	Temperature: °C	Temperature: 10.2 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Emily Bacon

Client PO: 7145-21-00015
Project: NAVAN 20412275
Custody: 61596,61595,61594

Report Date: 3-Jun-2021
Order Date: 26-May-2021

Order #: 2122249

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2122249-01	92-19
2122249-02	92-18
2122249-03	05-1C
2122249-04	05-1D
2122249-05	05-3C
2122249-06	05-3D
2122249-07	07-1C
2122249-08	07-1D
2122249-09	92-1D
2122249-10	05-11
2122249-11	Dupe-2
2122249-12	05-8
2122249-13	92-7
2122249-14	05-R3
2122249-15	95-8
2122249-16	98-1
2122249-17	Dupe-3
2122249-18	94-2
2122249-19	95-3
2122249-20	95-2
2122249-21	MW-C
2122249-22	MW-E
2122249-23	95-7
2122249-24	95-6
2122249-25	94-6
2122249-26	94-5

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, bicarbonate	calculated from EPA 310.1 - Titration to pH 4.5	27-May-21	27-May-21
Alkalinity, carbonate	calculated from EPA 310.1 - Titration to pH 4.5	27-May-21	27-May-21
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	27-May-21	27-May-21
Ammonia, as N	EPA 351.2 - Auto Colour	31-May-21	1-Jun-21
Anions	EPA 300.1 - IC	27-May-21	27-May-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	27-May-21	27-May-21
Hardness	Hardness as CaCO3	27-May-21	28-May-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	27-May-21	28-May-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	28-May-21	28-May-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	27-May-21	28-May-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	27-May-21	28-May-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	27-May-21	28-May-21
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	28-May-21	27-May-21

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-19	92-18	05-1C	05-1D
	Sample Date:	26-May-21 08:20	26-May-21 08:30	26-May-21 08:40	26-May-21 09:45
	Sample ID:	2122249-01	2122249-02	2122249-03	2122249-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	312	200	173	297
Alkalinity, bicarbonate	5 mg/L	312	199	172	296
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<5
Ammonia as N	0.01 mg/L	0.06	0.07	0.28	0.03
Chemical Oxygen Demand	10 mg/L	20	20	<10	13
Hardness	mg/L	500	522	161	486
Phenolics	0.001 mg/L	0.002	<0.001	<0.001	0.002
Phosphorus, total	0.01 mg/L	0.08	0.35	0.46	0.03
Total Dissolved Solids	10 mg/L	1030	954	342	1060
Total Kjeldahl Nitrogen	0.1 mg/L	0.4	0.1	0.4	0.2
Anions					
Chloride	1 mg/L	222	353	50	370
Nitrate as N	0.1 mg/L	<0.1	0.2	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	210	36	44	86
Metals					
Arsenic	1 ug/L	<1	4	2	<1
Boron	10 ug/L	50	23	63	24
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	160000	137000	38200	136000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Copper	0.5 ug/L	2.1	1.6	1.1	5.6
Iron	100 ug/L	<100	<100	252	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	24200	44000	15900	35700
Manganese	5 ug/L	472	<5	54	14
Potassium	100 ug/L	18200	7200	4920	11600
Sodium	200 ug/L	64700	98200	51100	187000
Zinc	5 ug/L	7	5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-19	92-18	05-1C	05-1D
	Sample Date:	26-May-21 08:20	26-May-21 08:30	26-May-21 08:40	26-May-21 09:45
	Sample ID:	2122249-01	2122249-02	2122249-03	2122249-04
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	118%	120%	120%	119%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	05-3C	05-3D	07-1C	07-1D
	Sample Date:	26-May-21 09:05	26-May-21 09:15	26-May-21 09:25	26-May-21 09:30
	Sample ID:	2122249-05	2122249-06	2122249-07	2122249-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	962	742	670	402
Alkalinity, bicarbonate	5 mg/L	954	738	667	401
Alkalinity, carbonate	5 mg/L	8	<5	<5	<5
Ammonia as N	0.01 mg/L	1.20	0.05	0.58	0.38
Chemical Oxygen Demand	10 mg/L	71	<10	38	251
Hardness	mg/L	105	388	241	483
Phenolics	0.001 mg/L	<0.004 [1]	<0.001	<0.004 [1]	<0.001
Phosphorus, total	0.01 mg/L	1.89	0.10	0.58	3.23
Total Dissolved Solids	10 mg/L	1560	1040	1550	670
Total Kjeldahl Nitrogen	0.1 mg/L	2.9	0.2	0.9	5.7
Anions					
Chloride	1 mg/L	276	110	412	18
Nitrate as N	0.1 mg/L	0.1	<0.1	<0.1	0.7
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	12	96	97	186
Metals					
Arsenic	1 ug/L	4	<1	3	<1
Boron	10 ug/L	1540	441	409	173
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	11300	65600	31400	123000
Chromium	1 ug/L	1	<1	<1	<1
Cobalt	0.5 ug/L	0.6	<0.5	0.8	<0.5
Copper	0.5 ug/L	6.2	4.4	0.9	2.6
Iron	100 ug/L	194	<100	287	184
Lead	0.1 ug/L	0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	18600	54500	39400	42300
Manganese	5 ug/L	6	494	348	144
Potassium	100 ug/L	15300	13700	14700	5470
Sodium	200 ug/L	553000	244000	501000	43800
Zinc	5 ug/L	7	13	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	05-3C	05-3D	07-1C	07-1D
	Sample Date:	26-May-21 09:05	26-May-21 09:15	26-May-21 09:25	26-May-21 09:30
	Sample ID:	2122249-05	2122249-06	2122249-07	2122249-08
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	118%	120%	118%	113%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-1D	05-11	Dupe-2	05-8
	Sample Date:	26-May-21 09:40	26-May-21 09:50	26-May-21 00:00	26-May-21 10:15
	Sample ID:	2122249-09	2122249-10	2122249-11	2122249-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	806	614	814	1020
Alkalinity, bicarbonate	5 mg/L	803	613	810	1010
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<25
Ammonia as N	0.01 mg/L	0.60	0.48	0.62	1.33
Chemical Oxygen Demand	10 mg/L	79	25	67	72
Hardness	mg/L	550	621	543	758
Phenolics	0.001 mg/L	<0.004 [1]	0.003	0.014	0.006
Phosphorus, total	0.01 mg/L	0.25	0.06	0.28	0.14
Total Dissolved Solids	10 mg/L	1210	744	1250	1090
Total Kjeldahl Nitrogen	0.1 mg/L	1.3	0.8	1.2	2.9
Anions					
Chloride	1 mg/L	223	30	220	38
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	39	126	40	<1
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	904	1010	893	640
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	90300	146000	89300	163000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Copper	0.5 ug/L	2.9	1.9	4.0	1.9
Iron	100 ug/L	<100	388	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	78700	62100	77700	85300
Manganese	5 ug/L	1330	310	1110	8690
Potassium	100 ug/L	16900	7080	16900	5250
Sodium	200 ug/L	281000	61700	285000	72500
Zinc	5 ug/L	<5	5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-1D	05-11	Dupe-2	05-8
	Sample Date:	26-May-21 09:40	26-May-21 09:50	26-May-21 00:00	26-May-21 10:15
	Sample ID:	2122249-09	2122249-10	2122249-11	2122249-12
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	100%	120%	106%	119%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-7	05-R3	95-8	98-1
	Sample Date:	26-May-21 10:05	26-May-21 10:25	26-May-21 10:50	26-May-21 10:55
	Sample ID:	2122249-13	2122249-14	2122249-15	2122249-16
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	658	774	935	417
Alkalinity, bicarbonate	5 mg/L	652	772	934	412
Alkalinity, carbonate	5 mg/L	6	<5	<5	<5
Ammonia as N	0.01 mg/L	0.21	0.04	2.51	0.69
Chemical Oxygen Demand	10 mg/L	25	<10	107	<10
Hardness	mg/L	259	688	833	302
Phenolics	0.001 mg/L	<0.004 [1]	<0.001	0.004	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.23	0.03	0.03	0.19
Total Dissolved Solids	10 mg/L	1380	1020	1250	1250
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	0.2	2.3	1.0
Anions					
Chloride	1 mg/L	423	15	174	503
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	222	11	<1
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	442	373	53	161
Cadmium	0.1 ug/L	<0.1	<0.1	0.3	<0.1
Calcium	100 ug/L	35200	160000	206000	61800
Chromium	1 ug/L	<1	2	11	<1
Cobalt	0.5 ug/L	<0.5	<0.5	2.1	<0.5
Copper	0.5 ug/L	2.6	2.0	91.9	1.2
Iron	100 ug/L	<100	<100	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	41500	70200	77500	35800
Manganese	5 ug/L	<5	<5	9670	47
Potassium	100 ug/L	16400	7780	17000	14100
Sodium	200 ug/L	454000	135000	122000	352000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-7	05-R3	95-8	98-1
	Sample Date:	26-May-21 10:05	26-May-21 10:25	26-May-21 10:50	26-May-21 10:55
	Sample ID:	2122249-13	2122249-14	2122249-15	2122249-16
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	119%	120%	118%	116%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	Dupe-3	94-2	95-3	95-2
	Sample Date:	26-May-21 00:00	26-May-21 12:10	26-May-21 12:35	26-May-21 12:25
	Sample ID:	2122249-17	2122249-18	2122249-19	2122249-20
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	915	912	699	1160
Alkalinity, bicarbonate	5 mg/L	913	900	696	1140
Alkalinity, carbonate	5 mg/L	<5	11	<5	<25
Ammonia as N	0.01 mg/L	2.57	0.11	0.17	1.67
Chemical Oxygen Demand	10 mg/L	113	36	137	70
Hardness	mg/L	846	292	176	259
Phenolics	0.001 mg/L	<0.004 [1]	<0.004 [1]	<0.004 [1]	<0.010 [1]
Phosphorus, total	0.01 mg/L	0.03	0.46	1.70	1.05
Total Dissolved Solids	10 mg/L	1190	1770	1090	2240
Total Kjeldahl Nitrogen	0.1 mg/L	3.2	0.6	1.5	2.1
Anions					
Chloride	1 mg/L	172	485	158	574
Nitrate as N	0.1 mg/L	<0.5 [1]	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	9	5	81	2
Metals					
Arsenic	1 ug/L	<1	2	<1	2
Boron	10 ug/L	54	494	705	851
Cadmium	0.1 ug/L	0.2	<0.1	<0.1	<0.1
Calcium	100 ug/L	211000	37100	26700	30200
Chromium	1 ug/L	11	<1	<1	<1
Cobalt	0.5 ug/L	1.6	0.6	0.5	<0.5
Copper	0.5 ug/L	97.9	1.1	1.1	1.6
Iron	100 ug/L	<100	113	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Magnesium	200 ug/L	77500	48400	26400	44700
Manganese	5 ug/L	9820	605	639	89
Potassium	100 ug/L	17200	14700	5790	17200
Sodium	200 ug/L	123000	515000	281000	731000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	Dupe-3	94-2	95-3	95-2
	Sample Date:	26-May-21 00:00	26-May-21 12:10	26-May-21 12:35	26-May-21 12:25
	Sample ID:	2122249-17	2122249-18	2122249-19	2122249-20
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	119%	119%	119%	120%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	MW-C	MW-E	95-7	95-6
	Sample Date:	26-May-21 12:45	26-May-21 13:00	26-May-21 13:20	26-May-21 13:15
	Sample ID:	2122249-21	2122249-22	2122249-23	2122249-24
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	520	377	629	955
Alkalinity, bicarbonate	5 mg/L	516	375	623	942
Alkalinity, carbonate	5 mg/L	<5	<5	6	13
Ammonia as N	0.01 mg/L	0.16	0.08	0.42	1.98
Chemical Oxygen Demand	10 mg/L	61	23	43	46
Hardness	mg/L	431	284	234	405
Phenolics	0.001 mg/L	0.002	0.002	<0.004 [1]	<0.010 [1]
Phosphorus, total	0.01 mg/L	0.86	0.19	0.24	0.67
Total Dissolved Solids	10 mg/L	1310	868	1350	2190
Total Kjeldahl Nitrogen	0.1 mg/L	1.2	0.7	1.0	2.2
Anions					
Chloride	1 mg/L	217	94	416	763
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.25 [2]
Sulphate	1 mg/L	315	300	13	<1
Metals					
Arsenic	1 ug/L	2	<1	2	1
Boron	10 ug/L	363	245	353	684
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	91400	77700	34100	48300
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	0.7	0.7
Copper	0.5 ug/L	2.0	2.4	2.2	1.3
Iron	100 ug/L	455	<100	460	258
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.1
Magnesium	200 ug/L	49200	21900	36200	69100
Manganese	5 ug/L	107	6	1890	190
Potassium	100 ug/L	6170	1600	7710	20300
Sodium	200 ug/L	165000	47700	372000	764000
Zinc	5 ug/L	<5	<5	5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	MW-C	MW-E	95-7	95-6
	Sample Date:	26-May-21 12:45	26-May-21 13:00	26-May-21 13:20	26-May-21 13:15
	Sample ID:	2122249-21	2122249-22	2122249-23	2122249-24
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	119%	121%	120%	119%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	94-6	94-5	-	-
	Sample Date:	26-May-21 13:55	26-May-21 13:45	-	-
	Sample ID:	2122249-25	2122249-26	-	-
	MDL/Units	Water	Water	-	-
General Inorganics					
Alkalinity, total	5 mg/L	345	875	-	-
Alkalinity, bicarbonate	5 mg/L	344	867	-	-
Alkalinity, carbonate	5 mg/L	<5	8	-	-
Ammonia as N	0.01 mg/L	0.07	0.91	-	-
Chemical Oxygen Demand	10 mg/L	34	60	-	-
Hardness	mg/L	323	409	-	-
Phenolics	0.001 mg/L	0.002	<0.010 [1]	-	-
Phosphorus, total	0.01 mg/L	0.40	1.14	-	-
Total Dissolved Solids	10 mg/L	972	2130	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.8	1.4	-	-
Anions					
Chloride	1 mg/L	224	721	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-
Sulphate	1 mg/L	226	13	-	-
Metals					
Arsenic	1 ug/L	<1	1	-	-
Boron	10 ug/L	157	381	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Calcium	100 ug/L	77900	53900	-	-
Chromium	1 ug/L	<1	<1	-	-
Cobalt	0.5 ug/L	2.7	0.8	-	-
Copper	0.5 ug/L	2.0	1.1	-	-
Iron	100 ug/L	329	423	-	-
Lead	0.1 ug/L	<0.1	<0.1	-	-
Magnesium	200 ug/L	31200	66600	-	-
Manganese	5 ug/L	2140	2320	-	-
Potassium	100 ug/L	5540	9620	-	-
Sodium	200 ug/L	156000	551000	-	-
Zinc	5 ug/L	<5	<5	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	94-6	94-5	-	-
	Sample Date:	26-May-21 13:55	26-May-21 13:45	-	-
	Sample ID:	2122249-25	2122249-26	-	-
	MDL/Units	Water	Water	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	119%	119%	-	-

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Alkalinity, bicarbonate	ND	5	mg/L						
Alkalinity, carbonate	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Surrogate: Toluene-d8	*95.0*		*ug/L*		*119*	*50-140*			

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	81.4	1	mg/L	81.0			0.5	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	87.0	1	mg/L	87.1			0.1	10	
General Inorganics									
Alkalinity, total	153	5	mg/L	154			0.5	14	
Alkalinity, bicarbonate	151	5	mg/L	151			0.6	14	
Alkalinity, carbonate	ND	5	mg/L	ND			NC	14	
Ammonia as N	0.067	0.01	mg/L	0.057			15.0	18	
Chemical Oxygen Demand	18	10	mg/L	20			10.5	12	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	1.54	0.02	mg/L	1.58			2.6	15	
Total Dissolved Solids	ND	10	mg/L	ND			NC	10	
Total Kjeldahl Nitrogen	16.4	1.0	mg/L	18.5			12.3	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	ND	10	ug/L	ND			NC	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	ND	100	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	ND	0.5	ug/L	ND			NC	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	ND	200	ug/L	ND			NC	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	ND	100	ug/L	ND			NC	20	
Sodium	ND	200	ug/L	ND			NC	20	
Zinc	ND	5	ug/L	ND			NC	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*95.4*		*ug/L*		*119*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-21-00015

Report Date: 03-Jun-2021
Order Date: 26-May-2021
Project Description: NAVAN 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	88.8	1	mg/L	81.0	77.8	77-123			
Nitrate as N	1.03	0.1	mg/L	ND	103	79-120			
Nitrite as N	0.871	0.05	mg/L	ND	87.1	84-117			
Sulphate	95.8	1	mg/L	87.1	86.8	74-126			
General Inorganics									
Ammonia as N	0.297	0.01	mg/L	0.057	95.7	81-124			
Chemical Oxygen Demand	223	10	mg/L	20	102	85-111			
Phenolics	0.021	0.001	mg/L	ND	86.0	69-132			
Phosphorus, total	0.463	0.01	mg/L	ND	92.7	80-120			
Total Dissolved Solids	102	10	mg/L	ND	102	75-125			
Total Kjeldahl Nitrogen	2.28	0.1	mg/L	0.27	101	81-126			
Metals									
Arsenic	52.7	1	ug/L	ND	105	80-120			
Boron	46	10	ug/L	ND	90.8	80-120			
Cadmium	51.2	0.1	ug/L	ND	102	80-120			
Calcium	9950	100	ug/L	ND	99.4	80-120			
Chromium	51.6	1	ug/L	ND	103	80-120			
Cobalt	50.4	0.5	ug/L	ND	101	80-120			
Copper	49.8	0.5	ug/L	ND	99.6	80-120			
Iron	2460	100	ug/L	ND	98.2	80-120			
Lead	45.2	0.1	ug/L	ND	90.4	80-120			
Magnesium	9740	200	ug/L	ND	97.4	80-120			
Manganese	51.0	5	ug/L	ND	102	80-120			
Potassium	9850	100	ug/L	ND	98.4	80-120			
Sodium	9440	200	ug/L	ND	94.2	80-120			
Zinc	54	5	ug/L	ND	102	80-120			
Volatiles									
Benzene	29.2	0.5	ug/L	ND	73.0	60-130			
1,1-Dichloroethane	29.2	0.5	ug/L	ND	73.0	60-130			
Ethylbenzene	33.2	0.5	ug/L	ND	82.9	60-130			
Methylene Chloride	28.8	5.0	ug/L	ND	72.1	60-130			
Toluene	33.2	0.5	ug/L	ND	83.0	60-130			
Vinyl chloride	27.5	0.5	ug/L	ND	68.7	50-140			
m,p-Xylenes	67.1	0.5	ug/L	ND	83.9	60-130			
o-Xylene	32.4	0.5	ug/L	ND	81.0	60-130			
Surrogate: Toluene-d8	*81.0*		*ug/L*		*101*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated Reporting Limit due to matrix interference.

2 : Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 2122249

PAL LABORATORY

Head Office: 300-4019 St. Laurent Blvd, Ottawa, Ontario K1G 4J8 | t: 1-800-749-1947 | e: paracel@paracellabs.com | www.paracellabs.com

Paracel Order Number (Lab Use Only): 2122249

Chain Of Custody (Lab Use Only): № 61596

Client Name: Golder Assoc. Ltd

Contact Name: Emily Bacon

Address: 1931 Robertson Rd, Ottawa ON

Telephone: 613-592-9600

Project Ref: NAUGM 20412225 21000-02

Quote #: 19-797 GW

PO: 7145-21-00015

Email: ymercerou@golder.com, ebacon@golder.ca, henri.hunegault@wsteconnections.com

Page: 1 of 3

Turnaround Time: ☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular

Date Required:

Regulation: ☐ REG 153/04 ☐ REG 406/19 | Other Regulations

Table: ☐ 1 ☐ 2 ☐ 3 ☐ Res/Park ☐ Med/Fine ☐ Agri/Other ☐ Table

For RSC: ☐ Yes ☐ No

Matrix: ☐ PW ☐ (Cist) ☐ Water ☐ SW (Storm/Surface Water) ☐ SW (Storm/Sanitary Sewer) ☒ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Time	19-797 GW	METALS, PB & TOTALS
1	92-9	GW	6	05/26/21	8:20AM	✓	✓
2	92-8				8:30AM	✓	✓
3	05-1C				8:40AM	✓	✓
4	05-1D				8:45AM	✓	✓
5	05-3C				9:05AM	✓	✓
6	05-3D				9:15AM	✓	✓
7	07-1C				9:25AM	✓	✓
8	07-1D				9:30AM	✓	✓
9	92-10				9:40AM	✓	✓
10	05-11				9:50AM	✓	✓

Comments: INVOICES TO GO TO HENRI HUNEAULT FROM WCC. THE FACILITY # FOR EQUIS IS 6253. THIS APPLIES TO ALL 3 COC'S.

Method of Delivery: Drop Box

Relinquished By (Sign):

Relinquished By (Print): Mike Armitage

Date/Time: 05 26 21

Received By Driver/Depot:

Received at Lab: Jumeghan Delumpa

Date/Time: May 26, 2021 04:10

Temperature: 5.1 °C

Date/Time: May 26/21 1649

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Temperature °C

Chain of Custody (Blank).xlsx

Revised 3.0

002820

PARA LABORATORIES

Paracel ID: 2122249

Paracel Order Number (Lab Use Only): 2122249

Chain Of Custody (Lab Use Only): No. 61595

Client Name: Golder Assoc. Ltd

Contact Name: Emily Bacon

Address: 1931 Robertson Rd Ottawa ON

Telephone: 613 592-9600

Project Ref: AOWA 20412225

Quote #: 19-797 GW

P.O. #: 7145-21-00015

Email: ymarcoux@golder.com, ebacon@golder.com, henri.lamoureux@wastecon sultants.com

Page 2 of 3

Turnaround Time: 1 day, 3 day, 2 day, Regular (X), Date Required:

Regulation: SUB, REC Water, Other Regulation

Matrix Types: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: 19-797 GW Metals (13 Plus) Hardness

Other: DOW as

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Time
1	DUP1-2	GW	76		05/21/21	
2	05-8					10:15AM
3	92-7					10:40AM
4	05-R3					10:25AM
5	95-8					10:50AM
6	98-1					10:55AM
7	DUP1-3					
8	94-2					12:10PM
9	95-3					12:35PM
10	95-2					12:25PM

Comments:

Special Instructions:

Relinquished By (Sign): Mike Armitage

Relinquished By (Print): Mike Armitage

Date/Time: 05/26/21

Received By Driver/Depot:

Date/Time:

Temperature:

Received at Lab: Junkeguan Ouyang

Date/Time: May 26, 2021 04:10

Temperature: 5.1 °C

Verified By: [signature]

Date/Time: May 26 2021 16:45

Chain of Custody (Blank).doc

Revised: Oct

002821

PARA LABORATORIES

Paracel ID: 2122249

Paracel Order Number: 2122249 2122252

Chain Of Custody (Laboratory Use Only) No: 61594

Client Name: GOLDER ASSOC. LTD

Contact Name: EMILY BACON

Address: 1931 ROBERTSON RD OTTAWA ON

Telephone: 613 592 9600

Project No: NAVFM 2041 2275

Quote #: 19-797 GW + 19-800-QA/QC

P.O. #: 7145-21-00015

Email: fmercer@golder.com, ebacon@golder.com, henri.hunsinger@waterecconnect.com

Page 3 of 3

Turnaround Time: 1 day, 3 day, 2 day, Regular

Date Required:

Regulation: RSC: Table 1, Res/Park, Med/Fine; Table 2, Ind/Comm, Coarse; Table 3, Agri/Other; Table; For RSC: Yes, No; MISA; PWQO; CCME; SU - Sani; SU - Storm; Other: OOW QS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: 19-797 GW PETROLEUM HYDROCARBONS; 19-800 QA/QC

	Sample ID/Description	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	19-797 GW	19-800 QA/QC
1	MW-C	GW		6	05/21/21	12:45 pm	✓	✓
2	MW-B					1 pm	✓	✓
3	95-7					1:20 pm	✓	✓
4	95-6					1:45 pm	✓	✓
5	94-6					1:55 pm	✓	✓
6	945					1:45 pm	✓	✓
7	FIELD BLANK					12:25 pm	✓	✓
8	TRIP BLANK				May 20, 2021			✓
9								
10								

Comments:

Relinquished By (Sign): Received By Driver/Depot: Received at Lab: Verified By:

Relinquished By (Print): MIKE ARMITAGE Date/Time: May 20, 2021 Temperature: °C Date/Time: May 21, 2021 16:10 Temperature: 5.1 °C

Chain of Custody (Blank).xlsx

Revision 4.0

002822

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www.paracellabs.com

Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 20412275
Custody:

Report Date: 4-Jun-2021
Order Date: 27-May-2021

Order #: 2122437

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2122437-01	S-21
2122437-02	S-1
2122437-03	S-3
2122437-04	S-15
2122437-05	S-16
2122437-06	S-17
2122437-07	S-8
2122437-08	S-9
2122437-09	S-10
2122437-10	S-11
2122437-11	S-12
2122437-12	Dupe-1

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 04-Jun-2021

Order Date: 27-May-2021

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	28-May-21	28-May-21
Ammonia, as N	EPA 351.2 - Auto Colour	31-May-21	1-Jun-21
Anions	EPA 300.1 - IC	28-May-21	28-May-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	28-May-21	2-Jun-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	28-May-21	31-May-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	28-May-21	31-May-21
Hardness	Hardness as CaCO3	1-Jun-21	1-Jun-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	1-Jun-21	1-Jun-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	2-Jun-21	2-Jun-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	31-May-21	31-May-21
Total Dissolved Carbon	MOE 3247B - Combustion IR	31-May-21	28-May-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	28-May-21	31-May-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	31-May-21	31-May-21
Total Suspended Solids	SM 2540D - Gravimetric	28-May-21	31-May-21

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

	Client ID:	S-21	S-1	S-3	S-15
	Sample Date:	27-May-21 12:25	27-May-21 12:55	27-May-21 14:15	27-May-21 13:55
	Sample ID:	2122437-01	2122437-02	2122437-03	2122437-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	212	399	392	298
Ammonia as N	0.01 mg/L	0.03	0.14	0.49	0.08
BOD	2 mg/L	2	<2	5	<2
Chemical Oxygen Demand	10 mg/L	32	34	51	34
Dissolved Inorganic Carbon	0.500 mg/L	46.8	82.5	86.6	67.4
Dissolved Organic Carbon	0.5 mg/L	11.0	12.8	13.7	10.6
Total Dissolved Carbon	0.5 mg/L	57.8	95.3	100	78.1
Hardness	mg/L	371	631	470	601
Phenolics	0.001 mg/L	0.003	0.003	0.007	0.002
Phosphorus, total	0.01 mg/L	0.02	<0.01	0.05	<0.01
Total Dissolved Solids	10 mg/L	758	1380	1000	892
Total Suspended Solids	2 mg/L	2	2	24	3
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	0.6	1.3	0.6
Anions					
Chloride	1 mg/L	196	387	289	86
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.5	0.4
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	190	194	116	317
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	142	121	65	66
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	85600	184000	142000	179000
Chromium	1 ug/L	<1	2	2	<1
Cobalt	0.5 ug/L	<0.5	0.8	1.3	<0.5
Copper	0.5 ug/L	1.1	1.3	1.8	1.0
Iron	100 ug/L	<100	1640	6480	415
Lead	0.1 ug/L	<0.1	0.5	0.5	0.2
Magnesium	200 ug/L	38100	41600	28100	37100
Manganese	5 ug/L	28	390	1530	509
Potassium	100 ug/L	9070	13800	9290	12200
Sodium	200 ug/L	139000	218000	178000	66000
Zinc	5 ug/L	<5	5	28	6

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

	Client ID:	S-16	S-17	S-8	S-9
	Sample Date:	27-May-21 14:55	27-May-21 14:35	27-May-21 09:05	27-May-21 10:20
	Sample ID:	2122437-05	2122437-06	2122437-07	2122437-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	256	247	441	337
Ammonia as N	0.01 mg/L	0.06	0.21	0.30	0.09
BOD	2 mg/L	<2	9	12	<2
Chemical Oxygen Demand	10 mg/L	28	45	112	65
Dissolved Inorganic Carbon	0.500 mg/L	56.2	56.6	92.1	69.9
Dissolved Organic Carbon	0.5 mg/L	9.7	13.7	19.0	13.9
Total Dissolved Carbon	0.5 mg/L	65.9	70.3	111	83.8
Hardness	mg/L	615	416	528	423
Phenolics	0.001 mg/L	0.002	0.005	0.010	0.004
Phosphorus, total	0.01 mg/L	0.03	0.09	0.46	0.10
Total Dissolved Solids	10 mg/L	834	1300	994	744
Total Suspended Solids	2 mg/L	24	5	64	35
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	1.1	2.5	0.9
Anions					
Chloride	1 mg/L	35	533	100	127
Nitrate as N	0.1 mg/L	0.4	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	370	99	222	150
Metals					
Arsenic	1 ug/L	<1	<1	1	<1
Boron	10 ug/L	69	47	92	112
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	188000	127000	138000	112000
Chromium	1 ug/L	2	1	3	4
Cobalt	0.5 ug/L	1.0	0.6	3.1	1.0
Copper	0.5 ug/L	1.7	1.3	3.2	3.4
Iron	100 ug/L	1260	844	1050	1470
Lead	0.1 ug/L	0.7	0.3	0.5	0.5
Magnesium	200 ug/L	35500	24100	44600	34900
Manganese	5 ug/L	216	438	12800	145
Potassium	100 ug/L	10400	9390	12800	8920
Sodium	200 ug/L	30300	300000	125000	115000
Zinc	5 ug/L	6	<5	9	8

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

	Client ID:	S-10	S-11	S-12	Dupe-1
	Sample Date:	27-May-21 09:20	27-May-21 09:55	27-May-21 10:55	27-May-21 09:00
	Sample ID:	2122437-09	2122437-10	2122437-11	2122437-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	215	204	166	213
Ammonia as N	0.01 mg/L	0.09	0.09	0.06	0.03
BOD	2 mg/L	<150 [1]	11	8	2
Chemical Oxygen Demand	10 mg/L	766	103	149	31
Dissolved Inorganic Carbon	0.500 mg/L	52.5	50.0	44.4	54.8
Dissolved Organic Carbon	0.5 mg/L	30.7	29.9	29.6	11.5
Total Dissolved Carbon	0.5 mg/L	83.2	79.9	74.0	66.3
Hardness	mg/L	279	204	146	388
Phenolics	0.001 mg/L	0.012	0.003	0.007	0.003
Phosphorus, total	0.01 mg/L	2.92	0.17	1.80	0.01
Total Dissolved Solids	10 mg/L	416	436	284	780
Total Suspended Solids	2 mg/L	221	4	59	2
Total Kjeldahl Nitrogen	0.1 mg/L	11.1	1.5	3.8	0.6
Anions					
Chloride	1 mg/L	71	104	47	192
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	16	<1	190
Metals					
Arsenic	1 ug/L	6	1	2	<1
Boron	10 ug/L	143	117	63	127
Cadmium	0.1 ug/L	0.3	<0.1	<0.1	<0.1
Calcium	100 ug/L	76700	53600	40100	90400
Chromium	1 ug/L	33	2	3	<1
Cobalt	0.5 ug/L	9.1	1.1	2.3	<0.5
Copper	0.5 ug/L	23.7	0.7	1.3	1.0
Iron	100 ug/L	54200	1180	9170	<100
Lead	0.1 ug/L	13.6	0.3	0.6	<0.1
Magnesium	200 ug/L	21300	16900	11100	39500
Manganese	5 ug/L	1970	1130	684	30
Potassium	100 ug/L	11300	8230	5860	9590
Sodium	200 ug/L	71800	79200	43500	147000
Zinc	5 ug/L	108	6	9	<5

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	35.0	1	mg/L	34.9			0.4	10	
Nitrate as N	0.37	0.1	mg/L	0.37			0.1	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	373	5	mg/L	370			1.0	10	
General Inorganics									
Alkalinity, total	291	5	mg/L	295			1.3	14	
Ammonia as N	0.067	0.01	mg/L	0.057			15.0	18	
BOD	36	2	mg/L	37			2.5	20	
Chemical Oxygen Demand	31	10	mg/L	32			3.2	12	
Dissolved Organic Carbon	2.4	0.5	mg/L	2.6			10.4	37	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.018	0.01	mg/L	0.018			1.9	15	
Total Dissolved Solids	1250	10	mg/L	1350			7.2	10	
Total Suspended Solids	7.0	2	mg/L	7.0			0.0	10	
Total Kjeldahl Nitrogen	0.59	0.1	mg/L	0.62			5.5	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	ND	10	ug/L	ND			NC	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	ND	100	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	1.26	0.5	ug/L	1.33			5.3	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	ND	200	ug/L	ND			NC	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	ND	100	ug/L	ND			NC	20	
Sodium	262	200	ug/L	258			1.5	20	
Zinc	ND	5	ug/L	ND			NC	20	

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	43.7	1	mg/L	34.9	88.2	77-123			
Nitrate as N	1.45	0.1	mg/L	0.37	108	79-120			
Nitrite as N	0.903	0.05	mg/L	ND	90.3	84-117			
Sulphate	9.02	1	mg/L	ND	90.2	86-114			
General Inorganics									
Ammonia as N	0.297	0.01	mg/L	0.057	95.7	81-124			
BOD	145	2	mg/L	ND	72.5	71-121			
Chemical Oxygen Demand	227	10	mg/L	32	97.5	85-111			
Dissolved Organic Carbon	13.6	0.5	mg/L	2.6	110	60-133			
Phenolics	0.025	0.001	mg/L	ND	98.8	69-132			
Phosphorus, total	0.494	0.01	mg/L	0.018	95.2	80-120			
Total Dissolved Solids	90.0	10	mg/L	ND	90.0	75-125			
Total Suspended Solids	18.0	2	mg/L	ND	90.0	75-125			
Total Kjeldahl Nitrogen	2.62	0.1	mg/L	0.62	99.8	81-126			
Metals									
Arsenic	49.4	1	ug/L	ND	98.6	80-120			
Boron	46	10	ug/L	ND	88.4	80-120			
Cadmium	50.1	0.1	ug/L	ND	100	80-120			
Calcium	9480	100	ug/L	ND	94.2	80-120			
Chromium	48.0	1	ug/L	ND	95.6	80-120			
Cobalt	47.6	0.5	ug/L	ND	95.2	80-120			
Copper	48.1	0.5	ug/L	1.33	93.5	80-120			
Iron	2330	100	ug/L	ND	93.4	80-120			
Lead	42.8	0.1	ug/L	ND	85.6	80-120			
Magnesium	9140	200	ug/L	ND	91.4	80-120			
Manganese	47.0	5	ug/L	ND	93.7	80-120			
Potassium	9040	100	ug/L	ND	90.2	80-120			
Sodium	9000	200	ug/L	258	87.4	80-120			
Zinc	49	5	ug/L	ND	97.5	80-120			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 04-Jun-2021
Order Date: 27-May-2021
Project Description: 20412275

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.

Applies to samples: S-11

Sample Qualifiers :

1 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

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Paracel ID: 2122437

Chain of Custody (Lab Use Only)

Page 1 of 2

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day
Contact Name: Yannick Marcoux	Quote #: 19-738	☐ 2 Day ☐ 1 Day
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	Date Required:
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bacon@golder.com, hemlihomeault@maxxecconstruction.com	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ___ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2122437

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per Guide	Required Analyses
1	~~S-20~~	~~SW~~			05/27/21		☑	
2	S-21	SW		7		12:25 PM	☑	
3	S-1	SW				12:55 PM	☑	
4	S-3	SW				2:15 PM	☑	
5	S-15	SW				1:35 PM	☑	
6	S-16	SW				2:55 PM	☑	
7	S-17	SW				2:35 PM	☑	
8	~~S-5-c~~	~~SW~~					☑	
9	S-6	SW				9:05 AM	☑	
10	S-9	SW				10:20 AM	☑	

Comments: Invoice to Waste Connections of Canada, with POW to be sent along with the results

EQuIS facility code (250)

Method of Delivery: Drop Box

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. MARCOUX	Date/Time:	Date/Time: 27/05/21 16:20	Date/Time: 28/05/21 08:30
Date/Time: 05/27/21	Temperature: °C	Temperature: 16.2 °C	pH Verified ☐ By:

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Paracel ID: 2122437

Chain of Custody
(Lab Use Only)

Page 2 of 2

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day
Contact Name: Yannick Marcoux	Quote #: 19-798	☐ 2 Day ☐ 1 Day
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	Date Required:
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bacon@golder.com, hamil.hancock@wasteconnections.com	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: COMOS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2122437

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote	Required Analyses
1	S-10	SW		7	05/27/21	9:20a	✓	
2	S-11	SW				9:55a	✓	
3	S-12	SW				10:55a	✓	
4	Dupe-1	SW					✓	
5								
6								
7								
8								
9								
10								

Comments: Invoice to Waste Connections of Canada, with PO# to be sent along with the results

EDD/MS facility code (625)

Method of Delivery: Drop Off

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): A. Arbuthnot	Date/Time:	Date/Time: May 27 2021 16:40	Date/Time: 05/28/2021 08:30
Date/Time: 05/27/21	Temperature: °C	Temperature: 10.2 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

002833

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Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 30-Aug-2021
Order Date: 25-Aug-2021

Order #: 2135404

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2135404-01	Trip Blank
2135404-02	Field Blank

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	27-Aug-21	27-Aug-21

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	23-Aug-21 09:00	24-Aug-21 11:00	-	-
	Sample ID:	2135404-01	2135404-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
Chloroethane	1.0 ug/L	<1.0	<1.0	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Chloromethane	3.0 ug/L	<3.0	<3.0	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Hexane	1.0 ug/L	<1.0	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	23-Aug-21 09:00	24-Aug-21 11:00	-	-
	Sample ID:	2135404-01	2135404-02	-	-
	MDL/Units	Water	Water	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
4-Bromofluorobenzene	Surrogate	98.4%	101%	-	-
Dibromofluoromethane	Surrogate	85.3%	86.0%	-	-
Toluene-d8	Surrogate	103%	103%	-	-

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroethane	ND	1.0	ug/L						
Chloroform	ND	0.5	ug/L						
Chloromethane	ND	3.0	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dibromoethane	ND	0.2	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloroethylene, total	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
1,3,5-Trimethylbenzene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*68.6*		*ug/L*		*85.7*	*50-140*			
Surrogate: Dibromofluoromethane	*59.2*		*ug/L*		*74.0*	*50-140*			
Surrogate: Toluene-d8	*82.8*		*ug/L*		*104*	*50-140*			

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	3.18	0.5	ug/L	2.83			11.6	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroethane	ND	1.0	ug/L	ND			NC	30	
Chloroform	9.52	0.5	ug/L	7.95			18.0	30	
Chloromethane	ND	3.0	ug/L	ND			NC	30	
Dibromochloromethane	1.82	0.5	ug/L	1.98			8.4	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dibromoethane	ND	0.2	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
1,3,5-Trimethylbenzene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*79.4*		*ug/L*		*99.2*	*50-140*			
Surrogate: Dibromofluoromethane	*70.3*		*ug/L*		*87.9*	*50-140*			
Surrogate: Toluene-d8	*82.4*		*ug/L*		*103*	*50-140*			

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	110	5.0	ug/L	ND	110	50-140			
Benzene	31.6	0.5	ug/L	ND	79.1	60-130			
Bromodichloromethane	29.0	0.5	ug/L	ND	72.6	60-130			
Bromoform	39.5	0.5	ug/L	ND	98.6	60-130			
Bromomethane	28.0	0.5	ug/L	ND	70.0	50-140			
Carbon Tetrachloride	30.3	0.2	ug/L	ND	75.8	60-130			
Chlorobenzene	31.5	0.5	ug/L	ND	78.8	60-130			
Chloroethane	30.4	1.0	ug/L	ND	75.9	50-140			
Chloroform	31.2	0.5	ug/L	ND	78.1	60-130			
Chloromethane	27.2	3.0	ug/L	ND	68.0	50-140			
Dibromochloromethane	39.9	0.5	ug/L	ND	99.7	60-130			
Dichlorodifluoromethane	32.8	1.0	ug/L	ND	82.1	50-140			
1,2-Dibromoethane	39.7	0.2	ug/L	ND	99.4	60-130			
1,2-Dichlorobenzene	28.3	0.5	ug/L	ND	70.8	60-130			
1,3-Dichlorobenzene	29.1	0.5	ug/L	ND	72.8	60-130			
1,4-Dichlorobenzene	29.0	0.5	ug/L	ND	72.4	60-130			
1,1-Dichloroethane	33.5	0.5	ug/L	ND	83.6	60-130			
1,2-Dichloroethane	34.1	0.5	ug/L	ND	85.4	60-130			
1,1-Dichloroethylene	29.3	0.5	ug/L	ND	73.3	60-130			
cis-1,2-Dichloroethylene	28.1	0.5	ug/L	ND	70.4	60-130			
trans-1,2-Dichloroethylene	28.2	0.5	ug/L	ND	70.4	60-130			
1,2-Dichloropropane	30.9	0.5	ug/L	ND	77.4	60-130			
cis-1,3-Dichloropropylene	34.2	0.5	ug/L	ND	85.6	60-130			
trans-1,3-Dichloropropylene	27.5	0.5	ug/L	ND	68.8	60-130			
Ethylbenzene	29.4	0.5	ug/L	ND	73.6	60-130			
Hexane	37.1	1.0	ug/L	ND	92.8	60-130			
Methyl Ethyl Ketone (2-Butanone)	73.1	5.0	ug/L	ND	73.1	50-140			
Methyl Butyl Ketone (2-Hexanone)	81.1	10.0	ug/L	ND	81.1	50-140			
Methyl Isobutyl Ketone	108	5.0	ug/L	ND	108	50-140			
Methyl tert-butyl ether	70.5	2.0	ug/L	ND	70.5	50-140			
Methylene Chloride	28.9	5.0	ug/L	ND	72.3	60-130			
Styrene	33.9	0.5	ug/L	ND	84.6	60-130			
1,1,1,2-Tetrachloroethane	41.9	0.5	ug/L	ND	105	60-130			
1,1,2,2-Tetrachloroethane	34.1	0.5	ug/L	ND	85.2	60-130			
Tetrachloroethylene	40.4	0.5	ug/L	ND	101	60-130			
Toluene	32.7	0.5	ug/L	ND	81.8	60-130			
1,1,1-Trichloroethane	28.4	0.5	ug/L	ND	71.0	60-130			
1,1,2-Trichloroethane	30.3	0.5	ug/L	ND	75.6	60-130			
Trichloroethylene	27.1	0.5	ug/L	ND	67.8	60-130			
Trichlorofluoromethane	33.9	1.0	ug/L	ND	84.7	60-130			
1,3,5-Trimethylbenzene	30.1	0.5	ug/L	ND	75.2	60-130			
Vinyl chloride	31.0	0.5	ug/L	ND	77.6	50-140			
m,p-Xylenes	61.5	0.5	ug/L	ND	76.9	60-130			
o-Xylene	30.3	0.5	ug/L	ND	75.8	60-130			
Surrogate: 4-Bromofluorobenzene	*79.8*		*ug/L*		*99.7*	*50-140*			
Surrogate: Dibromofluoromethane	*72.4*		*ug/L*		*90.5*	*50-140*			
Surrogate: Toluene-d8	*82.1*		*ug/L*		*103*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-21-00015

Report Date: 30-Aug-2021
Order Date: 25-Aug-2021
Project Description: 20412275

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

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Paracel ID: 2135404

Chain of Custody (Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marceau	Quote #: 19-899 QAQC	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd, Ottawa, Ontario K2H 5B7	PO #: 7146-21-80015	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_bacon@golder.com, kerri.bureau@wastecorrections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: OCWDS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2135404

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	Trip Blank			1	Aug 24, 2021		☑
2	Field Blank			2	Aug 24, 2021	11 AM	☑
3							
4							
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Corrections of Canada

Method of Delivery: Courier

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Aug 25/2021 11:55	Verified By:
Relinquished By (Print): Yannick Marceau	Date/Time:	Date/Time:	Date/Time: Aug 25 2021 13:05
Date/Time: Aug 24 21	Temperature: °C	Temperature: 4.2 °C	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 0.3 Dec. 2014

002842

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Emily Bacon

Client PO:
Project: 20412275
Custody: 63337

Report Date: 30-Nov-2021
Order Date: 24-Nov-2021

Order #: 2148345

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2148345-01	SED-W
2148345-02	SED-C
2148345-03	SED-E

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.8 - ICP-MS	29-Nov-21	29-Nov-21
Mercury by CVAA	EPA 7471B - CVAA, digestion	30-Nov-21	30-Nov-21
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	29-Nov-21	29-Nov-21
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	29-Nov-21	29-Nov-21
Solids, %	Gravimetric, calculation	26-Nov-21	26-Nov-21

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

	Client ID:	SED-W	SED-C	SED-E	-
	Sample Date:	24-Nov-21 09:20	24-Nov-21 10:00	24-Nov-21 10:45	-
	Sample ID:	2148345-01	2148345-02	2148345-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	8.3	54.7	61.2	-
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	2.1	1.5	<1.0	-
Barium	1.0 ug/g dry	52.8	27.1	16.7	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Boron	5.0 ug/g dry	26.7	<5.0	<5.0	-
Boron, available	0.5 ug/g dry	7.2	1.0	<0.5	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	16.2	13.5	10.5	-
Cobalt	1.0 ug/g dry	3.2	2.0	1.6	-
Copper	5.0 ug/g dry	16.3	16.2	<5.0	-
Iron	200 ug/g dry	8340	5100	6290	-
Lead	1.0 ug/g dry	6.2	4.2	4.8	-
Manganese	5 ug/g dry	268	74	68	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	2.1	<1.0	<1.0	-
Nickel	5.0 ug/g dry	11.6	6.2	<5.0	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	1.7	<1.0	<1.0	-
Vanadium	10.0 ug/g dry	17.2	13.4	16.5	-
Zinc	20.0 ug/g dry	54.9	<20.0	<20.0	-

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Iron	ND	200	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Manganese	ND	5	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	1.5	1.0	ug/g dry	ND			NC	30	
Arsenic	8.9	1.0	ug/g dry	9.2			3.4	30	
Barium	80.0	1.0	ug/g dry	85.1			6.2	30	
Beryllium	0.6	0.5	ug/g dry	0.6			2.7	30	
Boron, available	ND	0.5	ug/g dry	ND			NC	35	
Boron	13.6	5.0	ug/g dry	13.1			3.9	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium	20.5	5.0	ug/g dry	20.8			1.6	30	
Cobalt	11.7	1.0	ug/g dry	11.8			1.3	30	
Copper	16.3	5.0	ug/g dry	17.0			3.8	30	
Lead	9.3	1.0	ug/g dry	9.6			3.8	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Molybdenum	2.9	1.0	ug/g dry	2.8			6.6	30	
Nickel	25.6	5.0	ug/g dry	27.1			5.5	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	30.6	10.0	ug/g dry	32.5			5.8	30	
Zinc	49.5	20.0	ug/g dry	48.4			2.1	30	
Physical Characteristics									
% Solids	95.1	0.1	% by Wt.	96.3			1.2	25	

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	39.1	1.0	ug/g	ND	77.9	70-130			
Arsenic	49.6	1.0	ug/g	3.7	91.8	70-130			
Barium	73.7	1.0	ug/g	34.1	79.2	70-130			
Beryllium	43.5	0.5	ug/g	ND	86.6	70-130			
Boron, available	3.83	0.5	ug/g	ND	76.7	70-122			
Boron	47.1	5.0	ug/g	5.3	83.6	70-130			
Cadmium	41.3	0.5	ug/g	ND	82.5	70-130			
Chromium	53.5	5.0	ug/g	8.3	90.3	70-130			
Cobalt	49.8	1.0	ug/g	4.7	90.1	70-130			
Copper	48.9	5.0	ug/g	6.8	84.2	70-130			
Iron	2780	200	ug/g	ND	111	70-130			
Lead	43.1	1.0	ug/g	3.8	78.5	70-130			
Mercury	1.53	0.1	ug/g	ND	102	70-130			
Manganese	56.4	5	ug/g	ND	113	70-130			
Molybdenum	45.2	1.0	ug/g	1.1	88.1	70-130			
Nickel	53.8	5.0	ug/g	10.8	85.8	70-130			
Selenium	42.9	1.0	ug/g	ND	85.6	70-130			
Silver	45.5	0.3	ug/g	ND	90.9	70-130			
Thallium	40.6	1.0	ug/g	ND	81.0	70-130			
Uranium	40.9	1.0	ug/g	ND	81.1	70-130			
Vanadium	57.7	10.0	ug/g	13.0	89.4	70-130			
Zinc	59.8	20.0	ug/g	ND	80.9	70-130			

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Paracel ID: 2148345

PARACEL LABORATORIES LTD.

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2148345	№ 63337

Client Name: GOLDER ASSOC.
Contact Name: EMILY BACON
Address: 1931 ROBERTSON RD OTTAWA ON
Telephone: 613 592-9600

Project Ref: 20912275
Quote #: 19-798-SW, 19-801-SED, 19-799 LEACHATE
PO #:
Email: ebacon@golder.com

Page 2 of 2

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☑ Regular
Date Required:

☐ REG 153/04 ☐ REG 406/19

Other Regulation: ☐ REG 558 ☐ SewerCan ☐ COME ☐ MISA ☐ SU - Sani ☐ SU - Storm ☐ Other

Table: ☐ 1 ☐ Res/Park ☐ Med/Fine ☐ 2 ☐ Ind/Comm ☐ Coarse ☐ 3 ☐ Agri/Other ☐ For RSC: ☐ Yes ☐ No

Mun:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: 19-798-SW; 19-801-SED; 19-799 LEACHATE

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	19-798-SW	19-801-SED	19-799 LEACHATE
1	S-15	SW		7	11 24 21	1:30 PM	✓		
2	S-3	SW		1		1:45 PM	✓		
3	S-17	SW				2:10 PM	✓		
4	S-16	SW		↓		2:30 PM	✓		
5	SED-W	S		1		9:20 AM		✓	
6	SED-C	S		1		10 AM		✓	
7	SED-E	S		1		10:45 AM		✓	
8	L-5	GW		01	↓	12:25 PM			✓
9									
10									

Comments: FACILITY #6253 FOR EQUIS FILES.
INVOICE WASTE CONNECTIONS OF CANADA (HENRI HUNEAULT)

Method of Delivery: DROP OFF

Relinquished By (Sign)	Received By Driver/Depot	Received at Lab	Verified By
Relinquished By (Print): P. MACMILLAN	Date/Time	Date/Time: NOV 24/21 16:30	Date/Time: Nov 24, 2021 17:07
Date/Time: 11 24 21	Temperature: °C	Temperature: 4.7 °C	pH Verified: ☑ By:

Chain of Custody (Blank).xlsx

PARACEL LABORATORIES LTD

Paracel ID: 2148345

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2148342 - (19-798)	Nº 63338
2148345 - SW1	
2148346 - (19-798)	

Client Name: GOLDER ASSOC.	Project Ref: 20412275	Page 1 of 2
Contact Name: EMILY BACON	Quote #: 19-798-SW	Turnaround Time: ☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Address: 1931 ROBERTSON RD OTTAWA ON	PO #:	Date Required:
Telephone: 613-592-9600	E-mail: EBacon@golder.com henri.hunegnaw@wasteconnections.com	

☐ REG 153/04 ☐ REG 406/19	Other Regulation	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☒ PWQO	
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ ICSME ☐ MISA	
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm	
☐ Table ___	Mun:	
For RSC: ☐ Yes ☐ No	☐ Other:	

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: SVOC + PAH - SW
1	S-8	SW		7	11/24/21	8:50 AM	✓
2	S-10					9:10 AM	✓
3	S-5					9:55 AM	✓
4	S-11					9:55 AM	✓
5	S-9					10:15 AM	✓
6	S-12					10:40 AM	✓
7	DUP-1					/	✓
8	S-20					11 AM	✓
9	S-21					12:45 PM	✓
10	S-1					1:10 PM	✓

Comments: FACILITY # 6253 PER GOULD FILES.
INVOICE WASTE CONNECTIONS OF CANADA (HENRI HUNEGNAW)

Method of Delivery: DELIVERY

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): F. ARMITAGE	Date/Time:	Date/Time: NOV 24, 2021 16:30	Date/Time: NOV 24, 2021 17:01
Date/Time: 11/24/21	Temperature: °C	Temperature: 7.3 °C	pH Verified: ✓ By:

Chain of Custody (Blank).xls

Revision 5.0

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 6-Dec-2021
Order Date: 2-Dec-2021

Order #: 2149553

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2149553-01	Trip Blank
2149553-02	Field Blank

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	5-Dec-21	5-Dec-21

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149553-01	2149553-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
Chloroethane	1.0 ug/L	<1.0	<1.0	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Chloromethane	3.0 ug/L	<3.0	<3.0	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Hexane	1.0 ug/L	<1.0	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149553-01	2149553-02	-	-
	MDL/Units	Water	Water	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
4-Bromofluorobenzene	Surrogate	105%	105%	-	-
Dibromofluoromethane	Surrogate	91.8%	93.2%	-	-
Toluene-d8	Surrogate	92.0%	91.7%	-	-

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroethane	ND	1.0	ug/L						
Chloroform	ND	0.5	ug/L						
Chloromethane	ND	3.0	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dibromoethane	ND	0.2	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloroethylene, total	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
1,3,5-Trimethylbenzene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*78.0*		*ug/L*		*97.5*	*50-140*			
Surrogate: Dibromofluoromethane	*58.7*		*ug/L*		*73.4*	*50-140*			
Surrogate: Toluene-d8	*75.0*		*ug/L*		*93.7*	*50-140*			

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroethane	ND	1.0	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Chloromethane	ND	3.0	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dibromoethane	ND	0.2	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
1,3,5-Trimethylbenzene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*84.6*		*ug/L*		*106*	*50-140*			
Surrogate: Dibromofluoromethane	*76.4*		*ug/L*		*95.6*	*50-140*			
Surrogate: Toluene-d8	*75.4*		*ug/L*		*94.3*	*50-140*			

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	99.7	5.0	ug/L	ND	99.7	50-140			
Benzene	34.8	0.5	ug/L	ND	87.0	60-130			
Bromodichloromethane	29.2	0.5	ug/L	ND	73.0	60-130			
Bromoform	33.1	0.5	ug/L	ND	82.8	60-130			
Bromomethane	42.2	0.5	ug/L	ND	105	50-140			
Carbon Tetrachloride	34.5	0.2	ug/L	ND	86.3	60-130			
Chlorobenzene	33.9	0.5	ug/L	ND	84.7	60-130			
Chloroethane	37.9	1.0	ug/L	ND	94.8	50-140			
Chloroform	33.8	0.5	ug/L	ND	84.6	60-130			
Chloromethane	41.0	3.0	ug/L	ND	102	50-140			
Dibromochloromethane	37.2	0.5	ug/L	ND	92.9	60-130			
Dichlorodifluoromethane	40.9	1.0	ug/L	ND	102	50-140			
1,2-Dibromoethane	37.3	0.2	ug/L	ND	93.2	60-130			
1,2-Dichlorobenzene	33.7	0.5	ug/L	ND	84.2	60-130			
1,3-Dichlorobenzene	34.3	0.5	ug/L	ND	85.8	60-130			
1,4-Dichlorobenzene	33.7	0.5	ug/L	ND	84.4	60-130			
1,1-Dichloroethane	33.3	0.5	ug/L	ND	83.2	60-130			
1,2-Dichloroethane	30.3	0.5	ug/L	ND	75.8	60-130			
1,1-Dichloroethylene	44.3	0.5	ug/L	ND	111	60-130			
cis-1,2-Dichloroethylene	31.3	0.5	ug/L	ND	78.2	60-130			
trans-1,2-Dichloroethylene	33.4	0.5	ug/L	ND	83.6	60-130			
1,2-Dichloropropane	36.0	0.5	ug/L	ND	90.0	60-130			
cis-1,3-Dichloropropylene	39.3	0.5	ug/L	ND	98.2	60-130			
trans-1,3-Dichloropropylene	39.2	0.5	ug/L	ND	98.0	60-130			
Ethylbenzene	33.1	0.5	ug/L	ND	82.8	60-130			
Hexane	37.8	1.0	ug/L	ND	94.4	60-130			
Methyl Ethyl Ketone (2-Butanone)	92.4	5.0	ug/L	ND	92.4	50-140			
Methyl Butyl Ketone (2-Hexanone)	112	10.0	ug/L	ND	112	50-140			
Methyl Isobutyl Ketone	108	5.0	ug/L	ND	108	50-140			
Methyl tert-butyl ether	117	2.0	ug/L	ND	117	50-140			
Methylene Chloride	36.4	5.0	ug/L	ND	90.9	60-130			
Styrene	32.2	0.5	ug/L	ND	80.4	60-130			
1,1,1,2-Tetrachloroethane	37.2	0.5	ug/L	ND	93.1	60-130			
1,1,2,2-Tetrachloroethane	40.2	0.5	ug/L	ND	100	60-130			
Tetrachloroethylene	32.9	0.5	ug/L	ND	82.2	60-130			
Toluene	33.4	0.5	ug/L	ND	83.4	60-130			
1,1,1-Trichloroethane	34.9	0.5	ug/L	ND	87.2	60-130			
1,1,2-Trichloroethane	38.7	0.5	ug/L	ND	96.8	60-130			
Trichloroethylene	36.0	0.5	ug/L	ND	90.0	60-130			
Trichlorofluoromethane	33.0	1.0	ug/L	ND	82.6	60-130			
1,3,5-Trimethylbenzene	34.7	0.5	ug/L	ND	86.7	60-130			
Vinyl chloride	35.7	0.5	ug/L	ND	89.2	50-140			
m,p-Xylenes	64.8	0.5	ug/L	ND	81.0	60-130			
o-Xylene	32.5	0.5	ug/L	ND	81.2	60-130			
Surrogate: 4-Bromofluorobenzene	*102*		*ug/L*		*128*	*50-140*			
Surrogate: Dibromofluoromethane	*90.5*		*ug/L*		*113*	*50-140*			
Surrogate: Toluene-d8	*73.4*		*ug/L*		*91.7*	*50-140*			

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.

Applies to samples: Trip , Field

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 2149553

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www.paracellabs.com

Chain of Custody (Lab Use Only)

Page 1 of 1

Client Name:	Golder Associates	Project Reference:	20417275
Contact Name:	Yannick Marcoux	Quote #:	19-809 QAQC
Address:	1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	7146-21-00015
Telephone:	613-592-9600	Email Address:	yannick_marcoux@golder.com, emily_bacon@golder.com hasan.hamoudi@wasteconnections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day

Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other: GQWQS

Matrix Types: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2149553

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote	Required Analyses
1	Trip Blank				11/30/21		✓	
2	Field Blank				"		✓	
3								
4								
5								
6								
7								
8								
9								
10								

Comments: Invoice to Waste Connections of Canada PO#7146-21-00015
EQuIS Facility Number 6053

Method of Delivery: Walked

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. MacLeod	Date/Time: 1203/21 4:10pm	Date/Time: Dec 3 2021 10:04	Date/Time: DEC 3 2021 1451
Date/Time: 1203 21	Temperature: 8.3 °C	Temperature: 5.7 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 8.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 15-Dec-2021
Order Date: 2-Dec-2021

Order #: 2149547

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2149547-01	92-19
2149547-02	05-1D
2149547-03	95-8
2149547-04	92-18
2149547-05	98-1
2149547-06	05-1C
2149547-07	05-R3
2149547-08	05-8
2149547-09	05-11
2149547-10	05-3D
2149547-11	07-1D
2149547-12	MW-C
2149547-13	MW-E
2149547-14	92-7
2149547-15	92-10
2149547-16	94-2
2149547-17	94-6
2149547-18	95-3
2149547-19	95-7
2149547-20	05-3C
2149547-21	07-1C
2149547-22	94-5
2149547-23	95-2
2149547-24	95-6
2149547-25	92-16
2149547-26	05-1B
2149547-27	11-1
2149547-28	92-5
2149547-29	92-9
2149547-30	94-1

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

2149547-31	05-3B
2149547-32	07-1B
2149547-33	94-4
2149547-34	95-5
2149547-35	92-12
2149547-36	05-1A
2149547-37	92-1
2149547-38	05-3A
2149547-39	07-1A
2149547-40	Dupe-2
2149547-41	Dupe-3
2149547-42	Dupe-4

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, bicarbonate	calculated from EPA 310.1 - Titration to pH 4.5	6-Dec-21	6-Dec-21
Alkalinity, carbonate	calculated from EPA 310.1 - Titration to pH 4.5	6-Dec-21	6-Dec-21
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	6-Dec-21	6-Dec-21
Ammonia, as N	EPA 351.2 - Auto Colour	6-Dec-21	6-Dec-21
Anions	EPA 300.1 - IC	6-Dec-21	6-Dec-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	6-Dec-21	6-Dec-21
Hardness	Hardness as CaCO3	3-Dec-21	15-Dec-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	3-Dec-21	3-Dec-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	7-Dec-21	7-Dec-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	6-Dec-21	7-Dec-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	6-Dec-21	6-Dec-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	7-Dec-21	8-Dec-21
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	4-Dec-21	4-Dec-21

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-19	05-1D	95-8	92-18
	Sample Date:	30-Nov-21 13:50	30-Nov-21 17:20	30-Nov-21 11:30	30-Nov-21 13:30
	Sample ID:	2149547-01	2149547-02	2149547-03	2149547-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	412	321	904	199
Alkalinity, bicarbonate	5 mg/L	412	320	903	197
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<5
Ammonia as N	0.01 mg/L	0.37	0.04	2.16	0.09
Chemical Oxygen Demand	10 mg/L	180	23	124	114
Hardness	mg/L	487	425	751	445
Phenolics	0.001 mg/L	<0.001	<0.001	<0.002 [1]	<0.001
Phosphorus, total	0.01 mg/L	4.69	0.07	0.96	0.90
Total Dissolved Solids	10 mg/L	1230	1130	1230	896
Total Kjeldahl Nitrogen	0.1 mg/L	1.4	0.3	3.7	0.4
Anions					
Chloride	1 mg/L	323	412	163	368
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	188	86	8	35
Metals					
Arsenic	1 ug/L	<1	<1	<1	3
Boron	10 ug/L	51	19	47	25
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	151000	125000	191000	120000
Chromium	1 ug/L	<1	<1	8	<1
Cobalt	0.5 ug/L	1.4	<0.5	1.9	<0.5
Copper	0.5 ug/L	7.8	5.4	41.5	2.5
Iron	100 ug/L	<100	<100	1150	<100
Lead	0.1 ug/L	0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	27000	27300	66400	35100
Manganese	5 ug/L	2520	15	8290	582
Potassium	100 ug/L	16700	7120	14800	6050
Sodium	200 ug/L	324000	187000	110000	79900
Zinc	5 ug/L	6	7	<5	7
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-19	05-1D	95-8	92-18
	Sample Date:	30-Nov-21 13:50	30-Nov-21 17:20	30-Nov-21 11:30	30-Nov-21 13:30
	Sample ID:	2149547-01	2149547-02	2149547-03	2149547-04
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.0%	92.7%	93.0%	93.0%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	98-1	05-1C	05-R3	05-8
	Sample Date:	30-Nov-21 11:45	30-Nov-21 17:15	30-Nov-21 12:20	30-Nov-21 12:40
	Sample ID:	2149547-05	2149547-06	2149547-07	2149547-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	401	176	737	1260
Alkalinity, bicarbonate	5 mg/L	398	174	733	1260
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<25
Ammonia as N	0.01 mg/L	0.97	0.10	0.02	0.81
Chemical Oxygen Demand	10 mg/L	40	13	26	130
Hardness	mg/L	276	139	615	863
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.40	0.35	0.02	0.16
Total Dissolved Solids	10 mg/L	1120	236	1050	1260
Total Kjeldahl Nitrogen	0.1 mg/L	1.4	0.3	0.2	3.0
Anions					
Chloride	1 mg/L	470	51	13	45
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.2	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	44	252	<1
Metals					
Arsenic	1 ug/L	<1	2	<1	<1
Boron	10 ug/L	145	60	367	1410
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	59000	34300	148000	192000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	0.8
Copper	0.5 ug/L	0.7	1.3	1.6	1.1
Iron	100 ug/L	647	280	<100	6170
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	31200	12800	59600	93300
Manganese	5 ug/L	388	35	65	11200
Potassium	100 ug/L	12600	4380	7030	6490
Sodium	200 ug/L	293000	44700	123000	108000
Zinc	5 ug/L	<5	10	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	98-1	05-1C	05-R3	05-8
	Sample Date:	30-Nov-21 11:45	30-Nov-21 17:15	30-Nov-21 12:20	30-Nov-21 12:40
	Sample ID:	2149547-05	2149547-06	2149547-07	2149547-08
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	92.7%	93.2%	93.0%	93.3%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	05-11	05-3D	07-1D	MW-C
	Sample Date:	30-Nov-21 14:25	30-Nov-21 16:15	30-Nov-21 15:30	30-Nov-21 08:55
	Sample ID:	2149547-09	2149547-10	2149547-11	2149547-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	555	755	461	310
Alkalinity, bicarbonate	5 mg/L	554	748	459	306
Alkalinity, carbonate	5 mg/L	<5	7	<5	<5
Ammonia as N	0.01 mg/L	0.47	0.24	0.07	0.06
Chemical Oxygen Demand	10 mg/L	64	18	51	163
Hardness	mg/L	578	328	495	357
Phenolics	0.001 mg/L	<0.004 [1]	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.07	0.12	0.71	1.45
Total Dissolved Solids	10 mg/L	746	1010	720	770
Total Kjeldahl Nitrogen	0.1 mg/L	1.1	0.5	1.2	2.1
Anions					
Chloride	1 mg/L	17	107	11	71
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.6	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	188	94	187	266
Metals					
Arsenic	1 ug/L	<1	<1	<1	2
Boron	10 ug/L	592	418	175	251
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	145000	57500	136000	86500
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	1.0	0.5	<0.5	<0.5
Copper	0.5 ug/L	0.9	1.8	2.7	5.8
Iron	100 ug/L	3750	<100	898	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Magnesium	200 ug/L	52800	44800	37400	34200
Manganese	5 ug/L	2950	648	369	<5
Potassium	100 ug/L	6450	13100	5750	4950
Sodium	200 ug/L	41600	244000	39800	112000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	05-11	05-3D	07-1D	MW-C
	Sample Date:	30-Nov-21 14:25	30-Nov-21 16:15	30-Nov-21 15:30	30-Nov-21 08:55
	Sample ID:	2149547-09	2149547-10	2149547-11	2149547-12
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	91.4%	93.0%	92.0%	92.8%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	MW-E	92-7	92-10	94-2
	Sample Date:	30-Nov-21 09:10	30-Nov-21 12:50	30-Nov-21 14:35	30-Nov-21 08:05
	Sample ID:	2149547-13	2149547-14	2149547-15	2149547-16
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	241	646	807	879
Alkalinity, bicarbonate	5 mg/L	239	636	801	866
Alkalinity, carbonate	5 mg/L	<5	9	5	13
Ammonia as N	0.01 mg/L	0.05	0.84	0.34	0.11
Chemical Oxygen Demand	10 mg/L	73	46	159	83
Hardness	mg/L	370	215	511	224
Phenolics	0.001 mg/L	<0.001	<0.001	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.31	0.43	0.18	0.70
Total Dissolved Solids	10 mg/L	772	1330	1170	1670
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	1.5	0.9	0.8
Anions					
Chloride	1 mg/L	80	420	229	457
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	271	1	39	9
Metals					
Arsenic	1 ug/L	<1	<1	<1	3
Boron	10 ug/L	343	412	820	360
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	100000	31300	87800	33600
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	0.7	0.5
Copper	0.5 ug/L	3.9	1.0	1.5	1.1
Iron	100 ug/L	<100	182	781	397
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	29100	33100	70700	34100
Manganese	5 ug/L	<5	124	1650	599
Potassium	100 ug/L	1740	14700	17300	12700
Sodium	200 ug/L	75900	419000	277000	555000
Zinc	5 ug/L	10	<5	6	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	MW-E	92-7	92-10	94-2
	Sample Date:	30-Nov-21 09:10	30-Nov-21 12:50	30-Nov-21 14:35	30-Nov-21 08:05
	Sample ID:	2149547-13	2149547-14	2149547-15	2149547-16
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.3%	93.2%	91.9%	92.6%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	94-6	95-3	95-7	05-3C
	Sample Date:	30-Nov-21 10:15	30-Nov-21 08:20	30-Nov-21 09:40	30-Nov-21 16:10
	Sample ID:	2149547-17	2149547-18	2149547-19	2149547-20
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	316	612	622	1040
Alkalinity, bicarbonate	5 mg/L	315	604	612	1030
Alkalinity, carbonate	5 mg/L	<5	8	10	<25
Ammonia as N	0.01 mg/L	0.03	0.21	0.03	1.75
Chemical Oxygen Demand	10 mg/L	63	96	80	84
Hardness	mg/L	349	159	231	93.7
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.40	16.1	0.40	2.27
Total Dissolved Solids	10 mg/L	1170	1000	1440	1720
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	5.1	0.9	3.1
Anions					
Chloride	1 mg/L	245	150	452	339
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	325	101	8	3
Metals					
Arsenic	1 ug/L	<1	<1	1	5
Boron	10 ug/L	274	819	401	1430
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	70900	25200	36200	11300
Chromium	1 ug/L	<1	<1	<1	1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	1.1
Copper	0.5 ug/L	2.2	1.4	3.3	1.6
Iron	100 ug/L	248	<100	<100	939
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	41700	23200	34100	15900
Manganese	5 ug/L	871	195	808	46
Potassium	100 ug/L	5090	6900	9280	14500
Sodium	200 ug/L	263000	320000	408000	562000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	94-6	95-3	95-7	05-3C
	Sample Date:	30-Nov-21 10:15	30-Nov-21 08:20	30-Nov-21 09:40	30-Nov-21 16:10
	Sample ID:	2149547-17	2149547-18	2149547-19	2149547-20
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.2%	92.8%	92.4%	91.5%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	07-1C	94-5	95-2	95-6
	Sample Date:	30-Nov-21 15:20	30-Nov-21 10:40	30-Nov-21 08:30	30-Nov-21 09:50
	Sample ID:	2149547-21	2149547-22	2149547-23	2149547-24
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	684	870	1200	955
Alkalinity, bicarbonate	5 mg/L	674	857	1190	950
Alkalinity, carbonate	5 mg/L	10	13	<25	<25
Ammonia as N	0.01 mg/L	0.31	0.52	1.20	1.47
Chemical Oxygen Demand	10 mg/L	51	91	82	72
Hardness	mg/L	165	369	227	326
Phenolics	0.001 mg/L	<0.001	<0.004 [1]	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.56	0.83	0.92	0.54
Total Dissolved Solids	10 mg/L	1650	2120	2230	2270
Total Kjeldahl Nitrogen	0.1 mg/L	0.8	1.2	2.1	2.4
Anions					
Chloride	1 mg/L	454	779	631	846
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	97	15	2	<1
Metals					
Arsenic	1 ug/L	3	<1	1	1
Boron	10 ug/L	398	473	799	650
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	25100	49900	28600	43600
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	0.7	0.9	<0.5	0.6
Copper	0.5 ug/L	1.1	2.5	0.9	1.0
Iron	100 ug/L	241	<100	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	25000	59200	37800	52700
Manganese	5 ug/L	488	2360	41	187
Potassium	100 ug/L	13300	11500	15900	17300
Sodium	200 ug/L	457000	581000	641000	685000
Zinc	5 ug/L	6	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	07-1C	94-5	95-2	95-6
	Sample Date:	30-Nov-21 15:20	30-Nov-21 10:40	30-Nov-21 08:30	30-Nov-21 09:50
	Sample ID:	2149547-21	2149547-22	2149547-23	2149547-24
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	92.4%	92.6%	91.9%	91.4%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-16	05-1B	11-1	92-5
	Sample Date:	30-Nov-21 14:05	30-Nov-21 17:05	30-Nov-21 12:00	30-Nov-21 13:00
	Sample ID:	2149547-25	2149547-26	2149547-27	2149547-28
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	194	268	545	810
Alkalinity, bicarbonate	5 mg/L	188	260	537	790
Alkalinity, carbonate	5 mg/L	5	7	8	19
Ammonia as N	0.01 mg/L	0.96	0.24	0.89	2.19
Chemical Oxygen Demand	10 mg/L	207	78	37	303
Hardness	mg/L	52.4	20.4	257	260
Phenolics	0.001 mg/L	<0.001	<0.001	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	13.7	2.18	0.43	13.9
Total Dissolved Solids	10 mg/L	316	338	1610	2700
Total Kjeldahl Nitrogen	0.1 mg/L	7.5	0.9	1.2	7.3
Anions					
Chloride	1 mg/L	26	19	696	1100
Nitrate as N	0.1 mg/L	<0.1	0.5	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	6	14	1	<1
Metals					
Arsenic	1 ug/L	2	4	2	3
Boron	10 ug/L	114	258	252	954
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	11900	4190	48900	31600
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	1.4	0.7
Copper	0.5 ug/L	2.9	2.6	1.5	3.5
Iron	100 ug/L	<100	<100	102	322
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Magnesium	200 ug/L	5520	2410	32700	44000
Manganese	5 ug/L	50	10	479	80
Potassium	100 ug/L	4860	5710	16900	25100
Sodium	200 ug/L	58200	106000	492000	812000
Zinc	5 ug/L	<5	5	6	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-16	05-1B	11-1	92-5
	Sample Date:	30-Nov-21 14:05	30-Nov-21 17:05	30-Nov-21 12:00	30-Nov-21 13:00
	Sample ID:	2149547-25	2149547-26	2149547-27	2149547-28
	MDL/Units	Water	Water	Water	Water
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	91.2%	91.0%	92.6%	90.3%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-9	94-1	05-3B	07-1B
	Sample Date:	30-Nov-21 14:25	30-Nov-21 07:55	30-Nov-21 16:00	30-Nov-21 15:10
	Sample ID:	2149547-29	2149547-30	2149547-31	2149547-32
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	738	1150	1120	973
Alkalinity, bicarbonate	5 mg/L	734	1140	1110	967
Alkalinity, carbonate	5 mg/L	<5	<25	<25	6
Ammonia as N	0.01 mg/L	1.12	2.25	2.73	3.79
Chemical Oxygen Demand	10 mg/L	86	92	91	124
Hardness	mg/L	206	214	78.1	368
Phenolics	0.001 mg/L	<0.004 [1]	<0.004 [1]	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	1.01	1.74	6.33	1.62
Total Dissolved Solids	10 mg/L	2130	2940	1890	3360
Total Kjeldahl Nitrogen	0.1 mg/L	2.4	3.2	4.2	5.5
Anions					
Chloride	1 mg/L	820	1050	442	1440
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	0.39	<1.00 [2]
Sulphate	1 mg/L	1	<1	3	<1
Metals					
Arsenic	1 ug/L	3	3	2	3
Boron	10 ug/L	755	1400	1920	846
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	25300	25000	9000	41700
Chromium	1 ug/L	<1	<1	1	<1
Cobalt	0.5 ug/L	0.6	<0.5	<0.5	0.6
Copper	0.5 ug/L	1.2	0.8	1.2	1.2
Iron	100 ug/L	<100	128	519	<100
Lead	0.1 ug/L	<0.1	<0.1	0.1	<0.1
Magnesium	200 ug/L	34600	36700	13500	64100
Manganese	5 ug/L	68	104	27	76
Potassium	100 ug/L	21500	23200	18300	26900
Sodium	200 ug/L	669000	909000	637000	874000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-9	94-1	05-3B	07-1B
	Sample Date:	30-Nov-21 14:25	30-Nov-21 07:55	30-Nov-21 16:00	30-Nov-21 15:10
	Sample ID:	2149547-29	2149547-30	2149547-31	2149547-32
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	90.9%	90.9%	91.2%	90.7%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	94-4	95-5	92-12	05-1A
	Sample Date:	30-Nov-21 10:25	30-Nov-21 09:30	30-Nov-21 13:45	30-Nov-21 16:50
	Sample ID:	2149547-33	2149547-34	2149547-35	2149547-36
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	1340	1250	669	1080
Alkalinity, bicarbonate	5 mg/L	1330	1250	655	1060
Alkalinity, carbonate	5 mg/L	<25	<25	14	<25 [2]
Ammonia as N	0.01 mg/L	4.34	3.60	1.06	1.93
Chemical Oxygen Demand	10 mg/L	195	129	48	333
Hardness	mg/L	451	355	29.3	46.7
Phenolics	0.001 mg/L	<0.004 [1]	<0.004 [1]	<0.001	<0.002 [1]
Phosphorus, total	0.01 mg/L	5.57	1.67	2.30	8.55
Total Dissolved Solids	10 mg/L	3970	3580	910	1770
Total Kjeldahl Nitrogen	0.1 mg/L	7.4	5.0	1.7	8.0
Anions					
Chloride	1 mg/L	1630	1420	131	203
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<1.00 [2]	<1.00 [2]	<0.05	<0.05
Sulphate	1 mg/L	<1	2	<1	2
Metals					
Arsenic	1 ug/L	2	2	<1	2
Boron	10 ug/L	1570	1620	861	1490
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	44800	37500	3880	4790
Chromium	1 ug/L	<1	<1	<1	1
Cobalt	0.5 ug/L	0.5	0.5	<0.5	<0.5
Copper	0.5 ug/L	1.1	1.1	1.2	1.0
Iron	100 ug/L	101	151	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	82300	63400	4760	8440
Manganese	5 ug/L	105	77	<5	<5
Potassium	100 ug/L	29900	28800	9730	13300
Sodium	200 ug/L	1090000	963000	308000	504000
Zinc	5 ug/L	<5	<5	6	6
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	94-4	95-5	92-12	05-1A
	Sample Date:	30-Nov-21 10:25	30-Nov-21 09:30	30-Nov-21 13:45	30-Nov-21 16:50
	Sample ID:	2149547-33	2149547-34	2149547-35	2149547-36
	MDL/Units	Water	Water	Water	Water
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	91.4%	91.4%	90.3%	90.9%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-1	05-3A	07-1A	Dupe-2
	Sample Date:	30-Nov-21 13:10	30-Nov-21 15:50	30-Nov-21 15:00	30-Nov-21 09:00
	Sample ID:	2149547-37	2149547-38	2149547-39	2149547-40
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	780	834	830	905
Alkalinity, bicarbonate	5 mg/L	763	820	816	904
Alkalinity, carbonate	5 mg/L	16	14	14	<5
Ammonia as N	0.01 mg/L	0.97	0.80	1.66	2.57
Chemical Oxygen Demand	10 mg/L	65	34	38	131
Hardness	mg/L	41.1	33.3	68.3	761
Phenolics	0.001 mg/L	<0.001	<0.002 [1]	<0.001	0.002
Phosphorus, total	0.01 mg/L	1.25	0.17	0.42	0.04
Total Dissolved Solids	10 mg/L	1350	1280	1720	1200
Total Kjeldahl Nitrogen	0.1 mg/L	1.7	1.2	2.0	3.5
Anions					
Chloride	1 mg/L	336	287	522	169
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	0.21	<0.05
Sulphate	1 mg/L	<1	<1	<1	9
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	877	807	906	52
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	0.1
Calcium	100 ug/L	5420	4700	7150	195000
Chromium	1 ug/L	<1	<1	<1	7
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	1.1
Copper	0.5 ug/L	4.0	1.0	0.9	73.7
Iron	100 ug/L	<100	<100	142	<100
Lead	0.1 ug/L	0.2	<0.1	<0.1	<0.1
Magnesium	200 ug/L	6690	5240	12300	66400
Manganese	5 ug/L	10	6	<5	8330
Potassium	100 ug/L	12000	8480	15700	14400
Sodium	200 ug/L	490000	489000	570000	110000
Zinc	5 ug/L	<5	5	<5	7
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-1	05-3A	07-1A	Dupe-2
	Sample Date:	30-Nov-21 13:10	30-Nov-21 15:50	30-Nov-21 15:00	30-Nov-21 09:00
	Sample ID:	2149547-37	2149547-38	2149547-39	2149547-40
	MDL/Units	Water	Water	Water	Water
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	90.4%	91.2%	92.2%	91.2%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Dupe-3	Dupe-4	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149547-41	2149547-42	-	-
	MDL/Units	Water	Water	-	-
General Inorganics					
Alkalinity, total	5 mg/L	646	270	-	-
Alkalinity, bicarbonate	5 mg/L	639	266	-	-
Alkalinity, carbonate	5 mg/L	7	<5	-	-
Ammonia as N	0.01 mg/L	0.83	0.20	-	-
Chemical Oxygen Demand	10 mg/L	43	106	-	-
Hardness	mg/L	218	21.2	-	-
Phenolics	0.001 mg/L	<0.001	<0.001	-	-
Phosphorus, total	0.01 mg/L	0.45	2.01	-	-
Total Dissolved Solids	10 mg/L	1360	390	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	1.4	0.8	-	-
Anions					
Chloride	1 mg/L	426	19	-	-
Nitrate as N	0.1 mg/L	<0.1	0.5	-	-
Nitrite as N	0.05 mg/L	0.16	<0.05	-	-
Sulphate	1 mg/L	<1	14	-	-
Metals					
Arsenic	1 ug/L	<1	4	-	-
Boron	10 ug/L	458	247	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Calcium	100 ug/L	33100	4240	-	-
Chromium	1 ug/L	<1	<1	-	-
Cobalt	0.5 ug/L	<0.5	<0.5	-	-
Copper	0.5 ug/L	<0.5	3.6	-	-
Iron	100 ug/L	402	<100	-	-
Lead	0.1 ug/L	<0.1	<0.1	-	-
Magnesium	200 ug/L	33000	2570	-	-
Manganese	5 ug/L	257	9	-	-
Potassium	100 ug/L	14200	5670	-	-
Sodium	200 ug/L	401000	106000	-	-
Zinc	5 ug/L	9	<5	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Dupe-3	Dupe-4	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149547-41	2149547-42	-	-
	MDL/Units	Water	Water	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	91.4%	92.0%	-	-

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Alkalinity, bicarbonate	ND	5	mg/L						
Alkalinity, carbonate	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Surrogate: Toluene-d8	*75.0*		*ug/L*		*93.7*	*50-140*			

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	109	1	mg/L	107			1.3	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	94.3	1	mg/L	94.1			0.2	10	
General Inorganics									
Alkalinity, total	408	5	mg/L	412			0.9	14	
Alkalinity, bicarbonate	408	5	mg/L	412			0.9	14	
Alkalinity, carbonate	ND	5	mg/L	ND			NC	14	
Ammonia as N	0.744	0.02	mg/L	0.676			9.7	18	
Chemical Oxygen Demand	22	10	mg/L	23			4.4	12	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.074	0.01	mg/L	0.072			3.4	15	
Total Dissolved Solids	1190	10	mg/L	1230			3.6	10	
Total Kjeldahl Nitrogen	0.33	0.1	mg/L	0.34			4.2	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	19	10	ug/L	19			1.4	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	30000	100	ug/L	30100			0.3	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	0.94	0.5	ug/L	0.95			1.5	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	7440	200	ug/L	7310			1.9	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	1360	100	ug/L	1370			0.7	20	
Sodium	13900	200	ug/L	13500			3.0	20	
Zinc	9	5	ug/L	10			11.7	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*75.4*		*ug/L*		*94.3*	*50-140*			

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	115	1	mg/L	107	81.3	77-123			
Nitrate as N	1.07	0.1	mg/L	ND	107	79-120			
Nitrite as N	1.04	0.05	mg/L	ND	104	84-117			
Sulphate	102	1	mg/L	94.1	76.5	74-126			
General Inorganics									
Ammonia as N	0.556	0.01	mg/L	0.342	85.6	81-124			
Chemical Oxygen Demand	221	10	mg/L	23	99.0	85-111			
Phenolics	0.024	0.001	mg/L	ND	96.1	69-132			
Phosphorus, total	0.560	0.01	mg/L	0.072	97.8	80-120			
Total Dissolved Solids	94.0	10	mg/L	ND	94.0	75-125			
Total Kjeldahl Nitrogen	2.13	0.1	mg/L	0.34	89.3	81-126			
Metals									
Arsenic	49.6	1	ug/L	ND	98.4	80-120			
Boron	40	10	ug/L	ND	80.3	80-120			
Cadmium	48.5	0.1	ug/L	ND	97.1	80-120			
Calcium	38300	100	ug/L	30100	82.5	80-120			
Chromium	45.8	1	ug/L	ND	91.2	80-120			
Cobalt	45.2	0.5	ug/L	ND	90.4	80-120			
Copper	44.9	0.5	ug/L	0.95	87.9	80-120			
Iron	2190	100	ug/L	ND	86.0	80-120			
Lead	43.2	0.1	ug/L	ND	86.2	80-120			
Magnesium	15600	200	ug/L	7310	83.4	80-120			
Manganese	50.1	5	ug/L	ND	94.8	80-120			
Potassium	10600	100	ug/L	1370	91.9	80-120			
Sodium	21500	200	ug/L	13500	80.3	80-120			
Zinc	53	5	ug/L	10	85.9	80-120			
Volatiles									
Benzene	34.8	0.5	ug/L	ND	87.0	60-130			
1,1-Dichloroethane	33.3	0.5	ug/L	ND	83.2	60-130			
Ethylbenzene	33.1	0.5	ug/L	ND	82.8	60-130			
Methylene Chloride	36.4	5.0	ug/L	ND	90.9	60-130			
Toluene	33.4	0.5	ug/L	ND	83.4	60-130			
Vinyl chloride	35.7	0.5	ug/L	ND	89.2	50-140			
m,p-Xylenes	64.8	0.5	ug/L	ND	81.0	60-130			
o-Xylene	32.5	0.5	ug/L	ND	81.2	60-130			
Surrogate: Toluene-d8	*73.4*		*ug/L*		*91.7*	*50-140*			

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.

Applies to samples: 92-19, 05-1D, 95-8, 92-18, 98-1, 05-1C, 05-R3, 05-8, 05-11, 05-3D, 07-1D, MW-C, MW-E, 92-7, 92-10, 94-2, 94-6, 95-3, 95-7, 05-3C, 07-1C, 94-5, 95-2, 95-6, 92-16, 05-1B, 11-1, 92-5, 92-9, 94-1, 05-3B, 07-1B, 94-4, 95-5, 92-12, 05-1A, 92-1, 05-3A, 07-1A, Dupe-2, Dupe-3, Dupe-4

Sample Qualifiers :

1 : Elevated Reporting Limit due to matrix interference.

2 : Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 2149547

PARACE LABORATORIES L

Head Office
300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
T: 1-800-749-1947
E: paracel@paracellabs.com
www.paracellabs.com

Chain of Custody (Lab Use Only)

Page 1 of 2

Client Name: Golder Associates	Project Reference: 20412275		
Contact Name: Yannick Marcantou	Quote #: 19-797		
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-80015		
Telephone: 613-592-9600	Email Address: yannick_marcantou@golder.com, emily_bacon@golder.com, hanni.huneault@wasteconnections.com		

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day

Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☑ Other: COWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	92-19	GW			11 Aug 21	1:50 PM	✓
2	05-10	GW				5:10 PM	✓
3	05-8	GW				11:30 AM	✓
4	92-18	GW				1:20 PM	✓
5	88-1	GW				11:45 AM	✓
6	05-1C	GW				5:15 PM	✓
7	05-R3	GW				12:20 PM	✓
8	05-8	GW				12:40 PM	✓
9	05-11	GW				2:25 PM	✓
10	05-3D	GW			↓	4:15 PM	✓

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-80015 to be sent along with the results

#Out5 facility code 6755

Method of Delivery: Courier

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Hanni Huneault	Date/Time: 12/08/21 9:20	Date/Time: DEC 3 2021 8:55	Date/Time: DEC 3 2021 10:1
Date/Time: 11/30/21	Temperature: 5.5 °C	Temperature: 0.2 °C	Initial Verified By: CS

Chain of Custody (Blank) - Rev 6.3 Oct. 2014

002890

Paracel ID: 2149547

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Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marceau	Quote #: 19-267	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-00015	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_bacon@golder.com henri.hunault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	97-1D	GW			11/30/21	3:30pm	✓
2	MW-C	GW				8:55am	✓
3	MW-E	GW				9:10 am	✓
4	92-7	GW				12:50pm	✓
5	92-10	GW				2:35pm	✓
6	94-2	GW				10:50am	✓
7	94-6	GW				10:15am	✓
8	95-3	GW				8:20am	✓
9	95-7	GW				9:40 AM	✓
10	95-3C	GW			↓	9:10 AM	✓

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-00015 to be sent along with the results
RQuIS facility code 6253

Method of Delivery:

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): H. MARCEAU	Date/Time: 12/2/21 11:00	Date/Time: DEC 2 2021 8:55	Date/Time: DEC 2 2021 [illegible]
Date/Time: 11/30/21	Temperature: 5.2 °C	Temperature: 5.2 °C	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

Paracel ID: 2149547

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Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412276		TAT: ☑ Regular ☐ 3 Day
Contact Name: Yannick Marcoux	Quote #: 19-797		☐ 2 Day ☐ 1 Day
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7143-21-30015		Date Required:
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bocon@golder.com henri.bureault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: DDWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	07-10	GW			11/30/21	3:20pm	✓
2	04-5	GW				10:40am	✓
3	05-2	GW				8:30am	✓
4	05-6	GW				9:50am	✓
5	02-16	GW				2:05pm	✓
6	06-16	GW				5:05pm	✓
7	11-1	GW				12 pm	✓
8	02-5	GW				1 pm	✓
9	02-9	GW				2:45pm	✓
10	04-1	GW				7:55am	✓

Comments: Invoice to Waste Connections of Canada, with PO#7143-21-30015 to be sent along with the results

EQuIS facility code 6255

Method of Delivery: Walk-in

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. MARRIAGE	Date/Time: 11/30/21 9:10pm	Date/Time: DEC 2 8:55	Date/Time:
Date/Time: 11/30/21	Temperature: 8.4°C	Temperature: 5.2 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

002892

Paracel ID: 2149547

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Page 1 of 6

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 1 Day	
Contact Name: Yannick Marcotte	Quote #: 15-797	☐ 2 Day ☐ 3 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-00015	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marcotte@golder.com, emily_bacon@golder.com henri.hunsault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other: OWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Per quote
1	05-3B	GW			14/04/21	4 PM	✓
2	07-1B	GW				3:10 PM	✓
3	94-4	GW				10:25AM	✓
4	~~96-1~~	~~GW~~					✓
5	96-5	GW				9:30 AM	✓
6	92-12	GW				1:45 PM	✓
7	05-1A	GW				4:50 PM	✓
8	92-1	GW				1:10 PM	✓
9	05-3A	GW				3:50 PM	✓
10	07-1A	GW				3 PM	✓

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-00015 to be sent along with the results
EQuIS facility code K253

Method of Delivery:

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:
Relinquished By (Print): H. HUNSAULT	Date/Time: 14/04/21 4:10 PM	Date/Time: 15/04/21 10:55
Date/Time: 14/04/21	Temperature: 5.6 °C	Temperature: 21.1 °C
		Verified By:
		Date/Time:
		pH Verified [ ] By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

002893

Paracel ID: 2149547

PARACEL LABORATORIES LTD.

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Chain of Custody (Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yasnick Marcenac	Quote #: 19-797	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-00015	Date Required:	
Telephone: 613-592-9600	Email Address: yasnick_marcenac@golder.com, emily_bacon@golder.com, Henri.Puneault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ REC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number:		Matrix	Air Volume	# of Containers	Sample Taken		Required Analyses: Per quote
	Sample ID/Location Name				Date	Time	
1	~~Dupe-1~~	~~GW~~					✓
2	Dupe-2	GW			17 Jun 21		✓
3	Dupe-3	GW			↓		✓
4	Dupe-4	GW					✓
5	~~Dupe-5~~	~~GW~~					✓
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-00015 to be sent along with the results

EQuIS facility code 8253

Method of Delivery:

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. Arbitrage	Date/Time: 17/06/21 10:00	Date/Time: 18/06/21 08:55	Date/Time: 18/06/21 09:30
Date/Time: 17/06/21	Temperature: 20 °C	Temperature: 5 °C	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 8.3 Oct. 2014

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1A 06-Sep-2005	05-1A 16-Nov-2005	05-1A 25-May-2006	05-1A 31-May-2012	05-1A 28-Nov-2012	05-1A 29-May-2014 [3]	05-1A 26-Nov-2015
							05-1A	05-1A	05-1A	05-1A
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1180	228	1020	950	980	950	954
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	24	20	35	<25 [6]
Alkalinity (Total as CaCO3)	mg/l	--	--	969	935	1020	970	1000	990	975
Ammonia Nitrogen	mg/l	--	--	1.68	1.94	1.76	1.8	2.0	2.5	2.03
Chemical Oxygen Demand	mg/l	--	--	263	117	134	110	120	400	177
Chloride	mg/l	--	250	174	180	198	180	180	200	219
Conductivity (Field)	uS/cm	--	--	1950	2100	1300	2042	2125	2135	2315
Hardness, Calcium Carbonate	mg/l	--	--	49	54	44	46	50	49	39.3
Nitrate as N	mg/l	10.0	--	0.2	0.1	<0.1	<0.10	<0.10	<0.50	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	0.037	<0.010	<0.050	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	6.64	4.38	4.84	3.9	4.9	28	4.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	<0.10	<0.50	--
pH	-	--	--	--	--	--	8.44	--	8.59	--
pH (Field)	-	--	--	8.3	--	8.5	8.44	8.53	7.63	8.49
Phosphorus	mg/l	--	--	6.87	2.93	--	2.6	3.5	11	3.04
Sulphate	mg/l	--	500 [4]	17	18	16	<1	<1	<1	1
Temperature (Field)	deg c	--	15	16.3	--	6	9.9	7.1	9.3	8.9
Total Dissolved Solids	mg/l	--	500	1380	1420	1410	1480	1590	1820	1840
Total Organic Carbon	mg/l	--	--	199	47.7	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	2720	58	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	<0.001	0.001	0.0011	0.003	0.0031	0.002
Boron, dissolved	mg/l	5	--	1.43	1.54	1.33	1.5	1.7	1.7	1.64
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	6.22	5.92	4.05	4.3	4.9	4.3	4.16
Chromium, dissolved	mg/l	0.05	--	<0.002	0.002	<0.002	<0.0050	<0.005	<0.0050	0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.0019	<0.001	<0.0010	<0.0005
Iron, dissolved	mg/l	--	0.3	0.111	0.241	0.071	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0008	0.001	0.0002	<0.00050	<0.0005	<0.00050	0.0001
Magnesium, dissolved	mg/l	--	--	8.05	9.48	8.19	8.6	9.1	9.2	7.03
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.005	0.0080	0.006	0.0039	<0.005
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.2	17.7	14.8	14	16	16	12.7
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	587	638	573	550	580	580	612
Zinc, dissolved	mg/l	--	5	0.006	0.008	0.007	0.0070	<0.005	<0.0050	0.009
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	0.0014	<0.002 [7]
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00050	<0.00010	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00050	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00050	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00050	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.0025	<0.00050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00050	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.0010	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.0010	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1A 24-May-2017 05-1A	05-1A 29-Nov-2018 05-1A	05-1A 21-May-2020 05-1A	05-1A 30-Nov-2021 05-1A
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1050	1040	1040	1060
Alkalinity, Carbonate as CaCO3	mg/l	--	--	23	<25 [8]	27	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1080	1070	1060	1080
Ammonia Nitrogen	mg/l	--	--	1.92	1.65	2.31	1.93
Chemical Oxygen Demand	mg/l	--	--	183	181	788	333
Chloride	mg/l	--	250	189	214	243	203
Conductivity (Field)	uS/cm	--	--	2265	2042	2128	2188
Hardness, Calcium Carbonate	mg/l	--	--	46	64	54.5	46.7
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.0	3.5	6.6	8.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.38	8.31	8.46	8.51
Phosphorus	mg/l	--	--	3.49	3.24	9.44	8.55
Sulphate	mg/l	--	500 [4]	2	2	2	2
Temperature (Field)	deg c	--	15	10.4	7.1	10.0	6.3
Total Dissolved Solids	mg/l	--	500	1840	1720	1900	1770
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.004	0.002	0.001	0.002
Boron, dissolved	mg/l	5	--	1.57	1.65	1.42	1.49
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	4.03	9.36	5.71	4.79
Chromium, dissolved	mg/l	0.05	--	0.009	0.001	0.001	0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0011	0.0026	0.0033	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	0.119	0.151	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	0.0002	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	8.68	9.83	9.77	8.44
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.7	16.4	15.3	13.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	580	566	557	504
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.009	0.006
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [7]	<0.001	0.010	<0.002 [10]
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1B 06-Sep-2005	05-1B 16-Nov-2005	05-1B 25-May-2006	05-1B 31-May-2012	05-1B 28-Nov-2012	05-1B 29-May-2014	05-1B 26-Nov-2015
							05-1B	05-1B	05-1B	05-1B
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	163	262	250	260	240	262
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	3.6	4.0	5.3	6
Alkalinity (Total as CaCO3)	mg/l	--	--	254	268	262	250	270	250	268
Ammonia Nitrogen	mg/l	--	--	0.8	0.98	0.69	0.36	0.94	0.28	0.33
Chemical Oxygen Demand	mg/l	--	--	40	44	31	36	73	20	45
Chloride	mg/l	--	250	24	21.6	20.8	19	21	29	20
Conductivity (Field)	uS/cm	--	--	460	480	490	555	557	568	598
Hardness, Calcium Carbonate	mg/l	--	--	28	32	26	27	26	24	21.9
Nitrate as N	mg/l	10.0	--	0.1	1.5	0.2	<0.10	0.13	0.22	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	0.019	0.026	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	10.1	5.89	2.28	1.5	<1.0 [11]	<2.0 [11]	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	0.15	0.25	--
pH	-	--	--	--	--	--	8.19	--	8.36	--
pH (Field)	-	--	--	7.5	--	8.1	8.55	8.26	7.95	8.40
Phosphorus	mg/l	--	--	2.07	0.59	--	1.8	6.1	1.5	1.72
Sulphate	mg/l	--	500 [4]	47	36	32	27	23	24	18
Temperature (Field)	deg c	--	15	11.7	--	8	9.6	7.4	8.9	9.4
Total Dissolved Solids	mg/l	--	500	380	390	350	344	516	468	446
Total Organic Carbon	mg/l	--	--	89.2	17.7	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1810	120	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.003	<0.001	<0.001	0.0051	0.004	0.0045	0.004
Boron, dissolved	mg/l	5	--	0.263	0.267	0.228	0.24	0.28	0.27	0.244
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.0003	<0.005	<0.00010	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	6.27	6.91	5.46	5.3	5.5	4.9	4.7
Chromium, dissolved	mg/l	0.05	--	<0.002	0.003	<0.002	<0.0050	<0.005	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.004	0.004	0.003	0.0078	0.007	0.0032	0.0014
Iron, dissolved	mg/l	--	0.3	0.086	0.261	0.104	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	0.0003	<0.00050	<0.0005	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	3.02	3.51	3.11	3.3	3	2.8	2.46
Manganese, dissolved	mg/l	--	0.05	0.052	0.054	0.026	0.0051	0.012	0.018	0.013
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.01	0.02	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8	8.8	6.8	6.1	6.4	6.7	5.17
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	145	153	130	120	130	130	140
Zinc, dissolved	mg/l	--	5	0.006	0.009	0.01	<0.0050	<0.005	<0.0050	0.007
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.00020	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1B 24-May-2017 05-1B	05-1B 29-Nov-2018 05-1B	05-1B 21-May-2020 05-1B	05-1B 30-Nov-2021 05-1B
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	268	283	252	260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	6	6	7
Alkalinity (Total as CaCO3)	mg/l	--	--	273	288	258	268
Ammonia Nitrogen	mg/l	--	--	0.02	0.15	0.19	0.24
Chemical Oxygen Demand	mg/l	--	--	23	29	39	78
Chloride	mg/l	--	250	17	19	24	19
Conductivity (Field)	uS/cm	--	--	560	553	558	574
Hardness, Calcium Carbonate	mg/l	--	--	27	34	22.5	20.4
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.4	0.5
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.6	0.5	0.8	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.36	8.47	8.89	8.12
Phosphorus	mg/l	--	--	0.85	0.69	1.54	2.18
Sulphate	mg/l	--	500 [4]	20	18	22	14
Temperature (Field)	deg c	--	15	9.7	7.5	9.4	6.3
Total Dissolved Solids	mg/l	--	500	372	396	450	338
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004	0.003	0.004
Boron, dissolved	mg/l	5	--	0.278	0.263	0.248	0.258
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	5.27	8.1	4.59	4.19
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0046	0.0092	0.0066	0.0026
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0002	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	3.3	3.35	2.67	2.41
Manganese, dissolved	mg/l	--	0.05	<0.005	0.008	0.009	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.37	6.74	6.36	5.71
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	122	122	118	106
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.002	<0.001
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1C 06-Sep-2005	05-1C 16-Nov-2005	05-1C 25-May-2006	05-1C 31-May-2012 05-1C	05-1C 28-Nov-2012 05-1C	05-1C 29-May-2013 05-1C	05-1C 26-Nov-2013 GW-6	05-1C 29-May-2014 05-1C
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	190	201	136	170	180	170	170	170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	1.6	1.9	1.8	1.4	2.1
Alkalinity (Total as CaCO3)	mg/l	--	--	156	165	136	170	180	170	170	170
Ammonia Nitrogen	mg/l	--	--	1.73	0.9	0.06	<0.050	0.11	0.090	0.081	0.29
Chemical Oxygen Demand	mg/l	--	--	36	11	21	36	14	17	10	10
Chloride	mg/l	--	250	59.5	52.2	25.4	41	42	44	42	45
Conductivity (Field)	uS/cm	--	--	480	510	350	548	541	528	518	531
Hardness, Calcium Carbonate	mg/l	--	--	216	229	156	170	160	180	160	180
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.7	0.32	0.44	0.29	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	<0.010	<0.010	<0.010	0.013
Nitrogen, Total Kjeldahl	mg/l	--	--	18.9	5.2	0.73	1.2	0.64	0.46	0.66	0.88
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	0.32	0.44	0.29	<0.10	0.10
pH	-	--	--	--	--	--	8.00	--	8.05	7.94	8.12
pH (Field)	-	--	--	7.1	--	7.8	7.74	7.85	7.51	7.69	6.71
Phosphorus	mg/l	--	--	2.23	0.65	--	1.1	0.85	0.41	0.36	0.42
Sulphate	mg/l	--	500 [4]	113	86	46	53	48	57	54	50
Temperature (Field)	deg c	--	15	11.5	10.4	7	9.1	7.8	8.3	8.6	8.7
Total Dissolved Solids	mg/l	--	500	405	373	234	326	364	366	310	318
Total Organic Carbon	mg/l	--	--	65.1	8.3	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	2670	520	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.003	0.0032	0.003	0.0019	0.0025	0.0023
Boron, dissolved	mg/l	5	--	0.08	0.074	0.028	0.078	0.083	0.077	0.082	0.072
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	52.7	55.9	42.7	40	40	44	39	42
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.0050	<0.005	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.003	<0.002	0.0018	0.002	0.0018	0.0012	0.0025
Iron, dissolved	mg/l	--	0.3	0.167	0.025	0.009	0.38	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0002	<0.0002	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	20.5	21.7	11.8	16	15	17	15	17
Manganese, dissolved	mg/l	--	0.05	0.232	0.112	0.044	0.032	0.002	0.045	0.023	0.062
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.02	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.9	7.7	6.9	5.2	5.5	5.6	5.2	5
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	61.9	56.1	23.3	50	49	53	50	54
Zinc, dissolved	mg/l	--	5	0.007	0.008	0.011	<0.0050	<0.005	<0.0050	0.012	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.00020	<0.00020	0.00079	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1C 19-Nov-2014	05-1C 02-Jun-2015	05-1C 26-Nov-2015	05-1C 26-May-2016	05-1C 17-Nov-2016	05-1C 24-May-2017	05-1C 29-Nov-2017	05-1C 24-May-2018
				05-1C	05-1C	05-1C	05-1C	05-1C	05-1C	05-1C	05-1C
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	170	170	175	178	179	187	185	190
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.8	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	170	171	176	179	180	188	186	191
Ammonia Nitrogen	mg/l	--	--	0.096	0.30	0.09	0.30	0.27	0.02	0.16	0.29
Chemical Oxygen Demand	mg/l	--	--	5.1	15	17	<10	11	44	51	15
Chloride	mg/l	--	250	45	51	50	55	49	53	58	55
Conductivity (Field)	uS/cm	--	--	592	576	565	578	619	579	553	584
Hardness, Calcium Carbonate	mg/l	--	--	170	115	138	168	164	165	158	173
Nitrate as N	mg/l	10.0	--	<0.10	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.024	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.39	0.4	0.4	0.5	0.5	0.4	0.4	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--
pH	-	--	--	8.06	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.01	7.75	7.99	7.59	7.22	7.94	6.95	7.77
Phosphorus	mg/l	--	--	0.40	0.29	0.26	0.30	0.32	0.32	0.35	0.39
Sulphate	mg/l	--	500 [4]	50	53	52	56	52	53	55	51
Temperature (Field)	deg c	--	15	5.6	8.4	9.7	9.2	10.0	9.5	8.4	8.7
Total Dissolved Solids	mg/l	--	500	296	324	336	368	314	354	314	344
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0027	0.002	0.002	0.002	0.003	0.002	0.003	0.002
Boron, dissolved	mg/l	5	--	0.075	0.066	0.071	0.072	0.081	0.074	0.095	0.07
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	42	21.2	31.4	40.3	40.5	38.4	38.1	45
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.003	0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	<0.0005	<0.0005	0.0009	0.0031	0.0024	0.0022	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.109	0.231
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	17	15	14.1	16.2	15.4	16.8	15.3	14.8
Manganese, dissolved	mg/l	--	0.05	0.021	0.069	0.019	0.038	<0.005	0.005	0.026	0.056
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	4.17	4.45	5.45	5.26	5.14	5.34	4.66
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	55	53.2	62	48.4	52.5	53.2	52.2	51.5
Zinc, dissolved	mg/l	--	5	0.0074	<0.005	0.009	<0.005	0.02	0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1C 29-Nov-2018	05-1C 19-Jun-2019	05-1C 20-Nov-2019	05-1C 21-May-2020	05-1C 26-Nov-2020	05-1C 26-May-2021	05-1C 30-Nov-2021
				05-1C	05-1C	05-1C	05-1C	05-1C	05-1C	05-1C
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	198	181	166	176	176	172	174
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	199	183	167	178	178	173	176
Ammonia Nitrogen	mg/l	--	--	0.08	0.29	0.17	0.27	0.18	0.28	0.10
Chemical Oxygen Demand	mg/l	--	--	11	19	21	18	33	<10	13
Chloride	mg/l	--	250	56	55	53	64	51	50	51
Conductivity (Field)	uS/cm	--	--	518	540	567	547	541	574	571
Hardness, Calcium Carbonate	mg/l	--	--	171	172	192	161	158	161	139
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.2	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.5	0.4	0.5	0.4	0.4	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.79	6.89	7.98	9.04	8.02	8.03	7.86
Phosphorus	mg/l	--	--	0.34	0.91	0.33	0.45	0.42	0.46	0.35
Sulphate	mg/l	--	500 [4]	51	52	50	62	48	44	44
Temperature (Field)	deg c	--	15	7.4	10.2	8.0	8.1	8.3	10.1	7.5
Total Dissolved Solids	mg/l	--	500	270	330	356	334	302	342	236
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.113	0.071	0.077	0.061	0.066	0.063	0.06
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	41.3	41.6	46.2	38.4	37.8	38.2	34.3
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0027	0.0025	0.0016	0.0031	0.0011	0.0011	0.0013
Iron, dissolved	mg/l	--	0.3	0.129	0.188	0.311	0.297	0.311	0.252	0.28
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	16.5	16.6	18.6	15.7	15.6	15.9	12.8
Manganese, dissolved	mg/l	--	0.05	0.016	0.046	0.074	0.058	0.035	0.054	0.035
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.32	5.53	6.8	4.81	4.87	4.92	4.38
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	54.1	53	57.3	51.5	52	51.1	44.7
Zinc, dissolved	mg/l	--	5	<0.005	0.005	<0.005	<0.005	0.009	<0.005	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1D 06-Sep-2005	05-1D 16-Nov-2005	05-1D 25-May-2006	05-1D 31-May-2012 05-1D	05-1D 28-Nov-2012 [13] 05-1D	05-1D 29-May-2013 05-1D	05-1D 26-Nov-2013 GW-1	05-1D 29-May-2014 95-1D
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	218	218	169	240	--	220	200	240
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	2.0	--	1.5	1.4	1.4
Alkalinity (Total as CaCO3)	mg/l	--	--	179	179	169	240	--	220	200	240
Ammonia Nitrogen	mg/l	--	--	4.94	0.26	0.56	<0.050	--	0.082	<0.050	0.063
Chemical Oxygen Demand	mg/l	--	--	37	12	20	13	--	78	11	16
Chloride	mg/l	--	250	46.9	27.2	53	30	--	170	200	480
Conductivity (Field)	uS/cm	--	--	550	440	470	601	--	922	952	1734
Hardness, Calcium Carbonate	mg/l	--	--	303	204	191	250	--	470	460	860
Nitrate as N	mg/l	10.0	--	0.4	1.4	0.7	<0.10	--	<0.10	0.13	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	--	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	30.3	1.45	2.1	0.93	--	0.99	0.28	0.68
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	--	<0.10	0.13	<0.10
pH	-	--	--	--	--	--	7.96	--	7.86	7.87	7.79
pH (Field)	-	--	--	6.9	--	7.8	7.59	--	7.36	7.25	6.26
Phosphorus	mg/l	--	--	1.45	0.66	--	0.30	--	0.38	0.16	0.22
Sulphate	mg/l	--	500 [4]	163	53	82	49	--	56	58	110
Temperature (Field)	deg c	--	15	17.5	9.9	6	11.0	--	10.0	8.4	9.5
Total Dissolved Solids	mg/l	--	500	476	301	351	342	--	796	780	1690
Total Organic Carbon	mg/l	--	--	78.8	5.5	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1380	420	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.0010	--	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.053	0.039	0.057	0.039	--	0.042	0.033	0.038
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	--	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	87.1	56.9	45.9	69	--	140	130	250
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.0050	--	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	--	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.004	<0.002	0.0037	--	0.0035	0.0040	0.0064
Iron, dissolved	mg/l	--	0.3	0.077	0.005	0.123	<0.1	--	<0.1	<0.1	0.5
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0002	0.0003	<0.00050	--	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	20.8	15	18.5	18	--	32	34	56
Manganese, dissolved	mg/l	--	0.05	0.422	0.081	0.1	0.03	--	0.016	0.023	0.0095
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.9	9.8	5.7	7	--	9.5	9.2	12
Selenium, dissolved	mg/l	0.05	--	<0.001	0.001	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	42.6	34.5	46.4	30	--	51	46	69
Zinc, dissolved	mg/l	--	5	0.007	0.01	0.019	<0.0050	--	0.0097	0.022	0.052
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	--	<0.0010	<0.0010	<0.0010
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	--	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	--	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	--	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	--	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	--	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	--	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	--	<0.00020	0.00037	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	--	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1D 19-Nov-2014	05-1D 02-Jun-2015	05-1D 26-Nov-2015	05-1D 26-May-2016	05-1D 17-Nov-2016	05-1D 24-May-2017	05-1D 29-Nov-2017	05-1D 24-May-2018
				05-1D	05-1D	05-1D	05-1D	05-1D	05-1D	05-1D	05-1D
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	240	242	234	259	248	244	251	269
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<1.0	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	240	243	234	259	249	245	251	270
Ammonia Nitrogen	mg/l	--	--	<0.050	0.06	0.03	0.03	0.03	0.03	0.05	0.02
Chemical Oxygen Demand	mg/l	--	--	8.1	17	42	31	15	25	14	37
Chloride	mg/l	--	250	510	469	418	475	285	374	271	524
Conductivity (Field)	uS/cm	--	--	2164	1924	1782	1940	1444	1600	961	2163
Hardness, Calcium Carbonate	mg/l	--	--	890	628	674	644	486	502	358	589
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	0.1	<0.1	0.3	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.37	0.3	0.4	0.4	0.3	0.2	0.5	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--
pH	-	--	--	7.63	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.16	7.24	7.44	7.41	7.03	7.40	7.05	7.30
Phosphorus	mg/l	--	--	0.33	0.20	0.12	0.20	0.17	0.08	0.05	0.13
Sulphate	mg/l	--	500 [4]	120	121	122	127	86	103	76	109
Temperature (Field)	deg c	--	15	5.8	9.1	8.9	10.5	9.2	9.9	7.6	8.2
Total Dissolved Solids	mg/l	--	500	1530	1400	1250	1550	832	1170	718	1630
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.034	0.031	0.033	0.031	0.04	0.024	0.061	0.029
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	250	169	180	181	139	153	102	180
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.006	0.005	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0022	0.0009	0.0011	0.0033	0.0051	0.0046	0.0032	0.0034
Iron, dissolved	mg/l	--	0.3	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	63	50.1	54.4	46.4	34	29.3	24.7	34
Manganese, dissolved	mg/l	--	0.05	0.14	0.042	0.059	0.06	<0.005	<0.005	0.109	0.043
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13	10.7	9.88	12.6	10.6	10.1	8.35	10.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	110	121	122	138	121	136	136	227
Zinc, dissolved	mg/l	--	5	0.0063	<0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1D 29-Nov-2018 05-1D	05-1D 19-Jun-2019 05-1D	05-1D 20-Nov-2019 05-1D	05-1D 21-May-2020 05-1D	05-1D 26-Nov-2020 05-1D	05-1D 26-May-2021 05-1D	05-1D 30-Nov-2021 05-1D
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	246	247	269	268	313	296	320
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	246	248	270	269	315	297	321
Ammonia Nitrogen	mg/l	--	--	0.06	0.09	0.02	0.02	0.02	0.03	0.04
Chemical Oxygen Demand	mg/l	--	--	19	<10	11	24	19	13	23
Chloride	mg/l	--	250	277	528	323	591	358	370	412
Conductivity (Field)	uS/cm	--	--	1089	1920	1721	1889	1601	1843	1758
Hardness, Calcium Carbonate	mg/l	--	--	428	617	474	501	479	486	425
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.4	0.2	0.4	0.3	0.2	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.45	7.04	7.23	8.01	7.63	7.36	7.40
Phosphorus	mg/l	--	--	0.04	0.08	0.10	0.04	0.04	0.03	0.07
Sulphate	mg/l	--	500 [4]	57	99	85	126	88	86	86
Temperature (Field)	deg c	--	15	6.7	11	7.6	8.8	6.1	13.2	6.9
Total Dissolved Solids	mg/l	--	500	720	1400	970	1300	1010	1060	1130
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.039	0.04	0.028	0.02	0.02	0.024	0.019
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	119	175	128	142	131	136	125
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0053	0.0069	0.0054	0.0060	0.0048	0.0056	0.0054
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31.5	43.4	37.3	35.5	37	35.7	27.3
Manganese, dissolved	mg/l	--	0.05	0.01	<0.005	0.005	0.047	0.006	0.014	0.015
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	15	11.1	12.8	7.87	11.6	7.12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	152	240	173	210	196	187	187
Zinc, dissolved	mg/l	--	5	0.005	<0.005	<0.005	0.005	0.009	<0.005	0.007
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.004 [10]	0.002	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	11-1 29-Nov-2011 [14] 11-1	11-1 28-Nov-2012 11-1	11-1 29-May-2014 MW11-1	11-1 26-Nov-2015 11-1	11-1 24-May-2017 11-1	11-1 22-Nov-2018 11-1	11-1 21-May-2020 11-1	11-1 30-Nov-2021 11-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	480	460	470	477	527	570	461	537
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	4.5	10	9	9	8	8	8
Alkalinity (Total as CaCO3)	mg/l	--	--	490	460	480	486	536	578	469	545
Ammonia Nitrogen	mg/l	--	--	1.20	1.2	1.3	1.05	0.03	0.68	0.60	0.89
Chemical Oxygen Demand	mg/l	--	--	50	28	27	46	32	48	45	37
Chloride	mg/l	--	250	657	700	780	770	630	742	912	696
Conductivity	uS/cm	--	--	3000	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2787	2473	2552	2975	3214	2823	2664	3057
Hardness, Calcium Carbonate	mg/l	--	--	292	270	270	219	243	314	277	257
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.31	<0.1	0.6	0.1	0.6	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	0.015	0.226	<0.05	<0.25 [8]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.48	1.7	1.8	1.7	0.5	1.5	1.1	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	0.53	--	--	--	--	--
pH	-	--	--	8.33	--	8.36	--	--	--	--	--
pH (Field)	-	--	--	7.93	8.15	7.26	8.29	8.04	7.92	7.58	8.04
Phosphorus	mg/l	--	--	0.65	0.53	0.62	0.24	0.14	0.49	0.25	0.43
Sulphate	mg/l	--	500 [4]	8	<1	<1	<1	3	2	<1	1
Temperature (Field)	deg c	--	15	7.0	6.3	9.7	8.0	11.7	7.8	11.4	7.0
Total Dissolved Solids	mg/l	--	500	1950	1650	1650	1630	1550	1660	1640	1610
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.002	0.0022	0.001	0.005	0.002	0.001	0.002
Boron, dissolved	mg/l	5	--	0.30	0.36	0.37	0.328	0.281	0.442	0.236	0.252
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	61	49	49	35.7	46.2	61.9	52.2	48.9
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.0050	<0.001	0.013	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0015	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	0.0014
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0034	<0.0005	0.0029	0.0046	0.0048	0.0015
Iron, dissolved	mg/l	--	0.3	<0.03	0.5	0.16	0.158	<0.1	<0.1	0.189	0.102
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001	0.0007	<0.0001
Magnesium, dissolved	mg/l	--	--	34	36	36	31.5	30.9	38.7	35.5	32.7
Manganese, dissolved	mg/l	--	0.05	0.39	0.11	0.11	0.081	<0.005	0.027	0.046	0.479
Potassium, dissolved	mg/l	--	--	16	19	19	15.6	16.8	20.4	18.7	16.9
Sodium, dissolved	mg/l	--	200 [5]	490	590	520	646	523	611	554	492
Zinc, dissolved	mg/l	--	5	0.01	<0.005	0.0063	0.016	0.006	0.006	0.005	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.001	<0.002 [7]	<0.001	<0.001	<0.004 [10]
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-12 09-Jun-1992	92-12 01-Nov-1992	92-12 15-Jun-1994	92-12 02-Nov-1994	92-12 22-Nov-1995	92-12 12-Oct-1996	92-12 06-Nov-1997	92-12 05-Jun-1998	92-12 06-May-1999
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	756	822	--	771	787	--	--	--	821
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	13	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	684	674	680	642	672	676	332	654	673
Ammonia Nitrogen	mg/l	--	--	--	--	--	0.72	0.69	0.97	0.62	0.6	0.94
Chemical Oxygen Demand	mg/l	--	--	--	--	386	113	50	38	36	46	45
Chloride	mg/l	--	250	121	122.8	170	125	109	133	300	118	117
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1528	1516	1620	1564	1610	1570	1460	1566	1500
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	6.42	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	37.65	34	78	34	36	32.9	29	32	28
Nitrate as N	mg/l	10.0	--	--	--	0.01	0.34	0.4	0.1	0.1	1.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	5.75	--	--	--	2.18
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	5.06	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.47	8.21	8.57	8.8	8.72	8.39	8.21	--	8.4
Phosphate	mg/l	--	--	--	--	--	--	2.6	--	--	--	--
Phosphorus	mg/l	--	--	--	--	3.2	2.288	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	4.1	1	6.7	2.5	2	2	69	37	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	820	785	800	790	730	790	750
Total Organic Carbon	mg/l	--	--	--	--	19	19.6	15.4	14.5	15.6	16.5	18.8
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	480	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.202	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	1.04	0.89	0.87	0.84	0.91	0.99	1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	3.7	5.42	10.3	2.698	3.97	3.62	2.67	2.62	1.1
Chromium, dissolved	mg/l	0.05	--	--	--	0.037	0.01	0.02	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0215	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	11.42	0.1	1.39	0.39	0.38	0.84	0.16
Lead, dissolved	mg/l	0.01	--	--	--	0.0032	0.1	0.0021	0.0002	0.0002	0.0002	0.0006
Magnesium, dissolved	mg/l	--	--	6.9	5.04	12.7	1.778	6.2	5.27	5.45	6.03	6
Manganese, dissolved	mg/l	--	0.05	--	--	0.179	0.012	0.03	0.02	0.01	0.02	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.039	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.2	12.2	25.3	7.441	13.4	11.9	13.1	15.4	5.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	358.9	387	313	333.9	373	314	316	416	370
Zinc, dissolved	mg/l	--	5	--	--	0.034	0.01	0.01	0.01	0.01	0.02	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.074	0.001	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-12 24-Oct-2000	92-12 14-Jun-2001	92-12 06-Nov-2002	92-12 30-May-2003	92-12 19-Nov-2004	92-12 16-Nov-2005	92-12 15-May-2007	92-12 10-Nov-2008	92-12 26-Nov-2009 M-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	887	765	794	811	856	171	690	699	648
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	7	1	1	1	<5	<5	<5	26
Alkalinity (Total as CaCO3)	mg/l	--	--	727	639	651	645	702	700	690	699	674
Ammonia Nitrogen	mg/l	--	--	0.47	0.88	0.99	0.73	0.87	1.02	0.89	0.98	0.94
Chemical Oxygen Demand	mg/l	--	--	--	35	54	108	52	42	54	28	45
Chloride	mg/l	--	250	133	132	128	127	110	129	131	129	129
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	1610
Conductivity (Field)	uS/cm	--	--	1570	1300	1410	1370	1690	1600	1100	1300	1442
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	27	28	28	27	26	31	27	26	28
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	<1	0.1	<0.1	<0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.62	2.75	1.83	1.61	1.73	1.78	1.8	1.72	1.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	8.63
pH (Field)	-	--	--	8.33	8.6	8.4	7.4	8.4	--	8.8	8.5	8.48
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.25	3.37	2.43	2.42	2.3	2.12	--	--	2.32
Sulphate	mg/l	--	500 [4]	1	1	1	1	10	<1	6	<1	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	10.9	8.3	7	9.3
Total Dissolved Solids	mg/l	--	500	928	900	876	685	845	981	941	945	1050
Total Organic Carbon	mg/l	--	--	--	14.8	15.9	17.8	15.9	19.5	--	--	--
Total Suspended Solids	mg/l	--	--	22	239	33	12	6	13	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	<0.001	0.0008	0.0006	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.93	0.99	0.98	0.94	0.992	1	0.919	0.919	1.0
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0005	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	2.85	2.43	2.44	2.76	2.19	3.08	2.39	2.14	3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	0.006
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005	0.006	<0.005	<0.0002
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	0.001
Iron, dissolved	mg/l	--	0.3	0.15	0.1	0.06	0.19	0.093	0.09	0.06	0.054	0.07
Lead, dissolved	mg/l	0.01	--	0.0022	0.0002	0.0011	0.0004	0.0004	0.0004	0.00007	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	4.92	5.27	5.29	3	5.03	5.57	5.06	4.95	5
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.01	0.003	0.002	0.013	0.002	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	10.5	6.2	8.6	10.8	11.1	13	11.7	11.5	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	430	353	368	363	374	420	370	377	397
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.006	0.008	<0.005	<0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.022	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	0.0006	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-12 24-May-2011 G-10	92-12 28-Nov-2012 92-12	92-12 29-May-2014 [3] 92-12	92-12 26-Nov-2015 92-12	92-12 24-May-2017 92-12	92-12 29-Nov-2018 92-12	92-12 21-May-2020 92-12	92-12 30-Nov-2021 92-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	637	630	630	661	680	729	647	655
Alkalinity, Carbonate as CaCO3	mg/l	--	--	33	22	28	19	17	18	29	14
Alkalinity (Total as CaCO3)	mg/l	--	--	670	650	660	680	697	747	676	669
Ammonia Nitrogen	mg/l	--	--	0.94	1.1	1.1	1.04	1.04	0.93	1.10	1.06
Chemical Oxygen Demand	mg/l	--	--	45	49	49	54	38	46	60	48
Chloride	mg/l	--	250	128	130	140	138	108	139	160	131
Conductivity	uS/cm	--	--	1640	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1472	1484	1383	1512	1595	1393	1530	1537
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	28	28	30	24.6	29	43	35.5	29.3
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.50	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.60	2.9	1.9	1.7	2.0	2.0	1.8	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.50	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.74	--	8.67	--	--	--	--	--
pH (Field)	-	--	--	8.79	8.72	8.14	8.86	8.30	8.36	7.20	8.82
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.39	2.5	2.2	2.11	2.06	2.09	2.31	2.30
Sulphate	mg/l	--	500 [4]	<1	<1	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	12.8	6.9	11.2	9.3	10.5	7.3	11.2	7.0
Total Dissolved Solids	mg/l	--	500	1070	946	916	936	956	974	980	910
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.96	1.1	1.1	0.106	1.07	1.06	0.821	0.861
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3	2.5	2.9	2.57	2.7	7.63	5.04	3.88
Chromium, dissolved	mg/l	0.05	--	0.005	<0.005	<0.0050	0.001	0.008	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0003	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0012	<0.0005	0.0011	<0.0005	<0.0005	0.0012
Iron, dissolved	mg/l	--	0.3	0.07	<0.1	<0.1	<0.1	<0.1	0.106	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	5	5.2	5.5	4.41	5.32	5.86	5.57	4.76
Manganese, dissolved	mg/l	--	0.05	<0.01	0.002	0.0028	<0.005	5.32	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	11	11	9.57	10.9	12.2	10.3	9.73
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	344	370	390	393	383	408	365	308
Zinc, dissolved	mg/l	--	5	0.02	<0.005	0.0051	0.01	<0.005	<0.005	<0.005	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.002 [7]	<0.002 [7]	0.003	0.004	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.00050	0.00016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0025	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0010	0.00031	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-16 09-Jun-1992	92-16 01-Nov-1992	92-16 08-Jun-1993	92-16 04-Nov-1993	92-16 15-Jun-1994	92-16 02-Nov-1994	92-16 28-Jun-1995	92-16 22-Nov-1995
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	224	226	201	195	--	190	205	218
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	--	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	184	185	165	160	164	156	168	179
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	0.95	0.62	0.27
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	42	194	350	23
Chloride	mg/l	--	250	31	12	4	6	4	2	7.7	2.5
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	556	398	358	446	400	391	460	380
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	7	9.65	--
Hardness, Calcium Carbonate	mg/l	--	--	95.53	68	58	76	63	70	59	56
Nitrate as N	mg/l	10.0	--	--	--	0.42	0.48	0.24	0.54	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	11.5	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	10.88	2.83
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.87	7.52	7.74	8.33	8.14	8.95	8.35	8.38
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.8
Phosphorus	mg/l	--	--	--	--	--	--	1.86	0.282	14.5	--
Sulphate	mg/l	--	500 [4]	43	21.2	19.2	28.3	27.7	24.8	22	22
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	280	212	200	197	190	180
Total Organic Carbon	mg/l	--	--	--	--	--	--	8.3	4.8	5.5	3.9
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	1.827	0.42	--	1.039	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.022	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	0.12	0.129	0.11	0.07
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**	0.0001	0.0001
Calcium, dissolved	mg/l	--	--	20.1	14	12.4	14.9	12.4	13.67	13.5	11.4
Chromium, dissolved	mg/l	0.05	--	--	--	0.014	0.01	0.01	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.1	0.01	0.007	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.109	0.1	1.25	1.293	0.03	0.76
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	0.0033	0.0004	**0.1**	0.0001	0.0009
Magnesium, dissolved	mg/l	--	--	11	7.99	6.6	9.3	7.8	2.614	5.95	6.7
Manganese, dissolved	mg/l	--	0.05	--	--	0.04	0.022	0.046	0.058	0.02	0.04
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.7	6.81	7.4	7.7	7.8	6.645	--	11.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	88.5	73.5	57.9	119	55	56.14	58.1	65.2
Zinc, dissolved	mg/l	--	5	--	--	0.048	0.01	0.01	0.03	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.002	0.053	0.001	0.001	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-16 12-Oct-1996	92-16 06-Nov-1997	92-16 05-Jun-1998	92-16 06-May-1999	92-16 24-Oct-2000	92-16 14-Jun-2001	92-16 16-Dec-2002	92-16 30-May-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	217	226	210	187	205
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	174	186	190	178	185	172	153	168
Ammonia Nitrogen	mg/l	--	--	0.74	0.27	0.2	0.04	0.03	0.48	0.38	0.13
Chemical Oxygen Demand	mg/l	--	--	5	3	22	3	--	18	23	9
Chloride	mg/l	--	250	2.4	3	2.8	2.3	2.8	2.8	16.4	4.2
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	370	380	370	350	346	340	374	300
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	50	59	68	56	46	52	47	47
Nitrate as N	mg/l	10.0	--	0.1	0.2	1	--	0.2	0.2	1.4	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	1.39	0.46	1.88	0.08	0.64
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.93	7.4	--	7.9	7.79	8.2	8.2	7.2
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.67	6.07	3	1.49
Sulphate	mg/l	--	500 [4]	19	18	49	15	15	15	30	13
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	180	190	184	180	214	250	236	150
Total Organic Carbon	mg/l	--	--	4.1	4.5	5	4.6	--	4.2	4	4.1
Total Suspended Solids	mg/l	--	--	1900	--	--	--	256	2760	2120	516
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.003	0.003	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.12	0.11	0.21	0.13	0.12	0.14	0.12	0.12
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	10	12.9	12.7	11.8	10.5	12	9.48	10.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.61	1.17	6.26	0.02	0.02	0.02	0.02	0.04
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0006	0.0002
Magnesium, dissolved	mg/l	--	--	5.87	6.5	8.72	6.36	4.81	5.45	5.58	5.07
Manganese, dissolved	mg/l	--	0.05	0.03	0.06	0.12	0.01	0.02	0.03	0.01	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	4.3	8.6	9.4	1.9	5.9	2.3	1.5	5.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	57.3	56.7	77.6	66.3	61.5	63	72.9	64.9
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.07	0.02	0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.024	0.001	0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-16 19-Nov-2004	92-16 16-Nov-2005	92-16 15-May-2007	92-16 10-Nov-2008	92-16 26-Nov-2009 M-7	92-16 24-May-2011 [14] G-2	92-16 28-Nov-2012 92-16	92-16 29-May-2014 92-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	220	233	186	183	179	178	180	180
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<2 [15]	4	2.7	2.6
Alkalinity (Total as CaCO3)	mg/l	--	--	180	191	186	180	179	182	180	180
Ammonia Nitrogen	mg/l	--	--	0.07	0.23	0.1	0.2	0.14	0.10	0.33	0.16
Chemical Oxygen Demand	mg/l	--	--	14	21	86	<5	15	25	14	7.3
Chloride	mg/l	--	250	4.3	5.4	7.1	6.4	11	13	21	25
Conductivity	uS/cm	--	--	--	--	--	--	390	404	--	--
Conductivity (Field)	uS/cm	--	--	440	350	280	390	360	379	391	366
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	44	48	43	47	41	48	48	52
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.3	0.1	<0.10	0.17	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.61	0.79	0.39	0.23	0.12	0.15	0.78	0.95
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	8.16	8.38	--	8.19
pH (Field)	-	--	--	8.2	8.93	8.4	8	7.8	8.02	8.16	8.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.68	1.41	--	--	0.61	0.87	0.60	0.59
Sulphate	mg/l	--	500 [4]	19	16	12	11	11	10	10	10
Temperature (Field)	deg c	--	15	--	11.6	8.7	7	8.5	10.6	7.5	10.7
Total Dissolved Solids	mg/l	--	500	220	229	224	218	254	263	340	414
Total Organic Carbon	mg/l	--	--	4.1	5.5	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	910	1800	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.0045	0.0035	0.003	<0.01	0.002	0.0025
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.118	0.12	0.107	0.105	0.12	0.11	0.12	0.12
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	9.89	10.8	9.42	10.5	10	11	11	12
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	--	<0.005	0.015	<0.005	<0.0002	0.0002	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.004	<0.002	0.003	0.005	0.006	0.003	0.0045
Iron, dissolved	mg/l	--	0.3	0.01	0.012	0.261	<0.005	<0.03	<0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0002	0.00034	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	4.8	5.17	4.62	5	4	5	5.2	5.6
Manganese, dissolved	mg/l	--	0.05	0.017	0.018	0.044	<0.001	<0.01	<0.01	<0.002	<0.0020
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.1	6.1	5.4	5.7	5	5	5.2	5.3
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	68.4	75.5	72.2	68.8	65	64	65	70
Zinc, dissolved	mg/l	--	5	0.005	0.008	<0.005	<0.005	0.01	0.01	0.006	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-16 26-Nov-2015 92-16	92-16 24-May-2017 92-16	92-16 29-Nov-2018 92-16	92-16 21-May-2020 92-16	92-16 30-Nov-2021 92-16
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	188	200	215	177	188
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	6	<5	5
Alkalinity (Total as CaCO3)	mg/l	--	--	189	202	221	180	194
Ammonia Nitrogen	mg/l	--	--	0.24	0.03	0.51	0.14	0.96
Chemical Oxygen Demand	mg/l	--	--	32	27	122	39	207
Chloride	mg/l	--	250	17	19	21	33	26
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	417	409	394	410	508
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	43.4	56	74	56.4	52.4
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.7	2.3	0.5	7.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.14	7.82	8.21	8.06	7.82
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.38	6.56	0.49	13.7
Sulphate	mg/l	--	500 [4]	8	9	6	10	6
Temperature (Field)	deg c	--	15	9.7	9.7	7.9	8.3	8.0
Total Dissolved Solids	mg/l	--	500	256	272	270	276	316
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003	0.002	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.11	0.145	0.114	0.112	0.114
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	9.82	12.1	19.3	12.5	11.9
Chromium, dissolved	mg/l	0.05	--	<0.001	0.002	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0037	0.0038	0.0032	0.0029
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.233	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	4.58	6.3	6.31	6.15	5.52
Manganese, dissolved	mg/l	--	0.05	0.028	<0.005	<0.005	0.066	0.05
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.34	5.65	5.76	5.35	4.86
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	79.3	68.3	70.4	65.3	58.2
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.007	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 09-Jun-1992	92-18 01-Nov-1992	92-18 04-Nov-1993	92-18 15-Jun-1994	92-18 02-Nov-1994	92-18 28-Jun-1995	92-18 22-Nov-1995	92-18 12-Jun-1996
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	244	198	210	--	190	193	195	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	--	1	1	5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	200	162	172	140	156	158	168	273
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	0.17	0.16	0.01	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	67	62	170	25	18
Chloride	mg/l	--	250	87	35.8	38	26	22	23	23.1	368
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	831	540	539	480	453	460	440	1790
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	11.65	9.65	--	--
Hardness, Calcium Carbonate	mg/l	--	--	276.9	178	150	136	138	144	137	587
Nitrate as N	mg/l	10.0	--	--	--	0.44	0.1	0.48	0.1	0.4	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	7.8	0.87	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	7.64	0.86	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.96	7.78	8.1	7.9	8.25	7.82	8.18	7
Phosphate	mg/l	--	--	--	--	--	--	--	--	0.2	--
Phosphorus	mg/l	--	--	--	--	--	2.96	0.148	7.62	--	--
Sulphate	mg/l	--	500 [4]	88	68.8	40.3	44.9	36.4	36	31	117
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	248	250	228	230	220	900
Total Organic Carbon	mg/l	--	--	--	--	--	6.8	4.8	6.3	3.1	7.2
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	579
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	**0.1**	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	0.022	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	0.03	0.06	0.04	0.01	0.038
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	**0.01**	0.0001	0.0001	--
Calcium, dissolved	mg/l	--	--	69.62	45.4	38.3	35.3	32.09	38.7	35.6	169
Chromium, dissolved	mg/l	0.05	--	--	--	0.01	0.01	0.01	0.01	0.02	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.01	0.003	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.124	0.336	0.103	0.02	1.04	1.17
Lead, dissolved	mg/l	0.01	--	--	--	0.0062	0.0002	**0.1**	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	25	15.7	13.3	11.7	4.599	11.3	11.5	39.9
Manganese, dissolved	mg/l	--	0.05	--	--	0.032	0.086	0.028	0.04	0.02	0.97
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	3.9	4.54	5.3	4.9	1.864	--	7.7	8.88
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	77.76	53.6	72	33	37.41	40.3	42.6	286
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.111	0.001	0.001	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 09-Jun-1992	92-18 01-Nov-1992	92-18 04-Nov-1993	92-18 15-Jun-1994	92-18 02-Nov-1994	92-18 28-Jun-1995	92-18 22-Nov-1995	92-18 12-Jun-1996
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 12-Oct-1996	92-18 18-Jun-1997	92-18 06-Nov-1997	92-18 05-Jun-1998	92-18 29-Oct-1998	92-18 06-May-1999	92-18 19-Oct-1999	92-18 05-May-2000
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	380	386	427	488
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	273	297	842	304	312	632	350	400
Ammonia Nitrogen	mg/l	--	--	0.14	0.65	0.05	0.1	0.11	0.04	0.11	0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	10	25	38	5	15	12	45
Chloride	mg/l	--	250	470	339	916	685	580	403	627	400
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1790	1670	2990	3060	3170	1870	2413	2850
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	3.16	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	590	608	829	543	379	482	593	551
Nitrate as N	mg/l	10.0	--	0.8	1	1.5	1.3	--	--	0.1	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	0.48	0.51	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.63	6.85	6.29	--	6.5	6.5	7.1	6.5
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	107	109	1	147	116	111	106	80
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	900	890	1500	1516	1590	930	1206	1425
Total Organic Carbon	mg/l	--	--	7.2	7.7	8.9	11.4	13.1	9.3	8.9	7.2
Total Suspended Solids	mg/l	--	--	1030	665	--	--	--	--	506	828
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.07	0.05	0.05	0.14	0.05	0.06	0.14	0.14
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	176	184	249	173	121	172	180	160
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.57	1.52	1.41	0.31	1.44	0.02	1.78	0.61
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	35.7	35.3	49.5	26.6	18.7	34.8	34.3	36.4
Manganese, dissolved	mg/l	--	0.05	0.81	1.01	1.8	1.26	1.82	1.14	2.51	1.61
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	7	7.4	7.7	9.7	12	2.7	10.6	3.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	232	253	437	343	358	387	400	300
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.23	0.01	0.01	0.11	0.22
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 12-Oct-1996	92-18 18-Jun-1997	92-18 06-Nov-1997	92-18 05-Jun-1998	92-18 29-Oct-1998	92-18 06-May-1999	92-18 19-Oct-1999	92-18 05-May-2000
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 24-Oct-2000	92-18 14-Jun-2001	92-18 23-Nov-2001	92-18 23-May-2002	92-18 06-Nov-2002	92-18 30-May-2003	92-18 09-Oct-2003	92-18 14-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	356	315	304	216	198	200	--	194
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	7	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	292	258	249	189	162	164	161	159
Ammonia Nitrogen	mg/l	--	--	0.07	0.21	0.2	0.03	0.02	0.01	0.03	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	1	--
Chemical Oxygen Demand	mg/l	--	--	--	13	22	3	9	2	2	11
Chloride	mg/l	--	250	614	468	1470	89.1	103	102	100	108
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2490	1750	454	640	468	540	720	710
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	37	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	394	379	866	191	186	199	197	211
Nitrate as N	mg/l	10.0	--	0.7	0.4	0.9	0.2	0.2	0.2	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.52	0.46	0.67	0.05	0.21	0.12	0.19	0.28
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.6	6.8	6.08	7.21	8.2	7.1	7.5	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.28	0.58	0.13	0.17	0.19	0.24	0.4	1.41
Sulphate	mg/l	--	500 [4]	85	72	146	29	29	28	36	25
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1290	1150	2900	436	340	270	365	355
Total Organic Carbon	mg/l	--	--	--	6.1	11	16	2.8	3.5	5	2.4
Total Suspended Solids	mg/l	--	--	348	415	117	94	251	100	280	1180
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.002	0.003	0.002	0.002	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.06	0.05	0.07	0.05	0.06	0.04	0.043	0.038
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	123	124	282	50.8	49.2	53	51.3	56.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.002	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.59	0.03	0.05	0.02	0.02	0.11	0.792	0.005
Lead, dissolved	mg/l	0.01	--	0.0022	0.0002	0.0002	0.0002	0.0009	0.0003	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	21	16.8	39.3	15.6	15.4	16.1	16.8	17.2
Manganese, dissolved	mg/l	--	0.05	2.38	1.68	1.5	0.01	0.01	0.01	0.012	0.003
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.04	0.02	0.02	0.02	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	14.6	6.2	22.7	5.3	5.6	4.3	4.8	4.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	411	272	730	56.7	55.8	61.5	58.2	57.4
Zinc, dissolved	mg/l	--	5	0.02	0.01	0.01	0.01	0.02	0.01	0.005	0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.042	0.001	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 24-Oct-2000	92-18 14-Jun-2001	92-18 23-Nov-2001	92-18 23-May-2002	92-18 06-Nov-2002	92-18 30-May-2003	92-18 09-Oct-2003	92-18 14-May-2004
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 19-Nov-2004	92-18 24-May-2005	92-18 16-Nov-2005	92-18 25-May-2006	92-18 21-Nov-2006	92-18 15-May-2007	92-18 30-Nov-2007	92-18 22-May-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	212	220	220	172	184	177	183	150
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	170	180	180	170	184	177	183	150
Ammonia Nitrogen	mg/l	--	--	0.05	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	6	<5	<5	7	27	47	<5
Chloride	mg/l	--	250	117	135	132	156	156	175	176	175
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	900	1200	1000	400	725	700	525	850
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	215	258	258	244	265	297	281	301
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.3	0.1	<0.1	0.2	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.31	0.31	0.05	0.13	0.1	0.1	0.28	0.18
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	6	8	8.3	6.9	8.3	7.5	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.18	0.8	0.12	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	25	31	29	29	27	30	28	28
Temperature (Field)	deg c	--	15	--	12.6	10.5	5.5	5	8.8	6	11
Total Dissolved Solids	mg/l	--	500	450	437	429	432	456	489	481	467
Total Organic Carbon	mg/l	--	--	2.5	1.9	3.5	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	468	1560	531	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.001	0.001	0.0035	0.0041	0.0037	0.0036
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.049	0.026	0.049	0.034	0.041	0.037	0.042	0.037
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	57.4	67.5	68.6	64.6	69.9	79.2	74.5	81.1
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.004	0.003	0.005	0.01	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Lead, dissolved	mg/l	0.01	--	0.0002	0.0005	<0.0002	<0.0002	<0.0001	0.00004	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	17.3	21.8	21	20.2	22	24.2	23	23.9
Manganese, dissolved	mg/l	--	0.05	0.01	<0.001	0.002	0.001	0.178	0.002	0.027	0.002
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.3	4.9	6.1	4.5	5.5	5.2	5.5	4.9
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	57	73	68.9	59.3	64.7	67.7	63.7	63.7
Zinc, dissolved	mg/l	--	5	0.005	0.008	0.01	<0.005	0.008	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 19-Nov-2004	92-18 24-May-2005	92-18 16-Nov-2005	92-18 25-May-2006	92-18 21-Nov-2006	92-18 15-May-2007	92-18 30-Nov-2007	92-18 22-May-2008
Semi-VOCs											
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 10-Nov-2008	92-18 19-May-2009 G-1	92-18 26-Nov-2009 M-12	92-18 25-May-2010 [14] M-2	92-18 20-Oct-2010 [14] G-2	92-18 24-May-2011 [14] G-5	92-18 29-Nov-2011 [14] 92-18	92-18 31-May-2012 92-18
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	183	174	175	168	172	174	177	170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	1.8
Alkalinity (Total as CaCO3)	mg/l	--	--	180	174	175	168	172	174	177	180
Ammonia Nitrogen	mg/l	--	--	<0.01	0.02	0.02	<0.02	0.03	<0.02	0.04	<0.050
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	<5	5	13	10	15	8	25	12
Chloride	mg/l	--	250	182	179	197	193	215	213	226	210
Conductivity	uS/cm	--	--	--	1000	1010	1060	1060	1090	1120	--
Conductivity (Field)	uS/cm	--	--	825	800	834	1119	1020	1021	1028	1076
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	296	315	297	345	365	352	358	410
Nitrate as N	mg/l	10.0	--	0.2	0.24	0.13	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.08	0.16	<0.10	<0.10	<0.10	<0.10	0.14	0.51
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	7.98	8.09	8.11	7.91	8.22	8.15	8.05
pH (Field)	-	--	--	7.8	--	7.58	6.95	7.61	7.85	7.71	6.73
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.18	0.15	0.08	0.09	0.11	0.07	0.054
Sulphate	mg/l	--	500 [4]	27	26	31	28	28	28	29	27
Temperature (Field)	deg c	--	15	9	7	9.7	14.8	10.1	13.6	9.3	10.2
Total Dissolved Solids	mg/l	--	500	491	650	657	689	689	708	728	836
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0032	0.003	0.002	<0.01	<0.01	<0.01	<0.01	0.0028
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.036	0.05	0.05	0.04	0.04	0.04	0.05	0.043
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	79.8	85	81	92	100	93	97	110
Chromium, dissolved	mg/l	0.05	--	<0.002	0.005	0.004	0.002	0.004	0.003	0.003	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.0002	<0.0002	<0.0002	0.0005	0.0003	<0.0002	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.003	0.003	0.001	0.004	<0.001	0.0036
Iron, dissolved	mg/l	--	0.3	<0.005	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	23.4	25	23	28	28	29	28	33
Manganese, dissolved	mg/l	--	0.05	<0.001	<0.01	<0.01	<0.01	0.40	<0.01	0.21	0.079
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	5	5	6	5	5	5	5.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	62.9	63	65	66	68	64	67	76
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	0.01	<0.01	0.01	<0.01	0.011
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 10-Nov-2008	92-18 19-May-2009 G-1	92-18 26-Nov-2009 M-12	92-18 25-May-2010 [14] M-2	92-18 20-Oct-2010 [14] G-2	92-18 24-May-2011 [14] G-5	92-18 29-Nov-2011 [14] 92-18	92-18 31-May-2012 92-18
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 28-Nov-2012 92-18	92-18 29-May-2013 92-18	92-18 26-Nov-2013 GW-17	92-18 29-May-2014 92-18	92-18 19-Nov-2014 92-18	92-18 02-Jun-2015 92-18	92-18 26-Nov-2015 92-18	92-18 26-May-2016 92-18
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	190	170	170	180	180	181	184	195
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.5	1.7	1.7	2.0	1.5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	190	170	180	180	180	182	185	196
Ammonia Nitrogen	mg/l	--	--	0.093	0.082	<0.050	<0.050	0.051	0.08	0.07	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	22	6.8	23	6.3	<4.0	21	13	12
Chloride	mg/l	--	250	220	230	230	270	260	356	340	329
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1084	1032	1081	1105	1215	1238	1282	1362
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	370	430	310	460	410	395	358	469
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.36	0.31	0.30	0.43	0.22	0.2	0.2	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.04	8.02	8.09	7.97	--	--	--
pH (Field)	-	--	--	7.81	6.40	6.42	7.57	7.95	7.40	8.11	7.42
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.13	0.20	0.11	0.089	0.26	0.15	0.11	0.15
Sulphate	mg/l	--	500 [4]	28	28	26	31	30	31	30	35
Temperature (Field)	deg c	--	15	7.5	9.6	7.7	11.8	5.4	9.1	9.5	10.1
Total Dissolved Solids	mg/l	--	500	636	852	836	912	778	884	836	1080
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.002	0.0030	0.0023	0.0032	0.0028	0.003	0.003	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.04	0.033	0.042	0.04	0.034	0.024	0.033	0.025
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	97	120	83	120	110	92.8	98.2	123
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.001	0.0027	0.0012	0.0031	0.0020	<0.0005	<0.0005	0.0013
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	0.00051	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31	34	25	37	34	39.7	27.2	39
Manganese, dissolved	mg/l	--	0.05	0.004	0.0048	0.0080	<0.0020	<0.0020	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.5	5.7	5.4	6.1	5.7	5.15	4.89	7.06
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	67	76	57	85	76	86.4	85.3	83.8
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.0056	0.0051	<0.0050	0.007	0.007	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 28-Nov-2012 92-18	92-18 29-May-2013 92-18	92-18 26-Nov-2013 GW-17	92-18 29-May-2014 92-18	92-18 19-Nov-2014 92-18	92-18 02-Jun-2015 92-18	92-18 26-Nov-2015 92-18	92-18 26-May-2016 92-18
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 17-Nov-2016 92-18	92-18 24-May-2017 92-18	92-18 29-Nov-2017 92-18	92-18 24-May-2018 92-18	92-18 29-Nov-2018 92-18	92-18 19-Jun-2019 92-18	92-18 20-Nov-2019 92-18	92-18 21-May-2020 92-18
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	193	204	202	213	213	197	187	200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	193	205	203	214	214	198	189	202
Ammonia Nitrogen	mg/l	--	--	0.12	0.03	0.11	0.03	0.03	0.03	0.03	0.08
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	12	39	22	53	30	72	14	17
Chloride	mg/l	--	250	307	325	361	348	333	356	393	456
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1439	1373	1318	1463	1331	1395	1505	1434
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	462	495	442	499	455	511	539	499
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.2	0.3	0.3	0.3	0.3	0.1	<0.1	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.61	7.44	6.53	7.34	6.5	6.24	7.65	7.76
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.18	0.19	0.49	0.27	0.44	0.09	0.10	0.30
Sulphate	mg/l	--	500 [4]	33	33	36	36	36	38	<1	48
Temperature (Field)	deg c	--	15	10.9	9.3	8.9	8.8	8.2	12.1	7.6	9.7
Total Dissolved Solids	mg/l	--	500	886	1080	882	1280	882	1040	976	1140
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004	0.004	0.003	0.003	0.004	0.004	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.03	0.029	0.06	0.028	0.048	0.026	0.031	0.024
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	126	140	117	134	119	132	140	130
Chromium, dissolved	mg/l	0.05	--	0.004	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0030	0.0019	0.0013	0.0013	0.0023	0.0022	0.0028	0.0038
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	35.9	35.4	36.4	40	38.2	43.8	46.4	42.4
Manganese, dissolved	mg/l	--	0.05	<0.005	0.018	<0.005	0.008	<0.005	<0.005	0.182	0.013
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.1	5.87	6.15	6.17	6.83	7.89	8.73	7.02
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	82.6	84.6	79.4	89.6	81.5	96	97.6	95.6
Zinc, dissolved	mg/l	--	5	0.014	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 17-Nov-2016 92-18	92-18 24-May-2017 92-18	92-18 29-Nov-2017 92-18	92-18 24-May-2018 92-18	92-18 29-Nov-2018 92-18	92-18 19-Jun-2019 92-18	92-18 20-Nov-2019 92-18	92-18 21-May-2020 92-18
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 26-Nov-2020 92-18	92-18 26-May-2021 92-18	92-18 30-Nov-2021 92-18
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	210	199	197
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	212	200	199
Ammonia Nitrogen	mg/l	--	--	0.29	0.07	0.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	166	20	114
Chloride	mg/l	--	250	363	353	368
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1387	1563	1533
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	484	522	445
Nitrate as N	mg/l	10.0	--	<0.1	0.2	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.8	0.1	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	7.43	7.79	7.84
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	5.50	0.35	0.90
Sulphate	mg/l	--	500 [4]	36	36	35
Temperature (Field)	deg c	--	15	7.4	10.0	6.9
Total Dissolved Solids	mg/l	--	500	1090	954	896
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.003	0.004	0.003
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.025	0.023	0.025
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	126	137	120
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0015	0.0016	0.0025
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	41.2	44	35.1
Manganese, dissolved	mg/l	--	0.05	0.02	<0.005	0.582
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.46	7.2	6.05
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	92.7	98.2	79.9
Zinc, dissolved	mg/l	--	5	0.008	0.005	0.007
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 26-Nov-2020 92-18	92-18 26-May-2021 92-18	92-18 30-Nov-2021 92-18
Semi-VOCs						
Naphthalene	mg/l	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 09-Jun-1992	92-19 01-Nov-1992	92-19 08-Jun-1993	92-19 15-Jun-1994	92-19 02-Nov-1994	92-19 28-Jun-1995	92-19 22-Nov-1995	92-19 12-Jun-1996
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	390	283	381	--	326	336	327	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	--	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	320	232	312	320	267	276	268	242
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	0.1	0.06	0.01	0.02
Chemical Oxygen Demand	mg/l	--	--	--	--	--	34	77	35	33	11
Chloride	mg/l	--	250	254	97.8	315	860	400	250	156	25
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1688	934	1750	2490	1950	2120	1180	470
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	9.69	8.52	--	--
Hardness, Calcium Carbonate	mg/l	--	--	687.61	459	719	637	561	605	525	137
Nitrate as N	mg/l	10.0	--	--	--	0.6	0.1	0.42	0.1	0.7	0.6
Nitrite as N	mg/l	1.0	--	--	--	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	2.3	29	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	2.24	28.99	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.69	7.09	6.35	6.5	6.73	6.64	6.9	7.88
Phosphate	mg/l	--	--	--	--	--	--	--	--	0.4	--
Phosphorus	mg/l	--	--	--	--	--	0.3	0.203	0.62	--	--
Sulphate	mg/l	--	500 [4]	165	146.5	154	147	116	107	118	35
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	--	--	4900
Total Organic Carbon	mg/l	--	--	--	--	--	9	9.4	8.8	55	4.1
Total Suspended Solids	mg/l	--	--	--	--	1140	1260	980	1060	590	240
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	0.168	--	0.093	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	**0.1**	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	0.164	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	0.07	0.078	0.01	0.01	0.04
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	**0.01**	0.0001	0.0001	--
Calcium, dissolved	mg/l	--	--	189.1	138	210	167	154.8	176	157	34.9
Chromium, dissolved	mg/l	0.05	--	--	--	0.015	0.01	0.01	0.02	0.03	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.012	0.0113	0.01	0.02	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.47	0.621	0.412	0.02	0.36	0.492
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	0.0008	**0.1**	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	52.18	27.8	47.3	53.4	23.506	39.6	31.7	11.9
Manganese, dissolved	mg/l	--	0.05	--	--	2.722	1.449	1.056	1.02	0.52	0.054
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.03	0.02	0.02
Potassium, dissolved	mg/l	--	--	5.39	5.33	6.9	11.6	3.634	--	8.9	4.03
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	89.81	33.5	112	185	164.6	180	130	45.7
Zinc, dissolved	mg/l	--	5	--	--	0.037	0.01	0.018	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.047	0.001	0.001	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 09-Jun-1992	92-19 01-Nov-1992	92-19 08-Jun-1993	92-19 15-Jun-1994	92-19 02-Nov-1994	92-19 28-Jun-1995	92-19 22-Nov-1995	92-19 12-Jun-1996
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 12-Oct-1996	92-19 18-Jun-1997	92-19 06-Nov-1997	92-19 05-Jun-1998	92-19 29-Oct-1998	92-19 06-May-1999	92-19 19-Oct-1999	92-19 05-May-2000
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	205	222	244	227
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	183	158	188	174	168	182	200	186
Ammonia Nitrogen	mg/l	--	--	0.36	0.41	0.14	0.11	0.07	0.01	0.11	0.03
Chemical Oxygen Demand	mg/l	--	--	15	6	5	20	3	3	3	3
Chloride	mg/l	--	250	26.3	28	29	40.5	41.9	46.1	46.8	51.8
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	450	480	450	521	493	540	521	575
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	3.75	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	134	160	152	153	129	163	168	174
Nitrate as N	mg/l	10.0	--	0.4	0.1	0.1	1	--	--	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	0.51	0.4	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.62	7.64	6.05	--	7.5	7.4	7.8	7.9
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	32	33	21	61	28	30	24	25
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2580	2740	--	--	--	--	3100	5840
Total Organic Carbon	mg/l	--	--	3.6	3.2	3.9	3.1	4.8	3.2	3.2	3.4
Total Suspended Solids	mg/l	--	--	230	240	220	260	245	270	260	288
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.05	0.04	0.04	0.21	0.22	0.05	0.15	0.13
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.6	43.4	41.1	38.8	35.5	40	44.6	46.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.07	0.56	0.53	2.24	2.03	0.02	1.94	2.87
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	10.8	12.4	11.9	13.4	9.83	13.8	13.6	14
Manganese, dissolved	mg/l	--	0.05	0.05	0.04	0.05	0.07	0.08	0.01	0.09	0.06
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	3.8	0.9	6.8	8	4.5	4.2	4.4	2.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	40.7	40.1	39.7	67.8	50	55.6	60	62.1
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.12	0.08	0.02	0.03	0.03
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 12-Oct-1996	92-19 18-Jun-1997	92-19 06-Nov-1997	92-19 05-Jun-1998	92-19 29-Oct-1998	92-19 06-May-1999	92-19 19-Oct-1999	92-19 05-May-2000
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 24-Oct-2000	92-19 14-Jun-2001	92-19 23-Nov-2001	92-19 23-May-2002	92-19 06-Nov-2002	92-19 30-May-2003	92-19 09-Oct-2003	92-19 14-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	228	216	201	395	326	355	--	381
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	7	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	187	189	165	324	267	291	273	312
Ammonia Nitrogen	mg/l	--	--	0.01	0.08	0.11	0.24	0.31	0.1	0.23	0.06
Chemical Oxygen Demand	mg/l	--	--	--	6	4	10	28	14	21	26
Chloride	mg/l	--	250	63.5	75.9	76.7	502	617	168	582	293
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	564	500	508	1890	2630	1440	3020	2230
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	62	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	144	181	189	554	503	441	418	469
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.2	0.5	0.4	0.6	0.3	1.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.37	0.37	0.22	0.36	0.73	0.45	0.6	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.62	8	7.49	6.68	8.66	6.4	7	6.8
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.9	1.49	0.14	0.2	0.21	0.22	0.35	0.66
Sulphate	mg/l	--	500 [4]	28	29	28	103	117	166	109	146
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	870	3910	136	168	308	246	294	796
Total Organic Carbon	mg/l	--	--	--	2.6	4	6	9	8.7	10	9.1
Total Suspended Solids	mg/l	--	--	310	366	320	1370	1510	720	1307	1115
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.003	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.05	0.05	0.07	0.07	0.06	0.06	0.06	0.057
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	37.5	49.5	49.7	183	165	150	140	159
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.005	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.008	0.004
Iron, dissolved	mg/l	--	0.3	0.05	0.02	0.13	0.02	0.11	0.51	2.3	0.019
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0016	0.0002	0.0007	0.0002
Magnesium, dissolved	mg/l	--	--	12.3	13.9	15.7	23.6	22	16.2	16.6	17.5
Manganese, dissolved	mg/l	--	0.05	0.02	0.01	0.02	1.8	1.35	0.74	1.77	0.847
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	3.4	0.4	1.9	16.7	16.9	11.3	14.7	13.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	52.4	55.2	60.6	284	320	151	367	202
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.03	0.01	0.01	0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.048	0.001	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 24-Oct-2000	92-19 14-Jun-2001	92-19 23-Nov-2001	92-19 23-May-2002	92-19 06-Nov-2002	92-19 30-May-2003	92-19 09-Oct-2003	92-19 14-May-2004
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 19-Nov-2004	92-19 24-May-2005	92-19 16-Nov-2005	92-19 25-May-2006	92-19 21-Nov-2006	92-19 15-May-2007	92-19 30-Nov-2007	92-19 22-May-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	370	332	227	286	284	364	332	237
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	303	272	186	286	284	364	332	240
Ammonia Nitrogen	mg/l	--	--	0.19	0.06	0.1	0.27	0.06	0.14	0.31	<0.01
Chemical Oxygen Demand	mg/l	--	--	23	21	22	9	9	97	61	14
Chloride	mg/l	--	250	736	199	271	298	463	571	957	318
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3060	1400	1400	1425	2100	1400	2700	1800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	436	179	146	371	484	367	421	354
Nitrate as N	mg/l	10.0	--	1	0.2	0.1	0.2	0.9	1.1	0.7	1.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.73	0.6	0.45	0.54	0.5	0.91	0.87	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	5.8	8.57	7.5	6.5	7.7	6.5	6.7
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.73	0.51	0.55	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	110	87	60	119	82	121	111	105
Temperature (Field)	deg c	--	15	--	10.8	9.2	7	7	8.9	5	10
Total Dissolved Solids	mg/l	--	500	296	695	715	855	1150	1420	1920	887
Total Organic Carbon	mg/l	--	--	8.7	9.5	10.7	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1530	250	118	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.001	0.0013	0.0011	0.0018	0.0014
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.064	0.04	0.067	0.037	0.045	0.078	0.071	0.063
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.0005	<0.005	0.0002	0.00014	0.00012	<0.00002
Calcium, dissolved	mg/l	--	--	147	55.8	46.8	127	164	125	145	121
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.006	0.007	0.008	0.003	0.003	0.006	0.004	0.002
Iron, dissolved	mg/l	--	0.3	0.128	0.015	0.062	0.071	0.032	0.1	0.06	0.006
Lead, dissolved	mg/l	0.01	--	0.0006	0.0004	<0.0002	<0.0002	<0.0001	0.00006	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	16.5	9.61	6.94	13.2	18.1	13.6	14.4	12.4
Manganese, dissolved	mg/l	--	0.05	1.74	0.118	0.399	0.598	1.56	1.19	1.65	0.774
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13.7	6.3	5.9	7.9	11.5	10.1	9.7	7.7
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	413	179	219	125	237	357	478	175
Zinc, dissolved	mg/l	--	5	0.005	0.006	0.009	0.006	0.009	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 19-Nov-2004	92-19 24-May-2005	92-19 16-Nov-2005	92-19 25-May-2006	92-19 21-Nov-2006	92-19 15-May-2007	92-19 30-Nov-2007	92-19 22-May-2008
Semi-VOCs											
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 10-Nov-2008	92-19 19-May-2009 G-2	92-19 26-Nov-2009 J-16	92-19 25-May-2010 M-1	92-19 20-Oct-2010 G-1	92-19 24-May-2011 G-1	92-19 29-Nov-2011 92-19	92-19 31-May-2012 92-19
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	264	290	361	235	344	336	362	320
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<1.0
Alkalinity (Total as CaCO3)	mg/l	--	--	260	290	361	235	344	336	362	320
Ammonia Nitrogen	mg/l	--	--	0.17	0.09	0.25	0.07	<0.02	<0.02	<0.02	<0.050
Chemical Oxygen Demand	mg/l	--	--	22	13	33	28	30	25	28	24
Chloride	mg/l	--	250	459	432	594	325	738	434	67	110
Conductivity	uS/cm	--	--	--	2120	2700	1740	3100	2220	1020	--
Conductivity (Field)	uS/cm	--	--	3100	1900	2300	926	2994	1943	1044	1192
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	351	411	391	283	725	440	419	340
Nitrate as N	mg/l	10.0	--	0.8	0.59	0.16	<0.10	1.28	0.81	1.07	4.1
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.6	0.33	0.48	0.20	0.48	0.35	0.18	0.88
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	4.2
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	7.17	7.50	7.67	7.04	7.76	7.61	7.51
pH (Field)	-	--	--	6.7	--	6.63	6.70	6.46	6.52	6.64	6.69
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	1.13	0.20	0.99	0.29	0.76	0.30	0.22
Sulphate	mg/l	--	500 [4]	72	86	90	56	118	109	85	140
Temperature (Field)	deg c	--	15	11	7	9.6	13.6	11.3	11.4	10.0	9.5
Total Dissolved Solids	mg/l	--	500	1060	1380	1760	1130	2010	1440	663	774
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.044	0.05	0.08	0.05	0.07	0.07	0.06	0.052
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	120	140	130	92	244	148	143	120
Chromium, dissolved	mg/l	0.05	--	<0.002	0.009	<0.005	0.003	0.009	0.007	0.004	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	0.0005	0.0009	0.0019	0.0021	0.0016	0.0008	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.004	0.007	0.005	0.008	0.010	0.003	0.0035
Iron, dissolved	mg/l	--	0.3	0.305	<0.03	<0.03	0.08	0.09	0.12	0.10	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	12.2	15	16	13	28	17	15	11
Manganese, dissolved	mg/l	--	0.05	0.29	0.22	0.60	1.09	1.51	0.74	0.37	0.13
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.7	8	8	7	12	8	6	5.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	227	246	466	221	290	266	49	100
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	<0.01	<0.01	0.01	0.02	<0.01	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 10-Nov-2008	92-19 19-May-2009 G-2	92-19 26-Nov-2009 J-16	92-19 25-May-2010 M-1	92-19 20-Oct-2010 G-1	92-19 24-May-2011 G-1	92-19 29-Nov-2011 92-19	92-19 31-May-2012 92-19
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 28-Nov-2012	92-19 29-May-2013	92-19 26-Nov-2013	92-19 29-May-2014	92-19 19-Nov-2014	92-19 02-Jun-2015	92-19 26-Nov-2015	92-19 26-May-2016
				92-19	92-19	GW-18	92-19	92-19	92-19	92-19	92-19
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	360	360	310	360	260	300	391	328
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.6	1.1	<1.0	<1.0	<1.0	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	360	360	310	360	260	300	391	328
Ammonia Nitrogen	mg/l	--	--	0.082	0.080	<0.050	0.14	<0.050	0.06	0.04	0.05
Chemical Oxygen Demand	mg/l	--	--	23	31	20	34	9.3	30	53	30
Chloride	mg/l	--	250	110	84	220	170	100	118	163	84
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1256	1200	1449	1579	1081	1493	1583	1308
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	570	440	430	420	270	294	470	353
Nitrate as N	mg/l	10.0	--	2.1	<0.10	<0.10	<0.10	0.39	0.3	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.60	0.72	0.68	0.95	0.32	0.4	0.5	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	2.1	<0.10	<0.10	<0.10	0.39	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	7.50	7.50	7.45	7.39	--	--	--
pH (Field)	-	--	--	6.64	6.13	6.53	6.80	6.83	6.66	6.84	6.92
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.26	0.48	0.20	0.14	0.19	0.11	0.10	0.11
Sulphate	mg/l	--	500 [4]	180	210	190	300	98	231	268	255
Temperature (Field)	deg c	--	15	7.3	8.7	9.5	10.4	8.5	8.5	10.1	8.6
Total Dissolved Solids	mg/l	--	500	1080	840	952	1100	458	836	990	866
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.046	0.071	0.06	0.074	0.08	0.057	0.074	0.067
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	0.00011	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	200	150	140	140	92	92.8	154	108
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0010	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.0062	0.0048	0.0081	0.0045	<0.0005	0.0024	0.0038
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	19	17	17	18	10	15	20.5	20
Manganese, dissolved	mg/l	--	0.05	0.27	0.62	0.18	0.49	0.079	0.012	0.141	0.114
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.9	7.7	6.5	7.1	5	4.28	6.65	6.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	89	230	110	210	65	70.3	173	121
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.032	0.011	0.0059	0.007	0.008	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 28-Nov-2012 92-19	92-19 29-May-2013 92-19	92-19 26-Nov-2013 GW-18	92-19 29-May-2014 92-19	92-19 19-Nov-2014 92-19	92-19 02-Jun-2015 92-19	92-19 26-Nov-2015 92-19	92-19 26-May-2016 92-19
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 17-Nov-2016	92-19 24-May-2017	92-19 29-Nov-2017	92-19 24-May-2018	92-19 29-Nov-2018	92-19 19-Jun-2019	92-19 20-Nov-2019	92-19 21-May-2020
				92-19	92-19	92-19	92-19	92-19	92-19	92-19	92-19
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	381	354	309	290	400	191	332	266
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	381	354	309	291	400	191	332	267
Ammonia Nitrogen	mg/l	--	--	0.04	0.10	0.07	0.07	0.17	0.10	0.04	0.08
Chemical Oxygen Demand	mg/l	--	--	36	36	45	92	45	14	30	21
Chloride	mg/l	--	250	85	115	119	60	420	76	93	47
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1414	1291	1081	949	1625	719	1113	767
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	408	457	392	303	393	213	428	270
Nitrate as N	mg/l	10.0	--	0.3	<0.1	4.7	0.2	<0.1	<0.1	0.3	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.6	0.5	0.5	0.8	0.2	0.2	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.67	6.94	6.41	6.86	6.54	6.48	6.72	7.68
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.14	0.16	0.11	0.14	0.19	0.17	0.16	0.08
Sulphate	mg/l	--	500 [4]	250	171	199	96	158	39	123	115
Temperature (Field)	deg c	--	15	11.2	9.5	7.9	8.0	8.5	10.5	9.4	8.1
Total Dissolved Solids	mg/l	--	500	750	782	756	520	1280	406	662	464
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.077	0.067	0.106	0.054	0.111	0.047	0.078	0.052
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	130	150	127	97.6	127	67.7	137	86.3
Chromium, dissolved	mg/l	0.05	--	0.007	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0019	0.0014
Copper, dissolved	mg/l	--	1	0.0064	0.0064	0.0051	0.0033	0.0035	0.0027	0.0021	0.0076
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.199
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	20	20.2	18.2	14.5	18.6	10.7	21.1	13.3
Manganese, dissolved	mg/l	--	0.05	0.096	0.12	0.05	0.612	0.436	0.023	1.04	3.13
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.15	5.7	5.31	4.22	7.3	3.12	10.8	6.54
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	137	124	86.4	48.1	38	42.3	69.8	69.5
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.006	<0.005	0.009	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 17-Nov-2016	92-19 24-May-2017	92-19 29-Nov-2017	92-19 24-May-2018	92-19 29-Nov-2018	92-19 19-Jun-2019	92-19 20-Nov-2019	92-19 21-May-2020
				92-19	92-19	92-19	92-19	92-19	92-19	92-19	92-19
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 26-Nov-2020 92-19	92-19 26-May-2021 92-19	92-19 30-Nov-2021 92-19
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	338	312	412
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	339	312	412
Ammonia Nitrogen	mg/l	--	--	0.05	0.06	0.37
Chemical Oxygen Demand	mg/l	--	--	50	20	180
Chloride	mg/l	--	250	143	222	323
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1342	1663	1801
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	403	500	487
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.4	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	6.84	6.62	6.77
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.13	0.08	4.69
Sulphate	mg/l	--	500 [4]	148	210	188
Temperature (Field)	deg c	--	15	9.1	11.6	7.7
Total Dissolved Solids	mg/l	--	500	738	1030	1230
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Aluminum, dissolved	mg/l	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.06	0.05	0.051
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	129	160	151
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0012	<0.0005	0.0014
Copper, dissolved	mg/l	--	1	0.0027	0.0021	0.0078
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	19.5	24.2	27
Manganese, dissolved	mg/l	--	0.05	0.695	0.472	2.52
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.4	18.2	16.7
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	86	64.7	324
Zinc, dissolved	mg/l	--	5	0.009	0.007	0.006
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.002	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 26-Nov-2020 92-19	92-19 26-May-2021 92-19	92-19 30-Nov-2021 92-19
Semi-VOCs						
Naphthalene	mg/l	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 28-Jun-1995	95-4 22-Nov-1995	95-4 12-Jun-1996	95-4 12-Oct-1996	95-4 18-Jun-1997	95-4 06-Nov-1997	95-4 05-Jun-1998	95-4 29-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	158	142	--	--	--	--	--	239
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	130	116	143	179	123	170	156	196
Ammonia Nitrogen	mg/l	--	--	0.04	0.01	0.01	0.05	0.17	0.01	0.03	0.04
Chemical Oxygen Demand	mg/l	--	--	40	25	11	8	3	5	3	3
Chloride	mg/l	--	250	42	18.8	22	15.7	12.2	14.3	11.9	14.1
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	610	430	--	--	410	500	497	520
Dissolved Oxygen (Field)	mg/l	--	--	7.45	--	--	--	5.96	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	265	180	242	223	212	273	212	239
Nitrate as N	mg/l	10.0	--	11.6	5.8	9.1	7.7	5.6	6.8	6.7	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.5	0.48	--	--	--	--	--	0.47
Nitrogen, Organic	mg/l	--	--	3.46	0.47	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.99	7.35	--	--	7.31	6.15	--	7
Phosphate	mg/l	--	--	--	0.2	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.44	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	59	42	50	40	37	38	71	47
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	310	220	--	--	210	250	250	260
Total Organic Carbon	mg/l	--	--	2	1.7	2.3	2.8	2.2	3.1	1.7	4.2
Total Suspended Solids	mg/l	--	--	--	--	201	640	873	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.01	0.018	0.04	0.02	0.04	0.07	0.06
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	78.6	52.7	70	64.1	62.8	81.6	59.1	73.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.11	0.03	0.07	0.15	0.1	0.06	0.17
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	16.5	11.7	16.3	15.1	13.1	16.5	15.5	13.6
Manganese, dissolved	mg/l	--	0.05	0.06	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Nickel, dissolved	mg/l	--	--	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	9.5	4.6	4.6	0.6	6.5	5	5.3
Sodium, dissolved	mg/l	--	200 [5]	10.6	6.2	11.6	8.8	8.6	7.9	14.5	10.4
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.019	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 06-May-1999	95-4 19-Oct-1999	95-4 05-May-2000	95-4 24-Oct-2000	95-4 14-Jun-2001	95-4 23-Nov-2001	95-4 23-May-2002 [13]	95-4 06-Nov-2002 [13]
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	176	268	382	277	251	306	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	144	220	313	227	206	251	--	--
Ammonia Nitrogen	mg/l	--	--	0.01	0.04	0.01	0.01	0.01	0.01	--	--
Chemical Oxygen Demand	mg/l	--	--	4	6	3	--	5	3	--	--
Chloride	mg/l	--	250	7.1	10.2	37.7	16.9	11	10.3	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	370	460	850	630	500	522	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	185	233	479	216	268	302	--	--
Nitrate as N	mg/l	10.0	--	--	2.4	12.8	4.3	2.9	0.6	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.36	--	--	0.46	0.33	0.29	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	7.7	6.9	7.06	7.5	--	--	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.08	0.1	0.06	--	--
Sulphate	mg/l	--	500 [4]	34	39	97	63	47	30	--	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	190	230	425	354	320	468	--	--
Total Organic Carbon	mg/l	--	--	3.6	2.4	6.5	--	3.6	5	--	--
Total Suspended Solids	mg/l	--	--	--	182	154	108	259	74	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001	--	--
Boron, dissolved	mg/l	5	--	0.03	0.19	0.12	0.04	0.02	0.04	--	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	54.2	66.8	135	54.2	75.4	81	--	--
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	--	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	--	--
Iron, dissolved	mg/l	--	0.3	0.02	0.13	0.05	0.02	0.02	0.02	--	--
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0007	--	--
Magnesium, dissolved	mg/l	--	--	13.3	15.8	33.4	19.7	19.4	21	--	--
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.01	0.01	0.02	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	--	--
Potassium, dissolved	mg/l	--	--	0.4	5.1	2.2	5.4	2	0.4	--	--
Sodium, dissolved	mg/l	--	200 [5]	9.5	22.1	16.7	30	14.5	15.6	--	--
Zinc, dissolved	mg/l	--	5	0.01	0.1	0.14	0.03	0.01	0.01	--	--
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.007	0.001	--	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 30-May-2003 [13]	95-4 09-Oct-2003 [13]	95-4 14-May-2004 [13]	95-4 19-Nov-2004 [13]	95-4 24-May-2005 [13]	95-4 16-Nov-2005 [13]	95-4 25-May-2006	95-4 16-Nov-2006 [13]
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	222	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	--	--	--	--	222	--
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	--	<0.01	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--	36	--
Chloride	mg/l	--	250	--	--	--	--	--	--	5	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	--	--	--	--	460	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	--	--	--	--	323	--
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	--	1.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	0.64	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	--	--	--	--	7.8	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	--	--	--	--	--	--	124	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	9.5	--
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	--	393	--
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--	0.021	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.005	--
Calcium, dissolved	mg/l	--	--	--	--	--	--	--	--	84	--
Chromium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.002	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	--
Copper, dissolved	mg/l	--	1	--	--	--	--	--	--	0.003	--
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--	<0.005	--
Lead, dissolved	mg/l	0.01	--	--	--	--	--	--	--	<0.0002	--
Magnesium, dissolved	mg/l	--	--	--	--	--	--	--	--	27.5	--
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--	0.187	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	--	--	--	--	--	5.6	--
Sodium, dissolved	mg/l	--	200 [5]	--	--	--	--	--	--	14.2	--
Zinc, dissolved	mg/l	--	5	--	--	--	--	--	--	0.013	--
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	<0.001	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 15-May-2007 [13]	95-4 30-Nov-2007 [16]	95-4 22-May-2008 [13]	95-4 10-Nov-2008 [13]	95-4 19-May-2009 [13] 95-4	95-4 27-Nov-2009 J-52
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	112
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	--	--	--	112
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	<0.02
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	33
Chloride	mg/l	--	250	--	--	--	--	--	10
Conductivity	uS/cm	--	--	--	--	--	--	--	341
Conductivity (Field)	uS/cm	--	--	--	--	--	--	--	309
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	--	--	--	76
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	0.20
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	8.17
pH (Field)	-	--	--	--	--	--	--	--	8.97
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.21
Sulphate	mg/l	--	500 [4]	--	--	--	--	--	42
Temperature (Field)	deg c	--	15	--	--	--	--	--	8.4
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	222
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.004
Boron, dissolved	mg/l	5	--	--	--	--	--	--	0.07
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	--	--	--	--	--	19
Chromium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.0002
Copper, dissolved	mg/l	--	1	--	--	--	--	--	0.001
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	<0.03
Lead, dissolved	mg/l	0.01	--	--	--	--	--	--	<0.001
Magnesium, dissolved	mg/l	--	--	--	--	--	--	--	7
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	--	--	--	--	4
Sodium, dissolved	mg/l	--	200 [5]	--	--	--	--	--	40
Zinc, dissolved	mg/l	--	5	--	--	--	--	--	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0004
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0040
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 20-Oct-2010 G-13	95-4 24-May-2011 G-44	95-4 22-Nov-2011 [13] 95-4	95-4 31-May-2012 [17] 95-4
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	244	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [15]	6	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	310	250	--	--
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	--	--
Chemical Oxygen Demand	mg/l	--	--	25	10	--	--
Chloride	mg/l	--	250	10	8	--	--
Conductivity	uS/cm	--	--	701	550	--	--
Conductivity (Field)	uS/cm	--	--	701	552	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	342	267	--	--
Nitrate as N	mg/l	10.0	--	<0.10	0.15	--	--
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.34	0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	8.16	8.40	--	--
pH (Field)	-	--	--	7.46	7.49	--	--
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.09	0.07	--	--
Sulphate	mg/l	--	500 [4]	63	42	--	--
Temperature (Field)	deg c	--	15	13.8	16.9	--	--
Total Dissolved Solids	mg/l	--	500	456	358	--	--
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--
Boron, dissolved	mg/l	5	--	0.05	0.03	--	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	--	--
Calcium, dissolved	mg/l	--	--	86	69	--	--
Chromium, dissolved	mg/l	0.05	--	0.003	<0.001	--	--
Cobalt, dissolved	mg/l	--	--	0.0005	0.0003	--	--
Copper, dissolved	mg/l	--	1	0.003	0.006	--	--
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	--	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--
Magnesium, dissolved	mg/l	--	--	31	23	--	--
Manganese, dissolved	mg/l	--	0.05	0.25	0.03	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6	4	--	--
Sodium, dissolved	mg/l	--	200 [5]	18	15	--	--
Zinc, dissolved	mg/l	--	5	<0.01	0.02	--	--
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	--	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	--	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	--	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 28-Jun-1995	95-8 22-Nov-1995	95-8 12-Jun-1996	95-8 12-Oct-1996	95-8 18-Jun-1997	95-8 06-Nov-1997	95-8 05-Jun-1998	95-8 29-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	173	174	--	--	--	--	--	161
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	142	143	151	143	123	150	150	132
Ammonia Nitrogen	mg/l	--	--	0.18	0.15	0.12	0.11	0.01	0.09	0.22	0.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	33	13	15	3	3	19	3
Chloride	mg/l	--	250	122	121	115	130	136	146	140	142
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	840	860	810	850	840	770	836	888
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	8.18	--	--	--	2.84	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	251	265	259	234	288	288	242	227
Nitrate as N	mg/l	10.0	--	0.1	0.3	0.1	0.1	0.1	0.1	1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	4.5	--	--	--	--	--	0.49
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.32	4.35	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.23	6.87	7.26	7	6.18	--	6.7
Phosphate	mg/l	--	--	--	1.4	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.66	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	74	84	76	79	72	64	92	75
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	420	440	410	430	420	360	416	445
Total Organic Carbon	mg/l	--	--	7.3	3.6	5.9	4.8	3.8	5.3	5.2	6.2
Total Suspended Solids	mg/l	--	--	--	--	1480	1780	1230	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.01	0.021	0.05	0.03	0.04	0.14	0.07
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	56.3	56	57.7	50.7	69.5	65	52.3	50.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.75	3.79	0.56	2.22	0.4	1.58	2.72
Lead, dissolved	mg/l	0.01	--	0.0002	0.0004	0.0002	0.0002	0.0002	0.0015	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	26.7	30	27.4	25.7	27.3	30.1	26.6	24.8
Manganese, dissolved	mg/l	--	0.05	0.24	0.27	0.383	0.25	0.39	0.27	0.3	0.37
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	7.6	6.98	3.8	7.7	7.5	6.5	9.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	63	67.7	78.5	71.1	71.8	61.4	93.9	69.1
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.35	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 28-Jun-1995	95-8 22-Nov-1995	95-8 12-Jun-1996	95-8 12-Oct-1996	95-8 18-Jun-1997	95-8 06-Nov-1997	95-8 05-Jun-1998	95-8 29-Oct-1998
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 06-May-1999	95-8 19-Oct-1999	95-8 05-May-2000	95-8 24-Oct-2000	95-8 14-Jun-2001	95-8 23-Nov-2001	95-8 23-May-2002	95-8 06-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	178	220	177	187	160	150	173	194
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	146	180	145	153	131	123	142	159
Ammonia Nitrogen	mg/l	--	--	0.03	0.08	0.01	0.04	0.31	0.03	0.22	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	3	13	--	11	4	3	12
Chloride	mg/l	--	250	135	151	138	152	139	136	144	158
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	840	908	700	780	850	750	770	652
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	266	269	259	208	230	238	250	247
Nitrate as N	mg/l	10.0	--	--	0.1	0.2	0.2	0.2	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.84	--	--	0.52	0.86	0.66	1.4	0.33
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.4	7.4	7.2	7.14	7.1	6.23	6.74	7.2
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	1.28	2.22	1.01	0.6	0.48
Sulphate	mg/l	--	500 [4]	68	71	67	75	76	79	77	64
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	430	450	350	486	496	448	564	576
Total Organic Carbon	mg/l	--	--	4.8	3.8	6	--	5	6	5	5.2
Total Suspended Solids	mg/l	--	--	--	712	598	1010	2150	682	436	554
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.04	0.16	0.12	0.04	0.04	0.05	0.04	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	61.4	61.4	58.2	41.6	54.3	51	53.1	53
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.17	1.47	1.73	0.03	0.08	0.04	1.8	0.75
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0002	0.0002	0.0008
Magnesium, dissolved	mg/l	--	--	27.1	27.6	27.2	25.2	22.9	26.8	28.4	27.9
Manganese, dissolved	mg/l	--	0.05	0.37	0.28	0.32	0.26	0.23	0.28	0.23	0.23
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5	7	2	4.5	2.4	2.6	6.5	7.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	81.3	90.5	71.7	90	70.1	71.1	64.6	76.7
Zinc, dissolved	mg/l	--	5	0.01	0.16	0.12	0.01	0.01	0.01	0.01	0.02
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.05	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 06-May-1999	95-8 19-Oct-1999	95-8 05-May-2000	95-8 24-Oct-2000	95-8 14-Jun-2001	95-8 23-Nov-2001	95-8 23-May-2002	95-8 06-Nov-2002
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 30-May-2003	95-8 09-Oct-2003	95-8 14-May-2004	95-8 19-Nov-2004	95-8 24-May-2005	95-8 16-Nov-2005	95-8 25-May-2006	95-8 21-Nov-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	154	--	162	275	310	222	358	492
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	126	184	133	230	254	364	358	492
Ammonia Nitrogen	mg/l	--	--	0.16	0.1	0.16	0.09	0.05	0.11	0.13	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	1	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	7	12	13	24	13	31	16	28
Chloride	mg/l	--	250	145	142	153	166	193	181	193	167
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	780	940	840	1110	1400	1300	1000	1300
Dissolved Inorganic Carbon	mg/l	--	--	--	44	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	231	265	233	310	366	579	408	552
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.2	0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.38	0.36	0.498	0.57	0.44	0.56	0.51	0.92
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.4	7	6.9	6.7	5.9	--	6.9	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.25	0.19	0.608	1.06	0.33	0.29	--	--
Sulphate	mg/l	--	500 [4]	65	73	71	77	79	107	90	103
Temperature (Field)	deg c	--	15	--	--	--	--	6.6	10.7	4	7.5
Total Dissolved Solids	mg/l	--	500	390	512	420	550	631	800	734	866
Total Organic Carbon	mg/l	--	--	5.2	10	3.6	5	5.2	10.2	--	--
Total Suspended Solids	mg/l	--	--	128	132	424	528	149	165	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	0.0007
Boron, dissolved	mg/l	5	--	0.03	0.039	0.027	0.038	0.025	0.044	0.038	0.043
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.005	0.0001
Calcium, dissolved	mg/l	--	--	48.9	56.5	48.9	66.9	75.8	124	86.3	119
Chromium, dissolved	mg/l	0.05	--	0.01	0.005	0.001	0.002	<0.002	0.003	<0.002	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.007	0.003	0.002	<0.002	0.007	0.004	0.011
Iron, dissolved	mg/l	--	0.3	1.13	2.73	0.497	0.205	2.02	0.674	2.16	1.17
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0006	<0.0002	<0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	26.4	30.2	27	34.8	42.9	65.7	46.7	62
Manganese, dissolved	mg/l	--	0.05	0.18	0.203	0.17	0.242	0.344	0.312	0.328	0.443
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	5.5	6.9	5.7	6.7	6.2	9.3	6.3	8.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [5]	68.4	90.3	70.9	89.2	85.1	103	100	110
Zinc, dissolved	mg/l	--	5	0.01	0.005	0.005	0.005	0.008	0.008	0.008	0.008
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.002	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 30-May-2003	95-8 09-Oct-2003	95-8 14-May-2004	95-8 19-Nov-2004	95-8 24-May-2005	95-8 16-Nov-2005	95-8 25-May-2006	95-8 21-Nov-2006
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 15-May-2007	95-8 30-Nov-2007	95-8 22-May-2008	95-8 10-Nov-2008	95-8 19-May-2009 G-12	95-8 27-Nov-2009 J-1	95-8 25-May-2010 [14] M-4	95-8 20-Oct-2010 G-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	507	531	501	519	417	417	475	452
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	507	531	501	519	417	417	475	452
Ammonia Nitrogen	mg/l	--	--	0.52	1.45	0.85	1.14	0.68	1.68	1.60	1.77
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	92	48	36	27	23	35	45	40
Chloride	mg/l	--	250	172	161	171	151	152	157	126	145
Conductivity	uS/cm	--	--	--	--	--	--	1350	1350	1410	1360
Conductivity (Field)	uS/cm	--	--	1100	1200	1300	1250	1000	1209	1511	1395
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	537	517	518	521	432	423	445	478
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	0.13
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.49	2.49	2	1.95	1.00	1.90	2.00	2.31
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.25	7.32	7.31	7.21
pH (Field)	-	--	--	7	6.7	6.5	6.5	--	6.64	6.48	6.63
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.4	0.09	0.11	0.06
Sulphate	mg/l	--	500 [4]	101	89	88	80	59	51	58	56
Temperature (Field)	deg c	--	15	6.3	5	8.5	7	5	4.7	9.4	8.8
Total Dissolved Solids	mg/l	--	500	881	879	871	857	878	878	917	884
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0011	0.0011	0.0013	0.001	<0.001	0.001	<0.01	<0.001
Boron, dissolved	mg/l	5	--	0.038	0.044	0.036	0.042	0.07	0.05	0.05	0.05
Cadmium, dissolved	mg/l	0.005	--	0.00007	<0.00002	<0.00002	0.00025	<0.0001	<0.0001	0.0003	0.0001
Calcium, dissolved	mg/l	--	--	115	117	117	122	97	97	104	114
Chromium, dissolved	mg/l	0.05	--	0.003	<0.002	0.002	0.002	0.007	0.008	0.008	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0014	0.0017	0.0029	0.0017
Copper, dissolved	mg/l	--	1	0.003	0.005	<0.002	0.045	0.010	0.005	0.046	0.005
Iron, dissolved	mg/l	--	0.3	3.16	1.55	3.35	0.038	0.03	3.11	0.54	2.83
Lead, dissolved	mg/l	0.01	--	0.00011	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	60.7	54.6	54.7	52.5	46	44	45	47
Manganese, dissolved	mg/l	--	0.05	0.508	0.551	0.593	1.36	1.12	1.57	2.30	1.54
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.5	10.7	9.4	12.4	8	10	10	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	114	127	125	124	111	116	102	116
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.005	<0.005	<0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 15-May-2007	95-8 30-Nov-2007	95-8 22-May-2008	95-8 10-Nov-2008	95-8 19-May-2009 G-12	95-8 27-Nov-2009 J-1	95-8 25-May-2010 [14] M-4	95-8 20-Oct-2010 G-11
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 24-May-2011 [18]	95-8 29-Nov-2011	95-8 31-May-2012	95-8 28-Nov-2012	95-8 29-May-2013 [19]	95-8 26-Nov-2013	95-8 29-May-2014	95-8 19-Nov-2014
				G-6	95-8	95-8	95-8	95-8	GW-13	95-8	95-8
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	486	521	540	690	700	670	710	670
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [15]	<2 [15]	1.2	1.6	1.5	1.2	1.9	1.0
Alkalinity (Total as CaCO3)	mg/l	--	--	486	521	540	690	700	670	720	680
Ammonia Nitrogen	mg/l	--	--	2.03	2.08	2.3	2.6	3.6	2.5	2.7	2.8
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	45	53	90	75	59	70	65
Chloride	mg/l	--	250	142	137	130	120	130	140	160	170
Conductivity	uS/cm	--	--	1410	1450	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1342	--	1416	1467	1448	1415	1576	1781
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	569	516	510	700	730	680	760	700
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.30	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.010	<0.010	0.010	<0.010	0.068	0.013
Nitrogen, Total Kjeldahl	mg/l	--	--	2.64	2.27	3.3	3.6	4.4	3.1	3.3	3.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	0.30	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.78	7.40	7.36	--	7.36	7.27	7.45	7.22
pH (Field)	-	--	--	6.57	--	6.51	6.51	6.61	6.73	6.57	6.62
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.02	0.08	0.058	0.052	0.19	0.11	0.07	0.063
Sulphate	mg/l	--	500 [4]	56	70	69	69	67	55	42	45
Temperature (Field)	deg c	--	15	13.2	--	11.0	7.4	12	8.7	9.2	6.0
Total Dissolved Solids	mg/l	--	500	916	942	872	990	1050	1010	1050	1010
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.05	0.04	0.056	0.052	0.054	0.057	0.065	0.063
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0002	0.00027	0.0004	0.00025	0.00023	0.00048	0.00050
Calcium, dissolved	mg/l	--	--	139	129	130	170	180	170	190	180
Chromium, dissolved	mg/l	0.05	--	0.006	0.006	<0.0050	<0.005	<0.0050	0.0059	0.0054	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0030	0.0020	0.0013	0.0029	0.0035	0.0032	0.0034	0.0027
Copper, dissolved	mg/l	--	1	0.037	0.046	0.054	0.05	0.011	0.031	0.015	0.0040
Iron, dissolved	mg/l	--	0.3	0.10	<0.03	<0.1	<0.1	1.6	<0.1	1.6	3.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	0.00060	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	54	47	49	64	64	62	69	64
Manganese, dissolved	mg/l	--	0.05	3.44	2.61	2.6	6.7	7.4	6.9	8.2	6.7
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16	13	13	19	18	16	17	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	94	100	100	100	100	100	120	120
Zinc, dissolved	mg/l	--	5	0.01	<0.01	0.0064	<0.005	0.0093	0.0087	0.0082	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 24-May-2011 [18] G-6	95-8 29-Nov-2011 95-8	95-8 31-May-2012 95-8	95-8 28-Nov-2012 95-8	95-8 29-May-2013 [19] 95-8	95-8 26-Nov-2013 GW-13	95-8 29-May-2014 95-8	95-8 19-Nov-2014 95-8
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.004	<0.0004	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.005	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.005	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.01	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.04	<0.0040	<0.00050	<0.0013	<0.0013	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.005	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.005	<0.0005	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.002	<0.0002	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 02-Jun-2015 95-8	95-8 26-Nov-2015 95-8	95-8 26-May-2016 95-8	95-8 17-Nov-2016 95-8	95-8 24-May-2017 95-8	95-8 29-Nov-2017 95-8	95-8 24-May-2018 95-8	95-8 22-Nov-2018 95-8
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	712	779	768	773	856	836	941	953
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	713	779	768	773	856	836	942	953
Ammonia Nitrogen	mg/l	--	--	2.57	2.60	2.83	2.25	1.80	2.17	2.42	1.92
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	81	94	91	88	286	94	129	117
Chloride	mg/l	--	250	185	177	188	181	172	226	200	199
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1782	1822	1817	1894	1915	1818	2068	1819
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	650	826	776	712	769	771	962	1120
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.7	3.7	3.5	3.2	3.0	3.3	4.0	3.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.57	6.74	6.77	7.05	6.62	6.67	6.48	6.68
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.05	0.05	0.07	0.06	0.02	0.06	0.04	0.08
Sulphate	mg/l	--	500 [4]	37	32	39	33	26	25	17	16
Temperature (Field)	deg c	--	15	10.7	8.4	13.5	10.4	12.0	8.3	11.9	6.8
Total Dissolved Solids	mg/l	--	500	1080	1110	1180	1030	1130	1140	1410	1210
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.001	0.002	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.059	0.068	0.084	0.058	0.051	0.083	0.065	0.091
Cadmium, dissolved	mg/l	0.005	--	0.0003	0.0003	0.0003	0.0003	0.0002	0.0004	0.0005	0.0003
Calcium, dissolved	mg/l	--	--	148	197	197	185	209	200	263	313
Chromium, dissolved	mg/l	0.05	--	0.004	0.006	0.006	0.014	0.014	0.007	0.008	0.007
Cobalt, dissolved	mg/l	--	--	0.0031	0.0034	0.0035	0.0012	0.0026	0.0031	0.0033	0.0035
Copper, dissolved	mg/l	--	1	0.0196	0.0571	0.0351	0.0547	0.0371	0.0087	0.112	0.107
Iron, dissolved	mg/l	--	0.3	<0.1	0.226	<0.1	<0.1	<0.1	1.33	<0.1	0.124
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	68	81.1	68.7	60.6	59.8	65.9	73.8	82.8
Manganese, dissolved	mg/l	--	0.05	10.2	8.9	9.2	5.7	8.23	8.27	11.8	5.83
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.7	16.7	21.5	16.5	16.5	17.8	17.9	20.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	116	139	120	129	128	125	117	145
Zinc, dissolved	mg/l	--	5	<0.005	0.016	0.006	0.008	0.008	<0.005	0.007	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [7]	<0.001	0.006	<0.002 [7]	<0.002 [7]	<0.001	<0.002 [7]	0.004

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 02-Jun-2015	95-8 26-Nov-2015	95-8 26-May-2016	95-8 17-Nov-2016	95-8 24-May-2017	95-8 29-Nov-2017	95-8 24-May-2018	95-8 22-Nov-2018
				95-8	95-8	95-8	95-8	95-8	95-8	95-8	95-8
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 19-Jun-2019 95-8	95-8 20-Nov-2019 95-8	95-8 21-May-2020 95-8	95-8 26-Nov-2020 95-8	95-8 26-May-2021 95-8	95-8 30-Nov-2021 95-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	943	916	1010	1160	934	903
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<25 [9]	<25	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	944	916	1010	1170	935	904
Ammonia Nitrogen	mg/l	--	--	2.25	2.66	2.82	1.70	2.51	2.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	124	121	138	169	107	124
Chloride	mg/l	--	250	161	165	198	166	174	163
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1848	2070	1876	1855	1973	1966
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	864	911	853	925	833	751
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1	<0.5 [10]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.4	3.3	3.5	3.0	3.5 [20]	3.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	6.5	7.14	6.8	6.49	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.02	0.02	0.03	0.04	0.03	0.96
Sulphate	mg/l	--	500 [4]	14	14	15	9	11	8
Temperature (Field)	deg c	--	15	12.5	7.1	16.7	6.8	11.7	6.6
Total Dissolved Solids	mg/l	--	500	1260	1250	1350	1270	1250	1230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.073	0.067	0.05	0.057	0.053	0.047
Cadmium, dissolved	mg/l	0.005	--	0.0003	0.0004	0.0001	0.0002	0.0003	<0.0001
Calcium, dissolved	mg/l	--	--	213	225	212	230	206	191
Chromium, dissolved	mg/l	0.05	--	0.009	0.013	0.013	0.011	0.011	0.008
Cobalt, dissolved	mg/l	--	--	0.0027	0.0043	0.0042	0.0027	0.0021	0.0019
Copper, dissolved	mg/l	--	1	0.0948	0.0094	0.0096	0.0926	0.0919	0.0415
Iron, dissolved	mg/l	--	0.3	<0.1	4.02	3.51	<0.1	<0.1	1.15
Lead, dissolved	mg/l	0.01	--	0.0001	0.0002	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	80.6	84.9	78.6	85.4	77.5	66.4
Manganese, dissolved	mg/l	--	0.05	11.3	10.6	10.9	10.8	9.67	8.29
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	22.6	24.2	19.3	18.8	17	14.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	124	131	132	125	122	110
Zinc, dissolved	mg/l	--	5	<0.005	0.008	0.006	0.014	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.010 [7]	0.009	<0.004 [10]	0.004	<0.002 [10]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 19-Jun-2019 95-8	95-8 20-Nov-2019 95-8	95-8 21-May-2020 95-8	95-8 26-Nov-2020 95-8	95-8 26-May-2021 95-8	95-8 30-Nov-2021 95-8
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 29-Oct-1998	98-1 06-May-1999	98-1 05-May-2000	98-1 24-Oct-2000	98-1 14-Jun-2001	98-1 23-Nov-2001	98-1 23-May-2002	98-1 06-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	293	342	357	323	272	267	266	271
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1	4	1
Alkalinity (Total as CaCO3)	mg/l	--	--	240	280	293	265	223	219	224	222
Ammonia Nitrogen	mg/l	--	--	0.34	0.63	0.01	0.01	0.34	0.33	0.26	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	7	6	--	12	5	3	13
Chloride	mg/l	--	250	210	290	197	209	184	181	189	182
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1066	1420	1200	1260	1050	1140	1210	1190
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	256	214	218	233	273	278	266	253
Nitrate as N	mg/l	10.0	--	--	--	0.3	0.5	0.4	0.2	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.87	0.99	--	0.5	0.57	0.62	0.5	0.43
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.1	7.7	7.7	7.7	6.87	7.06	7.6
Phosphorus	mg/l	--	--	--	--	--	0.13	0.12	0.07	0.09	0.06
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	116	33	47	55	63	77	63	61
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	536	710	600	612	584	556	20800	588
Total Organic Carbon	mg/l	--	--	13.8	8.4	4.6	--	3.8	6	4	4.6
Total Suspended Solids	mg/l	--	--	--	--	284	98	74	91	80	74
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.12	0.13	0.19	0.08	0.06	0.09	0.07	0.08
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	64.6	45.2	48.5	49.4	65.9	63.4	61.2	58.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.13	2.41	0.42	0.03	0.02	0.02	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0002	0.0002	0.0004
Magnesium, dissolved	mg/l	--	--	22.9	24.3	23.1	26.7	26.3	29.1	27.6	26
Manganese, dissolved	mg/l	--	0.05	0.53	0.27	0.18	0.19	0.26	0.33	0.33	0.28
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.5	6.7	8.2	12.4	3.4	5.3	9.3	8.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	150	238	200	148	114	131	120	120
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.08	0.01	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 29-Oct-1998	98-1 06-May-1999	98-1 05-May-2000	98-1 24-Oct-2000	98-1 14-Jun-2001	98-1 23-Nov-2001	98-1 23-May-2002	98-1 06-Nov-2002
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.055	0.001	0.001	0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 30-May-2003	98-1 09-Oct-2003	98-1 14-May-2004	98-1 19-Nov-2004	98-1 24-May-2005	98-1 16-Nov-2005	98-1 25-May-2006	98-1 21-Nov-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	271	--	282	329	310	178	310	300
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	222	227	231	270	254	292	310	300
Ammonia Nitrogen	mg/l	--	--	0.3	0.22	0.27	0.48	0.23	<0.01	0.16	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	2	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	10	7	16	248	9	9	6	6
Chloride	mg/l	--	250	192	196	183	199	191	246	205	224
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1060	1280	1200	1170	1800	930	1075	1100
Dissolved Inorganic Carbon	mg/l	--	--	--	53	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	268	242	263	284	222	258	263	260
Nitrate as N	mg/l	10.0	--	0.3	0.3	0.4	0.4	0.2	0.5	0.4	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.99	0.62	0.659	2.82	0.54	0.2	0.37	0.33
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7.4	7.5	7.3	6.1	--	7.7	8.2
Phosphorus	mg/l	--	--	0.55	0.36	0.136	3.09	0.11	0.09	--	--
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	57	51	57	63	55	35	52	42
Temperature (Field)	deg c	--	15	--	--	--	--	6.9	11.2	5	7
Total Dissolved Solids	mg/l	--	500	530	626	600	585	681	725	701	723
Total Organic Carbon	mg/l	--	--	4.6	8	4	6.2	4	5.4	--	--
Total Suspended Solids	mg/l	--	--	627	340	66	740	38	22	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.0001	0.001	<0.001	<0.001	0.002
Boron, dissolved	mg/l	5	--	0.05	0.072	0.065	0.062	0.095	0.089	0.074	0.084
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.005	<0.0001
Calcium, dissolved	mg/l	--	--	62.4	54.4	60.3	66.8	47.7	59.3	59	58.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.004	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.002	0.003	0.006	<0.002	0.004	0.009	0.003
Iron, dissolved	mg/l	--	0.3	0.19	1.02	0.01	0.007	0.013	0.007	0.014	0.008
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0005	<0.0002	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	27.2	25.7	27.4	28.5	25.1	26.6	28	27.7
Manganese, dissolved	mg/l	--	0.05	0.38	0.274	0.408	0.454	0.215	0.192	0.32	0.022
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	7.5	8.8	8.6	8.2	10.1	10.3	8.3	9.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [5]	114	153	148	119	208	180	169	180
Zinc, dissolved	mg/l	--	5	0.01	0.005	0.005	0.005	<0.005	0.009	<0.005	0.009

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 30-May-2003	98-1 09-Oct-2003	98-1 14-May-2004	98-1 19-Nov-2004	98-1 24-May-2005	98-1 16-Nov-2005	98-1 25-May-2006	98-1 21-Nov-2006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.002	<0.001	<0.001	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 15-May-2007	98-1 30-Nov-2007	98-1 22-May-2008	98-1 10-Nov-2008	98-1 19-May-2009 G-18	98-1 27-Nov-2009 J-4	98-1 25-May-2010 [14] M-3	98-1 20-Oct-2010 [14] G-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	328	336	333	327	364	369	476	502
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	328	336	333	327	364	369	476	502
Ammonia Nitrogen	mg/l	--	--	0.21	<0.01	0.02	0.08	0.27	0.57	1.09	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	47	10	<5	20	25	28	35
Chloride	mg/l	--	250	275	214	247	265	341	467	714	819
Conductivity	uS/cm	--	--	--	--	--	--	1830	2120	3320	3480
Conductivity (Field)	uS/cm	--	--	1100	1100	1250	1300	1200	750	3200	3190
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	246	291	278	251	292	213	246	260
Nitrate as N	mg/l	10.0	--	0.3	0.5	0.3	0.3	0.15	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.78	0.25	0.69	0.4	0.46	0.66	1.16	1.61
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.77	8.22	8.29	8.21
pH (Field)	-	--	--	8.2	7.6	--	7.4	--	7.15	7.78	7.82
Phosphorus	mg/l	--	--	--	--	--	--	--	0.32	0.54	0.53
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	0.76	--	--	--
Sulphate	mg/l	--	500 [4]	37	48	43	38	24	6	8	2
Temperature (Field)	deg c	--	15	6.9	6	--	6	6	5.5	12.6	8.7
Total Dissolved Solids	mg/l	--	500	824	788	798	822	1190	1380	2160	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0029	0.0028	0.0025	0.0023	0.003	0.004	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.109	0.095	0.092	0.109	0.21	0.18	0.26	0.30
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	54.6	67	63.6	56.7	64	44	44	48
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	0.009	<0.005	0.007	<0.005
Cobalt, dissolved	mg/l	--	--	0.007	<0.005	<0.005	<0.005	0.0003	0.0004	0.0004	0.0003
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.002	0.003	0.001	0.006	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.235	0.056	0.013	<0.005	0.22	<0.03	<0.03	0.08
Lead, dissolved	mg/l	0.01	--	0.00007	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	26.7	30.2	28.9	26.5	32	25	33	34
Manganese, dissolved	mg/l	--	0.05	0.19	0.319	0.379	0.039	0.27	0.27	0.11	0.09
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	10.2	9.1	10.4	11	11	18	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	222	215	206	229	243	386	516	578
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.01	0.01	<0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 15-May-2007	98-1 30-Nov-2007	98-1 22-May-2008	98-1 10-Nov-2008	98-1 19-May-2009 G-18	98-1 27-Nov-2009 J-4	98-1 25-May-2010 [14] M-3	98-1 20-Oct-2010 [14] G-12
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2011 [14]	98-1 08-Dec-2011 [14]	98-1 31-May-2012	98-1 28-Nov-2012	98-1 29-May-2013	98-1 26-Nov-2013	98-1 29-May-2014	98-1 19-Nov-2014
				G-3	B-1	98-1	98-1	98-1	GW-4	98-1	98-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	355	343	370	390	350	400	300	380
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7	<2 [15]	3.7	3.3	3.2	3.8	3.2	4.1
Alkalinity (Total as CaCO3)	mg/l	--	--	362	343	370	390	360	410	300	380
Ammonia Nitrogen	mg/l	--	--	0.88	0.84	0.12	0.77	1.2	0.92	0.89	0.94
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	33	20	23	30	36	23	29	21
Chloride	mg/l	--	250	488	389	320	360	400	260	330	470
Conductivity	uS/cm	--	--	2260	1860	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1897	2049	1615	1676	1459	1659	1613	1934
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	222	245	240	280	320	340	250	290
Nitrate as N	mg/l	10.0	--	<0.10	0.37	0.80	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.075	0.10	0.22	0.018	0.165	0.064
Nitrogen, Total Kjeldahl	mg/l	--	--	1.46	1.09	0.79	1.1	1.4	1.4	1.4	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	0.88	0.19	0.26	<0.10	0.19	<0.10
pH	-	--	--	8.32	8.16	8.02	--	7.98	8.00	8.06	8.06
pH (Field)	-	--	--	7.75	7.93	7.59	7.48	7.40	7.63	7.44	7.52
Phosphorus	mg/l	--	--	0.66	0.65	0.073	0.30	0.47	0.48	0.46	0.49
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	9	6	9	4	10	12	28	5
Temperature (Field)	deg c	--	15	12.6	7.1	11.0	7.2	10.1	7.3	9.4	7.9
Total Dissolved Solids	mg/l	--	500	1470	1210	974	986	1040	1100	1050	1090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	0.0016	0.001	<0.0010	<0.0010	0.0015	0.0017
Boron, dissolved	mg/l	5	--	0.16	0.13	0.21	0.21	0.15	0.11	0.16	0.17
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	46	57	50	58	82	80	65	68
Chromium, dissolved	mg/l	0.05	--	0.005	0.004	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0004	0.0003	<0.00050	<0.0005	0.00096	0.00053	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0017	<0.001	0.0012	0.0012	0.0027	<0.0020
Iron, dissolved	mg/l	--	0.3	<0.03	0.58	<0.1	0.52	<0.1	0.26	0.85	1.6
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	26	25	28	34	28	35	20	30
Manganese, dissolved	mg/l	--	0.05	0.10	0.14	0.25	0.35	0.78	0.34	0.17	0.46
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	10	12	14	14	15	12	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	388	271	350	350	230	140	250	300
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.0091	<0.005	<0.0050	<0.0050	0.0054	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2011 [14] G-3	98-1 08-Dec-2011 [14] B-1	98-1 31-May-2012 98-1	98-1 28-Nov-2012 98-1	98-1 29-May-2013 98-1	98-1 26-Nov-2013 GW-4	98-1 29-May-2014 98-1	98-1 19-Nov-2014 98-1
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 02-Jun-2015	98-1 26-Nov-2015	98-1 26-May-2016	98-1 17-Nov-2016	98-1 24-May-2017	98-1 29-Nov-2017	98-1 24-May-2018	98-1 29-Nov-2018
				98-1	98-1	98-1	98-1	98-1	98-1	98-1	98-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	404	389	426	477	442	547	501	548
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	406	392	428	479	445	549	504	550
Ammonia Nitrogen	mg/l	--	--	0.92	0.98	1.49	1.28	1.43	2.00	1.73	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	28	30	28	56	35	47	42	48
Chloride	mg/l	--	250	465	472	406	430	458	455	478	423
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1909	2143	2053	2259	2194	1982	2196	1901
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	293	235	399	322	315	357	330	400
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.6	0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07
Nitrogen, Total Kjeldahl	mg/l	--	--	1.5	1.4	1.8	1.6	1.8	2.5	3.0	2.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.52	8.02	7.95	7.39	7.75	7.61	7.44	7.47
Phosphorus	mg/l	--	--	0.39	0.36	0.31	0.41	0.35	0.46	0.45	0.69
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	5	3	7	3	3	3	2	3
Temperature (Field)	deg c	--	15	10.1	8.1	13.8	9.7	11.2	7.7	10.9	7.3
Total Dissolved Solids	mg/l	--	500	1200	1180	1090	1130	1130	1170	1390	1120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	0.001	0.002	0.003	0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.112	0.175	0.17	0.31	0.154	0.201	0.173	0.153
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	56.8	51.7	63.5	70.4	74.9	78.8	74	82.4
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.008	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	0.0009
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0010	0.0053	0.0012	0.0008	0.0008	0.0031
Iron, dissolved	mg/l	--	0.3	<0.1	0.584	<0.1	<0.1	0.942	4.67	0.699	0.581
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	36.7	25.8	36.3	35.5	31.1	39	35.2	47.2
Manganese, dissolved	mg/l	--	0.05	0.162	0.285	0.066	0.119	0.816	0.8	0.352	0.504
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11.6	10.8	15.3	14.5	12.8	15	13.5	16.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	164	376	283	319	353	317	335	332
Zinc, dissolved	mg/l	--	5	0.067	0.012	<0.005	0.017	0.009	<0.005	0.006	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 02-Jun-2015	98-1 26-Nov-2015	98-1 26-May-2016	98-1 17-Nov-2016	98-1 24-May-2017	98-1 29-Nov-2017	98-1 24-May-2018	98-1 29-Nov-2018
				98-1	98-1	98-1	98-1	98-1	98-1	98-1	98-1
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	0.003	0.003	<0.001	<0.001	<0.001	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 19-Jun-2019 98-1	98-1 20-Nov-2019 98-1	98-1 21-May-2020 98-1	98-1 26-Nov-2020 98-1	98-1 26-May-2021 98-1	98-1 30-Nov-2021 98-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	523	501	409	429	412	398
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	6	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	526	505	414	435	417	401
Ammonia Nitrogen	mg/l	--	--	2.15	1.23	0.63	1.12	0.69	0.97
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	51	39	37	<10	40
Chloride	mg/l	--	250	433	413	588	508	503	470
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2053	2260	1960	2033	2131	2161
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	414	412	312	334	302	276
Nitrate as N	mg/l	10.0	--	0.2	0.5	0.2	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.33	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.1	1.7	1.1	1.5	1.0	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.37	7.7	7.57	8.07	7.71	7.69
Phosphorus	mg/l	--	--	0.39	0.40	0.18	0.58	0.19	0.40
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	3	2	3	1	<1	2
Temperature (Field)	deg c	--	15	13.2	5.5	13.2	7.0	11.0	7.8
Total Dissolved Solids	mg/l	--	500	1170	1080	1190	1210	1250	1120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.163	0.157	0.163	0.156	0.161	0.145
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	93.7	87	66.1	69.8	61.8	59
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0009	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0011	0.0016	0.0031	0.0008	0.0012	0.0007
Iron, dissolved	mg/l	--	0.3	6.58	0.77	<0.1	2.47	<0.1	0.647
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	43.8	47.2	35.7	38.7	35.8	31.2
Manganese, dissolved	mg/l	--	0.05	1.39	0.268	0.222	0.344	0.047	0.388
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18.6	19.2	14.4	14.9	14.1	12.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	327	322	354	345	352	293
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.006	0.008	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 19-Jun-2019 98-1	98-1 20-Nov-2019 98-1	98-1 21-May-2020 98-1	98-1 26-Nov-2020 98-1	98-1 26-May-2021 98-1	98-1 30-Nov-2021 98-1
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.002	<0.004 [10]	<0.004 [10]	<0.001
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-2 06-May-1999	98-2 19-Oct-1999	98-2 24-Oct-2000	98-2 14-Jun-2001	98-2 06-Nov-2002	98-2 30-May-2003	98-2 19-Nov-2004	98-2 16-Nov-2005
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	610	584	382	289	296	215	348	189
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	13	1	2	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	500	500	313	241	243	176	290	314
Ammonia Nitrogen	mg/l	--	--	0.83	1.12	0.35	0.76	0.36	0.31	0.36	1.1
Chemical Oxygen Demand	mg/l	--	--	18	10	--	8	34	12	13	70
Chloride	mg/l	--	250	831	834	355	278	305	171	255	350
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	1710	1050	2100	890	1540	1800
Hardness, Calcium Carbonate	mg/l	--	--	263	268	189	198	207	195	211	198
Nitrate as N	mg/l	10.0	--	--	4.5	0.3	0.4	0.6	0.4	2	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	--	1.8	1.66	0.56	1.09	0.64	2.65
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.88	7.7	7.9	6.9	7.5	--
Phosphorus	mg/l	--	--	--	--	4.33	2.68	1.97	2.54	0.17	8.32
Sulphate	mg/l	--	500 [4]	11	13	42	46	46	54	40	39
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	11.4
Total Dissolved Solids	mg/l	--	500	--	--	836	764	738	445	770	958
Total Organic Carbon	mg/l	--	--	11.8	10	--	5.2	4.7	4.5	1.8	8.8
Total Suspended Solids	mg/l	--	--	--	1020	5450	3560	2430	2170	32	404
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	0.002	0.001	0.004	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	0.32	0.44	0.17	0.1	0.09	0.06	0.097	0.252
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	44.8	48.6	35.3	44.1	46.2	42.3	44.8	36.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.02	2.15	0.2	0.02	0.07	0.14	0.105	0.051
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0022	0.0002	0.0005	0.0003	0.0005	<0.0002
Magnesium, dissolved	mg/l	--	--	31.5	35.2	24.4	21.4	22.2	21.8	24	25.7
Manganese, dissolved	mg/l	--	0.05	0.08	0.24	0.33	0.38	0.53	0.49	0.217	0.197
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	16.8	19.2	8.4	2.5	8.3	7	12.6	12.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [5]	586	718	340	200	213	112	226	314
Zinc, dissolved	mg/l	--	5	0.01	0.06	0.01	0.01	0.01	0.01	0.005	0.007
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.001	0.049	0.001	0.001	0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-2 15-May-2007	98-2 10-Nov-2008	98-2 27-Nov-2009 J-11
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	422	423	533
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	422	423	533
Ammonia Nitrogen	mg/l	--	--	0.43	1.14	1.40
Chemical Oxygen Demand	mg/l	--	--	77	17	55
Chloride	mg/l	--	250	594	547	913
Conductivity	uS/cm	--	--	--	--	3710
Conductivity (Field)	uS/cm	--	--	1900	2550	2870
Hardness, Calcium Carbonate	mg/l	--	--	236	229	247
Nitrate as N	mg/l	10.0	--	0.3	0.4	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	2.28	1.65
pH	-	--	--	--	--	8.25
pH (Field)	-	--	--	8.1	7.8	8.8
Phosphorus	mg/l	--	--	--	--	1.66
Sulphate	mg/l	--	500 [4]	31	32	3
Temperature (Field)	deg c	--	15	8.2	9	4.3
Total Dissolved Solids	mg/l	--	500	1430	1320	2410
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.0049	0.0034	0.005
Boron, dissolved	mg/l	5	--	0.243	0.197	0.37
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	45	45.8	43
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0006
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.339	<0.005	<0.03
Lead, dissolved	mg/l	0.01	--	0.0002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	30	27.7	34
Manganese, dissolved	mg/l	--	0.05	0.202	0.002	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.2	13.1	18
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	460	399	635
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-3 06-May-1999	98-3 24-Oct-2000	98-3 14-Jun-2001	98-3 06-Nov-2002	98-3 30-May-2003	98-3 19-Nov-2004	98-3 16-Nov-2005	98-3 15-May-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	184	282	154	194	181	198	217	165
Alkalinity, Carbonate as CaCO3	mg/l	--	--	29	1	13	1	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	200	231	150	159	148	160	178	165
Ammonia Nitrogen	mg/l	--	--	2.03	1.3	1.19	0.17	0.09	0.98	0.26	<0.01
Chemical Oxygen Demand	mg/l	--	--	92	--	47	11	2	257	16	27
Chloride	mg/l	--	250	3.4	4.1	2	20.8	2.6	2	2.9	2.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	440	375	270	320	370	376	240
Hardness, Calcium Carbonate	mg/l	--	--	15	8	13	26	29	26	22	28
Nitrate as N	mg/l	10.0	--	--	0.2	0.3	2.3	1.2	0.9	0.4	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4.24	2.52	4.05	0.05	0.29	0.98	0.39	0.26
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	8.31	9	8.8	7.5	8.2	--	8.8
Phosphorus	mg/l	--	--	--	4.11	5.9	1.29	0.96	7.9	1.31	--
Sulphate	mg/l	--	500 [4]	34	38	42	33	27	26	19	28
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	8.7
Total Dissolved Solids	mg/l	--	500	--	340	260	400	160	185	218	216
Total Organic Carbon	mg/l	--	--	9	--	3.8	2.7	3.4	3.2	3.6	--
Total Suspended Solids	mg/l	--	--	--	11600	8900	1380	1300	2310	11400	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	0.006	0.008	0.006	0.005	0.004	<0.001	0.0077
Boron, dissolved	mg/l	5	--	0.16	0.14	0.15	0.15	0.14	0.144	0.147	0.135
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	0.00005
Calcium, dissolved	mg/l	--	--	2.37	2	3.29	5.72	7	6.34	5.57	6.56
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	0.008
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.004	<0.002
Iron, dissolved	mg/l	--	0.3	1.1	0.12	0.02	0.02	0.03	0.009	0.007	0.197
Lead, dissolved	mg/l	0.01	--	0.0026	0.0006	0.0003	0.0014	0.0005	0.0002	<0.0002	0.00079
Magnesium, dissolved	mg/l	--	--	2.22	0.82	1.24	2.82	2.86	2.57	2.07	2.83
Manganese, dissolved	mg/l	--	0.05	0.03	0.01	0.01	0.03	0.01	0.015	0.015	0.015
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	0.01	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	<0.01	--
Potassium, dissolved	mg/l	--	--	2.4	3	0.4	0.4	3.2	3.1	3.7	3.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001	--
Sodium, dissolved	mg/l	--	200 [5]	99.3	120	83.9	78.3	72.1	67.6	79.6	72.1
Zinc, dissolved	mg/l	--	5	0.05	0.01	0.01	0.01	0.01	0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	0.003	0.049	0.001	0.001	0.001	<0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	<0.0001
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-3 10-Nov-2008	98-3 27-Nov-2009 J-50	98-3 24-May-2011 [14] G-36
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	158	153	156
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	4	4
Alkalinity (Total as CaCO3)	mg/l	--	--	160	158	160
Ammonia Nitrogen	mg/l	--	--	0.2	0.15	<0.02
Chemical Oxygen Demand	mg/l	--	--	<100	25	10
Chloride	mg/l	--	250	2	4	3
Conductivity	uS/cm	--	--	--	342	360
Conductivity (Field)	uS/cm	--	--	335	331	338
Hardness, Calcium Carbonate	mg/l	--	--	24	30	30
Nitrate as N	mg/l	10.0	--	0.4	1.05	1.15
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.62	0.15	0.14
pH	-	--	--	--	8.48	8.43
pH (Field)	-	--	--	8.2	7.74	8.36
Phosphorus	mg/l	--	--	--	1.34	0.67
Sulphate	mg/l	--	500 [4]	20	21	21
Temperature (Field)	deg c	--	15	9	8.3	20.8
Total Dissolved Solids	mg/l	--	500	202	222	234
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.007	0.006	<0.01
Boron, dissolved	mg/l	5	--	0.131	0.16	0.14
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	5.74	7	7
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.0002	0.0002
Copper, dissolved	mg/l	--	1	<0.002	0.004	0.005
Iron, dissolved	mg/l	--	0.3	<0.005	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	0.00011	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	2.39	3	3
Manganese, dissolved	mg/l	--	0.05	0.013	0.01	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.7	4	3
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	71.9	75	71
Zinc, dissolved	mg/l	--	5	<0.005	0.01	<0.01
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 29-Oct-1998	98-4 06-May-1999	98-4 19-Oct-1999	98-4 05-May-2000	98-4 24-Oct-2000	98-4 14-Jun-2001	98-4 23-Nov-2001	98-4 23-May-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	151	148	159	143	134	140	131	131
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	2	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	124	121	130	117	110	119	107	107
Ammonia Nitrogen	mg/l	--	--	0.08	0.02	0.04	0.01	0.01	0.03	0.01	0.21
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	3	6	4	--	3	6	3
Chloride	mg/l	--	250	8.2	6.9	8	7.1	8.8	8.5	9.5	8.8
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	888	360	--	330	325	340	340	320
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	125	117	114	100	83	100	95	97
Nitrate as N	mg/l	10.0	--	--	--	0.6	0.6	0.6	0.7	0.6	0.6
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.04	1.27	--	--	0.32	0.32	0.45	0.14
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	6.9	--	7.9	7.55	7.9	7.65	7.32
Phosphorus	mg/l	--	--	--	--	--	--	0.26	0.67	0.5	0.3
Sulphate	mg/l	--	500 [4]	116	57	59	49	51	52	50	50
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	445	180	--	165	193	292	212	306
Total Organic Carbon	mg/l	--	--	12.7	5.1	3.9	2.8	--	1.9	4	2
Total Suspended Solids	mg/l	--	--	--	--	352	728	324	1060	1620	1220
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.002	0.002	0.004	0.002
Boron, dissolved	mg/l	5	--	0.08	0.06	0.17	0.14	0.07	0.06	0.08	0.06
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	37.8	29.3	29	25.7	21.4	26.2	23.9	24.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	0.02	1.64	1.12	0.03	0.02	0.05	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	7.34	10.6	9.97	8.51	7.14	8.42	8.51	9.02
Manganese, dissolved	mg/l	--	0.05	0.19	0.07	0.06	0.03	0.03	0.02	0.03	0.03
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5	0.8	5.9	0.4	4.3	0.4	0.4	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	53.3	35.7	44.8	39.9	36.5	35.1	40.1	36.7
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.07	0.02	0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.047	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 29-Oct-1998	98-4 06-May-1999	98-4 19-Oct-1999	98-4 05-May-2000	98-4 24-Oct-2000	98-4 14-Jun-2001	98-4 23-Nov-2001	98-4 23-May-2002
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 06-Nov-2002	98-4 30-May-2003	98-4 09-Oct-2003	98-4 14-May-2004	98-4 19-Nov-2004	98-4 24-May-2005	98-4 16-Nov-2005	98-4 25-May-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	132	134	--	118	137	132	138	108
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	1	1	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	108	110	102	97	112	110	113	108
Ammonia Nitrogen	mg/l	--	--	0.01	0.03	0.02	0.06	0.02	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	1	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	6	9	4	2	5	6	<5	10
Chloride	mg/l	--	250	8.9	8.5	8.2	9.2	8.4	8.7	8.9	9.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	241	290	360	320	450	360	320	280
Dissolved Inorganic Carbon	mg/l	--	--	--	--	25	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	87	88	87	88	87	92	91	81
Nitrate as N	mg/l	10.0	--	0.7	0.5	0.6	0.5	0.6	0.4	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.24	0.67	0.13	0.16	0.16	0.14	0.06	0.32
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.2	7.2	7.4	8.2	8.1	6.4	--	8.1
Phosphorus	mg/l	--	--	0.1	1	0.2	0.332	0.17	0.21	0.21	--
Sulphate	mg/l	--	500 [4]	48	49	46	49	51	49	47	48
Temperature (Field)	deg c	--	15	--	--	--	--	--	9.7	10.9	11.5
Total Dissolved Solids	mg/l	--	500	222	145	185	160	225	192	196	186
Total Organic Carbon	mg/l	--	--	2.1	2.3	4	1.5	1.4	1.5	3.3	--
Total Suspended Solids	mg/l	--	--	974	1480	564	416	113	108	96	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.003	0.001	0.002	0.002	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.07	0.05	0.063	0.05	0.067	0.042	0.071	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001	<0.0001	<0.005
Calcium, dissolved	mg/l	--	--	22.2	22.5	19.8	22.3	22.3	22.9	23.2	20.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.009	0.001	0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.004	0.002	0.002	<0.002	<0.002	0.003
Iron, dissolved	mg/l	--	0.3	0.02	0.05	0.23	0.006	0.005	<0.005	0.025	<0.005
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	0.0002	0.0002	0.0002	0.0003	<0.0002	<0.0002
Magnesium, dissolved	mg/l	--	--	7.64	7.69	9.01	7.75	7.62	8.34	7.99	7.38
Manganese, dissolved	mg/l	--	0.05	0.02	0.01	0.057	0.001	0.004	<0.001	0.003	0.002
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006	<0.00006	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01	<0.01	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.01	0.01	<0.01	<0.01	--
Potassium, dissolved	mg/l	--	--	1.1	3.5	5.3	3.8	4.1	3.6	4.5	3.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001	<0.001	--
Sodium, dissolved	mg/l	--	200 [5]	36.6	37.7	35.5	37.3	38.4	36.2	39.9	33.7
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.011	0.005	0.005	<0.005	<0.005	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 06-Nov-2002	98-4 30-May-2003	98-4 09-Oct-2003	98-4 14-May-2004	98-4 19-Nov-2004	98-4 24-May-2005	98-4 16-Nov-2005	98-4 25-May-2006
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	<0.0007	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0004	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	<0.0001	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0002	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	<0.0001	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	<0.0002	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	<0.002	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	<0.0002	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	<0.0002	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	<0.0003	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	<0.0002	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	<0.0001	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 21-Nov-2006	98-4 15-May-2007	98-4 30-Nov-2007	98-4 22-May-2008	98-4 10-Nov-2008	98-4 19-May-2009 G-3	98-4 26-Nov-2009 [13] 98-4	98-4 25-May-2010 [14] M-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	115	117	112	109	108	109	--	107
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [15]	--	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	115	117	112	109	108	109	--	107
Ammonia Nitrogen	mg/l	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	--	<0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	<5	8	42	7	<5	8	--	10
Chloride	mg/l	--	250	8.6	9.2	8.2	8.8	8.8	9	--	10
Conductivity	uS/cm	--	--	--	--	--	--	--	332	--	336
Conductivity (Field)	uS/cm	--	--	350	220	380	320	340	340	--	344
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	88	86	84	83	79	76	--	83
Nitrate as N	mg/l	10.0	--	0.3	0.4	0.4	0.3	0.2	0.50	--	0.13
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.12	0.07	0.05	0.15	0.05	<0.10	--	0.14
pH	-	--	--	--	--	--	--	--	8.03	--	8.14
pH (Field)	-	--	--	7.8	8.8	8.8	8.2	8.1	--	--	8.07
Phosphorus	mg/l	--	--	--	--	--	--	--	0.25	--	0.18
Sulphate	mg/l	--	500 [4]	45	45	45	46	44	42	--	43
Temperature (Field)	deg c	--	15	10.5	0	9.5	8.5	10	6	--	18.6
Total Dissolved Solids	mg/l	--	500	199	197	193	193	186	216	--	218
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0051	0.0041	0.0048	0.0033	0.0044	0.004	--	<0.01
Boron, dissolved	mg/l	5	--	0.059	0.052	0.061	0.049	0.056	0.05	--	0.09
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	--	--	22.4	21.6	21.6	21.2	20.4	19	--	20
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.001	--	0.002
Cobalt, dissolved	mg/l	--	--	<0.005	0.008	<0.005	<0.005	<0.005	<0.0002	--	<0.0002
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	<0.002	<0.002	0.002	--	0.029
Iron, dissolved	mg/l	--	0.3	<0.005	0.048	<0.005	0.008	0.017	<0.03	--	<0.03
Lead, dissolved	mg/l	0.01	--	<0.0001	0.00006	<0.00002	<0.00002	<0.00002	<0.001	--	<0.001
Magnesium, dissolved	mg/l	--	--	7.75	7.8	7.44	7.35	6.78	7	--	8
Manganese, dissolved	mg/l	--	0.05	<0.001	0.011	<0.001	<0.001	0.001	<0.01	--	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.1	3.6	4	3.6	4	3	--	4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	41.1	38.1	37.3	38.8	36.9	32	--	38
Zinc, dissolved	mg/l	--	5	0.005	<0.005	<0.005	<0.005	<0.005	0.01	--	0.02
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 21-Nov-2006	98-4 15-May-2007	98-4 30-Nov-2007	98-4 22-May-2008	98-4 10-Nov-2008	98-4 19-May-2009 G-3	98-4 26-Nov-2009 [13] 98-4	98-4 25-May-2010 [14] M-16
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	<0.0006	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	--	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	--	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	--	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 20-Oct-2010 [14] G-14	98-4 24-May-2011 [14] G-45	98-4 29-Nov-2011 [14] 98-4	98-4 31-May-2012 [17] 98-4
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	111	108	111	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [15]	2	<2 [15]	--
Alkalinity (Total as CaCO3)	mg/l	--	--	111	110	111	--
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	0.02	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	<5	5	--
Chloride	mg/l	--	250	10	10	10	--
Conductivity	uS/cm	--	--	336	344	340	--
Conductivity (Field)	uS/cm	--	--	339	330	374	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	89	85	88	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	--
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.25	<0.10	<0.10	--
pH	-	--	--	8.11	8.32	8.19	--
pH (Field)	-	--	--	7.96	8.02	8.43	--
Phosphorus	mg/l	--	--	0.22	0.19	0.14	--
Sulphate	mg/l	--	500 [4]	44	43	42	--
Temperature (Field)	deg c	--	15	13.3	12.7	9.9	--
Total Dissolved Solids	mg/l	--	500	218	224	221	--
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	--
Boron, dissolved	mg/l	5	--	0.07	0.05	0.08	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	24	21	22	--
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	0.002	--
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0002	<0.0002	--
Copper, dissolved	mg/l	--	1	0.003	0.003	0.002	--
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	--
Magnesium, dissolved	mg/l	--	--	7	8	8	--
Manganese, dissolved	mg/l	--	0.05	<0.01	<0.01	0.02	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	3	4	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	41	37	38	--
Zinc, dissolved	mg/l	--	5	<0.01	0.03	<0.01	--
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 20-Oct-2010 [14] G-14	98-4 24-May-2011 [14] G-45	98-4 29-Nov-2011 [14] 98-4	98-4 31-May-2012 [17] 98-4
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	--

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(4)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L
(5)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(6)	Elevated detection limit due to dilution required because of high target analyte concentration.
(7)	Elevated Reporting Limit due to matrix interference.
(8)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(9)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes
(10)	GEN02 Elevated Reporting Limit due to matrix interference.
(11)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
(12)	REV 1 Revision 1 - This report now includes data for Xylenes
(13)	Monitoring location was dry during this sampling event. No sample was collected.
(14)	Arsenic MRL elevated due to matrix interference.
(15)	pH < 8.3. Calculations not available.
(16)	Insufficient water for sample collection or analysis at this monitoring location during sampling event.
(17)	Monitoring location has been decommissioned.
(18)	Due to matrix interference 10x dilution factor required for VOCs.
(19)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(20)	REV 1 Revision 1 - This report includes revised TKN data based on re-digestion and analysis.

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 06-Sep-2005 [3]	05-11 16-Nov-2005	05-11 25-May-2006	05-11 21-Nov-2006	05-11 15-May-2007	05-11 30-Nov-2007	05-11 28-Feb-2008	05-11 22-May-2008	05-11 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	157	474	422	444	955	740	1030	1830
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	645	474	422	444	955	740	1030	1830
Ammonia Nitrogen	mg/l	--	--	--	2	0.93	0.91	0.52	0.96	0.87	0.46	0.61
Chemical Oxygen Demand	mg/l	--	--	--	54	26	25	53	112	41	86	242
Chloride	mg/l	--	250	--	38	26.5	7.9	7.9	118	68.6	156	351
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1700	1025	1400	1100	1500	--	2000	3300
Hardness, Calcium Carbonate	mg/l	--	--	--	645	427	553	539	889	745	995	1600
Nitrate as N	mg/l	10.0	--	--	<0.1	0.1	0.2	0.2	<0.1	0.3	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.79	1.56	1.49	1.15	2.23	2.08	2.49	4.27
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.3	7	7.4	7.3	--	6.6	6.7
Phosphorus	mg/l	--	--	--	0.6	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	320	240	540	360	183	230	153	69
Temperature (Field)	deg c	--	15	--	--	8.5	10.5	11.8	11	--	10	9
Total Dissolved Solids	mg/l	--	500	--	1180	822	1140	937	1390	1150	1460	2500
Total Organic Carbon	mg/l	--	--	--	16.3	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	1310	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.005	<0.001	0.0007	0.0006	0.0032	0.0016	0.0027	0.0035
Boron, dissolved	mg/l	5	--	--	0.832	0.566	0.572	0.547	1.97	1.19	2.38	13.4
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	--	153	98.7	136	130	206	170	231	356
Chromium, dissolved	mg/l	0.05	--	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	0.006
Iron, dissolved	mg/l	--	0.3	--	17.3	5	3.01	4.59	19.1	9.53	13.9	4.13
Lead, dissolved	mg/l	0.01	--	--	<0.0002	<0.0002	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	--	63.9	43.9	51.9	52.3	91.1	77.6	102	172
Manganese, dissolved	mg/l	--	0.05	--	2.14	1.13	1.21	1.3	3.14	2.52	3.65	4.17
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	10.6	7.4	5.8	6.8	10.4	9.2	8.4	15
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	197	119	143	102	191	130	176	430
Zinc, dissolved	mg/l	--	5	--	0.015	0.01	0.008	<0.005	<0.005	0.01	0.006	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	<0.0006	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	0.0013	--	0.0007	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	0.0014	<0.0005	0.0013	0.0012
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	0.0009	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 19-Dec-2008	05-11 19-May-2009 G-8	05-11 26-Nov-2009 J-19	05-11 25-May-2010 [4] M-11	05-11 20-Oct-2010 [4] G-6	05-11 24-May-2011 G-18	05-11 29-Nov-2011 05-11	05-11 31-May-2012 05-11	05-11 28-Nov-2012 05-11
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1400	793	723	921	696	744	678	630	580
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	3.5	1.4
Alkalinity (Total as CaCO3)	mg/l	--	--	1400	793	723	921	696	744	678	630	580
Ammonia Nitrogen	mg/l	--	--	0.56	0.42	0.57	0.53	0.68	0.35	0.49	0.26	0.65
Chemical Oxygen Demand	mg/l	--	--	117	45	63	73	55	35	40	30	32
Chloride	mg/l	--	250	267	218	76	115	80	89	66	49	42
Conductivity	uS/cm	--	--	--	2190	1700	2120	1650	1760	1550	--	--
Conductivity (Field)	uS/cm	--	--	2100	--	2119	2095	1805	934	1151	1015	1085
Hardness, Calcium Carbonate	mg/l	--	--	1030	558	700	947	661	634	578	610	560
Nitrate as N	mg/l	10.0	--	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.018	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.63	1.14	1.26	1.30	1.57	0.85	0.77	0.75	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	7.56	7.47	7.47	7.23	7.96	7.72	7.77	--
pH (Field)	-	--	--	607	--	6.54	6.63	7	6.86	6.74	6.85	6.73
Phosphorus	mg/l	--	--	--	0.40	0.06	0.05	0.08	0.03	0.03	<0.020	0.024
Sulphate	mg/l	--	500 [6]	107	97	146	128	135	117	131	130	160
Temperature (Field)	deg c	--	15	5	--	11.0	21.3	11.3	15.8	9.5	9.9	10.5
Total Dissolved Solids	mg/l	--	500	1810	1420	1110	1380	1070	1140	1010	744	878
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	<0.01	<0.01	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	6.33	1.24	4.2	3.6	2.2	0.51	2.4	2.1	1.7
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	240	98	155	206	146	132	126	130	120
Chromium, dissolved	mg/l	0.05	--	<0.002	0.009	0.009	0.004	0.006	0.005	0.004	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0002	0.0014	0.0035	0.0012	0.0016	0.0008	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.004	0.002	0.002	0.001	0.004	0.002	<0.0010	<0.001
Iron, dissolved	mg/l	--	0.3	3.29	<0.03	12.0	12.5	9.65	<0.03	<0.03	3.6	2.2
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	104	76	76	105	72	74	64	71	63
Manganese, dissolved	mg/l	--	0.05	3.4	0.04	2.37	2.95	1.57	0.84	0.65	0.69	0.34
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.8	14	10	11	9	10	9	10	10
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	235	241	105	149	111	111	106	110	83
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	0.01	<0.01	0.01	<0.01	<0.0050	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025	<0.00050
Benzene	mg/l	0.001	--	0.001	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.00025	<0.00050
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0025
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0010
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.0010

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 29-May-2013	05-11 26-Nov-2013 [5]	05-11 29-May-2014	05-11 19-Nov-2014	05-11 02-Jun-2015	05-11 26-Nov-2015	05-11 26-May-2016	05-11 17-Nov-2016	05-11 24-May-2017
				05-11	GW-25	05-11	05-11	05-11	05-11	05-11	05-11	05-11
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	400	440	390	390	442	471	432	389	672
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.2	1.6	1.6	<1.0	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	400	440	390	390	443	472	432	389	673
Ammonia Nitrogen	mg/l	--	--	0.15	0.90	0.26	0.12	0.24	0.05	0.28	0.27	0.16
Chemical Oxygen Demand	mg/l	--	--	27	34	15	17	21	33	24	24	24
Chloride	mg/l	--	250	11	8	10	5	9	5	7	6	22
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	822	889	813	908	973	1097	979	1785	1337
Hardness, Calcium Carbonate	mg/l	--	--	510	510	500	480	389	585	473	890	655
Nitrate as N	mg/l	10.0	--	0.11	<0.10	<0.10	<0.10	<0.1	0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.018	0.027	0.048	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.34	1.3	0.52	0.48	0.3	0.4	0.5	0.5	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.12	<0.10	0.13	<0.10	--	--	--	--	--
pH	-	--	--	7.50	7.60	7.65	7.38	--	--	--	--	--
pH (Field)	-	--	--	6.82	7.09	6.88	6.88	6.91	6.82	7.10	6.91	6.81
Phosphorus	mg/l	--	--	0.035	0.048	0.045	0.056	<0.01	0.01	0.09	0.06	0.03
Sulphate	mg/l	--	500 [6]	150	160	150	110	148	183	136	708	130
Temperature (Field)	deg c	--	15	8.6	9.0	9.8	6.8	8.5	10.4	11.8	12.0	10.4
Total Dissolved Solids	mg/l	--	500	682	650	650	526	662	732	630	1320	812
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.41	0.36	0.41	0.65	0.148	0.405	0.397	0.663	0.361
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	120	130	120	110	84.6	128	110	230	170
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.006	0.005
Cobalt, dissolved	mg/l	--	--	0.0016	0.0026	0.0016	0.00057	0.0009	0.0011	0.0020	0.0010	0.0024
Copper, dissolved	mg/l	--	1	0.0015	0.0015	0.0034	0.0018	<0.0005	<0.0005	0.0008	0.0013	0.0057
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	0.0007
Magnesium, dissolved	mg/l	--	--	50	48	50	50	43	64.4	48.4	76.4	56
Manganese, dissolved	mg/l	--	0.05	0.64	1.1	0.64	0.63	0.472	0.51	1.04	0.626	1.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.6	6.6	6.1	7.1	4.48	5.84	6.96	7.92	5.83
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	37	39	33	41	23.3	43.4	33.5	42.8	22.7
Zinc, dissolved	mg/l	--	5	<0.0050	0.0090	<0.0050	<0.0050	0.005	0.01	0.006	<0.005	0.008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	0.003	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 29-Nov-2017	05-11 24-May-2018	05-11 29-Nov-2018	05-11 19-Jun-2019	05-11 20-Nov-2019	05-11 21-May-2020	05-11 26-Nov-2020	05-11 26-May-2021	05-11 30-Nov-2021
				05-11	05-11	05-11	05-11	05-11	05-11	05-11	05-11	05-11
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	900	1400	1800	1330	1170	773	762	613	554
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25 [9]	<25 [9]	<25 [9]	<25	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	901	1400	1800	1330	1170	775	764	614	555
Ammonia Nitrogen	mg/l	--	--	0.50	1.72	1.99	2.27	0.76	0.64	0.58	0.48	0.47
Chemical Oxygen Demand	mg/l	--	--	93	138	192	124	129	66	65	25	64
Chloride	mg/l	--	250	120	199	250	173	128	69	47	30	17
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1913	3123	3102	2431	2670	1412	1575	1453	1252
Hardness, Calcium Carbonate	mg/l	--	--	916	1190	2030	1160	939	748	826	621	578
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.6	4.6	5.2	4.1	2.8	1.5	1.4	0.8	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.51	6.69	6.67	6.85	6.97	7.14	7.06	6.86	6.55
Phosphorus	mg/l	--	--	0.11	0.13	0.17	0.12	0.16	0.10	0.10	0.06	0.07
Sulphate	mg/l	--	500 [6]	63	64	35	44	77	126	267	126	188
Temperature (Field)	deg c	--	15	9.3	10.2	9.1	14.2	8.5	12.0	8.3	10.9	8.5
Total Dissolved Solids	mg/l	--	500	1130	2060	2210	1660	1480	978	1130	744	746
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	0.002	0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	2.46	3.93	13.9	5.73	6.13	1.96	2.05	1.01	0.592
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	215	288	516	266	185	171	186	146	145
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.002	0.001	0.002	0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0053	0.0027	0.0059	0.0029	0.0026	0.0012	<0.0005	<0.0005	0.0010
Copper, dissolved	mg/l	--	1	0.0008	0.0014	0.0036	0.0013	0.0007	0.0034	0.0040	0.0019	0.0009
Iron, dissolved	mg/l	--	0.3	5.8	<0.1	1.17	<0.1	10.2	10.4	<0.1	0.388	3.75
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	92.2	113	181	121	116	77.7	88.2	62.1	52.8
Manganese, dissolved	mg/l	--	0.05	3.72	5.23	5.63	6.68	4.34	3.24	0.678	0.31	2.95
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.5	9.51	19	14.5	16.3	9.61	9.44	7.08	6.45
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	79.9	166	335	189	189	89.7	98.4	61.7	41.6
Zinc, dissolved	mg/l	--	5	<0.005	0.007	<0.005	<0.005	<0.005	0.007	0.005	0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	0.004	0.003	<0.004 [10]	0.009	<0.004 [11]	0.003	<0.004 [11]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3A 06-Sep-2005	05-3A 16-Nov-2005	05-3A 25-May-2006	05-3A 15-May-2007	05-3A 10-Nov-2008	05-3A 26-Nov-2009 M-11	05-3A 24-May-2011 [4] G-42	05-3A 29-Nov-2012 05-3A	05-3A 29-May-2014 05-3A
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1030	200	845	885	800	829	778	790	770
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	29	42	34	30
Alkalinity (Total as CaCO3)	mg/l	--	--	845	820	845	885	800	858	820	830	800
Ammonia Nitrogen	mg/l	--	--	0.78	0.77	0.72	0.64	0.79	0.75	0.76	0.96	0.88
Chemical Oxygen Demand	mg/l	--	--	278	33	351	83	93	85	575	45	39
Chloride	mg/l	--	250	226	235	272	270	265	160	273	240	260
Conductivity	uS/cm	--	--	--	--	--	--	--	2330	2410	--	--
Conductivity (Field)	uS/cm	--	--	1900	3000	1800	1700	1800	2075	2157	1898	1998
Hardness, Calcium Carbonate	mg/l	--	--	42	31	25	25	25	28	35	28	31
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	0.1	0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	6.01	1.2	1.99	1.42	2.16	0.82	1.55	2.2	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	--	--	--	--	8.57	8.76	8.66	8.62
pH (Field)	-	--	--	8.4	--	8.5	8.9	8.4	8.83	8.71	8.65	7.79
Phosphorus	mg/l	--	--	8.2	0.15	--	--	--	2.48	1.09	0.51	0.26
Sulphate	mg/l	--	500 [6]	5	<1	1	2	2	2	<1	<1	<1
Temperature (Field)	deg c	--	15	11.8	--	7	8.8	4	8.7	12.0	6.9	9.0
Total Dissolved Solids	mg/l	--	500	1380	1340	1320	1280	1300	1510	1570	1310	1320
Total Organic Carbon	mg/l	--	--	53.2	10.9	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	6760	63	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	<0.001	0.0015	0.0021	0.002	<0.01	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.978	0.964	0.828	0.826	0.878	0.98	0.87	0.97	1
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00002	<0.00002	<0.0001	<0.0001	0.00011	<0.00010
Calcium, dissolved	mg/l	--	--	7.05	3.62	2.32	2.41	2.38	3	4	3.2	3.3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.009	<0.005	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0002	0.0003	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	0.002	<0.002	<0.002	<0.002	0.001	0.002	<0.0010	0.0023
Iron, dissolved	mg/l	--	0.3	0.334	0.08	0.062	0.128	<0.005	0.08	0.07	0.12	<0.1
Lead, dissolved	mg/l	0.01	--	0.0008	0.0017	0.0002	0.00002	<0.00002	<0.001	<0.001	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	6.03	5.26	4.59	4.66	4.74	5	6	4.9	5.6
Manganese, dissolved	mg/l	--	0.05	0.017	0.003	0.002	0.005	0.008	<0.01	<0.01	0.0025	<0.0020
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.5	10.6	8.5	8.9	9.5	8	9	8.3	8.9
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	625	599	535	461	533	493	476	540	580
Zinc, dissolved	mg/l	--	5	0.007	0.007	0.01	0.02	<0.005	<0.01	0.01	<0.0050	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3A 26-Nov-2015 05-3A	05-3A 24-May-2017 05-3A	05-3A 29-Nov-2018 05-3A	05-3A 21-May-2020 05-3A	05-3A 30-Nov-2021 05-3A
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	823	858	889	788	820
Alkalinity, Carbonate as CaCO3	mg/l	--	--	22	16	20	33	14
Alkalinity (Total as CaCO3)	mg/l	--	--	845	874	910	822	834
Ammonia Nitrogen	mg/l	--	--	0.84	0.81	0.77	0.82	0.80
Chemical Oxygen Demand	mg/l	--	--	118	32	40	51	34
Chloride	mg/l	--	250	294	285	297	365	287
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2246	2266	2042	2116	2177
Hardness, Calcium Carbonate	mg/l	--	--	25.5	41	51	38.9	33.3
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.4	1.5	1.4	1.3	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.64	8.37	8.54	8.76	8.64
Phosphorus	mg/l	--	--	0.67	0.12	0.19	0.25	0.17
Sulphate	mg/l	--	500 [6]	<1	3	<1	<1	<1
Temperature (Field)	deg c	--	15	8.4	10.1	7.8	11.2	6.7
Total Dissolved Solids	mg/l	--	500	1440	1340	1360	1380	1280
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.962	1.01	0.98	0.778	0.807
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	2.73	5.45	9.76	5.91	4.7
Chromium, dissolved	mg/l	0.05	--	<0.001	0.009	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0005	0.0022	0.0031	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.13	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	4.54	6.67	6.45	5.86	5.24
Manganese, dissolved	mg/l	--	0.05	<0.005	0.025	0.011	0.005	0.006
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.01	9.62	10	9.19	8.48
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	617	572	536	555	489
Zinc, dissolved	mg/l	--	5	0.01	<0.005	<0.005	<0.005	0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.002 [10]	0.002	0.006	<0.002 [11]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3B 06-Sep-2005	05-3B 16-Nov-2005	05-3B 25-May-2006	05-3B 15-May-2007	05-3B 10-Nov-2008	05-3B 26-Nov-2009 J-20	05-3B 24-May-2011 [4] G-41	05-3B 29-Nov-2012 05-3B	05-3B 29-May-2014 [13] 05-3B
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1340	256	1160	1190	1170	1130	1080	1100	1100
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	27	52	35	36
Alkalinity (Total as CaCO3)	mg/l	--	--	1100	1050	1160	1190	1170	1160	1135	1100	1100
Ammonia Nitrogen	mg/l	--	--	18	7.1	3.21	2.38	2.84	2.83	2.64	0.51	2.8
Chemical Oxygen Demand	mg/l	--	--	143	139	124	142	104	95	85	41	76
Chloride	mg/l	--	250	434	423	482	465	469	451	433	410	440
Conductivity	uS/cm	--	--	--	--	--	--	--	3410	3510	--	--
Conductivity (Field)	uS/cm	--	--	2800	2100	2900	2400	2900	2820	2563	2776	2865
Hardness, Calcium Carbonate	mg/l	--	--	60	91	77	70	65	69	76	70	80
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.1	0.1	0.2	<0.10	<0.10	<0.10	<0.50
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.010	<0.050
Nitrogen, Total Kjeldahl	mg/l	--	--	19.7	10.9	6.3	6.12	5.29	4.12	4.70	4.6	4.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.50
pH	-	--	--	--	--	--	--	--	8.41	8.71	8.53	8.54
pH (Field)	-	--	--	7.7	--	8.2	8.5	8.2	8.2	8.40	8.43	8.10
Phosphorus	mg/l	--	--	1.41	3.18	--	--	--	6.94	7.09	7.1	6.6
Sulphate	mg/l	--	500 [6]	109	152	72	23	2	4	<1	<1	<1
Temperature (Field)	deg c	--	15	12.5	--	9	8.6	7	8.0	10.2	6.8	10.2
Total Dissolved Solids	mg/l	--	500	2110	2100	2030	1920	1880	2220	2280	1880	1830
Total Organic Carbon	mg/l	--	--	87	47.6	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	220	30	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.007	**0.013**	0.01	**0.0138**	0.0006	0.010	<0.01	0.0038	0.0034
Boron, dissolved	mg/l	5	--	1.64	1.74	1.52	1.46	1.53	1.8	1.5	1.8	1.8
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00005	<0.00002	<0.0001	<0.0001	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	8.66	10.7	8.92	8.11	7.27	8	9	8.3	9.3
Chromium, dissolved	mg/l	0.05	--	0.005	0.005	0.004	0.003	<0.002	<0.005	<0.005	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	0.0005	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.009	0.003	0.009	<0.002	<0.002	0.002	0.003	<0.0010	0.0023
Iron, dissolved	mg/l	--	0.3	0.766	1.15	3.05	1.68	0.374	1.19	0.65	0.45	0.65
Lead, dissolved	mg/l	0.01	--	0.0029	0.0007	0.0013	0.00041	<0.00002	<0.001	<0.001	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	9.43	15.7	13.4	12.2	11.4	12	13	12	14
Manganese, dissolved	mg/l	--	0.05	0.12	0.128	0.071	0.037	0.016	0.03	0.02	0.02	0.024
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.06	0.04	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.4	25.7	21.6	21	19.8	19	19	18	20
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	866	862	751	673	669	816	784	740	720
Zinc, dissolved	mg/l	--	5	<0.005	0.01	0.02	<0.005	<0.005	<0.01	<0.01	<0.0050	0.0052
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00020	<0.00020
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00020	<0.00020
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0010	<0.0010
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00040	<0.00040
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00040	<0.00040

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3B 26-Nov-2015 05-3B	05-3B 24-May-2017 05-3B	05-3B 29-Nov-2018 05-3B	05-3B 21-May-2020 [14] 05-3B	05-3B 30-Nov-2021 05-3B
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1090	1050	1150	1120	1110
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [15]	<25 [9]	<25 [9]	<25 [16]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1110	1070	1170	1140	1120
Ammonia Nitrogen	mg/l	--	--	3.35	2.76	3.09	2.83	2.73
Chemical Oxygen Demand	mg/l	--	--	115	89	102	120	91
Chloride	mg/l	--	250	470	459	449	596	442
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3230	3248	2919	--	3122
Hardness, Calcium Carbonate	mg/l	--	--	249	73	105	86.4	78.1
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	0.39
Nitrogen, Total Kjeldahl	mg/l	--	--	5.3	4.3	4.7	3.8	4.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.43	8.35	8.49	--	8.47
Phosphorus	mg/l	--	--	6.72	5.73	5.95	5.89	6.33
Sulphate	mg/l	--	500 [6]	<1	5	9	4	3
Temperature (Field)	deg c	--	15	8.5	10.5	7.6	--	6.4
Total Dissolved Solids	mg/l	--	500	2020	1990	2020	2010	1890
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.004	0.01	0.005	0.003	0.002
Boron, dissolved	mg/l	5	--	1.97	1.62	1.97	1.78	1.92
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	8.04	8.55	16.1	10	9
Chromium, dissolved	mg/l	0.05	--	0.006	0.013	0.002	0.002	0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0008	0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0040	0.0035	0.0010	0.0012
Iron, dissolved	mg/l	--	0.3	0.632	0.125	0.805	0.76	0.519
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0003	0.0004	0.0002	0.0001
Magnesium, dissolved	mg/l	--	--	11.3	12.6	15.7	14.9	13.5
Manganese, dissolved	mg/l	--	0.05	0.022	0.019	0.027	0.029	0.027
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.2	19.8	23.8	20.3	18.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	878	817	842	719	637
Zinc, dissolved	mg/l	--	5	0.009	0.013	<0.005	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.004 [10]	<0.001	0.005	<0.004 [11]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 06-Sep-2005	05-3C 16-Nov-2005	05-3C 25-May-2006	05-3C 15-May-2007	05-3C 30-Nov-2007	05-3C 22-May-2008	05-3C 10-Nov-2008	05-3C 19-May-2009 G-14	05-3C 26-Nov-2009 J-17
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1090	227	880	995	1050	1010	1030	960	946
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	21	21
Alkalinity (Total as CaCO3)	mg/l	--	--	891	930	880	995	1050	1010	1030	981	967
Ammonia Nitrogen	mg/l	--	--	28.9	9.81	2.46	1.88	2.02	1.28	1.53	1.67	1.52
Chemical Oxygen Demand	mg/l	--	--	139	151	113	134	150	104	91	70	98
Chloride	mg/l	--	250	264	269	286	320	331	330	335	303	302
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	2700	2640
Conductivity (Field)	uS/cm	--	--	2600	860	1950	1500	1700	2300	2100	1300	2287
Hardness, Calcium Carbonate	mg/l	--	--	71	91	85	87	92	88	53	83	92
Nitrate as N	mg/l	10.0	--	<0.1	0.2	1.2	0.1	0.3	0.2	0.2	<0.10	0.23
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	34.8	12.6	4.46	5.04	3.9	3.63	3.55	3.35	2.46
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	8.36	8.38
pH (Field)	-	--	--	7.7	--	8.2	8.6	8.2	8.2	8.1	--	8.27
Phosphorus	mg/l	--	--	2	1.2	--	--	--	--	--	2.12	2.61
Sulphate	mg/l	--	500 [6]	200	119	80	35	19	13	15	14	30
Temperature (Field)	deg c	--	15	14.4	--	6.5	8.8	5.5	10.5	8	11	8.1
Total Dissolved Solids	mg/l	--	500	1770	1700	1560	1530	1770	1620	1560	1760	1720
Total Organic Carbon	mg/l	--	--	72.6	41.3	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	524	2520	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.003	0.008	0.009	**0.013**	**0.0246**	**0.0141**	0.0008	**0.013**	**0.016**
Boron, dissolved	mg/l	5	--	1.32	1.47	1.28	1.06	1.41	1.35	1.37	1.43	1.4
Cadmium, dissolved	mg/l	0.005	--	0.0002	<0.0001	<0.005	0.00008	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	11.4	13.5	10.7	10.6	12.6	11.6	5.92	10	12
Chromium, dissolved	mg/l	0.05	--	0.003	0.005	0.003	0.002	<0.002	<0.002	0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.011	0.006	0.003	0.003	<0.002	<0.002	0.004	0.006	0.011
Iron, dissolved	mg/l	--	0.3	0.199	1.81	1.56	2.05	2.77	2.08	0.477	0.58	0.41
Lead, dissolved	mg/l	0.01	--	0.0012	0.0003	0.0011	0.00032	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	10.4	14	14.3	14.7	14.6	14.4	9.37	14	15
Manganese, dissolved	mg/l	--	0.05	0.156	0.225	0.111	0.074	0.119	0.091	0.021	0.05	0.03
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.04	0.04	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.02	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	23	21.4	16.6	15.9	17.8	16	15.8	13	15
Selenium, dissolved	mg/l	0.05	--	0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	711	708	635	536	736	630	560	565	535
Zinc, dissolved	mg/l	--	5	0.009	0.01	0.006	<0.005	<0.005	<0.005	<0.005	<0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	0.0013	<0.0006	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 25-May-2010 [4] M-21	05-3C 20-Oct-2010 [4] G-26	05-3C 24-May-2011 [4] G-43	05-3C 29-Nov-2011 05-3C	05-3C 31-May-2012 05-3C	05-3C 29-Nov-2012 05-3C	05-3C 29-May-2013 [5] 05-3C	05-3C 26-Nov-2013 [17] GW-15	05-3C 29-May-2014 [18] 05-3C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	935	932	936	976	970	950	900	1000	910
Alkalinity, Carbonate as CaCO3	mg/l	--	--	22	22	44	33	21	25	17	22	25
Alkalinity (Total as CaCO3)	mg/l	--	--	957	954	980	1010	990	970	920	1000	940
Ammonia Nitrogen	mg/l	--	--	1.27	1.14	1.44	1.20	0.95	0.79	0.81	1.6	1.3
Chemical Oxygen Demand	mg/l	--	--	70	80	70	55	66	54	53	72	66
Chloride	mg/l	--	250	281	308	291	304	280	270	270	320	270
Conductivity	uS/cm	--	--	2680	2610	2770	2760	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2641	2533	1162	2144	2225	1873	1478	2124	1893
Hardness, Calcium Carbonate	mg/l	--	--	87	88	96	93	94	160	140	110	88
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	0.16	0.23	<1.0	<0.50
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.20	0.10	0.40	0.14	0.287
Nitrogen, Total Kjeldahl	mg/l	--	--	2.27	2.52	2.97	2.08	2.4	2.3	1.8	3.5	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	0.26	0.26	0.64	<1.0	<0.50
pH	-	--	--	8.39	8.39	8.70	8.56	8.37	8.44	8.29	8.38	8.46
pH (Field)	-	--	--	8.24	8.4	8.29	8.00	8.12	7.86	7.82	7.73	7.76
Phosphorus	mg/l	--	--	2.38	2.22	2.40	1.57	0.63	1.1	1.0	2.3	1.8
Sulphate	mg/l	--	500 [6]	15	25	10	9	<1	3	8	<1	<1
Temperature (Field)	deg c	--	15	21.4	11.9	11.0	7.3	10.7	7.4	11.4	6.7	9.2
Total Dissolved Solids	mg/l	--	500	1740	1700	1800	1790	1510	1410	1570	1530	1530
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	0.0045	0.0039	0.0039	0.0038	0.0042
Boron, dissolved	mg/l	5	--	1.8	1.4	1.6	1.6	1.4	1.1	1.3	1.3	1.6
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	10	12	12	11	12	28	22	17	11
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.005	<0.0050	0.0068	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0006	0.0006	0.00055	0.00058	<0.00050	0.00076	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.003	0.002	0.002	0.0071	0.0021	0.0018	0.0012	0.0023
Iron, dissolved	mg/l	--	0.3	1.53	0.29	2.64	0.36	0.62	0.26	0.3	0.2	1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.00050	0.00059	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	15	14	16	16	16	22	20	17	15
Manganese, dissolved	mg/l	--	0.05	0.06	0.03	0.06	0.04	0.052	0.11	0.079	0.28	0.057
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	14	15	14	14	15	14	14	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	559	629	561	615	620	490	530	570	560
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	<0.01	0.017	0.0077	<0.0050	0.0099	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.0013	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 19-Nov-2014 [19] 05-3C	05-3C 02-Jun-2015 05-3C	05-3C 26-Nov-2015 05-3C	05-3C 26-May-2016 05-3C	05-3C 17-Nov-2016 05-3D	05-3C 24-May-2017 05-3C	05-3C 29-Nov-2017 05-3C	05-3C 24-May-2018 05-3C	05-3C 29-Nov-2018 05-3C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	920	969	868	928	1000	674	880	932	1050
Alkalinity, Carbonate as CaCO3	mg/l	--	--	18	25	14	14	13	<5	<25 [9]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	940	994	882	942	1010	678	891	942	1070
Ammonia Nitrogen	mg/l	--	--	1.3	1.48	1.20	0.28	2.12	0.01	1.62	1.71	1.75
Chemical Oxygen Demand	mg/l	--	--	74	85	58	78	111	28	86	97	88
Chloride	mg/l	--	250	270	348	214	257	316	107	360	341	364
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2090	2319	2053	2106	2751	1537	2439	2639	2434
Hardness, Calcium Carbonate	mg/l	--	--	150	127	79.1	158	280	323	83	82	121
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	0.1	<0.1	0.3	0.2	<0.1
Nitrite as N	mg/l	1.0	--	0.126	<0.05	<0.05	<0.05	<0.05	<0.05	0.27	0.05	0.08
Nitrogen, Total Kjeldahl	mg/l	--	--	2.9	3.3	2.6	1.5	3.3	0.3	3.3	3.5	3.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.17	--	--	--	--	--	--	--	--
pH	-	--	--	8.31	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.10	8.15	7.94	7.97	7.91	7.64	7.81	8.11	8.39
Phosphorus	mg/l	--	--	2.2	1.77	1.38	0.98	2.41	0.15	2.18	2.05	2.21
Sulphate	mg/l	--	500 [6]	3	10	50	29	16	94	8	11	2
Temperature (Field)	deg c	--	15	3.2	8.8	7.9	9.9	8.9	8.9	7.8	10.6	7.7
Total Dissolved Solids	mg/l	--	500	1470	1560	1270	1440	1610	928	1570	1740	1680
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0033	0.003	0.004	0.003	0.003	0.001	0.005	0.005	0.005
Boron, dissolved	mg/l	5	--	1.2	0.864	1.71	1.05	0.839	0.434	1.67	1.59	1.54
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	22	20.4	9.86	25.3	50.7	61.3	10.3	10.7	18.8
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	0.001	<0.001	0.008	0.005	0.001	0.001	0.002
Cobalt, dissolved	mg/l	--	--	0.00091	0.0019	<0.0005	0.0005	<0.0005	<0.0005	0.0006	0.0005	0.0014
Copper, dissolved	mg/l	--	1	0.0033	<0.0005	<0.0005	0.0008	0.0044	0.0046	0.0037	0.0030	0.0065
Iron, dissolved	mg/l	--	0.3	0.14	0.621	0.558	0.278	<0.1	<0.1	0.149	0.194	1.32
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	22	18.4	13.2	23	37.2	41.4	14	13.4	17.9
Manganese, dissolved	mg/l	--	0.05	0.055	0.312	0.05	0.159	0.289	<0.005	0.024	0.018	0.058
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13	9.97	13.3	12.9	11.4	11.4	15.1	14.6	16.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	520	470	71.7	420	339	245	608	574	658
Zinc, dissolved	mg/l	--	5	0.011	0.012	0.01	0.006	0.016	0.008	<0.005	0.009	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.002 [10]	<0.002 [10]	0.006	0.007	<0.001	<0.001	<0.001	0.005
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 19-Jun-2019 05-3C	05-3C 20-Nov-2019 05-3C	05-3C 21-May-2020 05-3C	05-3C 26-Nov-2020 05-3C	05-3C 26-May-2021 05-3C	05-3C 30-Nov-2021 05-3C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	957	1030	942	970	954	1030
Alkalinity, Carbonate as CaCO3	mg/l	--	--	25	<25	18	37	8	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	982	1040	960	1010	962	1040
Ammonia Nitrogen	mg/l	--	--	0.62	1.71	0.65	1.93	1.20	1.75
Chemical Oxygen Demand	mg/l	--	--	84	80	92	81	71	84
Chloride	mg/l	--	250	316	385	392	349	276	339
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2497	2730	2565	2368	2672	2608
Hardness, Calcium Carbonate	mg/l	--	--	90.4	121	95.0	99.6	105	93.7
Nitrate as N	mg/l	10.0	--	0.9	0.2	0.9	<0.5 [11]	0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.10	0.40	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.1	2.9	2.1	3.1	2.9	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.77	8.27	8.46	8.41	8.28	8.34
Phosphorus	mg/l	--	--	0.83	2.31	1.04	2.30	1.89	2.27
Sulphate	mg/l	--	500 [6]	23	2	25	3	12	3
Temperature (Field)	deg c	--	15	13.3	5.8	12	8.2	11.8	7.3
Total Dissolved Solids	mg/l	--	500	1580	1710	1630	1630	1560	1720
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	0.005	0.004	0.003	0.004	0.005
Boron, dissolved	mg/l	5	--	1.49	1.42	1.52	1.48	1.54	1.43
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	10.7	14.4	11.2	11.2	11.3	11.3
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	0.001	0.001	0.001	0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0006	0.0006	0.0005	0.0006	0.0011
Copper, dissolved	mg/l	--	1	0.0106	0.0031	0.0045	0.0075	0.0062	0.0016
Iron, dissolved	mg/l	--	0.3	0.502	0.429	0.977	0.304	0.194	0.939
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0004	0.0002	0.0002	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	15.4	20.7	16.3	17.4	18.6	15.9
Manganese, dissolved	mg/l	--	0.05	0.029	0.052	0.042	0.034	0.006	0.046
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.2	21.2	16.8	15.4	15.3	14.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	557	640	641	620	553	562
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.006	0.01	0.007	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	0.008	<0.010 [11]	<0.004 [11]	<0.004 [11]
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 06-Sep-2005	05-3D 16-Nov-2005	05-3D 25-May-2006	05-3D 15-May-2007	05-3D 30-Nov-2007	05-3D 22-May-2008	05-3D 10-Nov-2008	05-3D 19-May-2009 G-15	05-3D 26-Nov-2009 J-13
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	593	271	480	478	507	484	505	508	538
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	486	444	480	478	507	484	505	508	538
Ammonia Nitrogen	mg/l	--	--	0.3	<0.01	0.21	<0.01	<0.01	<0.01	<0.01	0.05	0.02
Chemical Oxygen Demand	mg/l	--	--	43	12	28	47	59	15	<5	10	15
Chloride	mg/l	--	250	80.7	66.7	77.1	76	77.8	83.6	84	79	89
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	1310	1370
Conductivity (Field)	uS/cm	--	--	1600	2500	950	900	750	1050	1100	1050	1227
Hardness, Calcium Carbonate	mg/l	--	--	233	258	224	249	257	251	264	268	239
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.3	0.2	0.2	0.3	0.2	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.82	0.41	0.67	0.44	0.37	0.42	0.37	0.18	<0.10
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	8.04	8.05
pH (Field)	-	--	--	7.4	--	7.7	7.9	8.1	7.5	7.5	--	7.23
Phosphorus	mg/l	--	--	3.35	0.55	--	--	--	--	--	0.15	0.35
Sulphate	mg/l	--	500 [6]	137	101	96	94	91	89	91	78	90
Temperature (Field)	deg c	--	15	17.3	--	8.5	8.5	5	10.5	8	8	7.8
Total Dissolved Solids	mg/l	--	500	843	720	722	701	775	743	771	852	890
Total Organic Carbon	mg/l	--	--	35.2	4.1	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	4570	659	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.005	0.001	0.001	0.0014	0.0019	0.0014	0.0016	0.001	0.001
Boron, dissolved	mg/l	5	--	0.621	0.483	0.376	0.31	0.421	0.346	0.427	0.45	0.51
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00013	<0.00002	0.00015	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	44.3	47.5	39.1	44.5	46.8	45.1	48.6	48	48
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.004	0.004
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.0002	<0.0002
Copper, dissolved	mg/l	--	1	0.003	0.006	0.013	0.003	0.004	0.004	0.003	0.006	0.005
Iron, dissolved	mg/l	--	0.3	0.038	0.012	0.014	0.009	0.005	0.02	<0.005	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	0.0005	0.0004	0.0007	0.0002	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	29.8	33.8	30.8	33.5	34.1	33.6	34.7	36	29
Manganese, dissolved	mg/l	--	0.05	0.255	0.269	0.232	0.079	0.013	0.366	0.004	0.09	0.02
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.02	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.2	13.6	10.7	9.4	11.8	10	12.3	9	10
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	258	204	189	156	208	190	197	195	207
Zinc, dissolved	mg/l	--	5	0.014	0.017	0.017	0.015	<0.005	0.017	<0.005	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 25-May-2010 [4] M-26	05-3D 20-Oct-2010 [4] G-27	05-3D 24-May-2011 G-40	05-3D 29-Nov-2011 [4] 05-3D	05-3D 31-May-2012 05-3D	05-3D 29-Nov-2012 05-3D	05-3D 29-May-2013 05-3D	05-3D 26-Nov-2013 GW-19	05-3D 29-May-2014 05-3D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	515	565	576	617	610	640	640	670	660
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	14	<2 [8]	6.5	8.5	6.1	6.0	6.8
Alkalinity (Total as CaCO3)	mg/l	--	--	515	565	590	617	620	650	650	680	670
Ammonia Nitrogen	mg/l	--	--	0.06	0.05	0.06	<0.02	<0.050	0.080	0.11	<0.050	0.11
Chemical Oxygen Demand	mg/l	--	--	10	15	10	8	9.2	15	21	11	46
Chloride	mg/l	--	250	76	84	82	84	75	74	77	78	77
Conductivity	uS/cm	--	--	1320	1400	1430	1460	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1246	1400	1122	1437	1313	1341	1241	1324	1324
Hardness, Calcium Carbonate	mg/l	--	--	274	312	296	291	290	330	320	330	280
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010	0.018	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.13	0.12	0.56	0.16	0.64	0.63	0.57	0.54	0.55
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
pH	-	--	--	8.14	8.00	8.42	8.16	8.05	8.15	8.01	7.98	8.04
pH (Field)	-	--	--	7.46	7.62	7.38	7.68	7.95	7.75	7.47	7.55	7.35
Phosphorus	mg/l	--	--	0.17	0.11	0.08	0.06	0.089	0.085	0.17	0.070	0.052
Sulphate	mg/l	--	500 [6]	79	80	79	82	71	71	72	77	72
Temperature (Field)	deg c	--	15	20.2	12.2	15.0	6.9	11.3	6.0	11.8	6.8	8.6
Total Dissolved Solids	mg/l	--	500	858	910	930	949	840	858	920	866	866
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.001	<0.001	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.40	0.50	0.39	0.46	0.39	0.53	0.4	0.5	0.39
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	47	54	51	54	50	59	56	58	49
Chromium, dissolved	mg/l	0.05	--	0.004	0.006	<0.005	0.005	<0.0050	0.0060	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0011	0.0006	0.0020	<0.0002	0.0017	0.00072	0.0012	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.008	0.003	0.005	0.005	0.0042	0.0033	0.0055	0.0041	0.0044
Iron, dissolved	mg/l	--	0.3	0.05	<0.03	<0.03	<0.03	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	38	43	41	38	39	45	43	45	38
Manganese, dissolved	mg/l	--	0.05	1.99	0.62	1.60	0.08	1.7	0.84	0.98	0.18	0.23
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	13	11	11	10	13	11	13	9.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	209	235	187	216	210	240	220	260	220
Zinc, dissolved	mg/l	--	5	0.02	<0.01	0.02	<0.01	0.015	0.012	0.0070	0.036	0.0090
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 19-Nov-2014	05-3D 02-Jun-2015	05-3D 26-Nov-2015	05-3D 26-May-2016	05-3D 17-Nov-2016	05-3D 24-May-2017	05-3D 29-Nov-2017	05-3D 24-May-2018	05-3D 29-Nov-2018
				05-3D	05-3D	05-3D	05-3D	05-3C	05-3D	05-3D	05-3D	05-3D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	650	658	642	646	651	1070	714	714	753
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.1	<5	<5	<5	<5	17	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	660	661	644	648	654	1090	718	718	756
Ammonia Nitrogen	mg/l	--	--	<0.050	0.10	0.02	0.04	0.08	1.91	0.22	0.03	0.16
Chemical Oxygen Demand	mg/l	--	--	9.6	18	18	19	40	98	33	20	37
Chloride	mg/l	--	250	88	92	98	104	106	342	126	111	112
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1499	1419	1494	1455	1596	2590	1470	1608	1457
Hardness, Calcium Carbonate	mg/l	--	--	320	190	322	276	315	86	322	334	369
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.24	0.2	0.3	0.3	0.3	3.2	0.6	0.4	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--	--
pH	-	--	--	7.83	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.49	7.49	7.67	7.78	7.56	8.18	7.40	7.49	7.78
Phosphorus	mg/l	--	--	0.076	<0.01	0.04	0.06	0.25	2.28	0.40	0.10	0.20
Sulphate	mg/l	--	500 [6]	79	83	87	91	100	9	113	107	107
Temperature (Field)	deg c	--	15	5.9	8.7	7.1	9.4	9.7	10.2	8.8	9.0	8.2
Total Dissolved Solids	mg/l	--	500	850	918	874	896	882	1660	970	992	646
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	0.001	0.01	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.46	0.193	0.424	0.343	0.578	1.32	0.523	0.593	0.581
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	57	29.4	45.7	49.8	57	10.9	53.5	60.1	62.7
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.006	0.011	<0.001	<0.001	0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0067	0.0013	0.0006	0.0027	0.0045	0.0008	0.0070	0.0039	0.0109
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.635	<0.1	<0.1	0.499
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0018
Magnesium, dissolved	mg/l	--	--	43	28.3	50.5	36.8	41.9	14.4	45.8	44.7	51.6
Manganese, dissolved	mg/l	--	0.05	0.063	0.06	<0.005	0.091	0.058	0.046	0.6	<0.005	0.248
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	7.92	10	10.7	11.7	14.3	13	11.7	14.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	260	222	282	188	249	697	247	236	0.283
Zinc, dissolved	mg/l	--	5	0.024	0.007	0.009	0.011	0.007	<0.005	0.01	0.006	0.015
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.002	<0.001	<0.004 [10]	<0.001	<0.001	0.003
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 19-Jun-2019 05-3D	05-3D 20-Nov-2019 05-3D	05-3D 21-May-2020 05-3D	05-3D 26-Nov-2020 05-3D	05-3D 26-May-2021 05-3D	05-3D 30-Nov-2021 05-3D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	694	666	704	719	738	748
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	5	8	6	<5	7
Alkalinity (Total as CaCO3)	mg/l	--	--	701	671	712	725	742	755
Ammonia Nitrogen	mg/l	--	--	0.04	0.22	0.02	0.14	0.05	0.24
Chemical Oxygen Demand	mg/l	--	--	11	25	25	33	<10	18
Chloride	mg/l	--	250	113	116	139	117	110	107
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1518	1646	1541	1490	1671	1700
Hardness, Calcium Carbonate	mg/l	--	--	380	378	366	344	388	328
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.2	0.4	0.4	0.4	0.2	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.53	7.4	8.24	7.64	7.36	7.41
Phosphorus	mg/l	--	--	0.16	0.16	0.12	0.16	0.10	0.12
Sulphate	mg/l	--	500 [6]	111	110	126	103	96	94
Temperature (Field)	deg c	--	15	12.7	9.3	12.4	7.4	10.8	8.1
Total Dissolved Solids	mg/l	--	500	970	1060	1040	1000	1040	1010
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.444	0.435	0.411	0.436	0.441	0.418
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	67.2	60	62.7	57.2	65.6	57.5
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.0051	0.0030	0.0061	0.0018	0.0044	0.0018
Iron, dissolved	mg/l	--	0.3	0.122	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	51.5	55.4	50.9	48.9	54.5	44.8
Manganese, dissolved	mg/l	--	0.05	0.052	0.623	0.04	0.401	0.494	0.648
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.8	18.3	13.6	13.7	13.7	13.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	258	276	272	268	244	244
Zinc, dissolved	mg/l	--	5	0.006	0.008	<0.005	0.01	0.013	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.003	0.004	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 06-Sep-2005 [3]	05-8 16-Nov-2005	05-8 25-May-2006	05-8 21-Nov-2006	05-8 15-May-2007	05-8 30-Nov-2007	05-8 28-Feb-2008	05-8 22-May-2008	05-8 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	159	855	876	980	1040	940	970	1900
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	650	855	876	980	1040	940	970	1900
Ammonia Nitrogen	mg/l	--	--	--	3.29	2.02	0.79	2.22	0.35	0.44	<0.01	0.8
Chemical Oxygen Demand	mg/l	--	--	--	61	57	39	169	108	43	67	214
Chloride	mg/l	--	250	--	89.9	27.9	16.8	24.3	122	81.2	103	444
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1600	1400	1425	1300	1500	--	1700	3500
Hardness, Calcium Carbonate	mg/l	--	--	--	649	794	769	794	1040	925	1030	1500
Nitrate as N	mg/l	10.0	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	5.48	3.48	1.74	4.35	1.69	1.75	1.81	5.56
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	6.8	6.9	7.2	6.9	--	6.5	6.6
Phosphorus	mg/l	--	--	--	2.06	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	220	203	169	79	139	144	123	12
Temperature (Field)	deg c	--	15	--	--	4	11	9	11.5	--	10.5	11
Total Dissolved Solids	mg/l	--	500	--	1100	1120	1070	1080	1370	1200	1260	2560
Total Organic Carbon	mg/l	--	--	--	17.5	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	4590	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.007	<0.001	0.0006	0.0013	0.0013	0.0015	0.0011	0.0023
Boron, dissolved	mg/l	5	--	--	0.642	0.262	0.368	0.306	1.51	0.966	1.01	13.1
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00007	<0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	--	136	179	165	174	222	200	223	341
Chromium, dissolved	mg/l	0.05	--	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	0.045	<0.002	<0.002	<0.002	<0.002	<0.002	0.006
Iron, dissolved	mg/l	--	0.3	--	19.6	21	2.49	9.56	6.03	6.52	4.52	0.054
Lead, dissolved	mg/l	0.01	--	--	<0.0002	0.0008	<0.0001	0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	--	75.4	84.4	86.9	87.5	119	103	116	158
Manganese, dissolved	mg/l	--	0.05	--	1.63	2.36	3.23	3.02	4.47	4.09	4.88	5.75
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	14.6	5.9	5.8	6.8	6.4	6	4.9	12.3
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	169	86.8	91.4	109	129	93.6	98.4	443
Zinc, dissolved	mg/l	--	5	--	0.016	0.026	0.01	0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	<0.0006	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0011
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 19-Dec-2008	05-8 19-May-2009 G-20	05-8 26-Nov-2009 M-15	05-8 25-May-2010 [4] M-12	05-8 20-Oct-2010 G-8	05-8 24-May-2011 G-14	05-8 29-Nov-2011 [4] 05-8	05-8 31-May-2012 05-8	05-8 28-Nov-2012 05-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1850	1610	1400	1250	1210	1100	1170	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	2.7	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	1850	1613	1400	1248	1210	1100	1170	1200	1200
Ammonia Nitrogen	mg/l	--	--	0.72	0.72	0.67	0.57	0.76	0.70	1.16	0.74	1.0
Chemical Oxygen Demand	mg/l	--	--	272	140	130	75	85	55	85	56	61
Chloride	mg/l	--	250	409	302	243	133	135	91	158	43	96
Conductivity	uS/cm	--	--	--	3450	2960	2490	2420	2110	2380	--	--
Conductivity (Field)	uS/cm	--	--	3200	--	2511	2474	2277	1688	2127	1866	1922
Hardness, Calcium Carbonate	mg/l	--	--	1390	1220	1120	1040	1140	982	818	960	920
Nitrate as N	mg/l	10.0	--	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	5.34	3.34	2.56	1.51	2.29	1.55	2.71	1.7	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	6.71	7.21	7.14	7.02	7.76	7.51	7.38	--
pH (Field)	-	--	--	6.6	--	6.34	6.64	6.64	6.40	6.67	6.56	6.50
Phosphorus	mg/l	--	--	--	0.53	0.79	0.20	0.70	0.50	0.52	0.29	0.29
Sulphate	mg/l	--	500 [6]	7	16	21	29	36	34	5	<1	<1
Temperature (Field)	deg c	--	15	5	--	11.4	16.3	13	16.5	9.3	11.0	10.1
Total Dissolved Solids	mg/l	--	500	2490	2240	1920	1620	1570	1370	1550	1240	1330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.005	0.003	0.004	<0.01	<0.001	<0.001	<0.01	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	**12.6**	**8.71**	**5.9**	4.8	3.6	0.50	3.6	1.6	2.7
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	325	262	248	222	255	207	166	210	190
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.005	<0.005	0.006	0.006	0.008	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0022	0.0015	0.0010	0.0012	0.0010	0.0004	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.006	0.001	0.006	0.003	0.004	<0.001	0.0016	0.001
Iron, dissolved	mg/l	--	0.3	0.938	<0.03	7.09	0.92	2.39	0.11	13.0	1.8	3.8
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	140	138	122	119	122	113	98	110	110
Manganese, dissolved	mg/l	--	0.05	5.26	6.76	5.29	5.63	6.38	6.78	3.19	7	4.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.5	8	12	10	9	8	12	7.6	12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	476	297	263	211	194	140	225	130	190
Zinc, dissolved	mg/l	--	5	0.026	0.02	0.01	0.02	0.02	0.02	<0.01	<0.0050	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00050	<0.00050
Benzene	mg/l	0.001	--	**0.0015**	**0.0020**	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.00050	<0.00050
Ethylbenzene	mg/l	0.14	0.0016	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
m,p-Xylenes	mg/l	--	--	0.0053	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00050	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0025	<0.0025
o-Xylene	mg/l	--	--	0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	<0.0010
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	<0.0010

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 29-May-2013 [5] 05-8	05-8 26-Nov-2013 [5] GW-23	05-8 29-May-2014 05-8	05-8 19-Nov-2014 [19] 05-8	05-8 02-Jun-2015 05-8	05-8 26-Nov-2015 [3] 05-8	05-8 26-May-2016 05-8	05-8 17-Nov-2016 05-8	05-8 24-May-2017 05-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1200	1200	1100	1200	983	--	1080	1030	1120
Alkalinity, Carbonate as CaCO3	mg/l	--	--	2.2	2.2	1.8	1.9	<50	--	<25 [9]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1200	1100	1200	984	--	1080	1040	1120
Ammonia Nitrogen	mg/l	--	--	1.8	1.7	1.5	0.95	1.04	--	0.88	1.25	0.21
Chemical Oxygen Demand	mg/l	--	--	78	57	51	61	69	--	54	95	54
Chloride	mg/l	--	250	70	64	30	95	67	--	55	90	14
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1733	1727	1566	2174	2045	--	1983	2205	1888
Hardness, Calcium Carbonate	mg/l	--	--	1000	990	970	1100	933	--	987	937	1140
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	2.5	2.4	2.0	2.0	--	1.6	2.1	1.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--	--	--	--
pH	-	--	--	7.29	7.29	7.25	7.21	--	--	--	--	--
pH (Field)	-	--	--	6.52	6.40	6.65	6.86	6.58	--	6.58	6.94	6.65
Phosphorus	mg/l	--	--	0.14	0.13	0.21	0.21	0.09	--	0.18	0.79	0.06
Sulphate	mg/l	--	500 [6]	<1	<1	3	<1	<1	--	2	<1	<1
Temperature (Field)	deg c	--	15	9.7	8.6	10.6	7.0	9.2	--	13.4	11.4	10.4
Total Dissolved Solids	mg/l	--	500	1330	1280	1030	1300	1300	--	1330	1300	1170
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	--	<0.001	0.002	<0.001
Boron, dissolved	mg/l	5	--	1.6	1.2	0.4	1.9	1.07	--	0.824	2.36	0.273
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	220	220	220	230	169	--	208	197	258
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	--	<0.001	0.016	0.01
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	<0.0010	0.0023	0.0010	<0.0005	--	<0.0005	0.0017	0.0019
Iron, dissolved	mg/l	--	0.3	0.69	8.8	<0.1	0.76	<0.1	--	<0.1	10	0.46
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	120	110	100	120	124	--	114	108	120
Manganese, dissolved	mg/l	--	0.05	6.8	8.2	7.6	7	6.82	--	8.74	5.59	12.6
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.3	7.1	4	8.6	6.37	--	8.06	11.7	3.69
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	140	110	49	150	126	--	84.9	159	55.4
Zinc, dissolved	mg/l	--	5	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	--	<0.005	0.005	0.006
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.0056	0.0019	0.0015	0.0048	<0.002 [10]	--	<0.004 [11]	0.007	<0.002 [10]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00025	<0.00025	0.00033	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.0013	<0.00050	<0.0010	<0.0050	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00050	<0.00050	<0.00020	<0.00040	<0.0005	--	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00050	<0.00020	<0.00040	<0.0005	--	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 29-Nov-2017 05-8	05-8 24-May-2018 05-8	05-8 22-Nov-2018 05-8	05-8 19-Jun-2019 05-8	05-8 20-Nov-2019 05-8	05-8 21-May-2020 05-8	05-8 26-Nov-2020 05-8	05-8 26-May-2021 05-8	05-8 30-Nov-2021 05-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1020	1310	1500	1250	1310	979	1430	1010	1260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25 [9]	<25 [9]	<25 [9]	<25	<25 [16]	<25	<25	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1020	1310	1500	1260	1310	980	1440	1020	1260
Ammonia Nitrogen	mg/l	--	--	0.84	0.39	0.90	0.79	0.42	1.03	0.17	1.33	0.81
Chemical Oxygen Demand	mg/l	--	--	87	134	174	110	141	89	122	72	130
Chloride	mg/l	--	250	68	121	219	113	94	24	113	38	45
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2003	2388	2506	2173	2520	1667	1975	1925	1993
Hardness, Calcium Carbonate	mg/l	--	--	891	1220	1630	942	1200	899	1000	758	863
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.3	2.1	3.5	2.5	2.2	2.4	1.9	2.9	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.41	6.52	6.65	6.71	6.87	8.12	6.86	6.64	6.67
Phosphorus	mg/l	--	--	1.95	0.14	0.24	0.13	0.11	0.16	0.14	0.14	0.16
Sulphate	mg/l	--	500 [6]	1	1	3	1	9	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	9.4	12.0	9.8	13.3	6.5	10.8	8.0	11	8.5
Total Dissolved Solids	mg/l	--	500	1130	1570	1700	1400	1550	1020	1420	1090	1260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1.98	3.21	12.9	2.48	4.67	0.932	3.4	0.64	1.41
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	200	274	396	195	254	191	206	163	192
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.001	0.001	0.002	0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	0.0027	0.0009	0.0027	<0.0005	0.0009	<0.0005	0.0008
Copper, dissolved	mg/l	--	1	0.0008	0.0008	0.0012	0.0046	0.0015	0.0031	0.0027	0.0019	0.0011
Iron, dissolved	mg/l	--	0.3	4.12	0.878	7.95	0.21	10.3	11.7	3.26	<0.1	6.17
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	0.0003	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	95.1	130	156	110	137	102	119	85.3	93.3
Manganese, dissolved	mg/l	--	0.05	9.67	12.5	12.9	13.7	13.2	9.57	11.4	8.69	11.2
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.93	4.96	11.6	6.52	11.7	5.91	10.4	5.25	6.49
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	90.4	124	226	136	190	88.5	182	72.5	108
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.002 [11]	0.006	0.003	0.006	0.005	<0.004 [11]	0.006	<0.004 [11]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 06-Sep-2005 [3]	05-R3 16-Nov-2005	05-R3 25-May-2006	05-R3 21-Nov-2006	05-R3 15-May-2007	05-R3 30-Nov-2007	05-R3 28-Feb-2008	05-R3 22-May-2008	05-R3 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	140	720	765	768	815	800	850	920
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	575	720	765	768	815	800	850	920
Ammonia Nitrogen	mg/l	--	--	--	6.74	0.54	0.38	0.11	0.12	<0.01	0.04	0.26
Chemical Oxygen Demand	mg/l	--	--	--	106	25	15	38	57	<5	17	14
Chloride	mg/l	--	250	--	80.2	81.9	76	79.6	68.6	72.8	71.7	74.1
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1600	1300	1425	1300	1375	--	--	1600
Hardness, Calcium Carbonate	mg/l	--	--	--	556	501	547	554	601	601	639	639
Nitrate as N	mg/l	10.0	--	--	<0.1	0.8	0.8	0.5	0.5	0.4	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	33.1	1.16	0.84	0.67	0.49	0.34	0.5	0.65
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.2	7.1	7.6	7.6	--	--	6.8
Phosphorus	mg/l	--	--	--	5.05	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	300	185	196	198	211	202	186	158
Temperature (Field)	deg c	--	15	--	--	4.5	11.5	11.1	9	--	--	9
Total Dissolved Solids	mg/l	--	500	--	1160	1080	1150	1150	1230	1180	1210	1240
Total Organic Carbon	mg/l	--	--	--	26.6	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	1200	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.008	<0.001	0.001	0.0008	0.001	0.001	0.0008	0.0008
Boron, dissolved	mg/l	5	--	--	1.27	1.06	1.28	1.1	1.18	1.08	1.01	1.17
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00006	<0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	--	129	108	121	122	139	136	142	143
Chromium, dissolved	mg/l	0.05	--	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	--	15.2	0.022	<0.005	0.06	0.089	0.031	0.279	0.099
Lead, dissolved	mg/l	0.01	--	--	<0.0002	<0.0002	<0.0001	0.00005	<0.00002	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	--	57	56.1	59.9	60.5	62	63.6	69.3	68.5
Manganese, dissolved	mg/l	--	0.05	--	1.19	1.18	1.21	0.844	0.551	0.614	1.19	0.964
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	15.3	10.1	11.7	10.3	10.2	9.5	10.3	11.7
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	225	208	220	212	246	213	218	230
Zinc, dissolved	mg/l	--	5	--	0.017	0.006	0.008	<0.005	<0.005	<0.005	0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	<0.0006	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 19-Dec-2008	05-R3 19-May-2009 G-24	05-R3 26-Nov-2009 M-16	05-R3 25-May-2010 M-15	05-R3 20-Oct-2010 G-10	05-R3 24-May-2011 G-16	05-R3 29-Nov-2011 05-R3	05-R3 31-May-2012 05-R3	05-R3 28-Nov-2012 05-R3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	870	899	908	852	896	951	968	940	940
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	4.4	5.0
Alkalinity (Total as CaCO3)	mg/l	--	--	870	899	908	852	896	951	968	940	940
Ammonia Nitrogen	mg/l	--	--	0.03	0.09	0.53	0.10	0.06	0.26	0.25	<0.050	0.11
Chemical Oxygen Demand	mg/l	--	--	15	23	27	23	30	23	25	21	25
Chloride	mg/l	--	250	65.9	60	73	58	55	51	81	46	44
Conductivity	uS/cm	--	--	--	1940	2000	1950	1970	1980	2030	--	--
Conductivity (Field)	uS/cm	--	--	1500	1500	1776	1954	1905	1745	1852	1780	1792
Hardness, Calcium Carbonate	mg/l	--	--	666	646	580	732	784	766	660	750	780
Nitrate as N	mg/l	10.0	--	0.5	0.18	<0.10	0.14	<0.10	<0.10	0.11	0.21	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.37	0.36	0.60	0.28	0.83	0.50	0.62	0.58	0.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	0.21	<0.10
pH	-	--	--	--	7.06	7.45	7.76	7.40	7.98	7.76	7.70	--
pH (Field)	-	--	--	7.3	--	6.79	6.88	6.98	6.86	6.83	6.99	6.79
Phosphorus	mg/l	--	--	--	0.06	0.18	0.07	0.04	0.05	0.05	0.059	0.028
Sulphate	mg/l	--	500 [6]	150	173	153	192	193	158	131	160	170
Temperature (Field)	deg c	--	15	5	8	10.7	14.5	11.9	16.7	9.5	10.6	8.6
Total Dissolved Solids	mg/l	--	500	1210	1260	1300	1270	1280	1290	1320	1230	1280
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0008	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	1.24	1.75	1.4	1.4	1.1	0.97	1.4	0.97	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	152	145	120	163	187	173	134	170	180
Chromium, dissolved	mg/l	0.05	--	<0.002	0.009	0.003	0.005	0.005	0.002	0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0005	0.0008	0.0007	0.0012	0.0007	0.0007	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.002	0.003	0.004	0.006	0.002	0.0024	0.002
Iron, dissolved	mg/l	--	0.3	0.006	<0.03	3.93	0.24	0.31	<0.03	1.18	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	69.5	69	68	79	77	81	79	81	81
Manganese, dissolved	mg/l	--	0.05	1.5	0.42	1.61	0.81	1.10	0.52	1.91	1.1	0.39
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.5	9	11	12	10	10	12	11	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	236	204	224	218	197	170	222	180	190
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.02	0.01	<0.01	0.01	<0.01	0.016	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	--	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	--	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	--	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0002	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 29-May-2013 05-R3	05-R3 26-Nov-2013 [5] GW-22	05-R3 29-May-2014 05-R3	05-R3 19-Nov-2014 05-R3	05-R3 02-Jun-2015 05-R3	05-R3 26-Nov-2015 05-R3	05-R3 26-May-2016 05-R3	05-R3 17-Nov-2016 05-R3	05-R3 24-May-2017 05-R3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	940	970	960	940	958	978	960	981	939
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.2	4.1	5.2	3.2	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	950	970	960	940	959	980	961	983	941
Ammonia Nitrogen	mg/l	--	--	0.074	0.087	0.075	0.051	0.07	0.05	0.02	0.13	0.03
Chemical Oxygen Demand	mg/l	--	--	27	27	15	17	19	32	16	28	17
Chloride	mg/l	--	250	43	42	46	39	48	49	42	42	20
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1611	1646	1704	1878	1860	1849	1880	2018	1874
Hardness, Calcium Carbonate	mg/l	--	--	820	750	790	820	702	800	764	788	933
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.17	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.50	0.45	0.43	0.33	0.2	0.4	0.3	0.4	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	0.17	<0.10	--	--	--	--	--
pH	-	--	--	7.68	7.65	7.76	7.56	--	--	--	--	--
pH (Field)	-	--	--	6.95	6.93	7.27	7.08	6.99	6.98	7.18	7.34	6.89
Phosphorus	mg/l	--	--	0.046	0.053	0.049	0.060	0.04	0.04	0.07	0.08	0.03
Sulphate	mg/l	--	500 [6]	150	150	160	170	184	144	223	168	296
Temperature (Field)	deg c	--	15	9.9	9.0	11.4	7.2	10.2	10.4	13.1	11.8	11.8
Total Dissolved Solids	mg/l	--	500	1250	1220	1220	1180	1290	1250	1320	1200	1290
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.97	0.96	0.91	0.94	0.698	0.838	0.796	1.14	0.58
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	190	170	180	190	132	153	172	174	229
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.012	0.008
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0019	0.0024	0.0031	0.0017	<0.0005	<0.0005	0.0010	0.0026	0.0024
Iron, dissolved	mg/l	--	0.3	<0.1	0.2	<0.1	0.31	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	83	81	84	85	90.3	101	81.5	85.7	87.5
Manganese, dissolved	mg/l	--	0.05	0.51	0.55	0.25	0.41	0.583	0.804	0.233	0.725	0.008
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.8	11	9.2	9.7	7.95	9.9	9.76	11.7	6.97
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	180	180	190	180	195	187	173	169	171
Zinc, dissolved	mg/l	--	5	<0.0050	0.0074	<0.0050	0.0065	0.011	0.01	<0.005	<0.005	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	0.001	<0.001	0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 29-Nov-2017	05-R3 24-May-2018	05-R3 22-Nov-2018	05-R3 19-Jun-2019	05-R3 20-Nov-2019	05-R3 21-May-2020	05-R3 26-Nov-2020	05-R3 26-May-2021	05-R3 30-Nov-2021
				05-R3	05-R3	05-R3	05-R3	05-R3	05-R3	05-R3	05-R3	05-R3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	917	1030	991	899	756	845	821	772	733
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	919	1030	992	902	760	848	826	774	737
Ammonia Nitrogen	mg/l	--	--	0.12	0.10	0.03	0.05	0.02	<0.01	0.03	0.04	0.02
Chemical Oxygen Demand	mg/l	--	--	30	48	21	18	23	28	24	<10	26
Chloride	mg/l	--	250	21	20	21	21	18	25	20	15	13
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1656	1790	1435	1560	1625	1516	1436	1570	1598
Hardness, Calcium Carbonate	mg/l	--	--	789	824	797	814	613	719	722	688	615
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.2	1.2	<0.5 [11]	<0.1	0.2
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.5	0.3	0.3	0.2	0.3	0.3	0.2	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.81	6.92	7.25	7.22	7.07	7.69	7.09	6.94	6.94
Phosphorus	mg/l	--	--	0.04	0.06	0.06	0.03	0.04	0.04	0.03	0.03	0.02
Sulphate	mg/l	--	500 [6]	282	131	127	123	162	182	137	222	252
Temperature (Field)	deg c	--	15	10.6	11.2	9.2	14.1	7.4	12.8	8.6	12.4	7.2
Total Dissolved Solids	mg/l	--	500	1130	1150	990	1020	1100	1070	956	1020	1050
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.649	0.501	0.62	0.507	0.446	0.416	0.478	0.373	0.367
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	186	195	185	183	118	165	161	160	148
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	<0.001	<0.001	0.003	0.001	<0.001	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0016	0.0015	0.0037	0.0019	0.0025	0.0044	0.0041	0.0020	0.0016
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	78.8	81.7	81.5	86.4	77.1	74.3	78.1	70.2	59.6
Manganese, dissolved	mg/l	--	0.05	0.063	1.38	0.363	0.417	0.083	0.014	0.546	<0.005	0.065
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.7	7.99	9.51	9.85	10.2	8.27	9.84	7.78	7.03
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	167	137	123	128	125	117	111	135	123
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.003	0.001	<0.001	0.004	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1A 30-Nov-2007	07-1A 28-Feb-2008	07-1A 22-May-2008	07-1A 13-Aug-2008	07-1A 10-Nov-2008	07-1A 25-May-2010 [4] M-8	07-1A 24-May-2011 [4] G-7	07-1A 28-Nov-2012 07-1A	07-1A 29-May-2014 07-1A
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	860	795	820	805	800	761	784	780	770
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	28	37	18	30
Alkalinity (Total as CaCO3)	mg/l	--	--	860	795	820	805	800	789	821	800	800
Ammonia Nitrogen	mg/l	--	--	1.42	1.48	1.39	1.38	1.39	1.27	1.37	2.1	1.6
Chemical Oxygen Demand	mg/l	--	--	68	32	85	45	23	33	33	820	110
Chloride	mg/l	--	250	421	402	407	405	402	343	382	360	380
Conductivity	uS/cm	--	--	--	--	--	--	--	2640	2730	--	--
Conductivity (Field)	uS/cm	--	--	2000	--	2350	2500	2250	2693	2429	2381	2336
Hardness, Calcium Carbonate	mg/l	--	--	44	40	40	42	40	49	45	45	46
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1	<0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.19	2.65	3.92	2.93	1.99	1.66	1.78	13	5.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	--	--	--	--	8.59	8.70	--	8.62
pH (Field)	-	--	--	8.6	--	8.6	9	8.5	8.72	8.59	8.64	8.10
Phosphorus	mg/l	--	--	--	--	--	--	--	1.07	0.52	30	3.0
Sulphate	mg/l	--	500 [6]	4	1	2	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	3.5	--	11.5	11	7	11.9	18.0	7.5	9.9
Total Dissolved Solids	mg/l	--	500	1660	1440	1510	1440	1460	1720	1770	1560	1460
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0044	0.0035	0.0025	0.0008	0.001	<0.01	<0.01	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	1.05	0.993	1.01	1.03	1.06	1.3	1.0	1.3	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	2.8	2.4	2.4	2.9	2.27	3	3	3.1	3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.008	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0003	<0.0002	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.004	<0.002	0.002	<0.001	<0.001	0.0017
Iron, dissolved	mg/l	--	0.3	0.018	0.071	0.054	0.05	0.015	0.06	0.07	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	0.0002	0.00015	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	8.98	8.25	8.33	8.46	8.44	10	9	9.1	9.3
Manganese, dissolved	mg/l	--	0.05	0.004	0.005	0.003	0.003	0.002	<0.01	<0.01	0.003	0.0050
Potassium, dissolved	mg/l	--	--	17.5	14.2	14.9	15.6	15.9	16	15	15	14
Sodium, dissolved	mg/l	--	200 [7]	687	531	578	518	550	515	606	630	530
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00020	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00020	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0010	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00040	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00040	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1A 26-Nov-2015 07-1A	07-1A 24-May-2017 07-1A	07-1A 29-Nov-2018 07-1A	07-1A 21-May-2020 07-1A	07-1A 30-Nov-2021 07-1A
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	815	864	898	800	816
Alkalinity, Carbonate as CaCO3	mg/l	--	--	20	18	22	38	14
Alkalinity (Total as CaCO3)	mg/l	--	--	835	882	920	838	830
Ammonia Nitrogen	mg/l	--	--	1.50	1.61	1.89	1.93	1.66
Chemical Oxygen Demand	mg/l	--	--	56	34	39	45	38
Chloride	mg/l	--	250	406	469	482	728	522
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2585	2885	2620	2706	2966
Hardness, Calcium Carbonate	mg/l	--	--	36.5	54	79	70.8	68.3
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	0.21
Nitrogen, Total Kjeldahl	mg/l	--	--	2.0	2.5	2.7	2.1	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.68	8.51	8.57	8.99	8.67
Phosphorus	mg/l	--	--	0.49	0.34	0.46	0.48	0.42
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	8.7	10.4	6.8	11.2	6.8
Total Dissolved Solids	mg/l	--	500	1600	1640	1650	1840	1720
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1.26	1.24	1.26	0.947	0.906
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	2.73	3.23	10.5	7.23	7.15
Chromium, dissolved	mg/l	0.05	--	<0.001	0.011	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0015	0.0024	0.0016	0.0009
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.182	<0.1	0.142
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	7.21	11.1	12.9	12.8	12.3
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	<0.005	<0.005	<0.005
Potassium, dissolved	mg/l	--	--	12.9	16.6	18.7	17.1	15.7
Sodium, dissolved	mg/l	--	200 [7]	677	674	706	669	570
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	0.008	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.002 [10]	<0.001	0.003	<0.001
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1B 30-Nov-2007	07-1B 28-Feb-2008	07-1B 22-May-2008	07-1B 13-Aug-2008	07-1B 10-Nov-2008	07-1B 25-May-2010 [4] M-7	07-1B 24-May-2011 [4] G-9	07-1B 28-Nov-2012 07-1B	07-1B 29-May-2014 [5] 07-1B
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	965	925	920	945	950	902	942	910	900
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]	20	8.5	18
Alkalinity (Total as CaCO3)	mg/l	--	--	965	925	920	945	950	902	962	920	920
Ammonia Nitrogen	mg/l	--	--	2.99	3.06	2.51	2.74	3.14	2.54	2.77	3.2	3.2
Chemical Oxygen Demand	mg/l	--	--	130	82	77	124	68	65	63	69	61
Chloride	mg/l	--	250	1470	1480	1470	1510	1520	1280	1360	1300	1400
Conductivity	uS/cm	--	--	--	--	--	--	--	5690	6020	--	--
Conductivity (Field)	uS/cm	--	--	4500	--	>5000	>5000	>5000	>3999	>3999	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	389	333	357	362	366	346	355	380	370
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	0.1	<0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	5.21	5.31	4.41	5.6	4.85	3.89	3.95	4.3	4.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	--	--	--	--	8.28	8.35	--	8.34
pH (Field)	-	--	--	7.8	--	7.8	8.2	7.6	7.54	7.78	7.99	7.73
Phosphorus	mg/l	--	--	--	--	--	--	--	0.67	0.99	0.96	1.5
Sulphate	mg/l	--	500 [6]	200	185	132	73	52	30	7	<1	<1
Temperature (Field)	deg c	--	15	3	--	11.5	12	7	11.0	10.0	7.0	10.5
Total Dissolved Solids	mg/l	--	500	3890	3430	3420	3320	3330	3700	3910	3190	3050
Metals												
Arsenic, dissolved	mg/l	0.01	--	**0.0119**	**0.0216**	**0.0154**	**0.0108**	0.0049	<0.1	<0.1	0.006	0.0077 [20]
Boron, dissolved	mg/l	5	--	1.06	1.04	1.05	1.06	1.1	0.95	0.9	1.3	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	45.8	33.6	40.7	43.1	42.2	38	40	42	41
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0010	0.0011	0.0007	0.00074
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002	<0.002	<0.002	0.002	0.003	<0.001	0.0010
Iron, dissolved	mg/l	--	0.3	0.6	2.71	1.06	0.179	0.033	1.35	1.59	1.3	0.75
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	0.0005	<0.00002	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	66.8	60.6	62.1	61.8	63.4	61	62	66	65
Manganese, dissolved	mg/l	--	0.05	0.111	0.09	0.084	0.104	0.075	0.09	0.14	0.083	0.079
Potassium, dissolved	mg/l	--	--	40.7	34.4	35.8	38.1	36.1	32	30	32	30
Sodium, dissolved	mg/l	--	200 [7]	1440	1070	1120	1030	1040	955	1190	1100	1200
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	0.01	<0.005	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00050	<0.00020
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00050	<0.00020
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0025	<0.0010
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	<0.00040
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	<0.00040

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1B 26-Nov-2015 07-1B	07-1B 24-May-2017 07-1B	07-1B 22-Nov-2018 07-1B	07-1B 21-May-2020 07-1B	07-1B 30-Nov-2021 07-1B
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	967	1030	1040	917	967
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	17	8	19	6
Alkalinity (Total as CaCO3)	mg/l	--	--	987	1050	1050	936	973
Ammonia Nitrogen	mg/l	--	--	3.06	3.31	3.14	3.47	3.79
Chemical Oxygen Demand	mg/l	--	--	119	91	80	99	124
Chloride	mg/l	--	250	1420	1480	1390	1670	1440
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	>3999	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	376	331	562	425	368
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.50 [9]	<0.05	<0.05	<1.00 [16]
Nitrogen, Total Kjeldahl	mg/l	--	--	4.1	4.1	4.8	3.4	5.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.02	7.94	8.1	8.39	8.11
Phosphorus	mg/l	--	--	0.89	1.05	0.92	0.93	1.62
Sulphate	mg/l	--	500 [6]	4	3	2	2	<1
Temperature (Field)	deg c	--	15	8.8	9.9	7.1	10.4	7.2
Total Dissolved Solids	mg/l	--	500	3160	3340	3160	3190	3360
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.003	0.012	0.003	0.003	0.003
Boron, dissolved	mg/l	5	--	1.31	0.914	1.47	1.15	0.846
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29.2	40.5	60.6	47.1	41.7
Chromium, dissolved	mg/l	0.05	--	<0.001	0.04	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0012	0.0007	0.0006
Copper, dissolved	mg/l	--	1	<0.0005	0.0034	0.0029	0.0026	0.0012
Iron, dissolved	mg/l	--	0.3	0.519	0.832	1.53	0.541	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0003	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	73.4	55.9	99.7	74.7	64.1
Manganese, dissolved	mg/l	--	0.05	0.067	0.07	0.119	0.089	0.076
Potassium, dissolved	mg/l	--	--	27.2	31.6	47.6	32.7	26.9
Sodium, dissolved	mg/l	--	200 [7]	1260	1180	1180	1030	874
Zinc, dissolved	mg/l	--	5	0.008	0.012	<0.005	0.009	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.010 [11]	<0.001	0.007	<0.004 [11]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 30-Nov-2007	07-1C 28-Feb-2008	07-1C 22-May-2008	07-1C 13-Aug-2008	07-1C 10-Nov-2008	07-1C 19-May-2009 G-4	07-1C 26-Nov-2009 J-15	07-1C 25-May-2010 [4] M-6	07-1C 20-Oct-2010 [4] G-5
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	642	672	660	660	666	657	666	639	661
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	642	672	660	660	666	657	666	639	661
Ammonia Nitrogen	mg/l	--	--	1.41	0.73	0.66	0.79	0.75	0.30	0.53	0.49	0.28
Chemical Oxygen Demand	mg/l	--	--	360	13	40	102	29	18	30	25	40
Chloride	mg/l	--	250	562	471	507	505	605	425	454	422	468
Conductivity	uS/cm	--	--	--	--	--	--	--	2760	2820	2760	2820
Conductivity (Field)	uS/cm	--	--	2100	--	2850	2600	2350	2300	2420	2845	2945
Hardness, Calcium Carbonate	mg/l	--	--	252	245	260	245	235	243	158	186	191
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.1	0.2	0.2	0.42	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	5.52	2.23	1.93	1.88	1.73	0.66	0.70	0.62	0.60
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	7.78	8.06	8.10	7.79
pH (Field)	-	--	--	7.6	--	7.4	7.8	7.3	--	7.16	7.65	7.04
Phosphorus	mg/l	--	--	--	--	--	--	--	0.26	0.21	0.26	0.10
Sulphate	mg/l	--	500 [6]	197	176	163	158	119	119	115	108	98
Temperature (Field)	deg c	--	15	3.5	--	10.5	11	8	8	9.3	10.2	10.2
Total Dissolved Solids	mg/l	--	500	1900	1670	1710	1640	1740	1790	1830	1790	1830
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0048	0.0068	0.0084	0.0026	0.012	0.004	0.005	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.474	0.45	0.429	0.432	0.474	0.48	0.52	0.43	0.44
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	37.5	33.8	36.2	33.9	33.2	33	22	25	27
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	0.004	0.009
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0006	0.0007	0.0006	0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.003	<0.002	<0.002	0.003	0.004	0.002	0.002	<0.001
Iron, dissolved	mg/l	--	0.3	0.149	0.122	1.44	0.005	0.01	<0.03	0.11	0.40	0.75
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	38.5	39	41.2	39	37.1	39	25	30	30
Manganese, dissolved	mg/l	--	0.05	0.479	0.403	0.469	0.461	0.466	0.40	0.38	0.32	0.38
Potassium, dissolved	mg/l	--	--	17.9	14.9	14.9	16.1	15.6	12	12	12	11
Sodium, dissolved	mg/l	--	200 [7]	662	535	551	495	526	471	537	531	510
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	0.01	<0.01	<0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 24-May-2011 [4] G-4	07-1C 29-Nov-2011 [4] 07-1C	07-1C 31-May-2012 07-1C	07-1C 28-Nov-2012 07-1C	07-1C 29-May-2013 07-1C	07-1C 26-Nov-2013 GW-20	07-1C 29-May-2014 07-1C	07-1C 19-Nov-2014 07-1C	07-1C 02-Jun-2015 07-1C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	671	674	650	670	680	680	660	660	693
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [3]	14	7.7	5.5	5.8	7.6	8.6	6.2	8
Alkalinity (Total as CaCO3)	mg/l	--	--	671	688	660	680	690	680	670	670	701
Ammonia Nitrogen	mg/l	--	--	0.59	0.40	0.56	0.41	0.49	0.25	0.60	0.25	0.60
Chemical Oxygen Demand	mg/l	--	--	30	30	34	28	29	26	26	23	40
Chloride	mg/l	--	250	452	460	420	400	310	410	440	510	528
Conductivity	uS/cm	--	--	2840	2870	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2576	2534	2433	2423	1976	2172	2366	2664	2555
Hardness, Calcium Carbonate	mg/l	--	--	199	136	150	150	230	180	200	160	161
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	0.11	0.16	0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.050	<0.010	0.057	0.021	0.060	0.049	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.81	0.50	1.4	1.6	0.93	0.85	1.2	0.94	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	0.11	<0.10	0.17	0.18	0.16	<0.10	--
pH	-	--	--	8.26	8.35	8.10	--	7.96	8.08	8.14	8.00	--
pH (Field)	-	--	--	7.57	7.47	7.40	7.62	6.99	7.23	7.65	7.69	7.46
Phosphorus	mg/l	--	--	0.40	0.29	0.34	0.36	0.21	0.25	0.49	0.33	0.38
Sulphate	mg/l	--	500 [6]	86	84	72	75	94	81	66	54	56
Temperature (Field)	deg c	--	15	13.6	7.9	9.2	8.5	8.7	7.7	9.8	6.0	9.5
Total Dissolved Solids	mg/l	--	500	1850	1870	1560	1590	1600	1560	1490	1460	1700
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	0.0043	0.004	0.0030	0.0029	0.0049	0.0038	0.003
Boron, dissolved	mg/l	5	--	0.44	0.50	0.5	0.59	0.56	0.48	0.52	0.53	0.314
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	27	18	21	20	31	25	27	23	22.9
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.0050	<0.005	<0.0050	0.0054	<0.0050	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0003	<0.00050	<0.0005	<0.00050	<0.00050	0.00054	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.0010	<0.001	0.0014	0.0012	0.0025	<0.0020	<0.0005
Iron, dissolved	mg/l	--	0.3	0.88	<0.03	0.5	0.46	<0.1	<0.1	1.4	0.87	0.563
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	0.0004
Magnesium, dissolved	mg/l	--	--	32	22	24	24	38	28	31	24	25.2
Manganese, dissolved	mg/l	--	0.05	0.34	0.14	0.24	0.32	0.33	0.28	0.35	0.27	0.33
Potassium, dissolved	mg/l	--	--	13	11	12	13	14	12	13	12	10.7
Sodium, dissolved	mg/l	--	200 [7]	502	521	560	570	560	510	570	550	586
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.0050	<0.005	<0.0050	0.0086	<0.0050	<0.0050	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 26-Nov-2015 07-1C	07-1C 26-May-2016 07-1C	07-1C 17-Nov-2016 07-1C	07-1C 24-May-2017 07-1C	07-1C 29-Nov-2017 07-1C	07-1C 24-May-2018 07-1C	07-1C 22-Nov-2018 07-1C	07-1C 19-Jun-2019 07-1C	07-1C 20-Nov-2019 [21] 07-1C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	709	712	713	735	737	742	781	661	682
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	5	5	<5	8	8	7	<5	9
Alkalinity (Total as CaCO3)	mg/l	--	--	716	718	718	740	745	750	788	665	690
Ammonia Nitrogen	mg/l	--	--	0.32	0.71	0.54	1.14	0.40	0.68	0.38	0.61	0.36
Chemical Oxygen Demand	mg/l	--	--	32	31	49	30	39	67	40	28	42
Chloride	mg/l	--	250	450	509	511	434	478	465	552	418	448
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2678	2628	2773	2528	2303	2701	2379	2442	2600
Hardness, Calcium Carbonate	mg/l	--	--	114	177	152	192	153	201	192	229	276
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.2	0.8	1.6	0.8	1.3	0.8	0.9	0.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.65	7.73	7.28	7.55	7.50	7.36	7.85	7.49	--
Phosphorus	mg/l	--	--	0.50	0.45	0.32	0.64	0.35	0.64	0.41	0.66	0.54
Sulphate	mg/l	--	500 [6]	73	63	65	105	108	93	81	117	115
Temperature (Field)	deg c	--	15	9.3	9.3	10.1	8.5	8.2	9.0	7.7	11.7	8.4
Total Dissolved Solids	mg/l	--	500	1460	1630	1570	1520	1560	1560	1730	1440	1470
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.007	0.005	0.003	0.003	0.003	0.003	0.004
Boron, dissolved	mg/l	5	--	0.535	0.482	0.619	0.456	0.522	0.542	0.55	0.452	0.421
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	17	24.7	21.4	27	22.1	30.1	29.1	34	39.6
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.006	0.01	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.0007	0.0006
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0006	0.0012	0.0011	0.0005	0.0038	0.0010	0.0016
Iron, dissolved	mg/l	--	0.3	0.724	0.351	0.273	<0.1	0.133	0.426	0.218	0.917	0.411
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0006	0.0002
Magnesium, dissolved	mg/l	--	--	17.4	27.9	23.9	30.2	23.7	30.5	28.9	35	43.1
Manganese, dissolved	mg/l	--	0.05	0.34	0.279	0.429	0.341	0.3	0.312	0.22	0.389	0.401
Potassium, dissolved	mg/l	--	--	10.8	14.2	12.5	13.1	13.6	13.4	16.2	14.1	19.5
Sodium, dissolved	mg/l	--	200 [7]	587	502	587	583	553	509	597	442	518
Zinc, dissolved	mg/l	--	5	0.009	<0.005	<0.005	0.006	<0.005	0.005	<0.005	0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.003	0.004	<0.002 [11]	<0.001	<0.001	0.006	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 21-May-2020 07-1C	07-1C 26-Nov-2020 07-1C	07-1C 26-May-2021 07-1C	07-1C 30-Nov-2021 07-1C
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	657	671	667	674
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	7	<5	10
Alkalinity (Total as CaCO3)	mg/l	--	--	660	679	670	684
Ammonia Nitrogen	mg/l	--	--	0.54	0.27	0.58	0.31
Chemical Oxygen Demand	mg/l	--	--	49	65	38	51
Chloride	mg/l	--	250	566	419	412	454
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2387	2316	2544	2500
Hardness, Calcium Carbonate	mg/l	--	--	238	193	241	165
Nitrate as N	mg/l	10.0	--	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.4	0.8	0.9	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.25	7.64	7.36	7.49
Phosphorus	mg/l	--	--	1.01	0.72	0.58	0.56
Sulphate	mg/l	--	500 [6]	113	120	97	97
Temperature (Field)	deg c	--	15	8.1	8.1	9.3	7.1
Total Dissolved Solids	mg/l	--	500	1570	1490	1550	1650
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.003	0.003
Boron, dissolved	mg/l	5	--	0.389	0.411	0.409	0.398
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	34	27.2	31.4	25.1
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0007	0.0005	0.0008	0.0007
Copper, dissolved	mg/l	--	1	0.0034	0.0013	0.0009	0.0011
Iron, dissolved	mg/l	--	0.3	0.853	0.295	0.287	0.241
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	37.1	30.3	39.4	25
Manganese, dissolved	mg/l	--	0.05	0.396	0.371	0.348	0.488
Potassium, dissolved	mg/l	--	--	14.4	13.7	14.7	13.3
Sodium, dissolved	mg/l	--	200 [7]	537	521	501	457
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.006
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.004	<0.004 [11]	<0.004 [11]	<0.001
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 30-Nov-2007	07-1D 28-Feb-2008	07-1D 22-May-2008	07-1D 13-Aug-2008	07-1D 10-Nov-2008	07-1D 19-May-2009 G-6	07-1D 26-Nov-2009 J-14	07-1D 25-May-2010 [4] M-5	07-1D 20-Oct-2010 [4] G-3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	730	690	654	681	717	618	697	635	709
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	730	690	654	681	717	618	697	635	709
Ammonia Nitrogen	mg/l	--	--	1.31	1.26	0.8	1.18	1.21	1.75	1.52	1.73	1.21
Chemical Oxygen Demand	mg/l	--	--	307	58	54	114	43	33	90	40	38
Chloride	mg/l	--	250	105	90.7	77.2	96.4	104	63	95	59	84
Conductivity	uS/cm	--	--	--	--	--	--	--	1460	1660	1440	1590
Conductivity (Field)	uS/cm	--	--	1300	--	1500	1450	1400	1100	1456	1423	1530
Hardness, Calcium Carbonate	mg/l	--	--	383	401	381	357	386	319	333	369	404
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.2	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	7.44	3.91	3.24	3.32	3.2	2.37	1.94	2.23	1.75
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	7.23	7.64	7.39	7.16
pH (Field)	-	--	--	6.8	--	6.8	7.2	6.7	--	6.51	6.99	6.73
Phosphorus	mg/l	--	--	--	--	--	--	--	1.15	1.12	0.92	1.39
Sulphate	mg/l	--	500 [6]	182	164	150	140	140	108	102	59	60
Temperature (Field)	deg c	--	15	5.5	--	10.5	15	8	8	9.1	13.2	9
Total Dissolved Solids	mg/l	--	500	1210	1050	1040	1020	1080	949	1080	936	1030
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0086	0.0048	0.0044	0.0015	0.0045	<0.001	0.004	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.431	0.314	0.326	0.424	0.446	0.33	0.48	0.31	0.52
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	65.1	71.9	65.1	61.3	72.6	57	64	67	81
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.006	0.005	0.004	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	0.0007	0.0006	0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	0.002	<0.001
Iron, dissolved	mg/l	--	0.3	8.46	12.8	14.1	2.95	8.04	2.19	9.01	14.2	19.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	53.5	53.7	53.2	49.6	49.8	43	42	49	49
Manganese, dissolved	mg/l	--	0.05	2.14	2.67	2.13	2.14	2.71	2.78	2.01	2.79	3.55
Potassium, dissolved	mg/l	--	--	12	8	9.5	11.2	10.3	6	9	8	8
Sodium, dissolved	mg/l	--	200 [7]	347	234	270	248	259	187	237	211	207
Zinc, dissolved	mg/l	--	5	<0.005	0.013	0.008	<0.005	<0.005	0.03	0.01	<0.01	<0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 24-May-2011 [4] G-12	07-1D 29-Nov-2011 [4] 07-1D	07-1D 31-May-2012 07-1D	07-1D 28-Nov-2012 07-1D	07-1D 29-May-2013 7-1D	07-1D 26-Nov-2013 GW-12	07-1D 29-May-2014 [22] 07-1D	07-1D 19-Nov-2014 07-1D	07-1D 02-Jun-2015 07-1D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	642	690	620	700	510	630	370	610	503
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	2.0	1.5	1.8	1.9	1.8	1.5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	642	690	630	700	510	630	370	610	504
Ammonia Nitrogen	mg/l	--	--	0.62	0.98	1.0	1.4	0.82	1.6	0.90	0.61	1.23
Chemical Oxygen Demand	mg/l	--	--	30	33	33	41	36	34	25	25	37
Chloride	mg/l	--	250	58	62	46	75	30	41	19	58	42
Conductivity	uS/cm	--	--	1440	1450	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1070	1468	1201	1447	977	1202	862	1161	1153
Hardness, Calcium Carbonate	mg/l	--	--	397	403	380	430	390	360	350	400	236
Nitrate as N	mg/l	10.0	--	0.12	0.10	<0.10	<0.10	0.69	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.014	0.016	0.095	0.016	0.043	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.09	1.96	1.7	2.1	1.3	2.4	1.5	1.1	1.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	<0.10	<0.10	0.78	<0.10	<0.10	<0.10	--
pH	-	--	--	7.86	7.73	7.54	--	7.57	7.51	7.70	7.43	--
pH (Field)	-	--	--	6.89	7.07	6.95	6.76	6.62	6.76	7.07	6.83	6.85
Phosphorus	mg/l	--	--	0.55	0.34	0.32	0.51	0.35	0.58	0.41	0.38	0.37
Sulphate	mg/l	--	500 [6]	80	52	66	50	65	50	34	44	61
Temperature (Field)	deg c	--	15	14.0	7.7	9.9	7.8	9.0	7.7	9.5	7.6	9.3
Total Dissolved Solids	mg/l	--	500	936	942	824	950	746	736	418	600	684
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.0010	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	0.26	0.44	0.39	0.64	0.41	0.36	0.42	0.28	0.293
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	78	79	74	78	75	81	65	96	48.6
Chromium, dissolved	mg/l	0.05	--	0.002	0.006	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0009	0.0006	<0.00050	0.0008	<0.00050	0.00079	<0.00050	0.0011	0.0006
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0014	0.001	0.0015	0.0014	0.0016	0.0013	<0.0005
Iron, dissolved	mg/l	--	0.3	4.81	10.5	4.5	7	3.4	2.1	10	3.5	3.28
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	49	50	48	57	50	40	45	38	27.7
Manganese, dissolved	mg/l	--	0.05	1.63	3.22	1.7	4.1	2.2	1.7	2.1	3	1.57
Potassium, dissolved	mg/l	--	--	8	8	6.5	9.3	6.1	6.8	6.9	7.6	5.78
Sodium, dissolved	mg/l	--	200 [7]	174	208	170	230	160	130	160	100	121
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.0050	<0.005	<0.0050	0.011	<0.0050	0.0056	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0013	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 26-Nov-2015 07-1D	07-1D 26-May-2016 07-1D	07-1D 17-Nov-2016 07-1D	07-1D 24-May-2017 07-1D	07-1D 29-Nov-2017 07-1D	07-1D 24-May-2018 07-1D	07-1D 22-Nov-2018 07-1D	07-1D 19-Jun-2019 07-1D	07-1D 20-Nov-2019 07-1D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	471	477	516	383	455	439	545	426	361
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	471	477	517	384	456	440	546	428	361
Ammonia Nitrogen	mg/l	--	--	1.48	1.00	0.48	0.45	0.26	0.28	0.04	0.26	0.10
Chemical Oxygen Demand	mg/l	--	--	32	38	27	61	51	55	30	68	52
Chloride	mg/l	--	250	33	54	71	23	34	24	35	17	28
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1138	1261	1571	1046	1175	1099	971	1025	1178
Hardness, Calcium Carbonate	mg/l	--	--	365	441	561	438	527	503	592	485	539
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	<0.1	0.5	1.4	0.6	0.8	1.7
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.9	1.3	1.0	1.8	1.7	2.1	0.9	2.2	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.95	7.19	7.25	7.09	7.04	6.92	7.17	7.05	6.8
Phosphorus	mg/l	--	--	0.58	0.40	0.34	0.60	1.07	1.08	0.73	1.42	0.61
Sulphate	mg/l	--	500 [6]	58	153	313	220	270	196	207	197	215
Temperature (Field)	deg c	--	15	9.0	9.3	10.3	9.3	7.1	9.5	7	12.6	7.8
Total Dissolved Solids	mg/l	--	500	596	760	986	698	796	748	822	686	752
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.33	0.359	0.386	0.172	0.267	0.245	0.877	0.247	0.286
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	68.9	84.8	142	127	143	136	122	119	134
Chromium, dissolved	mg/l	0.05	--	0.001	<0.001	0.006	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0009	0.0019	0.0030	0.0025	0.0022	0.0042	0.0032	0.0031
Iron, dissolved	mg/l	--	0.3	4.66	4.71	2.05	0.497	1.1	0.57	2.61	<0.1	0.662
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	46.7	55.7	50.1	29.2	41.3	39.7	69.7	45.6	49.7
Manganese, dissolved	mg/l	--	0.05	1.31	2.03	0.824	0.27	0.487	0.334	1.03	0.67	0.344
Potassium, dissolved	mg/l	--	--	6.12	7.68	7.53	7.08	7.51	5.38	9.11	7.07	7.56
Sodium, dissolved	mg/l	--	200 [7]	137	152	105	42.3	62.9	48.6	139	63.8	63.3
Zinc, dissolved	mg/l	--	5	0.009	0.009	<0.005	<0.005	<0.005	<0.005	0.007	0.008	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.005	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 21-May-2020 07-1D	07-1D 26-Nov-2020 07-1D	07-1D 26-May-2021 07-1D	07-1D 30-Nov-2021 07-1D
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	391	426	401	459
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	393	428	402	461
Ammonia Nitrogen	mg/l	--	--	0.23	0.20	0.38	0.07
Chemical Oxygen Demand	mg/l	--	--	142	93	251	51
Chloride	mg/l	--	250	21	26	18	11
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1019	1111	1092	1145
Hardness, Calcium Carbonate	mg/l	--	--	466	513	483	495
Nitrate as N	mg/l	10.0	--	1.8	0.2	0.7	0.6
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.2	1.9	5.7	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.06	7.05	6.94	6.81
Phosphorus	mg/l	--	--	2.89	0.91	3.23	0.71
Sulphate	mg/l	--	500 [6]	253	254	186	187
Temperature (Field)	deg c	--	15	7.86	6.8	9.9	6.9
Total Dissolved Solids	mg/l	--	500	716	764	670	720
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.185	0.248	0.173	0.175
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	116	127	123	136
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0047	0.0031	0.0026	0.0027
Iron, dissolved	mg/l	--	0.3	0.195	<0.1	0.184	0.698
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	42.8	47.6	42.3	37.4
Manganese, dissolved	mg/l	--	0.05	0.392	0.07	0.144	0.369
Potassium, dissolved	mg/l	--	--	5.54	6.08	5.47	5.75
Sodium, dissolved	mg/l	--	200 [7]	55	62.9	43.8	39.8
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 09-Jun-1992	92-1 01-Nov-1992	92-1 15-Jun-1994	92-1 02-Nov-1994	92-1 22-Nov-1995	92-1 12-Oct-1996	92-1 06-Nov-1997
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	996	1061	--	771	848	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	10	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	816	870	706	642	712	716	640
Ammonia Nitrogen	mg/l	--	--	--	--	--	1.09	0.77	1.12	0.7
Chemical Oxygen Demand	mg/l	--	--	--	--	323	363	27	20	17
Chloride	mg/l	--	250	307	404	390	266	235	186	196
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2486	2579	2210	2140	2180	1910	1900
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	4.14	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	73.89	66	63	49	40	36	36
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	3.1	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	2.33	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.21	8.12	8.52	8.82	9.13	8.31	8.01
Phosphate	mg/l	--	--	--	--	--	--	1.7	--	--
Phosphorus	mg/l	--	--	--	--	1.63	1.095	--	--	--
Sulphate	mg/l	--	500 [6]	70	87.5	5.3	6	5	3	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1120	1080	1090	960	950
Total Organic Carbon	mg/l	--	--	--	--	11.8	23.3	10.8	8.9	9.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	4560	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.199	--	--	--
Boron, dissolved	mg/l	5	--	--	--	0.98	0.868	0.89	0.8	0.91
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.001	--	--
Calcium, dissolved	mg/l	--	--	7	7.77	9	3.8	4.5	4.4	4.14
Chromium, dissolved	mg/l	0.05	--	--	--	0.012	0.01	0.03	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0154	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	2.993	1.19	2.11	2.4	1.29
Lead, dissolved	mg/l	0.01	--	--	--	0.0012	0.1	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	13.7	11.4	10	2.115	7.01	5.96	6.1
Manganese, dissolved	mg/l	--	0.05	--	--	0.062	0.032	0.04	0.04	0.03
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	22.49	18	22	8.481	13.3	12.9	13.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	555.9	728	423	414.9	461	386	384
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.072	0.001	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 05-Jun-1998	92-1 26-Aug-1998	92-1 29-Oct-1998	92-1 06-May-1999	92-1 24-Oct-2000	92-1 14-Jun-2001	92-1 06-Nov-2002	92-1 30-May-2003	92-1 19-Nov-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	359	910	824	997	865	955	893	889
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	1	19	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	450	294	746	710	817	741	783	732	729
Ammonia Nitrogen	mg/l	--	--	0.63	0.21	6.05	1.34	0.06	1.26	0.74	0.62	1.03
Chemical Oxygen Demand	mg/l	--	--	35	49	392	310	--	27	39	27	41
Chloride	mg/l	--	250	450	20.9	275	285	275	219	334	236	248
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1893	1130	2040	1930	2130	1550	2020	1780	2180
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	552	559	54	36	28	25	30	29	27
Nitrate as N	mg/l	10.0	--	1	1.1	--	--	0.1	0.1	0.1	0.1	<1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	7.18	9.11	1.56	1.69	1.33	1.32	1.67
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.21	8.4	8.4	8.59	8.4	8.2	7.3	8.4
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	1.59	1.37	1.27	1.26	1.48
Sulphate	mg/l	--	500 [6]	39	314	2	1	1	1	1	1	10
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	946	563	1020	960	1170	966	1160	1150	1090
Total Organic Carbon	mg/l	--	--	7.4	22	11.7	16.5	--	10.4	11	12	10
Total Suspended Solids	mg/l	--	--	--	--	--	--	244	2490	102	80	114
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.002	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.04	0.47	1.08	1.03	0.96	0.94	0.99	0.94	1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	165	136	6.61	2.32	2.39	2.26	3.08	3.44	2.22
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.06	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.002
Iron, dissolved	mg/l	--	0.3	19.6	2.6	0.45	0.06	0.07	0.07	0.02	0.07	0.041
Lead, dissolved	mg/l	0.01	--	0.0067	0.0002	0.0002	0.0015	0.022	0.0002	0.0013	0.0005	0.0007
Magnesium, dissolved	mg/l	--	--	33.4	52.6	9.01	6.69	5.3	4.6	5.48	4.85	5.14
Manganese, dissolved	mg/l	--	0.05	1.05	1.16	0.02	0.01	0.01	0.01	0.01	0.01	0.003
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	20.9	6.5	28.5	10.2	13.7	6.8	10.7	11.1	11.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	281	78.6	499	532	490	423	498	448	477
Zinc, dissolved	mg/l	--	5	0.14	0.52	0.01	0.01	0.01	0.01	0.01	0.01	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.039	0.001	0.001	0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 16-Nov-2005	92-1 15-May-2007	92-1 10-Nov-2008	92-1 26-Nov-2009 M-4	92-1 24-May-2011 [4] G-19	92-1 28-Nov-2012 92-1	92-1 29-May-2014 92-1	92-1 26-Nov-2015 92-1	92-1 24-May-2017 92-1
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	188	770	750	724	713	700	700	746	776
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	27	37	25	30	16	18
Alkalinity (Total as CaCO3)	mg/l	--	--	770	770	750	751	750	730	730	762	795
Ammonia Nitrogen	mg/l	--	--	0.95	0.67	0.9	1.01	0.96	1.2	1.2	1.22	1.21
Chemical Oxygen Demand	mg/l	--	--	35	84	<100	93	35	37	40	67	41
Chloride	mg/l	--	250	240	268	286	277	299	290	320	347	334
Conductivity	uS/cm	--	--	--	--	--	2250	2340	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1900	1500	1900	1995	2089	2191	2031	2262	2309
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	32	31	41	35	39	36	36	28.4	36
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	<0.10	<0.10	<0.010	0.014	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.56	2.05	7.62	1.32	1.37	2.7	6.2	1.8	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	8.60	8.74	--	8.66	--	--
pH (Field)	-	--	--	--	8.9	8.2	8.55	8.72	8.53	8.39	8.69	8.63
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.98	--	--	2.98	1.31	1.3	1.2	1.13	1.13
Sulphate	mg/l	--	500 [6]	<1	1	2	2	<1	<1	<1	<1	<1
Temperature (Field)	deg c	15	--	10.2	9	10	12.5	6.0	11.1	9.7	11.4	
Total Dissolved Solids	mg/l	--	500	1260	1210	1280	1460	1520	1360	1350	1370	1360
Total Organic Carbon	mg/l	--	--	12	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	50	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0013	0.0025	0.002	<0.01	<0.001	<0.0010	<0.001	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.02	0.927	0.939	0.9	1.0	1.2	1.1	1.16	1.08
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3.11	3.1	4.14	4	4	3.5	3.5	2.5	3.3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	0.007	<0.005	<0.005	<0.0050	<0.001	0.01
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.0002	0.0003	<0.0005	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.001	0.002	<0.001	0.0020	<0.0005	0.0007
Iron, dissolved	mg/l	--	0.3	0.039	0.131	0.065	0.09	0.03	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0002	0.00006	<0.00002	<0.001	<0.001	<0.0005	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	5.8	5.74	7.35	6	7	6.6	6.7	5.39	6.69
Manganese, dissolved	mg/l	--	0.05	0.004	0.017	0.013	0.02	0.01	0.004	0.0036	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13.8	12.8	14.3	11	12	13	13	11.1	13.1
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	548	458	511	449	552	550	550	592	557
Zinc, dissolved	mg/l	--	5	0.006	<0.005	<0.005	<0.01	0.01	<0.005	<0.0050	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 22-Nov-2018 92-1	92-1 21-May-2020 92-1	92-1 30-Nov-2021 92-1
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	830	729	763
Alkalinity, Carbonate as CaCO3	mg/l	--	--	11	31	16
Alkalinity (Total as CaCO3)	mg/l	--	--	841	760	780
Ammonia Nitrogen	mg/l	--	--	1.15	1.13	0.97
Chemical Oxygen Demand	mg/l	--	--	68	71	65
Chloride	mg/l	--	250	372	423	336
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2096	2186	2296
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	63	74.5	41.1
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.1	1.7	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.47	8.06	8.70
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	1.40	1.22	1.25
Sulphate	mg/l	--	500 [6]	<1	<1	<1
Temperature (Field)	deg c	--	15	9.1	13.0	8.2
Total Dissolved Solids	mg/l	--	500	1390	1410	1350
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	1.08	0.83	0.877
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	11.9	14.5	5.42
Chromium, dissolved	mg/l	0.05	--	<0.001	0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0020	0.0032	0.0040
Iron, dissolved	mg/l	--	0.3	0.111	0.825	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	8.06	9.26	6.69
Manganese, dissolved	mg/l	--	0.05	0.016	0.055	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.9	14	12
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	549	563	490
Zinc, dissolved	mg/l	--	5	<0.005	0.008	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	0.004	0.007	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 09-Jun-1992	92-5 01-Nov-1992	92-5 08-Jun-1993	92-5 04-Nov-1993	92-5 15-Jun-1994	92-5 02-Nov-1994	92-5 28-Jun-1995
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	922	928	926	910	--	669	871
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	<1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	756	761	759	746	752	724	714
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	1.73	2.3
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	138	242	188
Chloride	mg/l	--	250	928	1240	1315	1375	1480	1090	167
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4255	4404	3990	4380	4890	4880	4820
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	6.02	4.64
Hardness, Calcium Carbonate	mg/l	--	--	361.84	361	286	276	318	320	221
Nitrate as N	mg/l	10.0	--	--	--	0.3	8.17	0.1	0.4	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	5.7
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.67	8.05	7.9	8.06	7.94	8.27	7.85
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	1.45	0.577	4.3
Sulphate	mg/l	--	500 [6]	29	25.5	4.8	7.1	1.9	1.9	6
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	2555	2520	2460	2440	2410
Total Organic Carbon	mg/l	--	--	--	--	--	--	22.2	26.6	24.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	0.139	0.068	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.088	--
Boron, dissolved	mg/l	5	--	--	--	--	--	1.19	1.068	0.83
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**	0.0001
Calcium, dissolved	mg/l	--	--	47.6	46	36.1	35	42.1	28.04	28.5
Chromium, dissolved	mg/l	0.05	--	--	--	**0.1**	<0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.017	0.01	0.0151	0.01	0.02
Iron, dissolved	mg/l	--	0.3	--	--	0.247	<0.1	0.436	0.159	0.06
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	**0.116**	0.0013	**0.1**	0.0002
Magnesium, dissolved	mg/l	--	--	59	59.8	47.6	45.7	51.6	23.816	36.1
Manganese, dissolved	mg/l	--	0.05	--	--	0.087	0.01	0.192	0.075	0.1
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.023	<0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	23	28.1	28.3	26.7	35	21.69	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	827.7	1050	909	945	791	848.8	693
Zinc, dissolved	mg/l	--	5	--	--	0.083	<0.01	0.01	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.007	0.063	0.001	0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 23-Nov-1995	92-5 12-Oct-1996	92-5 06-Nov-1997	92-5 05-Jun-1998	92-5 06-May-1999	92-5 24-Oct-2000	92-5 14-Jun-2001	92-5 06-Nov-2002	92-5 30-May-2003
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	893	--	--	--	900	1050	936	977	911
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	732	764	808	672	738	861	768	801	747
Ammonia Nitrogen	mg/l	--	--	1.34	2.18	1.25	0.93	1.98	1.07	1.99	2.63	2.14
Chemical Oxygen Demand	mg/l	--	--	68	43	36	31	51	--	51	99	68
Chloride	mg/l	--	250	1100	1110	944	1120	1110	1230	1100	1120	1190
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5080	4550	4600	4550	4400	4660	4350	4530	4270
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	269	239	266	252	246	272	214	250	227
Nitrate as N	mg/l	10.0	--	0.6	0.1	0.1	2.8	--	0.1	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4.5	--	--	--	5.84	2.77	3.14	4.89	3.63
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	3.16	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.75	7.76	7.48	--	7.8	8.06	7.8	7.8	7.1
Phosphate	mg/l	--	--	0.7	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	3.42	2.79	4.96	1.2
Sulphate	mg/l	--	500 [6]	1	4	1	39	2	3	1	2	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2540	2280	2310	2270	2200	2700	2300	2610	--
Total Organic Carbon	mg/l	--	--	19.9	17.5	18.4	18.8	22.4	--	18.7	19.1	17.9
Total Suspended Solids	mg/l	--	--	--	1730	--	--	--	4360	2070	2220	856
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.003	0.001	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.91	0.96	1.8	1.18	1.13	1.15	1.18	1.18	1.11
Cadmium, dissolved	mg/l	0.005	--	0.0001	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	32.1	28	32.7	30	31.2	28.7	26.9	29.5	29
Chromium, dissolved	mg/l	0.05	--	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.38	0.97	0.54	1.27	0.45	0.27	0.12	0.56	1.06
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0008	0.022	0.0002	0.0059	0.0006
Magnesium, dissolved	mg/l	--	--	45.2	40.5	44.2	42.5	40.3	48.6	35.6	42.8	37.5
Manganese, dissolved	mg/l	--	0.05	0.12	0.11	0.1	0.13	0.12	0.09	0.08	0.1	0.08
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	26.2	25.4	24.7	31	27.2	26.4	21	25.8	27.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	841	937	908	1140	951	937	923	984	812
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.003	0.08	0.001	0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 19-Nov-2004	92-5 16-Nov-2005	92-5 15-May-2007	92-5 10-Nov-2008	92-5 26-Nov-2009 [23] M-2	92-5 24-May-2011 [4] G-23	92-5 28-Nov-2012 92-5	92-5 29-May-2014 92-5	92-5 26-Nov-2015 92-5
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	982	198	840	810	796	766	750	760	790
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<2 [8]	23	9.7	15	13
Alkalinity (Total as CaCO3)	mg/l	--	--	805	810	840	810	796	789	760	770	803
Ammonia Nitrogen	mg/l	--	--	2.38	1.7	1.16	1.64	2.01	1.92	1.9	1.7	0.05
Chemical Oxygen Demand	mg/l	--	--	67	74	107	61	60	65	68	53	105
Chloride	mg/l	--	250	1200	1120	1200	1230	1110	1100	1100	1200	1180
Conductivity	uS/cm	--	--	--	--	--	--	4850	4890	--	--	--
Conductivity (Field)	uS/cm	--	--	4710	3400	3500	4350	>3999	>3999	3871	3903	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	231	253	235	229	224	244	250	260	271
Nitrate as N	mg/l	10.0	--	1	1.4	0.2	0.2	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.3	3.3	2.76	3.25	2.99	3.05	2.7	2.5	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	8.19	8.50	--	8.33	--
pH (Field)	-	--	--	7.9	--	8.4	8	7.9	8.09	8.04	7.63	8.01
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1	1.62	--	--	0.95	1.52	1.5	0.98	0.96
Sulphate	mg/l	--	500 [6]	10	<1	2	1	4	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	--	--	10.2	8	10.8	12.5	8.5	11.6	9.8
Total Dissolved Solids	mg/l	--	500	2355	2700	2700	2680	3150	3180	2590	2590	2730
Total Organic Carbon	mg/l	--	--	16.3	20.6	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	710	28	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.0076	0.0064	0.009	<0.01	0.002	0.0037 [20]	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.14	1.21	1.1	1.11	0.96	1.3	1.4	1.3	1.35
Cadmium, dissolved	mg/l	0.005	--	--	0.0001	0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	29.4	32.2	30.3	29.2	27	30	31	32	29
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	0.0006	0.0008	0.0005	0.00059	0.0005
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.006	0.003	0.007	0.006	0.003	0.0028	<0.0005
Iron, dissolved	mg/l	--	0.3	0.404	0.312	0.413	0.015	<0.03	<0.03	<0.1	0.18	<0.1
Lead, dissolved	mg/l	0.01	--	0.0013	0.0007	0.00016	<0.00002	<0.001	<0.001	<0.0005	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	38.3	41.9	38.7	37.9	38	41	42	44	48.2
Manganese, dissolved	mg/l	--	0.05	0.083	0.081	0.023	0.032	<0.01	0.02	<0.002	0.036	0.011
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.2	31.7	29.9	27.8	24	27	27	27	22.7
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	877	1010	887	864	884	833	930	830	1060
Zinc, dissolved	mg/l	--	5	0.005	0.006	<0.005	<0.005	0.01	0.02	<0.005	<0.0050	0.008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0010	<0.004 [10]
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00025	<0.00010	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00025	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0013	<0.00050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.00020	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 24-May-2017 92-5	92-5 29-Nov-2018 92-5	92-5 21-May-2020 92-5	92-5 30-Nov-2021 92-5
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	834	884	766	790
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	15	13	19
Alkalinity (Total as CaCO3)	mg/l	--	--	847	899	779	810
Ammonia Nitrogen	mg/l	--	--	0.01	0.20	1.44	2.19
Chemical Oxygen Demand	mg/l	--	--	111	147	127	303
Chloride	mg/l	--	250	1160	1120	1400	1100
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	94	327	290	260
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.25 [9]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	2.1	2.6	7.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.00	8.1	8.14	8.17
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.92	1.43	1.50	13.9
Sulphate	mg/l	--	500 [6]	1	<1	<1	<1
Temperature (Field)	deg c	--	15	11.9	6.9	13.6	8.2
Total Dissolved Solids	mg/l	--	500	2620	2600	2680	2700
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.008	0.003	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.981	1.26	0.92	0.954
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31.1	41.8	35.5	31.6
Chromium, dissolved	mg/l	0.05	--	0.017	0.002	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0012	0.0011	0.0007
Copper, dissolved	mg/l	--	1	0.0013	0.0046	0.0035	0.0035
Iron, dissolved	mg/l	--	0.3	<0.1	0.645	0.998	0.322
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0002	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	3.9	54	48.8	44
Manganese, dissolved	mg/l	--	0.05	0.12	0.024	0.122	0.08
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	27.9	33.6	28.9	25.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	981	1010	899	812
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.006	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.010 [10]	<0.001	0.005	<0.004 [11]
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 09-Jun-1992	92-7 01-Nov-1992	92-7 08-Jun-1993	92-7 04-Nov-1993	92-7 15-Jun-1994	92-7 02-Nov-1994	92-7 28-Jun-1995	92-7 23-Nov-1995	92-7 12-Jun-1996
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	561	529	515	538	--	503	524	597	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	<1	--	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	460	434	422	441	442	420	430	462	462
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	0.89	0.8	0.39	0.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	143	115	125	48	45
Chloride	mg/l	--	250	298	407	465	568	720	410	300	342	377
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1822	1687	1780	1930	2060	2050	2030	2100	1970
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	8.72	6.07	--	--
Hardness, Calcium Carbonate	mg/l	--	--	219.79	161	145	147	167	169	155	158	159
Nitrate as N	mg/l	10.0	--	--	--	0.3	3.1	0.1	1.08	0.1	0.8	0.6
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	6.8	1.8	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	6	1.41	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.76	8.02	7.3	7.7	7.53	7.94	7.49	8.16	7.69
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.3	--
Phosphorus	mg/l	--	--	--	--	--	--	3.85	0.356	4.1	--	--
Sulphate	mg/l	--	500 [6]	13	4.7	1.8	4.4	2.6	2.3	2	4	4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1176	1000	1040	1030	1020	1050	990
Total Organic Carbon	mg/l	--	--	--	--	--	--	15.2	19	15.8	14.8	15.2
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	1960
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	2.91	0.344	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.04	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	0.4	0.442	0.37	0.36	0.387
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**	0.0001	0.0001	--
Calcium, dissolved	mg/l	--	--	34.9	24	21.1	22.5	25.5	20.64	24.4	23.8	22.6
Chromium, dissolved	mg/l	0.05	--	--	--	0.018	0.01	0.01	0.01	0.01	0.02	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.1	0.01	0.0116	0.029	0.02	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.587	0.1	1.691	0.742	0.05	0.82	1.27
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	**0.0356**	0.0012	**0.1**	0.0003	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	32.18	24.6	22.3	22	25.2	10.426	22.5	23.6	24.5
Manganese, dissolved	mg/l	--	0.05	--	--	0.238	0.261	0.405	0.213	0.38	0.4	0.361
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.024	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.06	13.1	15.7	13.4	35.3	8.746	--	14	16.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	313.3	369	349	388	320	331	339	371	38.1
Zinc, dissolved	mg/l	--	5	--	--	0.059	0.01	0.01	0.456	0.01	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.019	0.087	0.001	0.001	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 09-Jun-1992	92-7 01-Nov-1992	92-7 08-Jun-1993	92-7 04-Nov-1993	92-7 15-Jun-1994	92-7 02-Nov-1994	92-7 28-Jun-1995	92-7 23-Nov-1995	92-7 12-Jun-1996
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 12-Oct-1996	92-7 18-Jun-1997	92-7 06-Nov-1997	92-7 05-Jun-1998	92-7 30-Oct-1998	92-7 06-May-1999	92-7 19-Oct-1999	92-7 05-May-2000	92-7 24-Oct-2000
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	366	372	471	684	620
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	23	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	479	452	466	456	300	305	424	561	508
Ammonia Nitrogen	mg/l	--	--	0.99	0.49	0.68	0.5	0.93	0.27	0.9	0.03	0.41
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	30	34	34	43	28	21	21	33	--
Chloride	mg/l	--	250	320	404	396	388	250	226	368	375	410
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1800	1980	2020	2020	1562	1180	1740	1800	2100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	2.77	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	149	176	176	173	142	165	176	166	168
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	1.6	--	--	0.1	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	3.93	1.44	--	--	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.23	7.69	7.27	--	7.3	7.1	7.6	7.6	7.57
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--	0.46
Sulphate	mg/l	--	500 [6]	9	1	2	47	29	31	13	9	8
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	900	990	1010	1000	783	590	870	900	1100
Total Organic Carbon	mg/l	--	--	15	13.5	14.7	13.7	9.4	9.2	10.6	11.8	--
Total Suspended Solids	mg/l	--	--	546	1340	--	--	--	--	1640	210	116
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.39	0.52	0.45	0.54	0.4	0.25	0.46	0.53	0.45
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	21.3	26.8	27.2	26.1	28.2	32.6	32.3	28.7	25.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.6	0.57	2.67	2.49	0.39	0.14	2.34	0.68	0.18
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0008	0.0002	0.0002	0.0003	0.0002	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	22.9	26.1	25.9	25.9	17.4	20	22.8	22.6	25.4
Manganese, dissolved	mg/l	--	0.05	0.39	0.33	0.45	0.37	0.27	0.24	0.19	0.03	0.37
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.4	12.9	15.9	14.4	12.5	11.3	12.7	6.2	11.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	321	325	331	443	244	226	334	382	459
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.22	0.01	0.01	0.13	0.1	0.02
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--	0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 12-Oct-1996	92-7 18-Jun-1997	92-7 06-Nov-1997	92-7 05-Jun-1998	92-7 30-Oct-1998	92-7 06-May-1999	92-7 19-Oct-1999	92-7 05-May-2000	92-7 24-Oct-2000
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 14-Jun-2001	92-7 23-Nov-2001	92-7 23-May-2002	92-7 06-Nov-2002	92-7 30-May-2003	92-7 09-Oct-2003	92-7 14-May-2004	92-7 19-Nov-2004	92-7 24-May-2005
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	561	583	542	597	575	--	597	634	605
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	18	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	460	478	474	489	471	480	489	520	496
Ammonia Nitrogen	mg/l	--	--	0.74	0.86	0.59	0.95	0.44	1.15	0.71	1.12	0.58
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	3	--	--	--
Chemical Oxygen Demand	mg/l	--	--	30	32	19	42	68	43	44	43	33
Chloride	mg/l	--	250	414	400	396	388	410	396	397	397	381
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1700	1750	1980	2000	1940	2000	2090	2290	2500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	112	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	135	179	178	166	159	161	167	169	174
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.1	0.2	0.2	0.1	0.2	1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.57	1.73	1.09	1.89	1.33	1.83	1.53	1.8	1.27
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.03	7.17	7.7	7	7.4	7.3	7.9	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.65	0.3	0.27	0.62	0.34	0.55	0.35	0.57	0.31
Sulphate	mg/l	--	500 [6]	5	12	7	8	6	4	10	20	9
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	10.6
Total Dissolved Solids	mg/l	--	500	1100	1040	1080	1180	970	1139	1045	1145	1130
Total Organic Carbon	mg/l	--	--	12.9	17	13	13.2	13.2	15	11.7	12.5	12.8
Total Suspended Solids	mg/l	--	--	167	82	45	202	76	100	43	910	31
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.47	0.56	0.47	0.44	0.44	0.445	0.451	0.478	0.451
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	20.9	28.6	29.5	25.3	24.9	23.8	25.8	26.3	25.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.006	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.003	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.16	0.15	0.05	0.05	0.2	2.19	0.052	0.747	0.039
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.001	0.0005	0.0009	0.0003	0.0006	0.0011
Magnesium, dissolved	mg/l	--	--	20	26.2	25.4	25	23.4	24.6	24.9	25.2	26.5
Manganese, dissolved	mg/l	--	0.05	0.01	0.36	0.31	0.57	0.27	0.296	0.163	0.349	0.098
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	9.5	13.7	15.3	12.8	13.2	13.9	14.3	14.1	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	382	388	366	348	385	386	411	397	384
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.01	0.01	0.005	0.005	0.005	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.054	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 14-Jun-2001	92-7 23-Nov-2001	92-7 23-May-2002	92-7 06-Nov-2002	92-7 30-May-2003	92-7 09-Oct-2003	92-7 14-May-2004	92-7 19-Nov-2004	92-7 24-May-2005
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 16-Nov-2005	92-7 25-May-2006	92-7 21-Nov-2006	92-7 15-May-2007	92-7 30-Nov-2007	92-7 22-May-2008	92-7 10-Nov-2008	92-7 19-May-2009 G-9	92-7 26-Nov-2009 M-6
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	303	515	528	531	540	531	543	517	534
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	496	515	528	531	540	531	543	517	534
Ammonia Nitrogen	mg/l	--	--	1.08	0.72	1.05	<0.01	0.94	0.46	1.08	0.36	1.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	35	38	55	72	26	34	30	40
Chloride	mg/l	--	250	387	413	387	437	432	413	413	402	421
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	2240	2280
Conductivity (Field)	uS/cm	--	--	2000	1700	2000	2190	1500	1900	1850	--	1998
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	178	160	175	168	170	166	174	165	163
Nitrate as N	mg/l	10.0	--	0.6	0.1	0.1	0.6	0.2	0.1	0.1	0.29	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.63	1.79	1.72	0.69	1.58	1.25	1.69	0.93	1.41
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	7.97	8.21
pH (Field)	-	--	--	--	7.7	6.7	8.1	7.9	7.7	7.5	--	7.66
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.44	--	--	--	--	--	--	0.36	0.45
Sulphate	mg/l	--	500 [6]	10	10	12	9	4	8	13	7	7
Temperature (Field)	deg c	--	15	--	5.5	11.5	10	8	12	8	--	11.6
Total Dissolved Solids	mg/l	--	500	1210	1180	1200	1250	1330	1230	1220	1460	1480
Total Organic Carbon	mg/l	--	--	14.6	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	110	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.0015	0.0019	0.0015	0.0021	0.0013	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.489	0.404	0.448	0.468	0.469	0.43	0.435	1.62	0.49
Cadmium, dissolved	mg/l	0.005	--	0.0002	<0.005	<0.0001	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	27.2	24	26.7	25.4	26	25.1	26.5	25	24
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	0.008
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0002	0.0003
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	0.001
Iron, dissolved	mg/l	--	0.3	0.667	0.053	1.19	0.019	0.728	0.025	0.009	<0.03	0.28
Lead, dissolved	mg/l	0.01	--	0.0009	0.0002	<0.0001	0.00004	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	26.8	24.4	26.2	25.4	25.5	25.1	26.3	25	25
Manganese, dissolved	mg/l	--	0.05	0.319	0.267	0.718	0.004	0.325	0.32	0.025	<0.01	0.29
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.2	13.2	14.3	15	15.5	13.6	14.6	13	15
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	456	402	410	417	502	422	403	389	427
Zinc, dissolved	mg/l	--	5	0.009	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 16-Nov-2005	92-7 25-May-2006	92-7 21-Nov-2006	92-7 15-May-2007	92-7 30-Nov-2007	92-7 22-May-2008	92-7 10-Nov-2008	92-7 19-May-2009 G-9	92-7 26-Nov-2009 M-6
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 25-May-2010 [4] M-13	92-7 20-Oct-2010 [4] G-9	92-7 24-May-2011 [4] G-15	92-7 29-Nov-2011 [4] 92-7	92-7 31-May-2012 92-7	92-7 28-Nov-2012 92-7	92-7 29-May-2013 [5] 92-7	92-7 26-Nov-2013 [5] GW-21	92-7 29-May-2014 92-7
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	513	534	541	552	530	540	540	570	570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	12	12	8.7	4.3	6.3	6.4	9.8
Alkalinity (Total as CaCO3)	mg/l	--	--	513	534	553	565	540	550	540	570	580
Ammonia Nitrogen	mg/l	--	--	0.34	0.95	0.56	0.74	0.10	1.1	1.0	1.2	0.59
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	55	35	38	45	50	45	41	45
Chloride	mg/l	--	250	387	393	403	399	370	380	400	380	390
Conductivity	uS/cm	--	--	2260	2210	2300	2350	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2306	2108	2099	2165	2011	1979	1818	1891	1939
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	179	197	176	186	170	190	190	190	210
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.028	<0.010	0.026	0.029	0.026
Nitrogen, Total Kjeldahl	mg/l	--	--	0.64	1.67	0.90	0.90	1.1	1.5	1.5	1.9	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	0.11	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.25	7.94	8.38	8.38	8.24	--	8.09	8.08	8.27
pH (Field)	-	--	--	7.69	7.62	7.73	8.12	7.79	7.77	7.18	7.09	7.52
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.31	0.43	0.27	0.46	0.21	0.47	0.47	0.77	0.35
Sulphate	mg/l	--	500 [6]	10	7	6	14	9	7	3	4	<1
Temperature (Field)	deg c	--	15	17.6	11.3	12.2	9.2	11.0	9.8	10.6	10.5	10.9
Total Dissolved Solids	mg/l	--	500	1470	1440	1500	1530	1240	1250	1260	1240	1230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	<0.0010	<0.001	0.0017	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.49	0.47	0.48	0.46	0.52	0.58	0.48	0.47	0.56
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	27	31	26	30	26	28	28	29	32
Chromium, dissolved	mg/l	0.05	--	<0.005	0.009	<0.005	<0.005	<0.0050	<0.005	0.012	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0005	0.0003	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.001	0.003	0.001	0.0018	<0.001	0.0020	<0.0010	0.0024
Iron, dissolved	mg/l	--	0.3	0.49	0.90	0.18	0.58	<0.1	<0.1	<0.1	0.56	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	27	29	27	27	26	30	28	29	32
Manganese, dissolved	mg/l	--	0.05	0.54	0.41	0.41	0.10	0.042	0.003	0.02	0.42	0.33
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	14	14	13	14	15	14	14	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	387	388	384	378	420	440	440	410	460
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	<0.01	<0.0050	<0.005	0.0062	0.0096	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 25-May-2010 [4] M-13	92-7 20-Oct-2010 [4] G-9	92-7 24-May-2011 [4] G-15	92-7 29-Nov-2011 [4] 92-7	92-7 31-May-2012 92-7	92-7 28-Nov-2012 92-7	92-7 29-May-2013 [5] 92-7	92-7 26-Nov-2013 [5] GW-21	92-7 29-May-2014 92-7
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	0.0005	<0.0004	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0025	<0.0013	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0010	<0.00050	<0.00050	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.0010	<0.00050	<0.00050	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Nov-2014 92-7	92-7 02-Jun-2015 92-7	92-7 26-Nov-2015 92-7	92-7 26-May-2016 92-7	92-7 17-Nov-2016 92-7	92-7 24-May-2017 92-7	92-7 29-Nov-2017 92-7	92-7 24-May-2018 92-7	92-7 22-Nov-2018 92-7
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	560	585	598	609	617	635	645	673	697
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6.0	6	<5	<5	<5	5	6	5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	570	591	602	612	620	640	651	678	702
Ammonia Nitrogen	mg/l	--	--	1.1	0.47	1.07	0.72	1.30	0.69	1.17	0.71	1.20
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	83	72	63	84	46	41	74	35
Chloride	mg/l	--	250	420	428	431	446	434	433	462	430	429
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2268	2185	2257	2242	2376	2262	2053	2308	2153
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	210	159	167	209	208	199	206	212	265
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.022	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	0.9	1.8	1.5	2.0	1.2	1.6	1.4	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.06	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.76	7.73	8.04	8.30	7.55	7.72	7.56	7.59	7.83
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.56	0.19	0.46	0.51	0.65	0.28	0.40	0.28	0.49
Sulphate	mg/l	--	500 [6]	1	4	2	4	2	3	5	4	4
Temperature (Field)	deg c	--	15	7.4	10.2	9.5	14.7	11.6	10.3	9.2	10.3	9.2
Total Dissolved Solids	mg/l	--	500	1270	1320	1320	1360	1270	1300	1330	1390	1320
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	0.001	0.002	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.53	0.334	0.522	0.555	0.711	0.46	0.535	0.527	0.57
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	33	26.2	26.5	31	31.2	31.3	30.1	33.3	38.4
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	0.002	<0.001	0.009	0.011	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0020	<0.0005	<0.0005	0.0020	0.0008	0.0013	0.0014	0.0011	0.0033
Iron, dissolved	mg/l	--	0.3	0.68	0.214	0.404	<0.1	<0.1	<0.1	<0.1	<0.1	0.574
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	32	22.8	24.4	31.9	31.7	29.3	31.7	31.3	41.2
Manganese, dissolved	mg/l	--	0.05	0.5	0.236	0.431	0.019	0.023	0.197	<0.005	0.13	0.411
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	12.5	12.4	16.6	14.6	14	15.1	14.4	18
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	450	466	491	436	464	469	441	426	529
Zinc, dissolved	mg/l	--	5	0.039	0.055	0.008	0.007	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.005	0.003	<0.002 [10]	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Nov-2014	92-7 02-Jun-2015	92-7 26-Nov-2015	92-7 26-May-2016	92-7 17-Nov-2016	92-7 24-May-2017	92-7 29-Nov-2017	92-7 24-May-2018	92-7 22-Nov-2018
				92-7	92-7	92-7	92-7	92-7	92-7	92-7	92-7	92-7
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Jun-2019 92-7	92-7 20-Nov-2019 92-7	92-7 21-May-2020 92-7	92-7 26-Nov-2020 92-7	92-7 26-May-2021 92-7	92-7 30-Nov-2021 92-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	640	621	617	628	652	636
Alkalinity, Carbonate as CaCO3	mg/l	--	--	9	6	13	9	6	9
Alkalinity (Total as CaCO3)	mg/l	--	--	649	627	630	637	658	646
Ammonia Nitrogen	mg/l	--	--	0.38	1.03	0.17	0.27	0.21	0.84
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	41	51	79	25	46
Chloride	mg/l	--	250	428	457	564 [24]	450	423	420
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2202	2390	2247	2134	2338	2332
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	394	288	239	241	259	215
Nitrate as N	mg/l	10.0	--	<0.1	0.3	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.7	1.3	0.7	0.9	0.6	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.71	7.74	8.68	8.07	7.74	7.93
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.20	0.38	0.25	0.35	0.23	0.43
Sulphate	mg/l	--	500 [6]	4	8	3	1	2	1
Temperature (Field)	deg c	--	15	13.3	8.8	12.0	8.1	12.1	8.3
Total Dissolved Solids	mg/l	--	500	1350	1290	1410	1310	1380	1330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.765	0.453	0.41	0.43	0.442	0.412
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	58.8	42.5	35.6	34.6	35.2	31.3
Chromium, dissolved	mg/l	0.05	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0046	0.0015	0.0035	0.0043	0.0026	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.182
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	60	44.2	36.5	37.5	41.5	33.1
Manganese, dissolved	mg/l	--	0.05	<0.005	0.047	0.203	0.039	<0.005	0.124
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	26.7	20.3	16.3	15.9	16.4	14.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	444	448	459	465	454	419
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.005	0.007	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.005	<0.001	<0.004 [11]	<0.004 [11]	<0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Jun-2019 92-7	92-7 20-Nov-2019 92-7	92-7 21-May-2020 92-7	92-7 26-Nov-2020 92-7	92-7 26-May-2021 92-7	92-7 30-Nov-2021 92-7
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 09-Jun-1992	92-8 01-Nov-1992	92-8 22-Jun-1994	92-8 02-Nov-1994	92-8 28-Jun-1995	92-8 23-Nov-1995	92-8 12-Jun-1996	92-8 12-Oct-1996	92-8 18-Jun-1997
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	503	1010	--	763	500	694	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	412	828	804	637	410	569	416	410	341
Ammonia Nitrogen	mg/l	--	--	--	--	--	4.62	3.1	0.15	6.2	1.96	0.18
Chemical Oxygen Demand	mg/l	--	--	--	--	214	194	138	85	72	45	44
Chloride	mg/l	--	250	173	213	310	156	102	148	68	29.3	72.8
Conductivity (Field)	uS/cm	--	--	1613	2300	2200	1650	1270	2200	1360	1250	1470
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	9.22	7.64	--	--	--	4.23
Hardness, Calcium Carbonate	mg/l	--	--	485.3	760	596	416	341	890	429	575	756
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.54	1.3	0.8	0.1	0.1	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	10.8	5.7	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	7.7	5.55	--	--	--
pH (Field)	-	--	--	7.07	7.04	6.5	7.06	6.74	7.06	6.81	6.53	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	0.3	--	--	--
Phosphorus	mg/l	--	--	--	--	0.82	0.249	3.25	--	--	--	--
Sulphate	mg/l	--	500 [6]	159	223.5	67.3	55.1	492	352	214	299	365
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1110	830	640	1100	680	620	740
Total Organic Carbon	mg/l	--	--	--	--	55.6	32	35.7	26.4	29	18.9	7.9
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	379	146	435
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.058	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	2.1	1.635	1.84	2.4	1.19	0.78	0.33
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	130.9	174	132	68.36	75.3	179	93.1	135	179
Chromium, dissolved	mg/l	0.05	--	--	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0198	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.433	0.491	0.07	10.4	27.2	12.2	5.19
Lead, dissolved	mg/l	0.01	--	--	--	0.0003	0.1	0.0012	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	38.44	78.9	64.6	25.716	36.8	106	47	57.1	74.2
Manganese, dissolved	mg/l	--	0.05	--	--	4.193	1.802	1.85	3.26	3.05	3.48	1.08
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.59	21.5	27.9	9.917	--	21.4	14.4	11.7	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	143.4	233	166	171.6	130	144	165	75.6	88.6
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.021	0.01	0.01	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 09-Jun-1992	92-8 01-Nov-1992	92-8 22-Jun-1994	92-8 02-Nov-1994	92-8 28-Jun-1995	92-8 23-Nov-1995	92-8 12-Jun-1996	92-8 12-Oct-1996	92-8 18-Jun-1997
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.142	0.001	0.001	--	--	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 06-Nov-1997	92-8 26-Aug-1998	92-8 29-Oct-1998	92-8 06-May-1999	92-8 19-Oct-1999	92-8 05-May-2000	92-8 24-Oct-2000	92-8 14-Jun-2001	92-8 23-Nov-2001
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	826	468	344	512	803	741	403	604
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	12	1	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	396	697	384	282	420	659	607	330	495
Ammonia Nitrogen	mg/l	--	--	4.66	1.01	1.24	0.01	0.47	0.01	1	1.52	1.94
Chemical Oxygen Demand	mg/l	--	--	82	56	7	39	19	372	--	47	45
Chloride	mg/l	--	250	26	387	39.4	18.7	12.9	30	50.7	18.8	45.8
Conductivity (Field)	uS/cm	--	--	1200	2370	1310	1230	1000	1500	1400	1050	1400
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	745	59	553	710	481	814	703	507	618
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	--	0.1	0.1	0.1	0.1	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	1.43	1.24	--	--	3.35	2.08	2.6
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.74	8.4	6.5	6.9	6.9	6.7	6.57	6.7	6.31
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.67	0.38	0.28
Sulphate	mg/l	--	500 [6]	348	5	325	460	110	240	184	315	208
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	600	1200	660	615	500	750	870	830	868
Total Organic Carbon	mg/l	--	--	28.8	7	18	14	9.5	122	--	14.8	23
Total Suspended Solids	mg/l	--	--	--	--	--	--	128	428	1800	170	204
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.22	1.14	0.44	0.09	0.45	0.27	0.21	0.21	0.4
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	181	6.12	144	188	130	178	143	115	139
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	22.2	5.02	9.21	7.93	3.91	52.7	12.6	16	32.7
Lead, dissolved	mg/l	0.01	--	0.0002	0.0004	0.0002	0.0003	0.0002	0.0002	0.0012	0.0002	--
Magnesium, dissolved	mg/l	--	--	70.2	10.6	47.1	57.6	37.4	88.5	84.1	53.5	65.9
Manganese, dissolved	mg/l	--	0.05	0.66	0.11	3.83	0.83	0.85	4.48	4.53	1.88	2.35
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.2	16.2	8.4	1.1	4.2	0.4	6.5	1.5	2.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	56.7	621	93	27.1	53.6	60	74.9	50	94.7
Zinc, dissolved	mg/l	--	5	0.01	0.08	0.01	0.02	0.47	0.03	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 06-Nov-1997	92-8 26-Aug-1998	92-8 29-Oct-1998	92-8 06-May-1999	92-8 19-Oct-1999	92-8 05-May-2000	92-8 24-Oct-2000	92-8 14-Jun-2001	92-8 23-Nov-2001
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.006	0.073	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 23-May-2002	92-8 06-Nov-2002 [3]	92-8 30-May-2003	92-8 09-Oct-2003 [3]	92-8 14-May-2004	92-8 19-Nov-2004	92-8 24-May-2005	92-8 16-Nov-2005 [3]	92-8 25-May-2006
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	401	--	641	--	772	750	714	--	685
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	--	1	1	<5	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	329	--	525	--	633	615	585	--	685
Ammonia Nitrogen	mg/l	--	--	1.16	--	1.12	--	0.83	0.94	0.76	--	1.03
Chemical Oxygen Demand	mg/l	--	--	37	--	74	--	55	50	35	--	42
Chloride	mg/l	--	250	51.8	--	24.4	--	67.7	28	23.3	--	15.2
Conductivity (Field)	uS/cm	--	--	980	--	1150	--	1600	1750	1800	--	1200
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	486	--	468	--	781	778	757	--	696
Nitrate as N	mg/l	10.0	--	0.1	--	0.2	--	0.2	1	0.1	--	<0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	1.95	--	3.63	--	1.81	1.76	1.43	--	1.81
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.82	--	6.4	--	6.9	6.8	6.6	--	6.9
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.3	--	0.41	--	0.31	0.24	0.24	--	--
Sulphate	mg/l	--	500 [6]	208	--	197	--	269	290	260	--	208
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	9.4	--	5
Total Dissolved Solids	mg/l	--	500	736	--	--	--	800	875	980	--	964
Total Organic Carbon	mg/l	--	--	13	--	13.8	--	10.6	10.7	12	--	--
Total Suspended Solids	mg/l	--	--	184	--	200	--	112	100	80	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	--	0.001	--	0.001	0.001	0.001	--	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.21	--	0.25	--	0.484	0.446	0.382	--	0.284
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	<0.005
Calcium, dissolved	mg/l	--	--	119	--	117	--	178	189	177	--	166
Chromium, dissolved	mg/l	0.05	--	0.01	--	0.01	--	0.001	0.002	<0.002	--	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	--	0.01	--	0.002	0.002	<0.002	--	<0.002
Iron, dissolved	mg/l	--	0.3	8.87	--	3.92	--	9.73	6.9	18.2	--	35.1
Lead, dissolved	mg/l	0.01	--	0.0002	--	0.0002	--	0.0011	0.0002	0.0007	--	<0.0002
Magnesium, dissolved	mg/l	--	--	45.8	--	42.7	--	81.9	74.4	76.9	--	68
Manganese, dissolved	mg/l	--	0.05	1.5	--	1	--	2.2	2.76	2.16	--	2.28
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	--	0.02	--	0.01	0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	5.2	--	6	--	6.4	6.5	5.5	--	5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [7]	56.7	--	107	--	109	71.9	74.7	--	57.2
Zinc, dissolved	mg/l	--	5	0.02	--	0.01	--	0.005	0.005	0.006	--	0.011

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 23-May-2002	92-8 06-Nov-2002 [3]	92-8 30-May-2003	92-8 09-Oct-2003 [3]	92-8 14-May-2004	92-8 19-Nov-2004	92-8 24-May-2005	92-8 16-Nov-2005 [3]	92-8 25-May-2006
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	0.001	--	0.001	0.001	<0.001	--	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 19-Dec-2008
General Chemistry				
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1540
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1540
Ammonia Nitrogen	mg/l	--	--	0.35
Chemical Oxygen Demand	mg/l	--	--	214
Chloride	mg/l	--	250	280
Conductivity (Field)	uS/cm	--	--	3100
Dissolved Oxygen (Field)	mg/l	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1310
Nitrate as N	mg/l	10.0	--	0.2
Nitrogen, Total Kjeldahl	mg/l	--	--	4.19
Nitrogen, Organic	mg/l	--	--	--
pH (Field)	-	--	--	6.6
Phosphate	mg/l	--	--	--
Phosphorus	mg/l	--	--	--
Sulphate	mg/l	--	500 [6]	34
Temperature (Field)	deg c	--	15	4
Total Dissolved Solids	mg/l	--	500	2050
Total Organic Carbon	mg/l	--	--	--
Total Suspended Solids	mg/l	--	--	--
Metals				
Arsenic, dissolved	mg/l	0.01	--	0.0048
Barium, dissolved	mg/l	1	--	--
Boron, dissolved	mg/l	5	--	9.88
Cadmium, dissolved	mg/l	0.005	--	<0.00002
Calcium, dissolved	mg/l	--	--	307
Chromium, dissolved	mg/l	0.05	--	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005
Copper, dissolved	mg/l	--	1	<0.002
Iron, dissolved	mg/l	--	0.3	0.873
Lead, dissolved	mg/l	0.01	--	<0.00002
Magnesium, dissolved	mg/l	--	--	133
Manganese, dissolved	mg/l	--	0.05	5.08
Mercury, dissolved	mg/l	0.001	--	--
Molybdenum, dissolved	mg/l	--	--	--
Nickel, dissolved	mg/l	--	--	--
Potassium, dissolved	mg/l	--	--	8
Selenium, dissolved	mg/l	0.05	--	--
Sodium, dissolved	mg/l	--	200 [7]	353
Zinc, dissolved	mg/l	--	5	0.007

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 19-Dec-2008
Phenols				
Phenolics, Total Recoverable	mg/l	--	--	<0.001
Semi-VOCs				
Naphthalene	mg/l	--	--	--
Styrene	mg/l	--	--	--
VOCs				
1,1,1,2-Tetrachloroethane	mg/l	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--
1,2-Dibromoethane	mg/l	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--
1,2-Dichloroethane	mg/l	0.005	--	--
1,2-Dichloropropane	mg/l	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--
Benzene	mg/l	0.001	--	0.001
Bromodichloromethane	mg/l	--	--	--
Bromoform	mg/l	--	--	--
Bromomethane	mg/l	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--
Chlorobenzene	mg/l	0.08	0.03	--
Chloroform	mg/l	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--
Dibromochloromethane	mg/l	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003
o-Xylene	mg/l	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--
Toluene	mg/l	0.06	0.024	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--
Trichloroethene	mg/l	0.005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 09-Jun-1992	92-9 01-Nov-1992	92-9 08-Jun-1993	92-9 04-Nov-1993	92-9 15-Jun-1994	92-9 02-Nov-1994	92-9 28-Jun-1995	92-9 22-Nov-1995	92-9 12-Oct-1996	92-9 06-Nov-1997	92-9 05-Jun-1998
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	849	931	910	921	--	853	883	880	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1	1	8	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	696	763	746	755	764	710	724	734	748	780	790
Ammonia Nitrogen	mg/l	--	--	1.57	2.34	--	--	--	--	0.97	0.51	1.41	1.04	1.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	4.6	8.3	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	219	97.8	--	--	79	90	65	60	5	56	37
Chloride	mg/l	--	250	820	1003	1005	1450	1290	882	875	838	858	840	1110
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3813	3938	3580	3890	4170	3990	4130	4260	--	3900	4220
Dissolved Inorganic Carbon	mg/l	--	--	153.6	175.2	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	5.59	5.86	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	258	238	213	224	280	269	220	194	225	228	222
Nitrate as N	mg/l	10.0	--	0.54	0.24	0.3	9.1	1.3	1.51	0.1	1.7	0.7	0.1	1.9
Nitrite as N	mg/l	1.0	--	0.1	0.17	0.1	0.12	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.64	8.12	--	--	--	--	5	2.45	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.07	5.78	--	--	--	--	4.03	1.94	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.18	8.1	7.65	8.07	7.73	7.99	7.63	8.12	--	6.95	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.3	--	--	--
Phosphorus	mg/l	--	--	0.57	0.71	--	--	1	0.626	0.99	--	--	--	--
Sulphate	mg/l	--	500 [6]	46	13	8.5	13	18	21.4	15	20	13	6	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2168	2164	2248	2290	2180	2000	2070	2140	--	1960	2100
Total Organic Carbon	mg/l	--	--	25.2	23.9	--	--	21.7	--	25.2	16.9	17.9	19.6	18.3
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	93	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	--	0.25	0.423	0.01	--	0.148	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.004	--	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	0.05	0.11	--	--	--	0.037	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.99	1.05	--	--	0.97	0.92	0.83	1.23	0.86	0.98	1.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**	0.0005	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	30.15	26.3	23.6	25.9	35.1	23.15	26.2	24.3	25.7	20.1	24.4
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.014	0.01	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.01	0.01	0.0186	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.4	0.13	0.249	0.1	0.243	0.223	0.05	0.18	0.94	0.69	0.4
Lead, dissolved	mg/l	0.01	--	**0.1**	**0.17**	**0.1**	**0.105**	0.0015	**0.1**	0.0006	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	44.39	41.8	37.5	38.7	46.7	20.626	37.2	31.8	38.5	42.6	38.6
Manganese, dissolved	mg/l	--	0.05	0.13	0.05	0.057	0.053	0.06	0.044	0.04	0.03	0.1	0.06	0.05
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.023	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	22.56	28.8	30.8	26.4	34.7	17.8	--	23.9	24.4	25.6	30.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	690.1	931	782	819	689	716.5	682	880	668	853	983
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.042	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.13
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.014	0.002	0.002	0.002	0.114	0.001	0.001	--	--	--	--
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Hexanone	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 06-May-1999	92-9 24-Oct-2000	92-9 14-Jun-2001	92-9 06-Nov-2002	92-9 30-May-2003	92-9 19-Nov-2004	92-9 16-Nov-2005	92-9 15-May-2007	92-9 10-Nov-2008	92-9 26-Nov-2009 J-22	92-9 24-May-2011 [4] G-17
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	961	1050	781	910	886	1020	189	800	765	760	754
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	47	1	1	1	<5	<5	<5	<2 [8]	21
Alkalinity (Total as CaCO3)	mg/l	--	--	788	861	720	846	726	835	775	800	765	760	776
Ammonia Nitrogen	mg/l	--	--	1.24	1.33	1.59	1.86	0.62	1.74	1.82	1.78	2.01	1.59	1.78
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	--	52	70	57	66	50	82	72	60	58
Chloride	mg/l	--	250	980	950	883	844	904	929	857	923	1010	852	834
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	3960	4100
Conductivity (Field)	uS/cm	--	--	3970	3660	3500	3990	1150	4050	2900	2800	3300	3421	3488
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	229	214	219	197	208	215	195	196	159	200
Nitrate as N	mg/l	10.0	--	--	0.1	0.2	0.2	0.3	1	0.8	0.2	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	3.07	2.22	2.85	3.02	1.99	2.76	2.95	3.16	3.24	2.41	3.26
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	8.23	8.48
pH (Field)	-	--	--	7.9	8.03	7.9	7.7	6.4	7.9	--	8.2	7.8	7.79	7.92
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	1.04	0.68	0.71	0.81	0.85	0.97	--	--	0.94	1.01
Sulphate	mg/l	--	500 [6]	10	2	8	6	5	10	3	1	<1	4	<1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	12.8	9.8	7	10.5	14.4
Total Dissolved Solids	mg/l	--	500	1990	2400	2000	2220	575	2025	2230	2220	2270	2570	2660
Total Organic Carbon	mg/l	--	--	23.5	--	16.7	19	16.6	17.8	21.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	182	70	47	25	122	25	--	--	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.003	0.001	0.002	0.003	0.002	0.001	0.0058	0.0063	0.008	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.04	0.97	1.04	0.98	0.93	1.02	1.01	0.893	0.935	0.93	0.79
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	0.0003	0.00003	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	26.3	23.7	27.8	26.1	24.5	25.6	26.7	24.7	24.5	19	24
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	0.007	<0.005	0.0007	0.0007
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	<0.001	<0.001
Iron, dissolved	mg/l	--	0.3	0.44	0.2	0.05	0.03	0.46	0.279	0.473	0.047	0.035	0.79	0.82
Lead, dissolved	mg/l	0.01	--	0.0004	0.022	0.0002	0.0028	0.0007	0.002	0.001	0.00005	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	39.4	41.3	35.2	37.3	32.9	35.1	36	32.3	32.8	27	34
Manganese, dissolved	mg/l	--	0.05	0.05	0.04	0.03	0.03	0.05	0.046	0.061	0.027	0.061	0.06	0.07
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.9	24.1	20.6	24.8	24	26	28	26.1	25.1	21	24
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	865	796	768	840	688	744	832	729	721	726	810
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.005	0.007	<0.005	<0.005	<0.01	<0.01
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	--	0.003	0.102	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004
2-Hexanone	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 28-Nov-2012 92-9	92-9 29-May-2014 92-9	92-9 26-Nov-2015 92-9	92-9 24-May-2017 92-9	92-9 22-Nov-2018 92-9	92-9 21-May-2020 92-9	92-9 30-Nov-2021 92-9
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	710	710	772	785	838	737	734
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7.7	16	12	13	16	14	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	720	730	784	798	854	751	738
Ammonia Nitrogen	mg/l	--	--	2.0	1.8	2.25	0.02	2.37	2.18	1.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	63	54	221	96	74	82	86
Chloride	mg/l	--	250	790	850	855	813	853	1070	820
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3281	3349	3698	3695	3439	3566	3588
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	200	210	164	190	255	235	206
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.1	<0.1	<0.1	0.2	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.151	<0.05	<0.25 [9]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.0	2.9	3.4	1.4	3.1	3.0	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.16	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.37	--	--	--	--	--
pH (Field)	-	--	--	8.08	7.63	8.03	8.06	7.85	7.41	8.17
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.0	0.79	0.99	0.85	0.99	0.96	1.01
Sulphate	mg/l	--	500 [6]	<1	<1	<1	1	<1	<1	1
Temperature (Field)	deg c	--	15	8.1	12.5	9.6	11.6	9.4	12.3	7.7
Total Dissolved Solids	mg/l	--	500	2120	2120	2180	2080	2120	2230	2130
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.0031	0.002	0.005	0.002	0.007	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.1	1	0.926	0.804	0.949	0.997	0.755
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25	26	22.7	24	33.9	28.6	25.3
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.001	0.029	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.00063	0.0005	0.0005	0.0009	0.0007	0.0006
Copper, dissolved	mg/l	--	1	<0.001	0.0021	<0.0005	0.0015	0.0027	0.0039	0.0012
Iron, dissolved	mg/l	--	0.3	<0.1	0.31	0.507	<0.1	0.499	0.421	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.0001	<0.0001	0.0002	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	35	36	26	31.5	41.3	39.6	34.6
Manganese, dissolved	mg/l	--	0.05	0.13	0.033	0.069	0.035	0.079	0.081	0.068
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	23	23	19.4	24.4	27.1	25.3	21.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	780	670	835	795	855	728	669
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.007	<0.005	<0.005	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]	<0.001	0.007	<0.004 [11]
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
2-Hexanone	mg/l	--	--	--	--	--	--	--	<0.0100	--
Benzene	mg/l	0.001	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0025	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 09-Jun-1992	92-10 01-Nov-1992	92-10 08-Jun-1993	92-10 04-Nov-1993	92-10 15-Jun-1994	92-10 02-Nov-1994	92-10 28-Jun-1995	92-10 22-Nov-1995	92-10 12-Jun-1996
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1078	980	937	939	--	907	915	969	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	884	803	768	770	760	756	750	794	783
Ammonia Nitrogen	mg/l	--	--	0.74	0.48	--	--	--	0.28	0.16	0.1	0.24
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	1.4	2.5	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	187	64.5	--	--	54	93	60	40	29
Chloride	mg/l	--	250	221	260	170	289	600	177	120	125	145
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2250	2100	1820	2100	2110	2070	1950	2040	1830
Dissolved Inorganic Carbon	mg/l	--	--	201.6	224.4	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	8.12	6.44	--	--
Hardness, Calcium Carbonate	mg/l	--	--	793.65	515	589	600	621	615	619	229	631
Nitrate as N	mg/l	10.0	--	0.24	0.24	0.3	2.39	0.1	0.42	1.7	0.5	0.6
Nitrite as N	mg/l	1.0	--	0.1	0.1	0.1	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.68	1.21	--	--	--	--	4	1.3	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.94	0.73	--	--	--	--	3.84	1.2	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.88	7.89	6.85	7.34	6.92	7.27	7	8.09	7.12
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.1	--
Phosphorus	mg/l	--	--	0.28	0.86	--	--	1.45	0.362	1.84	--	--
Sulphate	mg/l	--	500 [6]	95	95	103	116	98	110	15	101	128
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1492	1268	1220	1180	1070	1040	980	1020	920
Total Organic Carbon	mg/l	--	--	27.7	22.4	--	--	15.6	19	14.3	12.9	13.2
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	380
Metals												
Aluminum, dissolved	mg/l	--	--	--	0.21	0.152	0.044	--	0.069	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	--	--	--	0.1	--	--	--
Barium, dissolved	mg/l	1	--	0.07	0.14	--	--	--	0.052	--	--	--
Boron, dissolved	mg/l	5	--	1.1	1.31	--	--	1.18	1.517	1.49	0.76	1.47
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.01	0.0011	0.0001	--
Calcium, dissolved	mg/l	--	--	132.9	37.9	89.2	99.7	97	92.06	107	25.4	106
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.01	0.01	0.01	0.01	0.02	0.03	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.03	0.01	0.0142	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.66	0.3	0.341	0.1	0.431	0.366	0.02	0.2	0.665
Lead, dissolved	mg/l	0.01	--	0.1	0.05	0.1	0.0235	0.0007	0.1	0.0017	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	112.1	102	88.9	85.1	91.9	71.786	84.4	39.6	87.7
Manganese, dissolved	mg/l	--	0.05	1.45	0.92	0.97	0.787	0.558	1.039	0.52	0.56	0.745
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.028	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	13.03	18.1	16.1	18.9	18.4	12.13	--	26	17.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	211.2	260	227	289	200	228.9	195	738	214
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.101	0.01	0.01	0.01	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 09-Jun-1992	92-10 01-Nov-1992	92-10 08-Jun-1993	92-10 04-Nov-1993	92-10 15-Jun-1994	92-10 02-Nov-1994	92-10 28-Jun-1995	92-10 22-Nov-1995	92-10 12-Jun-1996
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.006	0.002	0.002	0.002	0.223	0.001	0.001	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 12-Oct-1996	92-10 18-Jun-1997	92-10 06-Nov-1997	92-10 05-Jun-1998	92-10 30-Oct-1998	92-10 06-May-1999	92-10 19-Oct-1999	92-10 06-May-2000	92-10 24-Oct-2000
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	810	773	732	833	732
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	752	749	630	656	664	634	600	683	600
Ammonia Nitrogen	mg/l	--	--	0.62	0.1	0.34	0.41	0.49	0.47	0.35	0.01	0.23
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	5	27	29	44	13	26	6	11	--
Chloride	mg/l	--	250	142	139	174	214	190	210	156	59.2	232
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1790	1850	1900	1970	1860	1780	1600	1500	1590
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	3.31	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	551	735	638	528	504	477	384	358	394
Nitrate as N	mg/l	10.0	--	0.6	0.1	0.1	1.3	--	--	0.8	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	1.3	1.39	--	--	1.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.86	7.24	6.28	--	7.1	7.3	7.6	7.4	7.36
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--	0.73
Sulphate	mg/l	--	500 [6]	120	140	136	132	122	105	100	82	66
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	900	920	980	980	920	890	800	750	1030
Total Organic Carbon	mg/l	--	--	12.8	12	12.1	13.2	14.6	12.4	9.4	8.4	--
Total Suspended Solids	mg/l	--	--	1290	2170	--	--	--	--	1380	210	852
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.62	1.88	1.59	1.5	1.27	1.3	1.33	1.05	1.08
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	92.2	142	120	87.5	77.1	82.1	65.4	58.3	58.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.78	2.12	0.93	1.17	1.71	1.08	2.54	1.86	0.38
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	76.9	91.1	81	74.3	75.8	65.1	52.8	51	60.3
Manganese, dissolved	mg/l	--	0.05	0.68	1.06	0.64	0.92	0.81	0.64	0.47	0.59	0.41
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.3	10.4	15.6	17.5	19.7	12.6	15.7	5.9	12.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	214	184	213	280	247	217	285	250	235
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.12	0.01	0.01	0.1	0.17	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 12-Oct-1996	92-10 18-Jun-1997	92-10 06-Nov-1997	92-10 05-Jun-1998	92-10 30-Oct-1998	92-10 06-May-1999	92-10 19-Oct-1999	92-10 06-May-2000	92-10 24-Oct-2000
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 14-Jun-2001	92-10 23-Nov-2001	92-10 23-May-2002	92-10 06-Nov-2002	92-10 30-May-2003	92-10 09-Oct-2003	92-10 14-May-2004	92-10 19-Nov-2004	92-10 24-May-2005
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	620	588	638	659	684	--	688	732	702
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	4	12	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	518	482	543	540	561	570	564	600	575
Ammonia Nitrogen	mg/l	--	--	0.34	0.33	0.25	0.26	0.26	0.54	0.25	0.32	0.58
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	2	--	--	--
Chemical Oxygen Demand	mg/l	--	--	10	21	12	19	16	68	26	23	19
Chloride	mg/l	--	250	128	194	141	116	158	195	186	147	168
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1200	1270	1590	1550	1560	1640	1650	1670	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	127	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	413	408	445	361	395	350	338	459	410
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.2	0.4	0.3	0.2	0.3	<1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.85	1.57	0.46	0.77	0.88	1.07	0.96	0.74	1.16
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.3	6.4	6.92	7.2	6.7	7.3	7.4	7.3	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.49	1.36	0.21	0.34	0.5	0.53	0.47	0.2	0.65
Sulphate	mg/l	--	500 [6]	60	58	104	96	89	68	83	110	156
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	9.8
Total Dissolved Solids	mg/l	--	500	796	912	824	810	780	992	825	835	1080
Total Organic Carbon	mg/l	--	--	8.3	14	8	7.3	7.7	14	7.4	7	8
Total Suspended Solids	mg/l	--	--	360	832	190	460	256	280	136	526	3220
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.13	1.35	1.06	0.97	0.94	0.845	0.826	1.1	0.879
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	75.6	65.9	77.4	60	69.1	58.2	56.5	81.3	67.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.001	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.18	0.03	0.56	0.76	0.7	0.598	0.526	0.479	0.379
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0005	0.0003	0.0005	0.0006
Magnesium, dissolved	mg/l	--	--	54.4	59.2	61.2	51.4	53.9	49.7	48	62.2	58.7
Manganese, dissolved	mg/l	--	0.05	0.26	0.46	0.23	0.39	0.27	0.356	0.284	0.237	0.432
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	7.9	11.3	13.2	14.8	13.5	14.5	15.8	14.9	17.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.001
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	164	206	167	221	196	264	294	185	286
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.01	0.005	0.005	0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 14-Jun-2001	92-10 23-Nov-2001	92-10 23-May-2002	92-10 06-Nov-2002	92-10 30-May-2003	92-10 09-Oct-2003	92-10 14-May-2004	92-10 19-Nov-2004	92-10 24-May-2005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.037	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 16-Nov-2005	92-10 25-May-2006	92-10 21-Nov-2006	92-10 15-May-2007	92-10 30-Nov-2007	92-10 22-May-2008	92-10 10-Nov-2008	92-10 19-May-2009 G-7	92-10 26-Nov-2009 J-18
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	148	590	624	612	595	550	720	949 [8]	784
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<2	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	605	590	624	612	595	550	720	949	784
Ammonia Nitrogen	mg/l	--	--	0.05	0.06	0.25	0.15	0.54	0.18	0.55	0.43	0.49
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	7	11	42	59	19	38	65	53
Chloride	mg/l	--	250	172	160	126	171	190	191	192	150	229
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	2240	2180
Conductivity (Field)	uS/cm	--	--	1600	1400	1500	1300	1400	1500	1700	1700	1911
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	501	490	471	442	420	402	460	871	463
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.1	0.3	0.1	0.2	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.49	0.55	0.64	0.66	1	0.87	1.22	1.49	0.94
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	7.16	7.86
pH (Field)	-	--	--	--	7.3	6.7	7.7	8	7.3	7.1	--	6.95
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.26	--	--	--	--	--	--	0.06	0.68
Sulphate	mg/l	--	500 [6]	124	176	178	155	122	131	124	139	92
Temperature (Field)	deg c	--	15	12.6	5	10.5	10.5	9	10.5	10	10	10.9
Total Dissolved Solids	mg/l	--	500	1030	1020	1060	1080	1090	1050	1160	1460	1420
Total Organic Carbon	mg/l	--	--	9.2	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	139	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	<0.001	0.0011	0.0011	0.002	0.0014	0.0016	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.08	0.873	0.986	0.869	0.85	0.778	0.949	3.96	1.3
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	90.2	87.6	83.2	77.8	73.2	70.2	82.2	189	80
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	0.006
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0028	0.0004
Copper, dissolved	mg/l	--	1	0.004	0.009	0.002	<0.002	<0.002	<0.002	<0.002	0.003	0.001
Iron, dissolved	mg/l	--	0.3	0.057	0.029	0.531	0.201	1.38	0.479	0.466	1.91	4.74
Lead, dissolved	mg/l	0.01	--	<0.0002	0.0003	<0.0001	0.00004	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	67.1	65.9	64	60.3	57.7	55.2	61.9	97	64
Manganese, dissolved	mg/l	--	0.05	0.169	0.464	1.31	0.133	0.994	4.32	3	2.91	1.01
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.2	13.6	15.7	15.7	15.8	14.2	16	9	16
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	214	175	215	236	276	257	245	151	272
Zinc, dissolved	mg/l	--	5	0.011	0.007	0.008	<0.005	<0.005	<0.005	<0.005	<0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 16-Nov-2005	92-10 25-May-2006	92-10 21-Nov-2006	92-10 15-May-2007	92-10 30-Nov-2007	92-10 22-May-2008	92-10 10-Nov-2008	92-10 19-May-2009 G-7	92-10 26-Nov-2009 J-18
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 25-May-2010 [4]	92-10 20-Oct-2010 [4]	92-10 24-May-2011	92-10 29-Nov-2011 [4]	92-10 31-May-2012	92-10 28-Nov-2012	92-10 29-May-2013 [5]	92-10 26-Nov-2013 [5]	92-10 29-May-2014
				M-10	G-7	G-22	92-10	92-10	92-10	92-10	GW-24	92-10
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	728	720	688	688	660	650	620	650	640
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	5.7	5.8	4.7	4.7	7.8
Alkalinity (Total as CaCO3)	mg/l	--	--	728	720	688	688	660	660	630	650	640
Ammonia Nitrogen	mg/l	--	--	0.45	0.52	0.30	0.63	0.46	0.83	0.57	0.62	0.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	43	38	45	36	40	38	36	25
Chloride	mg/l	--	250	199	195	187	193	210	210	180	170	230
Conductivity	uS/cm	--	--	2080	2000	1940	2010	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2051	1991	1865	1529	1723	1807	1462	1543	1706
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	548	540	457	477	440	440	390	400	390
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.14	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.013	<0.010	0.037	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.75	1.64	0.74	0.78	1.3	1.5	1.1	1.5	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.97	7.63	8.20	8.14	7.97	--	7.90	7.89	8.11
pH (Field)	-	--	--	7.33	7.17	7.30	7.36	7.30	7.40	6.87	6.92	7.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.39	0.41	0.42	0.40	0.28	0.48	0.54	0.40	0.43
Sulphate	mg/l	--	500 [6]	96	98	103	78	69	58	74	77	55
Temperature (Field)	deg c	--	15	15.3	10.7	12.6	8.8	10.0	9.4	9.8	10.0	11.0
Total Dissolved Solids	mg/l	--	500	1350	1300	1260	1310	1140	1180	1110	1060	1090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.001	<0.01	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.6	1.5	1.0	1.4	1	1.1	0.91	0.96	0.9
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	94	96	76	84	71	70	66	68	64
Chromium, dissolved	mg/l	0.05	--	0.006	0.006	<0.005	0.007	<0.0050	<0.005	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0006	0.0006	0.0005	0.0004	0.00054	<0.0005	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.001	0.005	0.002	0.0021	0.001	0.0014	0.0026	0.0033
Iron, dissolved	mg/l	--	0.3	0.38	5.89	<0.03	0.55	0.18	1.9	<0.1	<0.1	0.29
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	76	73	65	65	63	64	56	56	56
Manganese, dissolved	mg/l	--	0.05	0.82	1.77	0.62	1.98	0.84	0.99	0.74	0.33	0.48
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17	15	16	16	16	16	16	15	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	231	251	247	243	300	280	310	220	310
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	0.01	<0.01	<0.0050	<0.005	<0.0050	0.0059	0.018

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 25-May-2010 [4] M-10	92-10 20-Oct-2010 [4] G-7	92-10 24-May-2011 G-22	92-10 29-Nov-2011 [4] 92-10	92-10 31-May-2012 92-10	92-10 28-Nov-2012 92-10	92-10 29-May-2013 [5] 92-10	92-10 26-Nov-2013 [5] GW-24	92-10 29-May-2014 92-10
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0013	<0.0013	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Nov-2014 92-10	92-10 02-Jun-2015 92-10	92-10 26-Nov-2015 92-10	92-10 26-May-2016 92-10	92-10 17-Nov-2016 92-10	92-10 24-May-2017 92-10	92-10 29-Nov-2017 92-10	92-10 24-May-2018 92-10	92-10 22-Nov-2018 92-10
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	630	660	589	660	662	678	661	725	808
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.3	<5	<5	<5	<5	<5	5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	640	664	591	664	665	682	666	729	811
Ammonia Nitrogen	mg/l	--	--	0.59	0.09	0.75	0.16	0.62	0.03	0.49	0.35	0.62
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	29	72	116	76	78	39	34	67	77
Chloride	mg/l	--	250	200	218	128	210	201	194	218	180	200
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1761	1803	1489	1732	1849	1760	1576	1827	1777
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	420	339	382	390	399	374	376	434	552
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.1	0.6	2.2	0.8	1.0	0.5	0.9	1.4	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.86	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.34	7.54	7.31	7.42	7.09	7.45	7.29	7.23	7.18
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.42	0.14	2.10	0.60	0.57	0.14	0.45	0.87	0.93
Sulphate	mg/l	--	500 [6]	67	68	112	82	82	74	80	76	70
Temperature (Field)	deg c	--	15	8.9	9.1	10.4	12.5	11.0	11.0	8.7	11.1	10.4
Total Dissolved Solids	mg/l	--	500	1040	1140	914	1080	1020	1010	970	1080	1010
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.95	0.694	0.772	0.881	1.14	0.805	0.856	0.888	1.03
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	72	39.9	49.5	66.1	69.1	68.4	63.8	77	93.5
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.007	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.0032	<0.0005	0.0012	0.0028	0.0027	0.0028	0.0018	0.0028	0.0044
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.362	<0.1	0.824
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	58	58	62.7	54.7	55	49.4	52.7	58.8	77.4
Manganese, dissolved	mg/l	--	0.05	0.26	<0.005	0.011	<0.005	1.28	<0.005	0.333	0.006	0.785
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	12.4	12.8	16.5	14.4	13.9	14.3	14.5	18.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	270	274	317	246	261	261	224	236	283
Zinc, dissolved	mg/l	--	5	<0.0050	0.008	0.007	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Nov-2014 92-10	92-10 02-Jun-2015 92-10	92-10 26-Nov-2015 92-10	92-10 26-May-2016 92-10	92-10 17-Nov-2016 92-10	92-10 24-May-2017 92-10	92-10 29-Nov-2017 92-10	92-10 24-May-2018 92-10	92-10 22-Nov-2018 92-10
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.002	<0.001	0.002	<0.001	<0.001	0.003
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Jun-2019 92-10	92-10 20-Nov-2019 92-10	92-10 21-May-2020 92-10	92-10 26-Nov-2020 92-10	92-10 26-May-2021 92-1D	92-10 30-Nov-2021 92-10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	827	774	798	804	803	801
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	<5	11	5	<5	5
Alkalinity (Total as CaCO3)	mg/l	--	--	832	779	809	809	806	807
Ammonia Nitrogen	mg/l	--	--	0.24	0.58	0.52	0.60	0.60	0.34
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	84	86	71	91	79	159
Chloride	mg/l	--	250	227	226	278	232	223	229
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1925	2040	1936	1844	2046	2026
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	589	588	538	515	550	511
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.2	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	1.2	1.4	1.3	1.3	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.26	7.18	7.69	7.51	7.24	7.27
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.15	0.66	0.82	0.60	0.25	0.18
Sulphate	mg/l	--	500 [6]	60	57	63	45	39	39
Temperature (Field)	deg c	--	15	12.2	9.6	11.7	7.7	10.8	8.5
Total Dissolved Solids	mg/l	--	500	1240	1160	1220	1180	1210	1170
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.09	0.903	0.882	0.834	0.904	0.82
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	103	101	91.1	85.6	90.3	87.8
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.004	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0005	0.0017	<0.0005	<0.0005	0.0007
Copper, dissolved	mg/l	--	1	0.0053	0.0023	0.0065	0.0026	0.0029	0.0015
Iron, dissolved	mg/l	--	0.3	<0.1	0.66	5.69	1.44	<0.1	0.781
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0016	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	80.7	81.5	75.5	73.2	78.7	70.7
Manganese, dissolved	mg/l	--	0.05	0.876	1.2	1.34	0.911	1.33	1.65
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	19.6	21.6	17.7	17.1	16.9	17.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	272	290	291	292	281	277
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.014	<0.005	<0.005	0.006

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Jun-2019 92-10	92-10 20-Nov-2019 92-10	92-10 21-May-2020 92-10	92-10 26-Nov-2020 92-10	92-10 26-May-2021 92-1D	92-10 30-Nov-2021 92-10
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	0.010	<0.004 [11]	<0.004 [11]	<0.004 [11]
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 09-Jun-1992	92-11 01-Nov-1992	92-11 15-Jun-1994	92-11 02-Nov-1994	92-11 28-Jun-1995	92-11 22-Nov-1995	92-11 12-Jun-1996	92-11 12-Oct-1996	92-11 18-Jun-1997
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	795	705	--	907	754	664	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	652	578	796	756	618	544	605	603	604
Ammonia Nitrogen	mg/l	--	--	--	--	--	3.65	4.3	0.46	2.5	1.07	0.16
Chemical Oxygen Demand	mg/l	--	--	--	--	87	128	113	65	45	33	41
Chloride	mg/l	--	250	145	93	79	35	139	55	34	43.3	88.5
Conductivity (Field)	uS/cm	--	--	2014	1937	1990	2020	1620	1890	1690	1640	1620
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	10.47	7	--	--	--	6.17
Hardness, Calcium Carbonate	mg/l	--	--	647.71	662	740	869	679	658	886	753	793
Nitrate as N	mg/l	10.0	--	--	--	1.56	5.92	0.1	1.7	1.5	1.1	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	20.3	2.5	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	16	2.04	--	--	--
pH (Field)	-	--	--	7.76	7.13	6.68	7.34	7.03	7.52	6.85	6.81	7.05
Phosphate	mg/l	--	--	--	--	--	--	--	0.5	--	--	--
Phosphorus	mg/l	--	--	--	--	0.54	0.376	14.4	--	--	--	--
Sulphate	mg/l	--	500 [6]	204	423.5	189	229	99	362	320	352	273
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1000	1010	820	940	850	820	810
Total Organic Carbon	mg/l	--	--	--	--	22.4	25.5	37.7	15.8	18.5	16.8	16.1
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	481	323	3460
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.116	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	2.74	2.339	1.92	1.31	1.54	1.85	1.96
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	179.4	188	202	234.6	194	225	236	204	199
Chromium, dissolved	mg/l	0.05	--	--	--	--	0.01	0.01	0.02	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0212	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.702	0.526	0.04	0.14	2.89	0.88	0.94
Lead, dissolved	mg/l	0.01	--	--	--	0.0003	0.1	0.0003	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	48.4	46.7	57.2	42.426	46.5	50.8	71	58.3	70.9
Manganese, dissolved	mg/l	--	0.05	--	--	2.892	3.357	2.82	0.66	2.23	2.45	2.44
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.06	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	28.2	19	31.8	22.39	--	23.2	20.8	20.2	15.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	189.9	199	110	92.17	92.5	125	110	110	106
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 09-Jun-1992	92-11 01-Nov-1992	92-11 15-Jun-1994	92-11 02-Nov-1994	92-11 28-Jun-1995	92-11 22-Nov-1995	92-11 12-Jun-1996	92-11 12-Oct-1996	92-11 18-Jun-1997
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.134	0.002	0.001	--	--	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 06-Nov-1997	92-11 05-Jun-1998	92-11 30-Oct-1998	92-11 06-May-1999	92-11 19-Oct-1999	92-11 05-May-2000	92-11 24-Oct-2000	92-11 14-Jun-2001	92-11 23-Nov-2001
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	420	380	427	388	549	421	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	390	512	344	312	350	318	450	345	227
Ammonia Nitrogen	mg/l	--	--	0.04	0.14	0.13	0.01	0.06	0.01	0.07	0.01	0.01
Chemical Oxygen Demand	mg/l	--	--	30	41	12	7	10	18	--	7	15
Chloride	mg/l	--	250	109	85.4	19.9	10.2	9.5	9	41.5	22.5	51.7
Conductivity (Field)	uS/cm	--	--	1770	1518	940	860	740	700	1320	900	1300
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	759	695	500	473	385	354	577	535	696
Nitrate as N	mg/l	10.0	--	1	1.6	--	--	0.2	0.1	0.2	0.6	0.2
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	0.73	0.36	--	--	0.68	0.5	0.51
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.27	--	6.7	7.1	7.4	6.9	6.91	6.9	6.41
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.3	0.28	0.29
Sulphate	mg/l	--	500 [6]	398	283	183	185	110	91	263	179	395
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	930	760	470	430	370	350	884	632	952
Total Organic Carbon	mg/l	--	--	12.9	12.6	12.7	6.2	4.8	4.3	--	6.6	11
Total Suspended Solids	mg/l	--	--	--	--	--	--	123	170	346	218	326
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.28	1.45	1.25	0.48	0.89	0.5	0.9	0.39	0.53
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	204	172	140	130	100	104	152	160	190
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.16	0.18	1.13	0.02	0.16	0.1	0.16	0.02	0.03
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0004	0.0002	0.0002	0.0022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	59.8	63.7	36.4	35.6	32.4	22.7	47.9	32.9	53.8
Manganese, dissolved	mg/l	--	0.05	0.1	1.04	1.05	0.1	0.03	0.02	0.16	0.01	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.3	11.2	16.5	0.7	5.7	1.1	6.2	2.4	2.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	100	118	40	36.9	50	28	58.9	36.9	91.1
Zinc, dissolved	mg/l	--	5	0.01	0.36	0.01	0.01	0.27	0.22	0.03	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 06-Nov-1997	92-11 05-Jun-1998	92-11 30-Oct-1998	92-11 06-May-1999	92-11 19-Oct-1999	92-11 05-May-2000	92-11 24-Oct-2000	92-11 14-Jun-2001	92-11 23-Nov-2001
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.001	0.026	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 23-May-2002	92-11 06-Nov-2002	92-11 30-May-2003	92-11 09-Oct-2003 [3]	92-11 14-May-2004	92-11 19-Nov-2004	92-11 24-May-2005	92-11 16-Nov-2005	92-11 25-May-2006
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	410	659	780	--	651	802	799	176	595
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	1	1	--	1	1	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	352	540	639	--	534	657	655	720	595
Ammonia Nitrogen	mg/l	--	--	0.13	0.04	0.09	--	0.04	0.5	0.35	0.39	0.14
Chemical Oxygen Demand	mg/l	--	--	3	29	14	--	24	45	34	38	17
Chloride	mg/l	--	250	52	66	80	--	95.2	34	32.8	14.5	17.2
Conductivity (Field)	uS/cm	--	--	1150	1630	1300	--	1980	1900	2150	1600	1300
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	536	554	471	--	832	667	628	663	487
Nitrate as N	mg/l	10.0	--	3.1	0.2	0.4	--	0.3	1	0.1	0.1	0.3
Nitrogen, Total Kjeldahl	mg/l	--	--	0.62	0.54	0.65	--	0.5	1.47	1.31	1.4	0.61
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.96	6.6	6.5	--	7.2	6.9	6.5	--	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.24	0.05	0.21	--	0.14	0.15	0.23	0.2	--
Sulphate	mg/l	--	500 [6]	407	323	325	--	831	350	370	220	410
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	11.4	--	4
Total Dissolved Solids	mg/l	--	500	990	1100	650	--	990	950	1210	1090	1110
Total Organic Carbon	mg/l	--	--	6	8.3	6.9	--	6.7	10.2	6.6	9	--
Total Suspended Solids	mg/l	--	--	306	137	15	--	52	118	94	94	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	--	0.001	0.008	0.002	0.002	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.73	0.99	0.7	--	0.606	0.833	0.529	0.784	0.551
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	<0.0001	<0.005
Calcium, dissolved	mg/l	--	--	138	178	133	--	219	171	159	173	119
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	--	0.001	0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	--	0.003	0.002	<0.002	<0.002	0.01
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.21	--	0.015	21.4	10.3	8.74	0.828
Lead, dissolved	mg/l	0.01	--	0.0003	0.0007	0.0002	--	0.0002	0.0008	0.0006	0.0002	<0.0002
Magnesium, dissolved	mg/l	--	--	31.1	44.1	33.8	--	69.1	58.4	55.8	56.2	45.9
Manganese, dissolved	mg/l	--	0.05	0.01	0.02	0.01	--	0.002	8.21	3.08	2.92	1.62
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	<0.00006	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01	<0.01	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	--	0.01	0.01	<0.01	<0.01	--
Potassium, dissolved	mg/l	--	--	5.5	11.8	7.9	--	10.4	10.6	9.1	11.6	6.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	0.001	<0.001	--
Sodium, dissolved	mg/l	--	200 [7]	150	164	191	--	232	185	181	186	157
Zinc, dissolved	mg/l	--	5	0.01	0.02	0.01	--	0.005	0.005	<0.005	0.008	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 23-May-2002	92-11 06-Nov-2002	92-11 30-May-2003	92-11 09-Oct-2003 [3]	92-11 14-May-2004	92-11 19-Nov-2004	92-11 24-May-2005	92-11 16-Nov-2005	92-11 25-May-2006
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	--	0.001	0.001	0.004	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 19-Dec-2008
General Chemistry				
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1590
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1590
Ammonia Nitrogen	mg/l	--	--	0.5
Chemical Oxygen Demand	mg/l	--	--	314
Chloride	mg/l	--	250	300
Conductivity (Field)	uS/cm	--	--	2700
Dissolved Oxygen (Field)	mg/l	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1230
Nitrate as N	mg/l	10.0	--	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	5.76
Nitrogen, Organic	mg/l	--	--	--
pH (Field)	-	--	--	6.1
Phosphate	mg/l	--	--	--
Phosphorus	mg/l	--	--	--
Sulphate	mg/l	--	500 [6]	92
Temperature (Field)	deg c	--	15	6
Total Dissolved Solids	mg/l	--	500	2150
Total Organic Carbon	mg/l	--	--	--
Total Suspended Solids	mg/l	--	--	--
Metals				
Arsenic, dissolved	mg/l	0.01	--	0.0032
Barium, dissolved	mg/l	1	--	--
Boron, dissolved	mg/l	5	--	**10.4**
Cadmium, dissolved	mg/l	0.005	--	<0.00002
Calcium, dissolved	mg/l	--	--	298
Chromium, dissolved	mg/l	0.05	--	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005
Copper, dissolved	mg/l	--	1	<0.002
Iron, dissolved	mg/l	--	0.3	0.657
Lead, dissolved	mg/l	0.01	--	<0.00002
Magnesium, dissolved	mg/l	--	--	119
Manganese, dissolved	mg/l	--	0.05	3.39
Mercury, dissolved	mg/l	0.001	--	--
Molybdenum, dissolved	mg/l	--	--	--
Nickel, dissolved	mg/l	--	--	--
Potassium, dissolved	mg/l	--	--	11.6
Selenium, dissolved	mg/l	0.05	--	--
Sodium, dissolved	mg/l	--	200 [7]	373
Zinc, dissolved	mg/l	--	5	0.007

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 19-Dec-2008
Phenols				
Phenolics, Total Recoverable	mg/l	--	--	0.004
Semi-VOCs				
Naphthalene	mg/l	--	--	--
Styrene	mg/l	--	--	--
VOCs				
1,1,1,2-Tetrachloroethane	mg/l	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--
1,2-Dibromoethane	mg/l	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--
1,2-Dichloroethane	mg/l	0.005	--	--
1,2-Dichloropropane	mg/l	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--
Benzene	mg/l	0.001	--	0.0009
Bromodichloromethane	mg/l	--	--	--
Bromoform	mg/l	--	--	--
Bromomethane	mg/l	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--
Chlorobenzene	mg/l	0.08	0.03	--
Chloroform	mg/l	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--
Dibromochloromethane	mg/l	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	0.0011
m,p-Xylenes	mg/l	--	--	0.0032
Methylene Chloride	mg/l	0.05	--	<0.0003
o-Xylene	mg/l	--	--	0.0009
Tetrachloroethylene	mg/l	0.01	--	--
Toluene	mg/l	0.06	0.024	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--
Trichloroethene	mg/l	0.005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 09-Jan-1990	94-1 02-Mar-1990	94-1 28-Mar-1990	94-1 01-Aug-1990	94-1 06-Nov-1990	94-1 29-Nov-1991	94-1 09-Jun-1992	94-1 01-Nov-1992	94-1 08-Jun-1993	94-1 04-Nov-1993	94-1 15-Jun-1994
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1210	1220	--	--	--	1205	1561	1276	1300	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	--	--	--	14.4	1	1	<1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	2256	1000	950	1014	1060	1012	1280	1046	1063	1040
Ammonia Nitrogen	mg/l	--	--	0.64	--	--	2.2	1.8	0.5	2.28	1.86	--	--	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	3	20.8	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--	94	72.8	--	--	153
Chloride	mg/l	--	250	993	978	954	950	920	746	890	1018	1020	1250	1430
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2742	--	4352	4664	4368	7500	4685	4485	3760	4380	5340
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	**0.276**	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	213	250.3	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	260	265	278	229	180	186	202.56	198	200	237	293
Nitrate as N	mg/l	10.0	--	**18**	**69.6**	**19.5**	3.83	1.88	--	0.3	1.5	0.48	**10.8**	0.1
Nitrite as N	mg/l	1.0	--	**1.3**	--	--	0.21	0.001	**1.97**	0.1	0.18	0.1	0.14	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	3.36	4.01	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	1.08	2.15	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.67	8.25	8.11	8.26	8.2	8.1	8.37	7.99	7.82	8.18	7.96
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	2.36	1.1	--	--	2.63
Sulphate	mg/l	--	500 [6]	34	30.3	30	20	11	1	0.35	2	1.8	4.6	64
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	2256	2112	--	--	--	2737	2915	2692	2640	2680
Total Organic Carbon	mg/l	--	--	35.5	--	--	27	22.3	--	33.8	22.5	--	--	21.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	0.58	--	--	0.1	--	0.5	--	0.14	0.102	<0.01	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.003	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	0.04	0.1	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--	1.42	1.34	--	--	1.37
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	30.3	31	34	27	21	21.8	20.6	22.1	22	29.3	40.4
Chromium, dissolved	mg/l	0.05	--	**0.13**	--	--	0.05	--	0.001	0.02	0.05	0.01	<0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	--	--	0.05	--	0.02	0.02	0.05	0.01	<0.01	0.0225
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--	0.2	0.1	0.1	<0.1	0.299
Lead, dissolved	mg/l	0.01	--	**0.69**	--	--	**0.05**	--	0.001	**0.1**	**0.09**	**0.1**	**0.13**	0.0018
Magnesium, dissolved	mg/l	--	--	44.9	50	52	39	31	32	36.7	34.6	35.2	39.7	46.6
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--	0.03	0.05	0.062	0.057	0.129
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.04	--	--	0.05	--	0.07	0.02	0.05	0.02	<0.02	0.02
Potassium, dissolved	mg/l	--	--	62.5	31	31	23	23	21	16.5	25.4	24	25	37.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	0.01	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	790	1357	995	1063	1157	717	1049	1110	964	1020	897
Zinc, dissolved	mg/l	--	5	0.17	--	--	0.05	--	0.01	0.02	0.05	0.031	<0.01	0.01
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.002	--	--	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.01
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 02-Nov-1994	94-1 28-Jun-1995	94-1 23-Nov-1995	94-1 12-Oct-1996	94-1 06-Nov-1997	94-1 05-Jun-1998	94-1 06-May-1999	94-1 24-Oct-2000	94-1 14-Jun-2001	94-1 06-Nov-2002	94-1 30-May-2003
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1233	1268	1370	--	--	--	1430	1540	1100	1440	1310
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	--	--	--	1	1	97	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1030	1040	1120	1140	1130	1020	1170	1260	1060	1180	1070
Ammonia Nitrogen	mg/l	--	--	1.35	1.47	0.6	2.31	1.34	1.03	1.34	0.72	1.26	2.01	0.27
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	221	100	65	43	36	55	35	--	41	94	60
Chloride	mg/l	--	250	1040	1095	1070	928	1060	1130	1190	1200	1100	1080	1100
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5070	5300	5520	5340	4980	5090	4950	5210	4800	4860	4410
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.06	6.13	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	278	191	212	215	211	208	226	219	204	196	178
Nitrate as N	mg/l	10.0	--	1.98	1.8	2.2	0.1	0.1	4.6	--	1.5	0.3	0.2	1.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	6.5	4.3	--	--	--	5.69	1.5	2.86	0.41	1.77
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	5.03	3.7	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.19	8.06	8.41	7.83	7.78	--	7.9	8.15	8	7.9	7.3
Phosphate	mg/l	--	--	--	--	0.5	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.1	2.41	--	--	--	--	--	1.02	3.15	0.58	2.17
Sulphate	mg/l	--	500 [6]	30.9	23	20	10	3	41	3	7	4	4	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2550	2570	2770	2680	2500	2550	2490	3200	2600	2910	2205
Total Organic Carbon	mg/l	--	--	25	20.3	17.9	16.4	17	16.2	23.5	--	15.1	15.3	14.6
Total Suspended Solids	mg/l	--	--	--	--	--	2310	--	--	--	1410	2700	4730	2370
Metals														
Aluminum, dissolved	mg/l	--	--	0.01	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.1	--	--	--	--	--	--	0.003	0.003	0.002	0.003
Barium, dissolved	mg/l	1	--	0.057	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.143	1.04	1.03	1.15	1.18	1.36	1.37	1.27	1.37	1.2	1.2
Cadmium, dissolved	mg/l	0.005	--	0.01	0.0001	0.0001	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	22.63	23	24	24.5	24.7	23.2	28.4	22.9	26.5	24.5	22
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.1	0.05	1.14	1.43	0.83	3.19	0.02	0.37	0.13	0.02	0.26
Lead, dissolved	mg/l	0.01	--	0.1	0.001	0.0003	0.0002	0.0002	0.0012	0.0005	0.022	0.0002	0.0094	0.0012
Magnesium, dissolved	mg/l	--	--	19.606	31.9	36.6	36.9	35.8	35.9	37.3	39.3	33.4	32.8	29.9
Manganese, dissolved	mg/l	--	0.05	0.093	0.06	0.02	0.1	0.08	0.11	0.08	0.08	0.06	0.06	0.06
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.33	--	28.9	28.1	25.4	30.8	26	26.7	21.4	24.6	25.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	95.5	864	949	1000	1010	1330	1150	1110	1060	1120	921
Zinc, dissolved	mg/l	--	5	0.011	0.01	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.02	0.01
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	--	--	--	--	--	0.001	0.001	0.001	0.001
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 19-Nov-2004	94-1 16-Nov-2005	94-1 15-May-2007	94-1 10-Nov-2008	94-1 26-Nov-2009 [25] M-1	94-1 24-May-2011 [4] G-35	94-1 28-Nov-2012 94-1	94-1 29-May-2014 94-1	94-1 26-Nov-2015 94-1	94-1 24-May-2017 94-1	94-1 22-Nov-2018 94-1
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1400	279	1120	1090	1100	1080	1100	1100	1060	1030	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	23	39	20	38	<25 [15]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1150	1150	1120	1090	1120	1120	1100	1100	1070	1050	1160
Ammonia Nitrogen	mg/l	--	--	1.83	1.81	0.76	0.58	2.49	2.50	2.6	2.6	1.04	0.02	0.36
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	60	64	151	72	110	65	65	59	542	69	231
Chloride	mg/l	--	250	1140	997	1050	1100	1090	1010	1000	1100	1110	1100	1110
Conductivity	uS/cm	--	--	--	--	--	--	5220	5250	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5320	1700	3600	4450	>3999	>3999	3972	>3999	>3999	3999	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	191	199	174	163	173	193	200	190	170	191	270
Nitrate as N	mg/l	10.0	--	1	0.2	0.2	0.8	0.49	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	0.020	0.080	<0.05	<0.25 [9]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.11	3.22	1.2	2.33	3.43	3.27	4.9	5.1	3.1	1.2	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	0.11	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	8.35	8.58	--	8.58	--	--	--
pH (Field)	-	--	--	7.9	--	8.5	7.9	7.69	8.17	8.12	7.89	8.08	8.14	8.25
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.99	1.17	--	--	3.85	2.30	4.1	2.2	3.20	1.05	2.78
Sulphate	mg/l	--	500 [6]	10	2	2	2	5	<1	1	2	<1	1	2
Temperature (Field)	deg c	--	15	--	--	9.4	10	10.3	15.4	8.8	11.7	7.3	11.6	8.6
Total Dissolved Solids	mg/l	--	500	2660	2900	2820	2820	3390	3410	2860	2850	2940	2870	2910
Total Organic Carbon	mg/l	--	--	15.6	19.4	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	99	32	--	--	--	--	--	--	--	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.0096	0.0071	<0.01	<0.01	0.002	0.0025 [20]	0.003	0.008	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.28	1.34	1.13	1.12	1.8	1.3	1.5	1.4	1.44	1.12	1.47
Cadmium, dissolved	mg/l	0.005	--	--	0.0002	0.00005	<0.00002	<0.001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	23.9	24.5	22.1	20.3	20	23	24	23	22.4	23.9	33.9
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.005	0.014	<0.005	<0.01	<0.001	0.02	<0.001
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.002	0.0007	0.0005	<0.00050	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.005	0.003	<0.01	0.005	<0.001	0.0020	<0.0005	0.0016	0.0033
Iron, dissolved	mg/l	--	0.3	0.071	0.345	0.178	0.006	<0.3	<0.03	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0009	0.0006	0.00021	<0.00002	<0.01	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	32	33.5	28.8	27.4	30	33	34	32	27.7	31.9	44.9
Manganese, dissolved	mg/l	--	0.05	0.059	0.084	0.017	0.049	<0.1	0.03	0.14	0.065	0.123	0.018	0.021
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.1	30	28.5	25.2	23	27	25	24	21.3	25.9	31
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1200	1150	1020	984	1001	1100	1100	990	1230	1130	1050
Zinc, dissolved	mg/l	--	5	0.005	0.006	0.013	<0.005	<0.1	0.02	<0.005	<0.0050	0.007	<0.005	<0.005
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.002 [10]	<0.010 [10]	<0.001
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 21-May-2020 94-1	94-1 30-Nov-2021 94-1
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1110	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [16]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1130	1150
Ammonia Nitrogen	mg/l	--	--	2.27	2.25
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	84	92
Chloride	mg/l	--	250	1360	1050
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	>3999
Cyanide	mg/l	0.2	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	265	214
Nitrate as N	mg/l	10.0	--	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.0	3.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.22	8.14
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	1.29	1.74
Sulphate	mg/l	--	500 [6]	<1	<1
Temperature (Field)	deg c	--	15	13.7	3.8
Total Dissolved Solids	mg/l	--	500	3000	2940
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Aluminum, dissolved	mg/l	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--
Boron, dissolved	mg/l	5	--	1.43	1.4
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	32.8	25
Chromium, dissolved	mg/l	0.05	--	0.004	<0.001
Cobalt, dissolved	mg/l	--	--	0.0025	<0.0005
Copper, dissolved	mg/l	--	1	0.0013	0.0008
Iron, dissolved	mg/l	--	0.3	4.61	0.128
Lead, dissolved	mg/l	0.01	--	0.0048	<0.0001
Magnesium, dissolved	mg/l	--	--	44.4	36.7
Manganese, dissolved	mg/l	--	0.05	0.272	0.104
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	27.4	23.2
Selenium, dissolved	mg/l	0.05	--	--	--
Silver, dissolved	mg/l	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1020	909
Zinc, dissolved	mg/l	--	5	0.016	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	0.011	<0.004 [11]
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 09-Jan-1990	94-2 02-Mar-1990	94-2 20-Mar-1990	94-2 01-Aug-1990	94-2 06-Nov-1990	94-2 29-Nov-1991	94-2 09-Jun-1992	94-2 01-Nov-1992	94-2 15-Jun-1994
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	995	1000	--	--	--	927	1058	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	14.4	1	--	--	--	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1196	840	820	782	858	857	760	868	756
Ammonia Nitrogen	mg/l	--	--	0.1	--	--	1.24	0.57	0.4	0.27	1.69	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	1.9	21.3	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--	178	58.2	84
Chloride	mg/l	--	250	2070	539	549	553	513	532	505	667	530
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5180	--	3076	3290	2891	2890	3077	3120	2970
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	165.1	213.2	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	710	294	302	244	212	204	209.78	203	409
Nitrate as N	mg/l	10.0	--	**68**	**38.9**	**11.5**	2.81	0.52	1.02	0.66	1.35	0.3
Nitrite as N	mg/l	1.0	--	0.1	--	--	0.1	0.01	--	0.1	0.16	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	1.4	2.24	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	1.13	0.55	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.92	8.39	8.18	8.32	8.2	8	8.27	8.1	7.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.47	1.3	0.85
Sulphate	mg/l	--	500 [6]	43	35.6	42	25	27	10	19	8	127
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	1548	1628	--	--	--	1660	1884	1490
Total Organic Carbon	mg/l	--	--	--	--	--	23	18.1	--	27.4	18.9	18.4
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	0.1	--	0.5	--	0.1	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.003	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	0.04	0.1	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--	0.88	0.96	1.12
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	77.3	35	35	30	27	27.6	22.45	24.3	64.6
Chromium, dissolved	mg/l	0.05	--	--	--	--	0.05	--	0.01	0.02	0.05	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	--	0.05	--	0.002	0.02	0.05	0.0194
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--	0.2	0.07	0.421
Lead, dissolved	mg/l	0.01	--	--	--	--	**0.05**	--	0.001	**0.1**	**0.05**	0.0008
Magnesium, dissolved	mg/l	--	--	126	43	47	41	35	32.7	37.26	34.5	62
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--	0.02	0.13	0.725
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	0.05	--	0.05	0.02	0.05	0.02
Potassium, dissolved	mg/l	--	--	2070	539	549	553	17	14	12.56	17.3	17.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	0.01	--	--
Sodium, dissolved	mg/l	--	200 [7]	1919	800	686	693	66	532	513.4	768	415
Zinc, dissolved	mg/l	--	5	--	--	--	0.05	--	0.02	0.02	0.05	0.1

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 09-Jan-1990	94-2 02-Mar-1990	94-2 20-Mar-1990	94-2 01-Aug-1990	94-2 06-Nov-1990	94-2 29-Nov-1991	94-2 09-Jun-1992	94-2 01-Nov-1992	94-2 15-Jun-1994
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.13	0.002	0.002	0.002	0.002	0.011
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 02-Nov-1994	94-2 28-Jun-1995	94-2 23-Nov-1995	94-2 12-Jun-1996	94-2 18-Jun-1997	94-2 06-Nov-1997	94-2 05-Jun-1998	94-2 30-Oct-1998	94-2 06-May-1999
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	868	952	1030	--	--	--	--	986	1090
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	--	--	--	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	724	780	840	813	917	800	874	808	897
Ammonia Nitrogen	mg/l	--	--	0.15	0.17	0.04	0.12	0.37	0.32	0.23	0.11	0.23
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	115	65	50	38	26	38	48	9	42
Chloride	mg/l	--	250	392	430	400	455	456	520	509	470	552
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2930	2880	3060	2970	2760	2800	3020	2930	3010
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	9.09	8.7	--	--	3.88	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	323	270	268	265	261	243	241	197	244
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.3	0.1	0.1	0.1	1	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	8.8	1.11	--	--	--	--	0.94	1.19
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	8.63	1.07	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.68	7.65	8.32	8.03	7.76	7.56	--	7.6	7.6
Phosphate	mg/l	--	--	--	--	0.3	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.266	0.36	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	116	81	98	55	58	47	53	52	21
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1470	1460	1530	1490	1380	1410	1510	1480	1510
Total Organic Carbon	mg/l	--	--	19	16.1	15	15.5	13.9	13.9	14	16.4	16.6
Total Suspended Solids	mg/l	--	--	--	--	--	343	567	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	0.111	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	**0.1**	--	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	0.058	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.89	0.62	0.62	0.728	0.88	0.76	0.93	0.95	0.87
Cadmium, dissolved	mg/l	0.005	--	**0.01**	0.0015	0.0001	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	34.69	37.1	35.1	33.1	34.5	32.6	30.6	26.5	32.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.016	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.38	0.04	0.35	0.549	0.77	0.48	0.48	0.46	0.29
Lead, dissolved	mg/l	0.01	--	**0.1**	0.0051	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005
Magnesium, dissolved	mg/l	--	--	25.676	42.6	43.2	43.8	41.8	38.7	39.4	31.8	39.2
Manganese, dissolved	mg/l	--	0.05	0.359	0.4	0.32	0.339	0.25	0.22	0.32	0.27	0.24
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.8	--	14.6	19.7	12.5	16.3	15.1	16.4	5.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	514.6	492	542	586	496	495	709	599	625
Zinc, dissolved	mg/l	--	5	0.076	0.01	0.01	0.01	0.01	0.01	0.16	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 02-Nov-1994	94-2 28-Jun-1995	94-2 23-Nov-1995	94-2 12-Jun-1996	94-2 18-Jun-1997	94-2 06-Nov-1997	94-2 05-Jun-1998	94-2 30-Oct-1998	94-2 06-May-1999
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.005	0.001	--	--	--	--	--	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 19-Oct-1999	94-2 05-May-2000	94-2 24-Oct-2000	94-2 14-Jun-2001	94-2 23-Nov-2001	94-2 23-May-2002	94-2 06-Nov-2002	94-2 30-May-2003	94-2 09-Oct-2003
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	900	1161	1100	826	859	765	867	982	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	59	1	1	58	1	49	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	826	952	901	773	704	708	711	805	805
Ammonia Nitrogen	mg/l	--	--	0.22	0.05	0.03	0.06	0.02	0.06	0.06	0.07	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	1
Chemical Oxygen Demand	mg/l	--	--	33	38	--	30	25	15	32	39	35
Chloride	mg/l	--	250	532	370	453	371	362	347	383	420	421
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2800	2850	2910	2400	2360	2660	2670	2560	2700
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	185
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	240	237	248	242	240	224	221	204	201
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.3	0.1	0.2	0.3	0.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	0.64	0.95	0.66	0.54	0.6	0.78	0.68
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7.6	7.41	7.7	6.97	7.23	7.6	7	7.5
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.41	0.33	0.29	0.36	0.32	0.45	0.43
Sulphate	mg/l	--	500 [6]	40	90	67	68	86	73	59	43	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1390	1425	1530	1440	1340	1330	1500	1280	1541
Total Organic Carbon	mg/l	--	--	13.6	13.2	--	11	10	11	10.7	10.7	14
Total Suspended Solids	mg/l	--	--	208	100	55	55	137	152	44	35	56
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	0.003	0.001	0.003	0.001	0.003	0.002	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.02	0.84	0.74	0.9	0.99	0.71	0.79	0.66	0.667
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	33.9	31.9	30	36.3	33.4	33.7	29.2	28.9	26.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.003
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.004
Iron, dissolved	mg/l	--	0.3	1.15	0.51	0.28	0.08	0.03	0.02	0.11	0.2	1.33
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	0.0022	0.0002	0.0002	0.0002	0.0021	0.0008	0.0009
Magnesium, dissolved	mg/l	--	--	37.2	37.8	42	36.7	38	33.9	35.9	32.1	32.7
Manganese, dissolved	mg/l	--	0.05	0.18	0.25	0.45	0.13	0.13	0.12	0.12	0.01	0.17
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	15.9	9.4	17.7	7	7.8	13.9	12.8	12.8	13.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	700	623	645	487	509	452	468	505	524
Zinc, dissolved	mg/l	--	5	0.12	0.08	0.01	0.01	0.01	0.01	0.02	0.01	0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 19-Oct-1999	94-2 05-May-2000	94-2 24-Oct-2000	94-2 14-Jun-2001	94-2 23-Nov-2001	94-2 23-May-2002	94-2 06-Nov-2002	94-2 30-May-2003	94-2 09-Oct-2003
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.001	0.084	0.001	0.001	0.001	0.001	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 14-May-2004	94-2 19-Nov-2004	94-2 24-May-2005	94-2 16-Nov-2005	94-2 25-May-2006	94-2 21-Nov-2006	94-2 15-May-2007	94-2 30-Nov-2007	94-2 22-May-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	952	1090	1050	209	865	904	890	900	840
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	780	890	860	855	865	904	890	900	840
Ammonia Nitrogen	mg/l	--	--	0.03	0.01	0.12	0.17	0.01	0.01	<0.01	0.1	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	34	41	33	45	26	29	49	68	27
Chloride	mg/l	--	250	421	491	438	386	449	446	430	470	472
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2710	2900	3300	2400	2400	2600	1900	1300	2500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	219	213	226	228	210	194	214	215	213
Nitrate as N	mg/l	10.0	--	0.2	1	0.2	0.4	0.1	0.1	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.7	0.63	0.9	0.73	0.98	0.62	0.68	0.81	0.76
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.8	7.8	7.2	--	7.7	7.1	8.1	7.8	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.31	0.38	0.4	0.46	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	46	30	34	43	32	30	23	23	21
Temperature (Field)	deg c	--	15	--	--	10.1	--	5	10	9.3	6.5	9.5
Total Dissolved Solids	mg/l	--	500	1355	1450	1620	1670	1660	1660	1610	1830	1640
Total Organic Carbon	mg/l	--	--	9.8	11.4	11	13	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	35	28	43	33	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.002	0.002	<0.001	0.0067	0.0068	0.0054	0.0047
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.678	0.763	0.717	0.726	0.595	0.579	0.621	0.714	0.602
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	30	29.4	29	31.3	28.1	26.9	29.8	29.6	29.4
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.049	0.137	0.061	0.276	0.055	0.761	0.453	0.378	0.302
Lead, dissolved	mg/l	0.01	--	0.0007	0.0005	0.0012	0.0002	0.0004	<0.0001	0.00004	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	35.1	33.9	37.3	36.5	33.9	30.9	34	34.3	33.9
Manganese, dissolved	mg/l	--	0.05	0.3	0.151	0.135	0.396	0.175	0.346	0.331	0.184	0.289
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.7	15.1	16.2	16.5	13.6	14.1	15.1	17.5	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	<0.001	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	547	572	569	657	597	567	545	710	566
Zinc, dissolved	mg/l	--	5	0.005	0.005	<0.005	0.008	<0.005	0.008	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 14-May-2004	94-2 19-Nov-2004	94-2 24-May-2005	94-2 16-Nov-2005	94-2 25-May-2006	94-2 21-Nov-2006	94-2 15-May-2007	94-2 30-Nov-2007	94-2 22-May-2008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	<0.0007	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 10-Nov-2008	94-2 19-May-2009 G-21	94-2 26-Nov-2009 M-5	94-2 25-May-2010 [4] M-18	94-2 20-Oct-2010 [4] G-15	94-2 24-May-2011 [4] G-28	94-2 29-Nov-2011 [4] 94-2	94-2 31-May-2012 94-2	94-2 28-Nov-2012 94-2
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	880	862	877	838	860	854	859	840	840
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	27	19	12	14
Alkalinity (Total as CaCO3)	mg/l	--	--	880	862	877	838	860	881	878	850	850
Ammonia Nitrogen	mg/l	--	--	0.1	0.07	0.04	0.04	0.11	0.17	0.06	<0.050	0.18
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	31	35	35	38	45	33	35	33	43
Chloride	mg/l	--	250	500	455	478	432	471	476	458	440	420
Conductivity	uS/cm	--	--	--	2950	2990	2920	2960	3070	3000	--	--
Conductivity (Field)	uS/cm	--	--	2500	2500	2799	2876	2780	2735	2590	2530	2438
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	211	219	195	221	211	227	191	220	230
Nitrate as N	mg/l	10.0	--	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.69	0.49	0.40	0.55	0.47	0.62	0.48	1.2	0.87
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.10	8.07	8.28	8.09	8.52	8.38	8.20	--
pH (Field)	-	--	--	7.7	--	7.47	7.82	7.75	7.79	7.68	7.78	7.72
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.68	0.52	0.57	0.63	0.69	0.46	0.41	0.49
Sulphate	mg/l	--	500 [6]	14	14	15	17	12	10	11	<20	13
Temperature (Field)	deg c	--	15	9	10	10.5	22.3	14.9	15.6	9.7	11.1	9.7
Total Dissolved Solids	mg/l	--	500	1660	1920	1940	1900	1920	2000	1950	1610	1680
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0047	0.006	0.006	<0.01	<0.01	<0.01	<0.01	0.0026	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.606	0.74	0.90	0.68	0.58	0.7	0.59	0.63	0.7
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	29.3	30	27	29	30	30	27	30	31
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0004	0.0004	0.0005	0.0005	0.0005	0.0003	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.002	0.001	0.002	0.001	0.004	0.002	0.0025	0.002
Iron, dissolved	mg/l	--	0.3	<0.005	<0.03	0.95	0.34	0.73	<0.03	0.08	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	33.4	35	31	36	33	37	30	35	37
Manganese, dissolved	mg/l	--	0.05	0.036	<0.01	0.25	0.20	0.25	0.03	0.02	0.0029	<0.002
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.2	13	12	14	12	15	12	13	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	543	542	569	536	592	564	543	550	590
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.0050	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 10-Nov-2008	94-2 19-May-2009 G-21	94-2 26-Nov-2009 M-5	94-2 25-May-2010 [4] M-18	94-2 20-Oct-2010 [4] G-15	94-2 24-May-2011 [4] G-28	94-2 29-Nov-2011 [4] 94-2	94-2 31-May-2012 94-2	94-2 28-Nov-2012 94-2
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	<0.0006	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-May-2013 [5] 94-2	94-2 26-Nov-2013 GW-9	94-2 29-May-2014 94-2	94-2 19-Nov-2014 [5] 94-2	94-2 02-Jun-2015 94-2	94-2 26-Nov-2015 94-2	94-2 26-May-2016 94-2	94-2 17-Nov-2016 94-2	94-2 24-May-2017 94-2
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	840	860	830	870	902	885	922	925	949
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	13	15	12	13	9	9	9	11
Alkalinity (Total as CaCO3)	mg/l	--	--	850	880	850	880	915	894	931	934	960
Ammonia Nitrogen	mg/l	--	--	0.31	0.28	0.20	0.14	0.33	0.32	0.28	0.43	0.92
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	41	33	39	42	56	44	44	58
Chloride	mg/l	--	250	500	510	460	560	564	527	559	584	596
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2460	2399	2515	2674	2864	2895	2853	3019	3060
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	240	200	250	230	185	219	245	244	228
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.25 [9]
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.0	1.1	0.75	0.9	1.1	0.9	0.9	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.17	8.22	8.29	8.16	--	--	--	--	--
pH (Field)	-	--	--	7.60	7.61	7.90	7.82	7.80	7.74	8.11	7.94	7.82
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.56	0.61	0.42	0.54	0.40	0.61	0.48	0.55	0.73
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	6	7	6	4	4
Temperature (Field)	deg c	--	15	11.4	8.5	10.8	6.5	11.3	8.0	15.1	11.1	13.1
Total Dissolved Solids	mg/l	--	500	1810	1700	1670	1680	1760	1700	1870	1810	1840
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0017	0.0026	0.0019	0.0020	0.001	0.002	0.002	0.005	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.72	0.55	0.79	0.61	0.549	0.539	0.663	0.862	0.63
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	33	29	33	31	28.9	28.3	34.2	33.2	32.3
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.012	0.011
Cobalt, dissolved	mg/l	--	--	<0.00050	0.00051	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0017	0.0014	0.0021	<0.0020	<0.0005	<0.0005	0.0009	0.0008	0.0016
Iron, dissolved	mg/l	--	0.3	<0.1	0.19	0.51	0.62	<0.1	0.5	0.135	0.382	<0.1
Lead, dissolved	mg/l	0.01	--	0.00057	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	38	32	40	36	27.4	36.1	38.8	39.1	35.9
Manganese, dissolved	mg/l	--	0.05	0.22	0.33	0.2	0.34	0.036	0.259	0.092	0.408	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	13	15	14	12.3	11.4	15	13.6	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	550	550	580	600	611	632	542	639	629
Zinc, dissolved	mg/l	--	5	<0.0050	0.027	0.039	<0.0050	<0.005	0.008	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-May-2013 [5] 94-2	94-2 26-Nov-2013 GW-9	94-2 29-May-2014 94-2	94-2 19-Nov-2014 [5] 94-2	94-2 02-Jun-2015 94-2	94-2 26-Nov-2015 94-2	94-2 26-May-2016 94-2	94-2 17-Nov-2016 94-2	94-2 24-May-2017 94-2
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]	0.008	0.004	<0.004 [10]
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	0.00043	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-Nov-2017	94-2 24-May-2018	94-2 22-Nov-2018	94-2 19-Jun-2019 [26]	94-2 20-Nov-2019	94-2 21-May-2020	94-2 26-Nov-2020	94-2 26-May-2021	94-2 30-Nov-2021
				94-2	94-2	94-2	94-2	94-2	94-2	94-2	94-2	94-2
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	941	959	981	--	873	871	878	900	866
Alkalinity, Carbonate as CaCO3	mg/l	--	--	13	12	12	--	16	22	20	11	13
Alkalinity (Total as CaCO3)	mg/l	--	--	954	971	993	--	889	893	898	912	879
Ammonia Nitrogen	mg/l	--	--	0.37	0.25	0.51	--	0.35	0.09	0.30	0.11	0.11
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	60	61	76	--	54	57	80	36	83
Chloride	mg/l	--	250	629	548	544	--	586	612	495	485	457
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2593	2981	2725	--	3010	2793	2576	2894	2818
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	210	245	280	--	295	266	269	292	224
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.0	1.8	--	0.8	0.9	1.1	0.6	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.68	7.58	8.09	--	7.94	8.11	8.07	7.64	7.68
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.60	0.51	1.52	--	0.68	0.60	0.83	0.46	0.70
Sulphate	mg/l	--	500 [6]	6	6	9	--	5	11	5	5	9
Temperature (Field)	deg c	--	15	8.6	14.9	5.9	--	8.5	12.1	7.1	14.5	7.0
Total Dissolved Solids	mg/l	--	500	1820	1850	1730	--	1780	1680	1680	1770	1670
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.003	--	0.003	0.001	0.002	0.002	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.6	0.655	0.604	--	0.433	0.491	0.445	0.494	0.36
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29.9	35.2	38.5	--	40.7	37.1	36.6	37.1	33.6
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0008	--	0.0006	<0.0005	<0.0005	0.0006	0.0005
Copper, dissolved	mg/l	--	1	0.0007	0.0010	0.0037	--	0.0014	0.0053	0.0012	0.0011	0.0011
Iron, dissolved	mg/l	--	0.3	0.612	0.222	0.178	--	0.462	<0.1	0.536	0.113	0.397
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	--	0.0001	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	33	38.1	44.6	--	47	42.1	43	48.4	34.1
Manganese, dissolved	mg/l	--	0.05	0.42	0.258	0.544	--	0.354	0.026	0.377	0.605	0.599
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	14.1	16.3	--	20.4	16	14.5	14.7	12.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	598	565	641	--	636	599	587	515	555
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	--	0.005	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-Nov-2017	94-2 24-May-2018	94-2 22-Nov-2018	94-2 19-Jun-2019 [26]	94-2 20-Nov-2019	94-2 21-May-2020	94-2 26-Nov-2020	94-2 26-May-2021	94-2 30-Nov-2021
				94-2	94-2	94-2	94-2	94-2	94-2	94-2	94-2	94-2
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	--	0.003	0.004	<0.004 [11]	<0.004 [11]	<0.004 [11]
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 15-Jun-1994	94-3 02-Nov-1994	94-3 28-Jun-1995	94-3 23-Nov-1995	94-3 12-Jun-1996	94-3 12-Oct-1996	94-3 18-Jun-1997	94-3 06-Nov-1997	94-3 05-Jun-1998
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	907	453	850	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	940	756	372	697	466	533	511	620	530
Ammonia Nitrogen	mg/l	--	--	--	2.23	1.2	1.38	0.94	1.39	0.73	0.82	0.29
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	260	158	85	78	33	30	16	46	39
Chloride	mg/l	--	250	360	132	223	274	132	138	86.6	212	145
Conductivity (Field)	uS/cm	--	--	3070	2270	1960	2650	1680	1960	1370	1900	1700
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	10.19	8.2	--	--	--	2.47	--	--
Hardness, Calcium Carbonate	mg/l	--	--	878	783	787	853	588	514	445	492	435
Nitrate as N	mg/l	10.0	--	0.1	4.38	1.7	2	0.6	0.1	0.1	0.1	1.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	6.4	4.6	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	5.2	3.22	--	--	--	--	--
pH (Field)	-	--	--	6.69	7.08	7.55	7.52	7.06	6.68	7.25	6.55	--
Phosphate	mg/l	--	--	--	--	--	0.4	--	--	--	--	--
Phosphorus	mg/l	--	--	2.25	0.392	1.08	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	369	359	355	272	279	234	190	137	234
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1550	1140	999	1330	840	980	680	1010	842
Total Organic Carbon	mg/l	--	--	42.2	--	29	23.7	16.1	16.4	8.9	17.8	14.5
Total Suspended Solids	mg/l	--	--	--	--	--	--	853	396	1590	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	0.097	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.1	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.104	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	5.41	3.981	0.68	0.76	1.06	1.36	1.43	1.63	1.71
Cadmium, dissolved	mg/l	0.005	--	--	0.001	0.0004	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	170	165.1	198	212	133	117	102	103	97
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0233	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Iron, dissolved	mg/l	--	0.3	0.691	0.435	0.46	6.46	5.73	4.67	2.44	4.05	3.24
Lead, dissolved	mg/l	0.01	--	0.0007	0.1	0.0007	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	110	61.336	70.2	77.6	61.6	53.3	45.7	56.3	46.1
Manganese, dissolved	mg/l	--	0.05	1.708	1.313	1.05	1.69	1.47	1.22	1.04	0.89	0.67
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.04
Potassium, dissolved	mg/l	--	--	48	22.77	--	20.4	15.9	15.9	9.5	16.4	16.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	285	172.1	107	219	217	214	173	251	268
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.71
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.048	--	0.001	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 29-Oct-1998	94-3 06-May-1999	94-3 19-Oct-1999	94-3 05-May-2000	94-3 24-Oct-2000	94-3 14-Jun-2001	94-3 23-Nov-2001	94-3 23-May-2002	94-3 06-Nov-2002
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	556	588	650	708	732	476	405	412	754
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	10	1	1	1	1	15	1
Alkalinity (Total as CaCO3)	mg/l	--	--	456	482	549	580	600	390	332	362	618
Ammonia Nitrogen	mg/l	--	--	0.19	0.12	0.18	0.01	0.02	0.03	0.02	0.17	0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	10	92	11	--	10	12	13	18
Chloride	mg/l	--	250	62.9	71	226	39	127	51.1	45.9	43.6	56.5
Conductivity (Field)	uS/cm	--	--	1571	1450	1800	1400	1900	1130	1240	980	1380
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	363	527	456	570	404	408	531	374	515
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.2	0.4	0.1	0.2	0.2	1.9
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.75	0.94	--	--	0.75	0.45	0.68	0.52	0.5
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.6	6.7	7.6	6.8	6.81	6.9	6.19	6.77	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.24	0.26	0.29	0.21	0.17
Sulphate	mg/l	--	500 [6]	203	280	163	300	203	195	209	128	147
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	788	720	900	700	1000	782	770	564	868
Total Organic Carbon	mg/l	--	--	12.5	8.8	14.9	7.8	--	6.1	9	5	6.1
Total Suspended Solids	mg/l	--	--	--	--	2020	182	376	172	414	224	153
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.7	1.01	1.67	0.96	1.53	1.12	1.1	0.48	0.98
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	87.5	128	96.5	141	78.2	98.2	132	94.6	126
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.3	0.21	6.74	0.16	0.07	0.02	0.03	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0005	0.0002	0.0002	0.0022	0.0002	0.0002	0.0002	0.0007
Magnesium, dissolved	mg/l	--	--	35.2	49.6	51.6	52.1	50.7	39.5	48.9	33.4	48.6
Manganese, dissolved	mg/l	--	0.05	0.92	0.66	1	0.1	0.31	0.08	0.03	0.34	0.09
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	7.9	1.2	10.9	0.6	8.6	0.4	5.5	5	7.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	161	152	307	135	224	147	120	77.3	122
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.25	0.2	0.01	0.01	0.01	0.02	0.02
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.034	0.001	0.001	0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 30-May-2003	94-3 09-Oct-2003	94-3 14-May-2004	94-3 19-Nov-2004	94-3 24-May-2005	94-3 16-Nov-2005	94-3 25-May-2006	94-3 19-Dec-2008	94-3 19-Jun-2019 94-3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	671	--	776	824	781	179	660	770	930
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	550	579	636	675	640	735	660	770	934
Ammonia Nitrogen	mg/l	--	--	0.16	0.38	0.31	0.16	0.28	<0.01	0.2	0.08	0.31
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	2	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	17	21	23	28	20	15	24	<5	81
Chloride	mg/l	--	250	27.9	97.8	41.2	58	54.4	63.9	39.7	49.7	49
Conductivity (Field)	uS/cm	--	--	1240	1500	1490	1760	1950	1700	1325	1600	1556
Dissolved Inorganic Carbon	mg/l	--	--	--	129	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	529	434	553	530	589	659	662	756	708
Nitrate as N	mg/l	10.0	--	2.7	0.1	0.3	1	0.2	0.3	0.2	0.4	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.92	1.04	0.81	0.9	0.79	0.44	0.98	0.52	0.8
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.5	7	6.9	7	6.8	--	7.9	7.3	6.96
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.23	0.64	0.21	0.57	0.14	0.16	--	--	0.11
Sulphate	mg/l	--	500 [6]	161	138	179	170	186	200	330	270	64
Temperature (Field)	deg c	--	15	--	--	--	--	9	--	5.5	4	13.1
Total Dissolved Solids	mg/l	--	500	620	958	745	880	989	1120	1150	1250	1020
Total Organic Carbon	mg/l	--	--	6.9	11	6.2	7.5	6.7	9.2	--	--	--
Total Suspended Solids	mg/l	--	--	188	519	108	17	99	90	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	0.002	<0.001	0.0006	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.64	1.24	0.797	1.16	0.95	1.51	0.773	1.1	0.59
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.005	<0.00002	0.0001
Calcium, dissolved	mg/l	--	--	139	98.9	137	131	140	159	156	176	145
Chromium, dissolved	mg/l	0.05	--	0.01	0.001	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005	0.0006
Copper, dissolved	mg/l	--	1	0.01	0.003	0.003	0.002	<0.002	0.006	<0.002	0.003	0.0020
Iron, dissolved	mg/l	--	0.3	0.27	0.126	0.03	0.05	0.533	0.013	0.014	0.024	0.424
Lead, dissolved	mg/l	0.01	--	0.0002	0.0003	0.0003	0.0002	0.0009	0.0003	<0.0002	<0.00002	<0.0001
Magnesium, dissolved	mg/l	--	--	44.1	45.4	51.3	49.2	58.3	63.8	66.1	77.1	83.8
Manganese, dissolved	mg/l	--	0.05	0.55	0.501	0.544	0.259	1.3	0.019	0.777	0.392	3.43
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	7.6	10.6	8.8	8.6	8.8	11.4	8.4	11	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	0.001	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	104	219	159	172	164	200	157	200	116
Zinc, dissolved	mg/l	--	5	0.01	0.009	0.005	0.005	<0.005	0.009	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0005
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--	<0.001	<0.001	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--	<0.0003	<0.0003	<0.0050
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--	<0.0002	<0.0002	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 05-May-2000	MW-C 24-Oct-2000	MW-C 14-Jun-2001	MW-C 23-Nov-2001	MW-C 23-May-2002	MW-C 06-Nov-2002	MW-C 30-May-2003	MW-C 09-Oct-2003	MW-C 14-May-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	454	628	366	381	412	666	403	--	523
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	10	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	372	515	300	312	395	546	330	528	429
Ammonia Nitrogen	mg/l	--	--	0.12	0.37	0.33	0.01	0.35	0.65	0.14	0.59	0.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	3	--
Chemical Oxygen Demand	mg/l	--	--	--	--	8	77	56	120	70	59	89
Chloride	mg/l	--	250	103	212	122	206	117	279	201	171	123
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1150	1660	1100	1670	1410	1900	1500	1880	1790
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	122	--
Hardness, Calcium Carbonate	mg/l	--	--	212	182	224	331	344	147	372	125	402
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	0.3	1	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	15.5	2.66	3.43	2.26	3.26	4.9	2.79	3.77
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	7.5	7.1	6.94	6.94	7.8	6.8	7.4	7.5
Phosphorus	mg/l	--	--	--	7.27	5.4	5.15	2.81	8.71	3.01	2.15	2.87
Sulphate	mg/l	--	500 [6]	155	77	156	315	220	56	335	64	320
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	575	890	706	958	876	1100	750	950	895
Total Organic Carbon	mg/l	--	--	--	--	13.5	21	14	18.1	16.2	15	15.7
Total Suspended Solids	mg/l	--	--	22300	37000	5930	9420	3440	6550	5900	1130	4360
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.004	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.99	0.75	1.06	1.36	1.34	0.72	1.12	0.716	1.25
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	40.5	28.5	42.2	57	62.9	22.7	67.1	19.4	71.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.016	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.012	0.007
Iron, dissolved	mg/l	--	0.3	0.09	6.35	0.04	0.04	0.03	0.05	0.33	0.42	1.13
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0019	0.0002	0.0007	0.0003
Magnesium, dissolved	mg/l	--	--	26.5	27	28.8	45.8	45.4	21.9	49.7	18.7	54.1
Manganese, dissolved	mg/l	--	0.05	0.46	0.63	0.22	0.14	0.2	0.2	0.25	0.401	0.47
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	4.7	9.2	2.2	3.2	6.2	7.6	4.8	8.6	4.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	200	353	161	294	216	347	266	351	274
Zinc, dissolved	mg/l	--	5	0.03	0.04	0.01	0.01	0.02	0.04	0.01	0.027	0.006

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 05-May-2000	MW-C 24-Oct-2000	MW-C 14-Jun-2001	MW-C 23-Nov-2001	MW-C 23-May-2002	MW-C 06-Nov-2002	MW-C 30-May-2003	MW-C 09-Oct-2003	MW-C 14-May-2004
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.03	0.001	0.001	0.001	0.001	0.001	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-Nov-2004	MW-C 24-May-2005	MW-C 16-Nov-2005	MW-C 25-May-2006	MW-C 21-Nov-2006	MW-C 15-May-2007	MW-C 30-Nov-2007	MW-C 22-May-2008	MW-C 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	695	539	256	448	458	507	447	410	570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	570	442	420	448	458	507	447	410	570
Ammonia Nitrogen	mg/l	--	--	0.08	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	43	70	59	20	27	120	80	<5	31
Chloride	mg/l	--	250	153	67.2	235	159	76.9	62.9	197	99.8	157
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1820	1700	2000	1450	1200	800	1425	1350	1400
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	454	423	594	395	351	433	459	396	454
Nitrate as N	mg/l	10.0	--	1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.94	2.19	1.37	1.47	0.9	1.4	1.72	0.8	0.63
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.3	6.9	--	7.6	8.1	7.9	7.8	7.3	7.1
Phosphorus	mg/l	--	--	1.09	2.12	2.06	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	290	167	420	360	182	139	370	250	240
Temperature (Field)	deg c	--	15	--	10	--	6.5	6.5	9.2	6.5	14.5	6
Total Dissolved Solids	mg/l	--	500	910	804	1450	1220	864	772	1320	957	1150
Total Organic Carbon	mg/l	--	--	11.8	10.2	19.4	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1010	233	1430	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	0.0016	0.0024	0.0016	0.0015	0.0008
Boron, dissolved	mg/l	5	--	1.38	1.18	1.24	1.15	1.1	0.778	0.932	1.06	1.22
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	86.2	74	116	69.5	61.4	81.4	82.4	71.6	83.9
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.346	1.93	0.76	1.86	2.64	3.31	0.879	0.778	0.086
Lead, dissolved	mg/l	0.01	--	0.0007	0.0003	0.0002	<0.0002	<0.0001	0.00005	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	58.1	57.8	74.1	53.8	48.1	55.8	61.5	52.8	59.5
Manganese, dissolved	mg/l	--	0.05	1.1	0.591	0.329	0.254	0.373	0.517	0.434	0.188	0.078
Mercury, dissolved	mg/l	0.001	--	--	0.00014	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	3.9	7	5.5	5	3.6	6.5	4.8	6.2
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	288	170	351	306	212	121	335	227	268
Zinc, dissolved	mg/l	--	5	0.005	0.008	0.008	0.018	0.007	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-Nov-2004	MW-C 24-May-2005	MW-C 16-Nov-2005	MW-C 25-May-2006	MW-C 21-Nov-2006	MW-C 15-May-2007	MW-C 30-Nov-2007	MW-C 22-May-2008	MW-C 10-Nov-2008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-May-2009 G-16	MW-C 26-Nov-2009 J-8	MW-C 25-May-2010 M-20	MW-C 20-Oct-2010 G-19	MW-C 24-May-2011 G-27	MW-C 29-Nov-2011 [4] MW-C	MW-C 31-May-2012 MW-C	MW-C 28-Nov-2012 MW-C	MW-C 29-May-2013 [27] MW-C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	511	546	390	434	384	580	350	510	390
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	1.8	2.4	2.7
Alkalinity (Total as CaCO3)	mg/l	--	--	511	546	390	434	384	580	350	520	400
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	0.04	0.02	<0.02	0.52	<0.050	0.16	0.20
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	23	40	23	40	25	50	31	35	87
Chloride	mg/l	--	250	86	108	53	121	47	269	120	190	63
Conductivity	uS/cm	--	--	1420	1600	1080	1570	1060	2060	--	--	--
Conductivity (Field)	uS/cm	--	--	1150	1457	917	1527	1202	1863	1633	1949	1090
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	380	411	334	390	329	195	420	470	340
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.32	0.23	0.41	0.35	0.16	1.18	0.87	1.3	2.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10
pH	-	--	--	7.66	7.82	7.96	7.69	8.28	8.15	7.74	--	7.86
pH (Field)	-	--	--	--	6.29	7.18	7.1	7.11	7.65	7.39	7.23	7.36
Phosphorus	mg/l	--	--	0.71	0.90	0.85	0.87	0.35	2.17	0.40	0.83	4.8
Sulphate	mg/l	--	500 [6]	133	160	102	222	116	103	370	350	220
Temperature (Field)	deg c	--	15	7	8	20.2	11.8	12.4	8.5	10.6	6.3	10.7
Total Dissolved Solids	mg/l	--	500	923	1040	702	1020	689	1340	1130	1410	900
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	<0.01	0.0011	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	0.94	0.9	0.69	1.1	0.86	0.80	1.1	1.2	0.9
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	68	79	66	72	69	32	85	81	67
Chromium, dissolved	mg/l	0.05	--	0.004	0.004	0.004	0.005	0.004	0.009	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0003	0.0002	0.0003	0.0003	0.0003	<0.00050	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	0.001	0.002	<0.001	0.0019	<0.001	<0.0010
Iron, dissolved	mg/l	--	0.3	0.39	0.83	0.78	0.39	1.62	0.72	0.19	0.39	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	51	52	41	51	38	28	50	64	41
Manganese, dissolved	mg/l	--	0.05	0.06	0.29	0.09	0.58	0.11	0.42	0.44	0.97	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	4	4	7	4	8	6.4	8.7	5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	160	193	105	223	114	355	220	330	180
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.0050	<0.005	<0.0050

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-May-2009 G-16	MW-C 26-Nov-2009 J-8	MW-C 25-May-2010 M-20	MW-C 20-Oct-2010 G-19	MW-C 24-May-2011 G-27	MW-C 29-Nov-2011 [4] MW-C	MW-C 31-May-2012 MW-C	MW-C 28-Nov-2012 MW-C	MW-C 29-May-2013 [27] MW-C
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0054	0.015
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00050

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 26-Nov-2013 [28] GW-2	MW-C 29-May-2014 MW-C	MW-C 19-Nov-2014 MW-C	MW-C 02-Jun-2015 MW-C	MW-C 26-Nov-2015 MW-C	MW-C 26-May-2016 MW-C	MW-C 17-Nov-2016 MW-C	MW-C 24-May-2017 MW-C	MW-C 29-Nov-2017 MW-C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	540	350	510	431	580	303	574	332	472
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6.7	3.0	3.0	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	550	350	510	433	583	304	577	333	475
Ammonia Nitrogen	mg/l	--	--	0.33	0.11	0.080	0.13	0.64	0.13	0.54	0.04	0.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	52	25	38	45	217	131	83	55	40
Chloride	mg/l	--	250	240	100	140	89	322	65	269	134	102
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1711	1420	1776	1464	1997	1203	2136	1829	1375
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	280	340	340	382	276	283	216	396	343
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1	0.2	<0.1	0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.021	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.2	2.2	1.2	0.6	3.0	1.2	1.7	0.8	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	--	--	--	--	--	--
pH	-	--	--	8.12	7.96	7.79	--	--	--	--	--	--
pH (Field)	-	--	--	7.54	7.61	7.39	7.18	7.74	7.89	8.07	7.75	7.98
Phosphorus	mg/l	--	--	1.6	1.3	1.6	0.55	3.70	1.41	1.41	0.64	1.64
Sulphate	mg/l	--	500 [6]	160	350	250	342	140	263	165	473	339
Temperature (Field)	deg c	--	15	6.7	11.6	6.4	10.4	7.2	11.5	10.3	10.8	5.7
Total Dissolved Solids	mg/l	--	500	1250	1040	1060	976	1220	802	1180	1270	958
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.78	0.92	0.9	0.728	0.833	0.429	0.94	0.482	0.665
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	47	63	61	60.8	32.3	62.3	36.9	83.6	60.8
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	0.001	<0.001	0.008	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	0.00052	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0010	0.0035	<0.0020	<0.0005	<0.0005	0.0011	0.0015	0.0061	0.0016
Iron, dissolved	mg/l	--	0.3	0.2	0.17	<0.1	0.396	0.408	0.134	0.11	0.124	0.349
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0001
Magnesium, dissolved	mg/l	--	--	39	43	46	55.9	47.3	30.9	30.2	45.5	46.4
Manganese, dissolved	mg/l	--	0.05	0.62	0.14	0.42	0.158	0.814	0.066	0.202	0.119	0.607
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.2	5.5	7.4	4.55	7.9	4.72	7.87	5.25	6.53
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	400	210	310	195	509	101	414	172	235
Zinc, dissolved	mg/l	--	5	0.0052	<0.0050	0.034	<0.005	0.01	0.006	<0.005	0.006	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 26-Nov-2013 [28] GW-2	MW-C 29-May-2014 MW-C	MW-C 19-Nov-2014 MW-C	MW-C 02-Jun-2015 MW-C	MW-C 26-Nov-2015 MW-C	MW-C 26-May-2016 MW-C	MW-C 17-Nov-2016 MW-C	MW-C 24-May-2017 MW-C	MW-C 29-Nov-2017 MW-C
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.0012	<0.0010	<0.0010	<0.001	<0.001	0.003	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	0.00073	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 24-May-2018	MW-C 22-Nov-2018	MW-C 19-Jun-2019	MW-C 20-Nov-2019	MW-C 21-May-2020	MW-C 26-Nov-2020	MW-C 26-May-2021	MW-C 30-Nov-2021
				MW-C	MW-C	MW-C	MW-C	MW-C	MW-C	MW-C	MW-C
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	518	573	457	565	357	593	516	306
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	10	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	520	576	460	570	362	603	520	310
Ammonia Nitrogen	mg/l	--	--	0.07	0.06	0.16	0.31	0.04	0.52	0.16	0.06
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	107	105	140	127	63	91	61	163
Chloride	mg/l	--	250	57	201	68	283	151	282	217	71
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1248	1649	1351	2040	1616	1942	2072	1282
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	326	430	427	298	562	259	431	357
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	1.5	1.2	1.7	1.0	1.2	1.2	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.29	7.75	7.32	7.69	7.83	7.88	7.35	7.64
Phosphorus	mg/l	--	--	1.18	1.69	1.39	1.78	0.40	0.79	0.86	1.45
Sulphate	mg/l	--	500 [6]	186	197	317	165	146	154	315	266
Temperature (Field)	deg c	--	15	10.9	5.8	13	7.9	10.5	7.3	11.9	4.8
Total Dissolved Solids	mg/l	--	500	818	1090	986	1220	1250	1240	1310	770
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.002	0.001	0.001	0.002	0.002
Boron, dissolved	mg/l	5	--	0.407	0.781	0.392	0.633	0.403	0.582	0.363	0.251
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	68.9	85.3	86.8	48.7	114	41	91.4	86.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.004	0.004	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0015	0.0012	0.0005	<0.0005	0.0006	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0010	0.0087	0.0050	0.0028	0.0031	0.0016	0.0020	0.0058
Iron, dissolved	mg/l	--	0.3	0.312	1.77	1.56	0.223	0.734	0.622	0.455	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0009	0.0010	<0.0001	0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	37.3	52.7	51.1	42.9	67.1	37.9	49.2	34.2
Manganese, dissolved	mg/l	--	0.05	0.054	0.076	0.168	0.426	0.165	0.545	0.107	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.5	9.27	6.44	10.5	7.38	9.26	6.17	4.95
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	94.5	298	141	376	196	402	165	112
Zinc, dissolved	mg/l	--	5	<0.005	0.008	0.009	<0.005	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 24-May-2018	MW-C 22-Nov-2018	MW-C 19-Jun-2019	MW-C 20-Nov-2019	MW-C 21-May-2020	MW-C 26-Nov-2020	MW-C 26-May-2021	MW-C 30-Nov-2021
				MW-C	MW-C	MW-C	MW-C	MW-C	MW-C	MW-C	MW-C
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	<0.001	0.002	0.004	<0.001	0.002	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 05-May-2000	MW-E 24-Oct-2000	MW-E 14-Jun-2001	MW-E 23-Nov-2001	MW-E 23-May-2002	MW-E 06-Nov-2002	MW-E 30-May-2003	MW-E 09-Oct-2003 [3]	MW-E 14-May-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	388	668	390	400	338	615	244	--	490
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	7	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	318	548	320	328	289	504	200	--	402
Ammonia Nitrogen	mg/l	--	--	0.16	0.29	0.36	0.02	0.37	0.09	0.08	--	0.17
Chemical Oxygen Demand	mg/l	--	--	--	--	61	84	184	87	38	--	62
Chloride	mg/l	--	250	32.8	154	130	59	53.9	143	22.7	--	47.4
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	850	1770	1500	1230	570	--	980	--	1510
Hardness, Calcium Carbonate	mg/l	--	--	295	607	483	628	304	667	264	--	602
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.2	0.1	0.1	0.2	0.1	--	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.12	2.94	3.27	4.31	1.99	1.27	--	2.13
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	7.07	7	6.22	7.26	--	6.8	--	7.2
Phosphorus	mg/l	--	--	--	2.45	2.25	3.81	5.09	2.7	0.69	--	1.12
Sulphate	mg/l	--	500 [6]	102	320	354	340	163	420	95	--	273
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	1152	1070	942	636	1320	382	--	755
Total Organic Carbon	mg/l	--	--	--	--	22.5	31	27	19.1	13.6	--	14.5
Total Suspended Solids	mg/l	--	--	452	3890	2140	2740	4670	1910	628	--	700
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.001	0.001	--	0.001
Boron, dissolved	mg/l	5	--	0.99	1.47	1.41	2.26	0.94	1.63	0.8	--	1.16
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	70.1	111	108	120	67.7	133	67.5	--	156
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	--	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	--	0.002
Iron, dissolved	mg/l	--	0.3	0.2	0.7	0.71	0.47	0.31	0.16	0.58	--	0.305
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0025	0.0003	--	0.0002
Magnesium, dissolved	mg/l	--	--	28.8	80	51.7	49.5	32.7	81.3	23.2	--	51.7
Manganese, dissolved	mg/l	--	0.05	0.54	2.23	1.51	0.61	0.01	0.13	0.26	--	0.52
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	--	0.01
Potassium, dissolved	mg/l	--	--	4.8	11.8	4.7	4	4.7	12.5	3.1	--	4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	87.5	180	135	119	97.8	186	64.3	--	107
Zinc, dissolved	mg/l	--	5	0.04	0.01	0.01	0.01	0.02	0.02	0.01	--	0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 05-May-2000	MW-E 24-Oct-2000	MW-E 14-Jun-2001	MW-E 23-Nov-2001	MW-E 23-May-2002	MW-E 06-Nov-2002	MW-E 30-May-2003	MW-E 09-Oct-2003 [3]	MW-E 14-May-2004
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.016	0.001	0.001	0.001	0.001	--	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-Nov-2004	MW-E 24-May-2005	MW-E 16-Nov-2005	MW-E 25-May-2006	MW-E 21-Nov-2006	MW-E 15-May-2007	MW-E 30-Nov-2007	MW-E 22-May-2008	MW-E 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	527	398	131	242	308	380	567	222	290
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	432	326	531	242	308	380	567	222	290
Ammonia Nitrogen	mg/l	--	--	0.08	<0.01	<0.01	0.06	<0.01	<0.01	0.02	<0.01	0.08
Chemical Oxygen Demand	mg/l	--	--	49	49	35	38	33	74	71	35	30
Chloride	mg/l	--	250	65	21.5	94.6	21.5	22	23.3	120	25.5	69
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1360	1650	1600	525	650	700	1200	450	1000
Hardness, Calcium Carbonate	mg/l	--	--	549	330	511	261	339	338	549	170	397
Nitrate as N	mg/l	10.0	--	1	0.1	0.1	<0.1	<0.1	0.1	0.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.38	1.46	0.98	0.85	0.92	0.81	0.91	0.84	0.74
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	6.9	--	7.6	8	7.9	7.8	7.1	7.2
Phosphorus	mg/l	--	--	0.85	0.66	0.31	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	300	98	250	75	127	71	270	66	167
Temperature (Field)	deg c	--	15	--	7.8	--	7	6	10.4	4.5	10.5	6
Total Dissolved Solids	mg/l	--	500	680	477	989	394	513	484	1130	332	661
Total Organic Carbon	mg/l	--	--	15.4	15.1	15.1	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	304	516	232	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	<0.001	0.0007	0.0005	0.0007	0.0006	0.0004
Boron, dissolved	mg/l	5	--	1.4	0.804	1.33	0.732	0.807	0.683	1.32	0.535	0.84
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	148	84.9	134	64.9	91.9	93.3	117	43	97.5
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.005	0.002	0.005	<0.002	0.003	<0.002	0.003	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.071	0.364	0.057	0.153	0.042	0.12	0.039	0.387	0.069
Lead, dissolved	mg/l	0.01	--	0.0003	0.0007	<0.0002	<0.0002	<0.0001	0.00006	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	43.5	28.6	42.6	24.1	26.7	25.5	62.3	15.3	37.2
Manganese, dissolved	mg/l	--	0.05	0.086	0.728	0.077	0.383	0.158	0.119	0.029	0.272	0.037
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.1	2.1	4.8	3.7	3.1	1.9	12.1	2.3	6.5
Selenium, dissolved	mg/l	0.05	--	--	<0.001	0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	119	47.6	149	62.9	57.6	39.7	213	45.2	110
Zinc, dissolved	mg/l	--	5	0.005	0.007	0.008	0.005	0.007	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-Nov-2004	MW-E 24-May-2005	MW-E 16-Nov-2005	MW-E 25-May-2006	MW-E 21-Nov-2006	MW-E 15-May-2007	MW-E 30-Nov-2007	MW-E 22-May-2008	MW-E 10-Nov-2008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-May-2009 G-11	MW-E 26-Nov-2009 J-6	MW-E 25-May-2010 M-23	MW-E 20-Oct-2010 G-20	MW-E 24-May-2011 G-34	MW-E 29-Nov-2011 MW-E	MW-E 31-May-2012 [29] MW-E	MW-E 28-Nov-2012 MW-E	MW-E 29-May-2013 MW-E
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	336	361	464	316	243	485	310	270	280
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	1.6	2.0	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	336	361	464	316	243	485	310	270	280
Ammonia Nitrogen	mg/l	--	--	0.05	0.08	0.21	<0.02	0.03	0.05	<0.050	0.092	0.11
Chemical Oxygen Demand	mg/l	--	--	43	88	43	50	20	50	30	30	58
Chloride	mg/l	--	250	61	50	84	66	30	126	46	48	32
Conductivity	uS/cm	--	--	1050	1040	1430	1050	629	1590	--	--	--
Conductivity (Field)	uS/cm	--	--	550	1140	1070	1012	470	1538	918	1194	630
Hardness, Calcium Carbonate	mg/l	--	--	327	379	426	436	252	443	260	420	300
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.59	0.49	0.71	0.47	0.23	0.83	0.74	0.88	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10
pH	-	--	--	7.64	7.99	7.89	7.76	8.10	8.12	7.73	--	7.76
pH (Field)	-	--	--	--	6.69	7.36	7.4	7.07	7.32	7.16	7.46	7.19
Phosphorus	mg/l	--	--	1.00	0.26	0.30	0.24	0.12	0.06	0.16	0.18	1.7
Sulphate	mg/l	--	500 [6]	125	125	163	152	44	205	150	260	99
Temperature (Field)	deg c	--	15	8	7.8	21.1	11.4	12.5	8.0	12.6	5.7	11.2
Total Dissolved Solids	mg/l	--	500	683	676	930	683	409	1030	760	832	554
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	0.55	0.9	0.73	0.61	0.31	0.97	0.37	0.53	0.38
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	78	99	88	122	68	95	68	110	82
Chromium, dissolved	mg/l	0.05	--	0.002	0.003	0.003	0.003	0.003	0.004	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0003	0.0006	0.0006	0.0003	0.0008	0.0003	<0.00050	<0.0005	0.00082
Copper, dissolved	mg/l	--	1	0.003	0.003	0.004	0.003	0.004	0.005	0.0033	0.003	0.0025
Iron, dissolved	mg/l	--	0.3	0.59	0.17	1.59	0.33	0.59	0.07	0.22	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	32	32	50	32	20	50	21	32	23
Manganese, dissolved	mg/l	--	0.05	0.14	0.36	0.27	0.09	0.37	0.02	0.14	0.023	0.36
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5	8	9	3	3	9	2.7	3.2	1.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	86	77	137	74	36	167	63	86	47
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.0050	<0.005	<0.0050

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-May-2009 G-11	MW-E 26-Nov-2009 J-6	MW-E 25-May-2010 M-23	MW-E 20-Oct-2010 G-20	MW-E 24-May-2011 G-34	MW-E 29-Nov-2011 MW-E	MW-E 31-May-2012 [29] MW-E	MW-E 28-Nov-2012 MW-E	MW-E 29-May-2013 MW-E
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 26-Nov-2013 GW-14	MW-E 29-May-2014 [22] MW-E	MW-E 19-Nov-2014 [19] MW-E	MW-E 02-Jun-2015 MW-E	MW-E 26-Nov-2015 MW-E	MW-E 26-May-2016 MW-E	MW-E 17-Nov-2016 MW-E	MW-E 24-May-2017 MW-E	MW-E 29-Nov-2017 MW-E
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	460	240	460	509	621	529	374	393	469
Alkalinity, Carbonate as CaCO3	mg/l	--	--	2.9	1.3	2.5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	460	240	460	511	623	531	375	384	471
Ammonia Nitrogen	mg/l	--	--	0.12	0.13	0.073	0.21	0.09	0.29	0.07	0.09	0.10
Chemical Oxygen Demand	mg/l	--	--	120	60	72	14	105	73	49	50	47
Chloride	mg/l	--	250	120	54	41	114	124	120	111	82	88
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1455	601	1192	1293	1692	1472	1728	1080	1221
Hardness, Calcium Carbonate	mg/l	--	--	570	210	660	404	718	395	830	533	609
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	6.4	7.0	2.8	0.7	1.6	1.2	0.8	0.9	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	--	--	--	--	--	--
pH	-	--	--	7.83	7.77	7.76	--	--	--	--	--	--
pH (Field)	-	--	--	7.41	7.61	7.34	7.12	7.40	7.64	7.81	7.46	7.67
Phosphorus	mg/l	--	--	3.1	1.2	2.2	0.17	0.95	0.45	0.21	0.43	0.24
Sulphate	mg/l	--	500 [6]	320	120	240	227	225	241	436	272	393
Temperature (Field)	deg c	--	15	7.0	11.6	5.3	11.0	7.6	11.3	9.7	10.8	5.6
Total Dissolved Solids	mg/l	--	500	1110	588	850	922	1090	1070	1120	908	1090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1	0.25	0.79	0.39	1.42	0.503	1.24	0.457	0.448
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	130	56	180	103	139	104	214	128	163
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.006	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0027	0.0048	0.0033	<0.0005	<0.0005	0.0017	0.0034	0.0024	0.0026
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	60	16	49	35.5	90	32.9	71.5	52.2	49.1
Manganese, dissolved	mg/l	--	0.05	0.023	<0.0020	0.02	<0.005	0.035	0.032	<0.005	0.031	0.012
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	1.5	3.4	3.43	10.6	3.55	8.2	3.35	4.21
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	200	31	100	71	218	65.5	173	122	87.7
Zinc, dissolved	mg/l	--	5	0.02	<0.0050	<0.0050	<0.005	0.009	0.005	<0.005	0.006	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 26-Nov-2013 GW-14	MW-E 29-May-2014 [22] MW-E	MW-E 19-Nov-2014 [19] MW-E	MW-E 02-Jun-2015 MW-E	MW-E 26-Nov-2015 MW-E	MW-E 26-May-2016 MW-E	MW-E 17-Nov-2016 MW-E	MW-E 24-May-2017 MW-E	MW-E 29-Nov-2017 MW-E
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	0.002	<0.001	0.004	0.002	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 24-May-2018	MW-E 22-Nov-2018	MW-E 19-Jun-2019	MW-E 20-Nov-2019	MW-E 21-May-2020	MW-E 26-Nov-2020	MW-E 26-May-2021	MW-E 30-Nov-2021
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	492	416	366	472	244	521	375	239
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	10	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	494	418	368	476	245	531	377	241
Ammonia Nitrogen	mg/l	--	--	0.10	0.06	0.26	0.05	0.02	0.03	0.08	0.05
Chemical Oxygen Demand	mg/l	--	--	59	113	103	102	44	56	23	73
Chloride	mg/l	--	250	71	140	70	124	33	135	94	80
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1183	1298	935	1887	631	1783	1474	1044
Hardness, Calcium Carbonate	mg/l	--	--	371	798	388	627	267	739	284	370
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	2.2	1.6	1.5	0.8	0.8	0.7	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.19	7.72	7.12	7.78	7.79	7.98	7.07	7.40
Phosphorus	mg/l	--	--	0.36	1.39	0.93	1.32	0.25	0.19	0.19	0.31
Sulphate	mg/l	--	500 [6]	289	407	138	60	86	451	300	271
Temperature (Field)	deg c	--	15	10.9	4.9	13.9	7.4	11.6	6.7	11.9	4.7
Total Dissolved Solids	mg/l	--	500	1030	1160	662	1360	400	1300	868	772
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.255	1.12	0.235	0.854	0.217	0.871	0.245	0.343
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	104	187	100	150	73.3	168	77.7	100
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0017	0.0046	0.0034	0.0035	0.0070	0.0045	0.0024	0.0039
Iron, dissolved	mg/l	--	0.3	<0.1	0.157	<0.1	0.151	0.924	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	27.2	80.1	33.5	61.2	20.3	77.6	21.9	29.1
Manganese, dissolved	mg/l	--	0.05	0.639	0.11	0.342	<0.005	0.142	0.046	0.006	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	1.59	13.2	4.77	10.4	1.59	12.4	1.6	1.74
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	37.9	198	76.4	152	35.5	191	47.7	75.9
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 24-May-2018	MW-E 22-Nov-2018	MW-E 19-Jun-2019	MW-E 20-Nov-2019	MW-E 21-May-2020	MW-E 26-Nov-2020	MW-E 26-May-2021	MW-E 30-Nov-2021
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Monitoring location was dry during this sampling event. No sample was collected.
(4)	Arsenic MRL elevated due to matrix interference.
(5)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(6)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(7)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(8)	pH < 8.3. Calculations not available.
(9)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(10)	Elevated Reporting Limit due to matrix interference.
(11)	GEN02 Elevated Reporting Limit due to matrix interference.
(12)	REV 1 Revision 1 - This report now includes data for Xylenes
(13)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(14)	Field Parameters were not measured
(15)	Elevated detection limit due to dilution required because of high target analyte concentration.
(16)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(17)	Nitrite/Nitrate: Due to the colour interferences, sample required dilution. Detection limits were adjusted accordingly.
(18)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(19)	VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(20)	Detection Limit was raised due to matrix interferences.
(21)	pH Parameter was not measured.
(22)	Elevated ion balance was confirmed by re-analysis.
(23)	TKN results may be biased low due to elevated dissolved salt content.
(24)	REV 1 Revision 1 - Data updated with corrected dilution factor
(25)	Metals MRL elevated due to matrix interference.
(26)	Inadvertently, no sample was collected at this location.
(27)	VOC Analysis: Due to high concentrations of non-target analytes, sample required dilution. Detection limits were adjusted accordingly.
(28)	VOC Analysis: Due to high concentrations of non- target analytes, sample required dilution. Detection limits were adjusted accordingly.
(29)	Elevated ion balance result was confirmed by re-analysis.

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1A 12-Feb-2010 [3] A	09-1A 26-Jan-2011 [3] 09-1A	09-1A 18-Jan-2012 [3] 1A	09-1A 12-Feb-2013 [3] 09-1A	09-1A 27-Aug-2014 MW 09-1A	09-1A 25-Aug-2015 MW09-1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	–	--	--	–	820	853
Alkalinity, Carbonate as CaCO3	mg/l	–	--	–	--	--	–	22	26
Alkalinity (Total as CaCO3)	mg/l	–	--	–	--	--	–	840	880
Ammonia Nitrogen	mg/l	–	--	–	--	--	–	1.4	1.26
Chemical Oxygen Demand	mg/l	–	--	–	--	--	–	39	27
Chloride	mg/l	–	250	–	--	--	–	410	433
Conductivity (Field)	uS/cm	–	--	–	--	--	–	2658	2694
Hardness, Calcium Carbonate	mg/l	–	--	–	--	--	–	36	33.7
Nitrate as N	mg/l	10.0	--	–	--	--	–	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	–	--	--	–	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	--	–	--	--	–	4.7	1.8
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	<0.10	--
pH	-	–	--	–	--	--	–	8.45	--
pH (Field)	-	–	--	–	--	--	–	8.6	9.48
Phosphorus	mg/l	–	--	–	--	--	–	0.56	0.14
Sulphate	mg/l	–	500 [6]	–	--	--	–	2	<1
Temperature (Field)	deg c	–	15	–	--	--	–	10.0	10.3
Total Dissolved Solids	mg/l	–	500	–	--	--	–	1640	1710
Metals									
Arsenic, dissolved	mg/l	0.01	--	–	--	--	–	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	–	--	--	–	1.1	1.01
Cadmium, dissolved	mg/l	0.005	--	–	--	--	–	<0.00010	<0.0001
Calcium, dissolved	mg/l	–	--	–	--	--	–	3.2	1.89
Chromium, dissolved	mg/l	0.05	--	–	--	--	–	<0.0050	<0.001
Cobalt, dissolved	mg/l	–	--	–	--	--	–	<0.00050	<0.0005
Copper, dissolved	mg/l	–	1	–	--	--	–	<0.0050	<0.0005
Iron, dissolved	mg/l	–	0.3	–	--	--	–	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	–	--	--	–	<0.00050	<0.0001
Magnesium, dissolved	mg/l	–	--	–	--	--	–	6.8	7.03
Manganese, dissolved	mg/l	–	0.05	–	--	--	–	0.0059	0.006
Potassium, dissolved	mg/l	–	--	–	--	--	–	9.9	11.4
Sodium, dissolved	mg/l	–	200 [7]	–	--	--	–	640	628
Zinc, dissolved	mg/l	–	5	–	--	--	–	0.0063	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	–	--	--	–	<0.0010	0.002
VOCs									
1,1-Dichloroethane	mg/l	–	--	–	--	--	–	<0.00010	<0.0005
Benzene	mg/l	0.001	--	–	--	--	–	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	–	--	--	–	<0.00010	<0.0005
m,p-Xylenes	mg/l	–	--	–	--	--	–	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	–	--	--	–	<0.00050	<0.0050
o-Xylene	mg/l	–	--	–	--	--	–	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	–	--	--	–	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	–	--	--	–	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1A 18-Aug-2016 09-1A	09-1A 28-Aug-2017 [4] 09-1A	09-1A 29-Nov-2017 [3] 09-1A	09-1A 30-Aug-2018 09-1A	09-1A 28-Aug-2019 [5] 1A	09-1A 24-Aug-2021 09-1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	865	--	--	911	--	838
Alkalinity, Carbonate as CaCO3	mg/l	–	--	17	--	--	19	--	28
Alkalinity (Total as CaCO3)	mg/l	–	--	882	--	--	930	--	867
Ammonia Nitrogen	mg/l	–	--	1.26	--	--	1.47	--	1.47
Chemical Oxygen Demand	mg/l	–	--	67	--	--	38	--	36
Chloride	mg/l	–	250	438	--	--	445	--	403
Conductivity (Field)	uS/cm	–	--	2649	--	--	2630	--	2674
Hardness, Calcium Carbonate	mg/l	–	--	34	--	--	47	--	44.8
Nitrate as N	mg/l	10.0	--	<0.1	--	--	<0.1	--	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	--	--	<0.05	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	--	1.9	--	--	2.1	--	1.8
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	--	--
pH	-	–	--	–	--	--	–	--	--
pH (Field)	-	–	--	8.59	--	--	8.44	--	8.20
Phosphorus	mg/l	–	--	0.34	--	--	0.13	--	0.07
Sulphate	mg/l	–	500 [6]	<1	--	--	3	--	<1
Temperature (Field)	deg c	–	15	11.8	--	--	10.1	--	16.4
Total Dissolved Solids	mg/l	–	500	1630	--	--	1560	--	1590
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	--	--	<0.001	--	<0.001
Boron, dissolved	mg/l	5	--	1.08	--	--	0.942	--	0.79
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	--	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	–	--	2.59	--	--	6.04	--	4.6
Chromium, dissolved	mg/l	0.05	--	<0.001	--	--	<0.001	--	<0.001
Cobalt, dissolved	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Copper, dissolved	mg/l	–	1	<0.0005	--	--	0.0008	--	<0.0005
Iron, dissolved	mg/l	–	0.3	<0.1	--	--	<0.1	--	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	--	--	<0.0001	--	<0.0001
Magnesium, dissolved	mg/l	–	--	6.67	--	--	7.8	--	8.08
Manganese, dissolved	mg/l	–	0.05	0.006	--	--	0.011	--	0.006
Potassium, dissolved	mg/l	–	--	11.6	--	--	11.5	--	11.3
Sodium, dissolved	mg/l	–	200 [7]	597	--	--	647	--	552
Zinc, dissolved	mg/l	–	5	<0.005	--	--	0.006	--	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	<0.001	--	--	<0.001	--	<0.001
VOCs									
1,1-Dichloroethane	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Benzene	mg/l	0.001	--	<0.0005	--	--	<0.0005	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	--	--	<0.0050	--	<0.0050
o-Xylene	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	--	--	<0.0005	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	--	<0.0005	--	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1B 12-Feb-2010 [8] 1B	09-1B 26-Jan-2011 [3] 09-1B	09-1B 18-Jan-2012 [3] 1B	09-1B 12-Feb-2013 [3] 091B	09-1B 27-Aug-2014 MW 09-1B	09-1B 25-Aug-2015 MW09-1B	09-1B 18-Aug-2016 09-1B
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1270	--	--	--	1200	1170	1100
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	--	--	--	19	<25	10
Alkalinity (Total as CaCO3)	mg/l	--	--	1270	--	--	--	1300	1180	1110
Ammonia Nitrogen	mg/l	--	--	4.01	--	--	--	4.2	3.94	4.47
Chemical Oxygen Demand	mg/l	--	--	110	--	--	--	81	136	152
Chloride	mg/l	--	250	1350	--	--	--	1500	1420	1540
Conductivity	uS/cm	--	--	6500	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>5000	--	--	--	>3999	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	296	--	--	--	290	276	283
Nitrate as N	mg/l	10.0	--	<0.10	--	--	--	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	--	--	--	0.041	<0.05	<0.50 [11]
Nitrogen, Total Kjeldahl	mg/l	--	--	4.85	--	--	--	8.9	6.2	7.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--	--
pH	-	--	--	8.13	--	--	--	8.20	--	--
pH (Field)	-	--	--	8.29	--	--	--	7.95	9.66	9.06
Phosphorus	mg/l	--	--	2.72	--	--	--	3.3	4.00	6.45
Sulphate	mg/l	--	500 [6]	23	--	--	--	<1	6	5
Temperature (Field)	deg c	--	15	3.1	--	--	--	10.9	11.6	11.3
Total Dissolved Solids	mg/l	--	500	4220	--	--	--	3530	3580	3740
Metals										
Arsenic, dissolved	mg/l	0.01	--	**0.02**	--	--	--	0.0064	0.007	0.005
Boron, dissolved	mg/l	5	--	1.7	--	--	--	1.8	1.82	1.82
Cadmium, dissolved	mg/l	0.005	--	<0.001	--	--	--	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31	--	--	--	32	28.7	29.7
Chromium, dissolved	mg/l	0.05	--	<0.005	--	--	--	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.002	--	--	--	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.01	--	--	--	<0.0050	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	2.2	--	--	--	0.93	0.763	<0.1
Lead, dissolved	mg/l	0.01	--	<0.01	--	--	--	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	53	--	--	--	50	49.5	50.7
Manganese, dissolved	mg/l	--	0.05	0.2	--	--	--	0.076	0.079	0.063
Potassium, dissolved	mg/l	--	--	32	--	--	--	32	30.2	32.6
Sodium, dissolved	mg/l	--	200 [7]	1340	--	--	--	1400	1170	1280
Zinc, dissolved	mg/l	--	5	<0.1	--	--	--	0.0084	0.023	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--	--	<0.0010	<0.020 [10]	0.004
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0004	--	--	--	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	--	--	--	0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	--	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	--	--	--	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	--	--	--	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	--	--	--	<0.00010	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	--	--	--	<0.00020	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	--	--	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1B 28-Aug-2017 [4] 09-1B	09-1B 29-Nov-2017 09-1B	09-1B 30-Aug-2018 09-1B	09-1B 28-Aug-2019 [5] 1B	09-1B 20-Nov-2019 09-1B	09-1B 26-Nov-2020 09-1B	09-1B 24-Aug-2021 09-1B
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1120	1070	--	1260	1300	1360
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<25 [11]	<25 [11]	--	<25	25	26
Alkalinity (Total as CaCO3)	mg/l	--	--	--	1130	1090	--	1270	1320	1390
Ammonia Nitrogen	mg/l	--	--	--	4.58	4.46	--	3.97	4.52	4.43
Chemical Oxygen Demand	mg/l	--	--	--	101	122	--	88	88	108
Chloride	mg/l	--	250	--	1620	1500	--	1570	1470	1370
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	3999	>3999	--	6430	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	--	308	363	--	363	401	453
Nitrate as N	mg/l	10.0	--	--	<0.1	<0.1	--	<0.1	<0.5 [12]	<0.5 [12]
Nitrite as N	mg/l	1.0	--	--	<0.05	<0.05	--	<0.05	<1.00 [13]	<0.25 [13]
Nitrogen, Total Kjeldahl	mg/l	--	--	--	7.8	6.0	--	4.6	4.9	4.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	8.06	8.04	--	8.18	8.47	7.86
Phosphorus	mg/l	--	--	--	8.13	2.79	--	2.19	3.01	2.06
Sulphate	mg/l	--	500 [6]	--	1	6	--	2	<1	2
Temperature (Field)	deg c	--	15	--	6.3	9.5	--	6.6	6.2	13.4
Total Dissolved Solids	mg/l	--	500	--	3740	3550	--	3690	3610	3680
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	0.005	0.003	--	0.004	0.004	0.003
Boron, dissolved	mg/l	5	--	--	1.87	1.3	--	1.78	1.75	1.77
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	--	37.4	42	--	41	38.1	43.3
Chromium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	--	0.0013	<0.0005	--	0.0011	0.0010	0.0005
Copper, dissolved	mg/l	--	1	--	0.0029	0.0010	--	0.0011	0.0039	0.0017
Iron, dissolved	mg/l	--	0.3	--	<0.1	0.743	--	0.486	0.207	0.802
Lead, dissolved	mg/l	0.01	--	--	<0.0001	<0.0001	--	<0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	--	52.2	62.7	--	63.2	74.3	83.6
Manganese, dissolved	mg/l	--	0.05	--	0.066	0.082	--	0.09	0.07	0.096
Potassium, dissolved	mg/l	--	--	--	34.9	33.8	--	36.8	33.5	34.5
Sodium, dissolved	mg/l	--	200 [7]	--	1320	1340	--	1220	1270	1120
Zinc, dissolved	mg/l	--	5	--	<0.005	0.009	--	<0.005	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	<0.002 [10]	<0.001	--	<0.004 [10]	<0.004 [12]	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005 [14]	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005 [14]	<0.0005
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1C 12-Feb-2010 1C	09-1C 26-Jan-2011 [15] S-2	09-1C 18-Jan-2012 [3] 1C	09-1C 12-Feb-2013 [3] 09-1C	09-1C 27-Aug-2014 MW 09-1C	09-1C 25-Aug-2015 MW09-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	804	914	--	--	880	892
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	--	--	9.8	9
Alkalinity (Total as CaCO3)	mg/l	--	--	804	914	--	--	890	901
Ammonia Nitrogen	mg/l	--	--	2.15	1.54	--	--	2.7	2.14
Chemical Oxygen Demand	mg/l	--	--	43	150	--	--	280	221
Chloride	mg/l	--	250	624	710	--	--	780	799
Conductivity	uS/cm	--	--	3570	3910	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3240	3000	--	--	3545	3931
Hardness, Calcium Carbonate	mg/l	--	--	271	275	--	--	260	232
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	--	--	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	--	--	0.044	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.59	2.47	--	--	27	6.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--
pH	-	--	--	7.97	7.88	--	--	8.07	--
pH (Field)	-	--	--	7.99	6.28	--	--	7.66	9.42
Phosphorus	mg/l	--	--	18.6	14.2	--	--	19	8.92
Sulphate	mg/l	--	500 [6]	41	20	--	--	<1	8
Temperature (Field)	deg c	--	15	3.5	4.2	--	--	9.8	10.7
Total Dissolved Solids	mg/l	--	500	2320	2540	--	--	1960	1980
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.006	<0.01	--	--	0.0036	0.004
Boron, dissolved	mg/l	5	--	0.70	0.91	--	--	0.8	0.755
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	--	--	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	41	41	--	--	37	30
Chromium, dissolved	mg/l	0.05	--	<0.005	0.020	--	--	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0014	0.0014	--	--	0.00082	0.0008
Copper, dissolved	mg/l	--	1	0.002	0.002	--	--	<0.0050	<0.0005
Iron, dissolved	mg/l	--	0.3	0.70	1.52	--	--	0.23	0.181
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	41	42	--	--	40	38.2
Manganese, dissolved	mg/l	--	0.05	0.77	0.92	--	--	0.71	0.971
Potassium, dissolved	mg/l	--	--	15	13	--	--	13	11.5
Sodium, dissolved	mg/l	--	200 [7]	657	810	--	--	670	552
Zinc, dissolved	mg/l	--	5	0.02	0.02	--	--	0.0062	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	--	--	<0.0010	0.005
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0008	--	--	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.001	--	--	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.001	--	--	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0020	--	--	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0080	--	--	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.001	--	--	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.001	--	--	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0004	--	--	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1C 18-Aug-2016 09-1C	09-1C 28-Aug-2017 [4] 09-1C	09-1C 29-Nov-2017 09-1C	09-1C 30-Aug-2018 09-1C	09-1C 28-Aug-2019 [5] 1C	09-1C 20-Nov-2019 09-1C	09-1C 26-Nov-2020 [16] 09-1C
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	979	--	1010	1000	--	937	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5	--	18	9	--	10	--
Alkalinity (Total as CaCO3)	mg/l	--	--	984	--	1030	1010	--	947	--
Ammonia Nitrogen	mg/l	--	--	2.47	--	2.15	1.55	--	1.49	--
Chemical Oxygen Demand	mg/l	--	--	414	--	103	277	--	80	--
Chloride	mg/l	--	250	875	--	900	830	--	788	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3268	--	3394	3639	--	3730	--
Hardness, Calcium Carbonate	mg/l	--	--	265	--	278	257	--	375	--
Nitrate as N	mg/l	10.0	--	<0.1	--	<0.1	<0.1	--	0.6	--
Nitrite as N	mg/l	1.0	--	<0.50 [11]	--	<0.05	<0.05	--	0.25	--
Nitrogen, Total Kjeldahl	mg/l	--	--	8.0	--	4.2	3.8	--	2.5	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.22	--	7.97	7.96	--	7.9	--
Phosphorus	mg/l	--	--	11.8	--	7.18	2.82	--	1.64	--
Sulphate	mg/l	--	500 [6]	6	--	5	5	--	2	--
Temperature (Field)	deg c	--	15	12.1	--	6.4	9.4	--	7.1	--
Total Dissolved Solids	mg/l	--	500	2330	--	2290	2230	--	2250	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	--	0.004	0.003	--	0.003	--
Boron, dissolved	mg/l	5	--	0.748	--	0.785	0.629	--	0.672	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	<0.0001	<0.0001	--	<0.0001	--
Calcium, dissolved	mg/l	--	--	36.4	--	39.7	38.1	--	52.3	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--	<0.001	<0.001	--	<0.001	--
Cobalt, dissolved	mg/l	--	--	0.0007	--	0.0007	0.0008	--	0.0010	--
Copper, dissolved	mg/l	--	1	<0.0005	--	0.0018	0.0042	--	0.0061	--
Iron, dissolved	mg/l	--	0.3	0.262	--	0.118	0.115	--	<0.1	--
Lead, dissolved	mg/l	0.01	--	<0.0001	--	<0.0001	0.0002	--	0.0002	--
Magnesium, dissolved	mg/l	--	--	42.2	--	43.4	39.4	--	59.3	--
Manganese, dissolved	mg/l	--	0.05	0.746	--	0.437	0.828	--	0.837	--
Potassium, dissolved	mg/l	--	--	14.8	--	13.9	12.8	--	20.1	--
Sodium, dissolved	mg/l	--	200 [7]	623	--	654	577	--	717	--
Zinc, dissolved	mg/l	--	5	<0.005	--	<0.005	0.01	--	<0.005	--
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	--	<0.002 [10]	<0.001	--	0.004	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--	<0.0050	<0.0050	--	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1C 26-Nov-2020 09-1C	09-1C 24-Aug-2021 09-1C
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	901	873
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25	11
Alkalinity (Total as CaCO3)	mg/l	--	--	913	884
Ammonia Nitrogen	mg/l	--	--	1.80	2.22
Chemical Oxygen Demand	mg/l	--	--	105	125
Chloride	mg/l	--	250	736	677
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3035	3668
Hardness, Calcium Carbonate	mg/l	--	--	294	268
Nitrate as N	mg/l	10.0	--	<0.5 [12]	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [13]
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	8.13	7.63
Phosphorus	mg/l	--	--	1.39	3.28
Sulphate	mg/l	--	500 [6]	3	3
Temperature (Field)	deg c	--	15	6.0	13.2
Total Dissolved Solids	mg/l	--	500	2050	2050
Metals					
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003
Boron, dissolved	mg/l	5	--	0.609	0.53
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	40.7	37
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0009	0.0007
Copper, dissolved	mg/l	--	1	0.0037	0.0011
Iron, dissolved	mg/l	--	0.3	<0.1	0.351
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	46.8	42.7
Manganese, dissolved	mg/l	--	0.05	0.832	0.835
Potassium, dissolved	mg/l	--	--	12.8	12
Sodium, dissolved	mg/l	--	200 [7]	619	501
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.004 [12]	<0.001
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005 [14]	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005 [14]	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-Jun-1994	94-4 01-Nov-1994	94-4 28-Jun-1995	94-4 22-Nov-1995	94-4 12-Oct-1996	94-4 06-Nov-1997	94-4 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1347	1442	1030	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1092	1123	1182	840	1280	1270	1220
Ammonia Nitrogen	mg/l	--	--	--	2.77	4.6	3.75	3.47	4.84	3.84
Chemical Oxygen Demand	mg/l	--	--	437	283	188	100	70	62	64
Chloride	mg/l	--	250	1900	1530	1685	1610	1570	1730	1580
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6150	6900	7000	7440	7120	6190	6720
Dissolved Oxygen (Field)	mg/l	--	--	--	6.64	3.08	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	570	598	436	461	421	476	431
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	1.2	0.1	0.1	1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	11.3	5.75	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	6.7	2	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.77	8.08	7.89	8.36	7.69	8.5	--
Phosphate	mg/l	--	--	--	--	--	1.6	--	--	--
Phosphorus	mg/l	--	--	39.6	0.797	6.5	--	--	--	--
Sulphate	mg/l	--	500 [6]	27.4	13.8	5	32	15	3	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3090	3460	3510	3720	3570	3470	3350
Total Organic Carbon	mg/l	--	--	19	25.9	22.5	17.5	19.2	18.5	18.4
Total Suspended Solids	mg/l	--	--	--	--	--	--	4520	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	0.02	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.124	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.34	1.465	1.3	1.19	1.43	1.47	1.65
Cadmium, dissolved	mg/l	0.005	--	--	**0.01**	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	69	39.34	45.3	45.9	41.3	50	42.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.04	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0201	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.409	0.1	0.03	1.31	1.07	0.92	2.15
Lead, dissolved	mg/l	0.01	--	0.002	**0.1**	0.0009	0.0002	0.0002	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	96.6	58.416	77.4	83.1	76.3	84.2	78.1
Manganese, dissolved	mg/l	--	0.05	0.116	0.153	0.18	0.2	0.17	0.18	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.025	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	54.9	25.61	--	37.7	33.2	37.7	39.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1040	1327	1045	1150	1330	1210	1660
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.12

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-Jun-1994	94-4 01-Nov-1994	94-4 28-Jun-1995	94-4 22-Nov-1995	94-4 12-Oct-1996	94-4 06-Nov-1997	94-4 05-Jun-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.049	--	0.001	--	--	--	--
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 06-May-1999	94-4 24-Oct-2000	94-4 14-Jun-2001	94-4 06-Nov-2002	94-4 30-May-2003	94-4 19-Nov-2004	94-4 16-Nov-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1600	1730	1300	1720	1480	1610	160
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	90	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1310	1420	1210	1410	1220	1320	1310
Ammonia Nitrogen	mg/l	--	--	3.92	3.47	4.48	4.05	3.62	3.66	3.94
Chemical Oxygen Demand	mg/l	--	--	64	--	61	76	66	69	99
Chloride	mg/l	--	250	1690	1760	1500	1680	1650	1700	1600
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6540	6790	5000	6700	5400	7110	5500
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	456	474	449	439	397	412	430
Nitrate as N	mg/l	10.0	--	--	0.1	0.1	0.1	0.1	1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	5.4	5.32	5.28	5.8	5.84	4.97	6.08
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.8	8.22	8	7.8	6.9	8	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	2.03	2.21	2.59	2.42	1.25	3.18
Sulphate	mg/l	--	500 [6]	1	1	6	2	1	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3280	3850	3860	4040	2700	3555	3990
Total Organic Carbon	mg/l	--	--	24	--	17.3	17.5	17.1	17.1	21.1
Total Suspended Solids	mg/l	--	--	--	932	1560	1110	720	184	43
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.004	0.003	0.001	0.003	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.67	1.61	1.75	1.58	1.48	1.58	1.61
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	46.1	41.4	49.6	43.4	42.4	42.8	45.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	1.03	0.66	0.41	0.32	1.05	0.266	0.57
Lead, dissolved	mg/l	0.01	--	0.0005	0.022	0.0002	0.004	0.0009	0.0016	0.0004
Magnesium, dissolved	mg/l	--	--	81.8	90.1	79	80.2	70.8	74.2	76.7
Manganese, dissolved	mg/l	--	0.05	0.17	0.14	0.11	0.14	0.12	0.117	0.125
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	34.3	29.2	33.2	34	35.2	37.3	40.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	1400	1410	1350	1430	1150	1590	1470
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.02	0.01	0.005	0.006

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 06-May-1999	94-4 24-Oct-2000	94-4 14-Jun-2001	94-4 06-Nov-2002	94-4 30-May-2003	94-4 19-Nov-2004	94-4 16-Nov-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	0.003	0.054	0.001	0.001	0.001	<0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-May-2007	94-4 10-Nov-2008	94-4 26-Nov-2009 [24] J-2	94-4 24-May-2011 [25] G-25	94-4 29-Nov-2012 [26] 94-4	94-4 29-May-2014 [27] 94-4	94-4 26-Nov-2015 94-4
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1320	1230	1320	1260	1300	1300	1240
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [9]	39	25	29	<25 [28]
Alkalinity (Total as CaCO3)	mg/l	--	--	1320	1230	1320	1300	1300	1300	1240
Ammonia Nitrogen	mg/l	--	--	3.56	4	3.93	3.60	4.2	4.1	4.03
Chemical Oxygen Demand	mg/l	--	--	114	76	68	60	65	70	99
Chloride	mg/l	--	250	1750	1690	1630	1620	1500	1700	1710
Conductivity	uS/cm	--	--	--	--	7080	7310	--	--	--
Conductivity (Field)	uS/cm	--	--	4100	>5000	799	>3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	393	342	405	414	400	410	378
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	5.51	5.22	4.59	5.60	5.3	5.3	5.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.21	8.52	8.32	8.39	--
pH (Field)	-	--	--	8.4	7.9	6.89	7.94	8.02	7.29	8.04
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	1.20	1.50	1.6	1.4	1.60
Sulphate	mg/l	--	500 [6]	1	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	8.8	5	7.8	11.1	6.7	10.0	9.0
Total Dissolved Solids	mg/l	--	500	4200	3770	4600	4750	3860	3600	3860
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.009	0.0057	<0.01	<0.01	0.0062	<0.0050	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.37	1.39	1.6	1.8	1.6	1.6	1.47
Cadmium, dissolved	mg/l	0.005	--	0.00005	<0.00002	<0.001	<0.0001	<0.00050	<0.00050	<0.0001
Calcium, dissolved	mg/l	--	--	41.8	33.6	42	42	43	41	26.1
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.025	<0.025	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.002	0.0008	<0.0025	<0.0025	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.01	0.003	<0.0050	0.0058	<0.0005
Iron, dissolved	mg/l	--	0.3	0.465	0.265	<0.3	0.34	<0.5	<0.5	<0.1
Lead, dissolved	mg/l	0.01	--	0.00012	<0.00002	<0.01	<0.001	<0.0025	<0.0025	<0.0001
Magnesium, dissolved	mg/l	--	--	70.3	62.8	73	75	72	73	75.9
Manganese, dissolved	mg/l	--	0.05	0.105	0.06	0.1	0.11	0.12	0.12	0.089
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	38.1	34.2	32	37	31	31	27
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1500	1200	1390	1430	1400	1300	1350
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.1	0.01	<0.025	<0.025	0.009

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-May-2007	94-4 10-Nov-2008	94-4 26-Nov-2009 [24] J-2	94-4 24-May-2011 [25] G-25	94-4 29-Nov-2012 [26] 94-4	94-4 29-May-2014 [27] 94-4	94-4 26-Nov-2015 94-4
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.002 [10]
Semi-VOCs										
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.004	<0.00020	<0.00020	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.005	<0.00020	<0.00020	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.005	<0.00020	<0.00020	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.01	<0.00020	<0.00020	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.04	<0.0010	<0.0010	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.005	<0.00020	<0.00020	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.005	<0.00040	<0.00040	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.002	<0.00040	<0.00040	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 24-May-2017 94-4	94-4 22-Nov-2018 94-4	94-4 19-Jun-2019 94-4	94-4 21-May-2020 94-4	94-4 30-Nov-2021 94-4
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1320	1310	1070	1280	1330
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [11]	<25 [11]	<25 [11]	<25 [13]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1330	1330	1080	1300	1340
Ammonia Nitrogen	mg/l	--	--	5.16 [29]	4.05	4.36	4.15	4.34
Chemical Oxygen Demand	mg/l	--	--	107	102	84	121	195
Chloride	mg/l	--	250	1690	1810	1640	1980	1630
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3999	>3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	373	589	443	537	451
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.50 [11]	<1.00 [11]	<0.50 [11]	<0.05	<1.00 [13]
Nitrogen, Total Kjeldahl	mg/l	--	--	4.9	5.9	5.0	4.4	7.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.00	8.03	7.98	7.45	8.2
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.11	1.95	1.41	1.47	5.57
Sulphate	mg/l	--	500 [6]	<1	1	<1	<1	<1
Temperature (Field)	deg c	--	15	10.6	5.7	11.2	10.4	6.3
Total Dissolved Solids	mg/l	--	500	4040	3960	3690	4020	3970
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.01	0.003	0.003	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.17	1.58	0.14	1.64	1.57
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	41.7	61.8	48.2	52.2	44.8
Chromium, dissolved	mg/l	0.05	--	0.021	<0.001	<0.001	0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0009	0.0006	0.0007	0.0005
Copper, dissolved	mg/l	--	1	0.0012	0.0033	0.0012	0.0028	0.0011
Iron, dissolved	mg/l	--	0.3	<0.1	0.208	0.21	1.21	0.101
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	65.3	105	78.4	98.7	82.3
Manganese, dissolved	mg/l	--	0.05	0.089	0.138	0.112	0.13	0.105
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	32.5	42.5	32.5	37	29.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1360	1290	1060	1300	1090
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.007	0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 24-May-2017 94-4	94-4 22-Nov-2018 94-4	94-4 19-Jun-2019 94-4	94-4 21-May-2020 94-4	94-4 30-Nov-2021 94-4
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.010 [10]	<0.001	<0.001	0.012	<0.004 [12]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1D 12-Feb-2010 [17] 1D	09-1D 26-Jan-2011 [18] S-1	09-1D 18-Jan-2012 [19] 09-1B	09-1D 12-Feb-2013 [20] 09-1B	09-1D 27-Aug-2014 [21] 09-1D	09-1D 25-Aug-2015 MW09-1D	09-1D 18-Aug-2016 [21] 91D
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	155	86	105	90	--	64	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	<1.0	--	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	155	86	105	90	--	64	--
Ammonia Nitrogen	mg/l	--	--	1.15	0.97	1.26	1.4	--	1.46	--
Chemical Oxygen Demand	mg/l	--	--	1980	1020	85	140	--	232	--
Chloride	mg/l	--	250	99	83	97	84	--	70	--
Conductivity	uS/cm	--	--	619	437	517	--	--	--	--
Conductivity (Field)	uS/cm	--	--	325	-- [22]	745	586	--	519	--
Hardness, Calcium Carbonate	mg/l	--	--	96	42	46	27	--	24.8	--
Nitrate as N	mg/l	10.0	--	<1	<0.10	<1.0	<1.0	--	<0.1	--
Nitrite as N	mg/l	1.0	--	<1	<0.10	<1.0	<0.10	--	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.81	4.80	2.55	4.6	--	7.8	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<1.0	--	--	--
pH	-	--	--	7.32	7.06	6.89	7.12	--	--	--
pH (Field)	-	--	--	7.68	-- [22]	7.51	7.20	--	7.55	--
Phosphorus	mg/l	--	--	0.19	0.45	0.03	<0.40 [23]	--	0.86	--
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	--	<1	--
Temperature (Field)	deg c	--	15	0.4	-- [22]	0.4	2.8	--	18.6	--
Total Dissolved Solids	mg/l	--	500	402	284	336	320	--	196	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	--
Boron, dissolved	mg/l	5	--	0.07	0.06	0.06	0.027	--	0.037	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	--
Calcium, dissolved	mg/l	--	--	22	7	7	4.8	--	4.07	--
Chromium, dissolved	mg/l	0.05	--	0.004	0.004	0.002	<0.005	--	<0.001	--
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0005	<0.0005	--	<0.0005	--
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	0.003	--	<0.0005	--
Iron, dissolved	mg/l	--	0.3	0.86	1.29	1.24	0.65	--	0.682	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.0005	--	<0.0001	--
Magnesium, dissolved	mg/l	--	--	10	6	7	3.7	--	3.55	--
Manganese, dissolved	mg/l	--	0.05	0.19	0.14	0.15	0.091	--	0.089	--
Potassium, dissolved	mg/l	--	--	4	2	2	1.5	--	1.6	--
Sodium, dissolved	mg/l	--	200 [7]	101	67	86	41	--	40.8	--
Zinc, dissolved	mg/l	--	5	0.02	<0.01	0.02	0.015	--	0.024	--
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	<0.001	<0.0010	--	0.005	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0008	<0.0004	<0.00010	--	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0020	<0.0005	<0.00010	--	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0080	<0.0040	<0.00050	--	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005	--
Toluene	mg/l	0.06	0.024	0.0007	<0.001	<0.0005	<0.00020	--	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0004	<0.0002	<0.00020	--	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1D 28-Aug-2017 09-1D	09-1D 30-Aug-2018 [21] 09-1D	09-1D 28-Aug-2019 [5] 1D	09-1D 21-Nov-2019 09-1D	09-1D 26-Nov-2020 09-1D	09-1D 24-Aug-2021 [21] 09-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	50	--	--	72	103	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	--	--	<5	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	50	--	--	72	103	--
Ammonia Nitrogen	mg/l	--	--	0.94	--	--	1.19	1.35	--
Chemical Oxygen Demand	mg/l	--	--	441	--	--	1400	187	--
Chloride	mg/l	--	250	62	--	--	74	107	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	313	--	--	506	505	--
Hardness, Calcium Carbonate	mg/l	--	--	42	--	--	35.4	46.7	--
Nitrate as N	mg/l	10.0	--	<0.1	--	--	<0.1	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.05	--	--	<0.05	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.2	--	--	12.5	3.3	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.80	--	--	6.82	6.92	--
Phosphorus	mg/l	--	--	0.23	--	--	0.62	0.11	--
Sulphate	mg/l	--	500 [6]	<1	--	--	2	<1	--
Temperature (Field)	deg c	--	15	18.1	--	--	4.9	5.3	--
Total Dissolved Solids	mg/l	--	500	212	--	--	238	328	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	--	--	<0.001	<0.001	--
Boron, dissolved	mg/l	5	--	0.064	--	--	0.044	0.058	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	--	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	6.48	--	--	5.97	7.29	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--	--	<0.001	<0.001	--
Cobalt, dissolved	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005	--
Copper, dissolved	mg/l	--	1	<0.0005	--	--	0.0014	0.0030	--
Iron, dissolved	mg/l	--	0.3	0.984	--	--	0.679	1.32	--
Lead, dissolved	mg/l	0.01	--	0.0001	--	--	0.0002	0.0002	--
Magnesium, dissolved	mg/l	--	--	6.31	--	--	4.97	6.91	--
Manganese, dissolved	mg/l	--	0.05	0.14	--	--	0.098	0.187	--
Potassium, dissolved	mg/l	--	--	2.2	--	--	2.86	2.29	--
Sodium, dissolved	mg/l	--	200 [7]	71.4	--	--	63.2	76.3	--
Zinc, dissolved	mg/l	--	5	<0.005	--	--	<0.005	0.007	--
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--	0.008	<0.002 [12]	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--	--	<0.0005	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005 [14]	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--	--	<0.0050	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005 [14]	--
Toluene	mg/l	0.06	0.024	<0.0005	--	--	<0.0005	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	--	<0.0005	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 15-Jun-1994	94-5 02-Nov-1994	94-5 28-Jun-1995	94-5 22-Nov-1995	94-5 12-Jun-1996	94-5 12-Oct-1996	94-5 18-Jun-1997
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	841	929	81	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	622	701	762	804	796	840	871
Ammonia Nitrogen	mg/l	--	--	--	0.66	0.86	0.5	0.85	1.14	0.85
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	171	150	275	63	33	26	13
Chloride	mg/l	--	250	1400	795	880	915	900	870	881
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3550	4050	4060	4480	3850	4450	3900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	7.95	7.27	--	--	--	2.34
Hardness, Calcium Carbonate	mg/l	--	--	448	474	425	444	449	419	499
Nitrate as N	mg/l	10.0	--	0.1	--	0.1	1.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	15.5	3.25	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	14.64	2.75	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.17	7.66	7.4	8.22	8.03	7.25	7.54
Phosphate	mg/l	--	--	--	--	--	0.8	--	--	--
Phosphorus	mg/l	--	--	6.7	0.391	7.22	--	--	--	--
Sulphate	mg/l	--	500 [6]	32.5	17.1	5	4	5	4	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1790	2040	2060	2240	2070	2230	1830
Total Organic Carbon	mg/l	--	--	12	16.5	22	9.1	12.2	11	9.9
Total Suspended Solids	mg/l	--	--	--	--	--	--	2940	1070	1880
Metals										
Aluminum, dissolved	mg/l	--	--	--	0.062	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.061	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.44	0.601	0.45	0.4	0.48	0.61	0.69
Cadmium, dissolved	mg/l	0.005	--	--	**0.01**	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	66.6	48.11	57.2	57	56.6	53	69
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0173	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.39	0.175	0.02	0.9	1.2	0.55	0.53
Lead, dissolved	mg/l	0.01	--	0.0011	**0.1**	0.0005	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	68.5	44.206	67.8	72.4	73.8	68.7	78.3
Manganese, dissolved	mg/l	--	0.05	0.78	0.933	1.29	1.37	1.47	1.22	1.56
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.9	8.244	--	15.2	17.7	13.2	14.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	508	651.7	630	711	694	658	608
Zinc, dissolved	mg/l	--	5	0.01	0.012	0.01	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 15-Jun-1994	94-5 02-Nov-1994	94-5 28-Jun-1995	94-5 22-Nov-1995	94-5 12-Jun-1996	94-5 12-Oct-1996	94-5 18-Jun-1997
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.12	0.005	0.001	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 06-Nov-1997	94-5 05-Jun-1998	94-5 30-Oct-1998	94-5 06-May-1999	94-5 19-Oct-1999	94-5 05-May-2000	94-5 24-Oct-2000
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	996	1040	983	1220	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	26	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	276	869	816	852	850	1000	935
Ammonia Nitrogen	mg/l	--	--	0.68	0.56	0.79	0.36	0.97	0.01	0.27
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	42	24	30	12	40	--
Chloride	mg/l	--	250	812	1020	910	970	951	845	1010
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3930	4280	4350	4030	3800	4025	4250
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	468	440	361	457	443	463	475
Nitrate as N	mg/l	10.0	--	0.6	1.8	--	--	--	0.2	0.8
Nitrite as N	mg/l	1.0	--	--	--	--	--	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	2.14	2.08	--	--	1.02
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.88	--	7.2	7.2	7.4	7.5	7.67
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.68
Sulphate	mg/l	--	500 [6]	98	37	2	2	2	2	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1990	2150	2180	2020	1900	4910	2260
Total Organic Carbon	mg/l	--	--	11.6	11.5	11.4	12.2	11.2	12.1	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	1320	--	556
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.62	0.64	0.75	0.6	0.84	0.78	0.66
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	65	55.8	49.4	59.4	61.2	60.1	56.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.44	1.69	0.2	0.93	1.53	4.96	0.22
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.022
Magnesium, dissolved	mg/l	--	--	73.4	72.1	57.6	74	69.5	75.1	81.1
Manganese, dissolved	mg/l	--	0.05	1.68	1.85	1.8	1.93	1.58	1.62	1.88
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.6	13.4	16.2	17.4	16	11.1	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	613	893	762	765	876	770	763
Zinc, dissolved	mg/l	--	5	0.01	0.14	0.01	0.01	0.11	0.21	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 06-Nov-1997	94-5 05-Jun-1998	94-5 30-Oct-1998	94-5 06-May-1999	94-5 19-Oct-1999	94-5 05-May-2000	94-5 24-Oct-2000
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 14-Jun-2001	94-5 23-Nov-2001	94-5 23-May-2002	94-5 06-Nov-2002	94-5 30-May-2003	94-5 09-Oct-2003	94-5 14-May-2004
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	826	991	888	1140	915	--	939
Alkalinity, Carbonate as CaCO3	mg/l	--	--	39	1	38	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	741	812	791	936	750	845	770
Ammonia Nitrogen	mg/l	--	--	0.98	0.84	0.91	0.26	0.92	1.01	0.85
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	5	--
Chemical Oxygen Demand	mg/l	--	--	28	37	15	34	25	25	38
Chloride	mg/l	--	250	910	898	925	855	840	798	950
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3750	3560	770	4000	3280	3980	3950
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	189	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	458	465	455	435	419	395	444
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.1	0.9	0.2	0.4	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2	1.94	1.68	1.17	2.16	2.09	2.31
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.22	6.74	7.4	6.8	7.4	7.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.37	1.31	0.85	0.64	1.18	1.21	1.4
Sulphate	mg/l	--	500 [6]	2	3	3	5	3	3	4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2160	2260	2000	2300	1640	2118	1975
Total Organic Carbon	mg/l	--	--	10.3	16	12	11.4	11.1	24	9.2
Total Suspended Solids	mg/l	--	--	1120	1130	792	454	708	580	648
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.002	0.003	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.64	0.8	0.61	0.7	0.5	0.617	0.548
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	65.8	59.6	61.5	64.1	57.6	53.4	59.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.85	0.11	0.87	0.33	3.09	0.541	0.898
Lead, dissolved	mg/l	0.01	--	0.0032	0.0002	0.0002	0.006	0.0015	0.001	0.0015
Magnesium, dissolved	mg/l	--	--	71.3	76.9	73.1	71.1	66.9	63.7	71.8
Manganese, dissolved	mg/l	--	0.05	2.03	1.95	2.17	1.7	1.99	1.53	2.07
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.03	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	5.2	7.3	13.8	13.3	12.3	13.3	13.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	714	811	657	731	626	677	686
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.02	0.005	0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 14-Jun-2001	94-5 23-Nov-2001	94-5 23-May-2002	94-5 06-Nov-2002	94-5 30-May-2003	94-5 09-Oct-2003	94-5 14-May-2004
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.113	0.001	0.001	0.001	0.001	0.001	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Nov-2004	94-5 24-May-2005	94-5 16-Nov-2005	94-5 25-May-2006	94-5 21-Nov-2006	94-5 15-May-2007	94-5 30-Nov-2007
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1070	1040	220	860	892	880	895
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	875	850	900	860	892	880	895
Ammonia Nitrogen	mg/l	--	--	0.32	0.92	0.04	0.98	0.54	0.94	0.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	34	25	25	25	49	89	75
Chloride	mg/l	--	250	943	853	886	942	906	928	939
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4370	4200	3000	3300	3450	2600	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	415	437	417	425	396	404	408
Nitrate as N	mg/l	10.0	--	1	0.2	0.7	0.2	0.3	0.1	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.22	1.97	0.97	1.89	2.2	2	1.72
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7.2	--	7.6	7.2	8.1	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.78	1.86	--	--	--	--
Sulphate	mg/l	--	500 [6]	10	5	4	5	4	5	4
Temperature (Field)	deg c	--	15	--	8.4	--	4.5	7.5	7.3	5
Total Dissolved Solids	mg/l	--	500	2185	2170	2340	2370	2290	2240	2490
Total Organic Carbon	mg/l	--	--	10	9.2	11.2	--	--	--	--
Total Suspended Solids	mg/l	--	--	1450	852	436	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	0.0035	0.0056	0.0038
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.651	0.534	0.671	0.586	0.629	0.487	0.619
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	<0.00002
Calcium, dissolved	mg/l	--	--	56.9	57.5	58.3	56.7	52.6	54.7	57
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	0.007	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.676	0.226	0.149	1.93	0.759	1.35	0.076
Lead, dissolved	mg/l	0.01	--	0.0017	0.0017	0.0004	<0.0002	<0.0001	0.00004	<0.00002
Magnesium, dissolved	mg/l	--	--	66.5	71.3	66.1	69	64.4	65.1	64.5
Manganese, dissolved	mg/l	--	0.05	1.86	2.04	1.9	1.56	1.41	1.88	1.66
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.7	14.1	15.4	15	14.6	13	16.8
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	712	672	779	775	709	646	870
Zinc, dissolved	mg/l	--	5	0.005	0.008	0.008	<0.005	0.008	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Nov-2004	94-5 24-May-2005	94-5 16-Nov-2005	94-5 25-May-2006	94-5 21-Nov-2006	94-5 15-May-2007	94-5 30-Nov-2007
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 22-May-2008	94-5 10-Nov-2008	94-5 19-May-2009	94-5 26-Nov-2009	94-5 20-Oct-2010 [30]	94-5 24-May-2011 [30]	94-5 29-Nov-2011 [30]
						G-13	J-5	G-24	G-38	94-5
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	820	860	832	869	863	853	852
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [9]	<2 [9]	<2 [9]	20	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	820	860	832	869	863	873	852
Ammonia Nitrogen	mg/l	--	--	0.57	0.78	0.82	0.66	0.76	0.90	0.61
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	7	33	38	55	50	60	45
Chloride	mg/l	--	250	866	879	822	868	872	798	823
Conductivity	uS/cm	--	--	--	--	4010	4170	4120	4080	4050
Conductivity (Field)	uS/cm	--	--	3950	3500	3400	3511	3808	2603	3657
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	407	379	385	363	411	352	398
Nitrate as N	mg/l	10.0	--	0.2	0.3	0.19	0.12	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.1	1.64	1.47	1.12	1.37	1.67	1.05
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	7.94	8.17	8.04	8.40	7.95
pH (Field)	-	--	--	7.6	7.4	--	7.12	7.67	7.41	7.57
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	7.56	1.44	2.58	1.65	1.09
Sulphate	mg/l	--	500 [6]	5	4	5	7	6	5	5
Temperature (Field)	deg c	--	15	12	7	10	3.0	10.8	19.1	7.6
Total Dissolved Solids	mg/l	--	500	2220	2190	2610	2710	2680	2650	2630
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0052	0.0033	0.003	0.005	<0.01	<0.01	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.543	0.584	0.60	0.73	0.62	0.42	0.63
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	55.1	51	52	48	54	47	54
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	0.009	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0009	0.0011	0.0009	0.0010	0.0009
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002	0.002	0.001	0.003	0.002
Iron, dissolved	mg/l	--	0.3	1.55	0.022	<0.03	0.34	0.75	0.43	0.17
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	65.6	61.1	62	59	67	57	64
Manganese, dissolved	mg/l	--	0.05	1.63	1.42	1.74	1.60	1.67	1.53	1.87
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13.7	13.3	11	13	12	10	12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	718	664	680	780	720	698	684
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01	0.01	<0.01	0.02	<0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 22-May-2008	94-5 10-Nov-2008	94-5 19-May-2009 G-13	94-5 26-Nov-2009 J-5	94-5 20-Oct-2010 [30] G-24	94-5 24-May-2011 [30] G-38	94-5 29-Nov-2011 [30] 94-5
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	<0.0006	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 31-May-2012 [31] 94-5	94-5 29-Nov-2012 94-5	94-5 29-May-2013 [32] 94-5	94-5 26-Nov-2013 GW-16	94-5 29-May-2014 94-5	94-5 19-Nov-2014 94-5	94-5 02-Jun-2015 94-5
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	810	830	820	870	810	840	756
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7.6	11	7.3	9.2	10	7.9	8
Alkalinity (Total as CaCO3)	mg/l	--	--	820	840	830	880	820	850	765
Ammonia Nitrogen	mg/l	--	--	0.97	0.78	1.5	0.81	1.3	1.0	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	40	70	47	38	76	122
Chloride	mg/l	--	250	750	770	890	860	840	860	754
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3337	3227	3096	3225	3227	3726	3707
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	310	390	430	410	370	410	305
Nitrate as N	mg/l	10.0	--	<0.10	0.14	0.68	0.22	<0.10	0.18	<0.1
Nitrite as N	mg/l	1.0	--	0.12	<0.010	0.10	0.023	0.095	0.059	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.8	2.6	4.5	5.6	4.9	4.3	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.13	0.14	0.78	0.24	0.12	0.24	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.00	8.16	7.98	8.05	8.13	8.00	--
pH (Field)	-	--	--	7.48	7.66	6.95	7.54	6.60	7.59	7.43
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.8	2.1	8.7	4.0	3.4	10	1.27
Sulphate	mg/l	--	500 [6]	<1	1	<1	<1	<1	<1	8
Temperature (Field)	deg c	--	15	10.5	6.2	9.8	6.3	9.5	7.8	7.7
Total Dissolved Solids	mg/l	--	500	2050	2190	2370	2220	2100	2170	1910
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0015	0.0028	<0.0010	<0.0010	0.0013	0.0014	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.46	0.67	0.6	0.64	0.52	0.72	0.223
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	44	51	60	54	49	58	40.9
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.01 [34]	<0.001
Cobalt, dissolved	mg/l	--	--	0.00080	0.00075	0.0011	0.0011	0.00085	0.0010	0.0006
Copper, dissolved	mg/l	--	1	0.0023	0.0012	0.0020	0.0019	0.0023	0.0011	<0.0005
Iron, dissolved	mg/l	--	0.3	0.7	0.27	<0.1	<0.1	0.48	0.48	<0.1
Lead, dissolved	mg/l	0.01	--	0.0018	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	49	64	68	67	61	66	49.3
Manganese, dissolved	mg/l	--	0.05	1.6	2.1	2.2	1.5	1.7	1.9	1.78
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.1	12	12	13	10	13	6.72
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	520	720	650	660	580	740	507
Zinc, dissolved	mg/l	--	5	0.0061	<0.0050	<0.0050	0.0065	<0.0050	<0.0050	0.007

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 31-May-2012 [31] 94-5	94-5 29-Nov-2012 94-5	94-5 29-May-2013 [32] 94-5	94-5 26-Nov-2013 GW-16	94-5 29-May-2014 94-5	94-5 19-Nov-2014 94-5	94-5 02-Jun-2015 94-5
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 26-Nov-2015	94-5 26-May-2016	94-5 17-Nov-2016	94-5 24-May-2017	94-5 29-Nov-2017	94-5 24-May-2018	94-5 22-Nov-2018
				94-5	94-5	94-5	94-5	94-5	94-5	94-5
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	871	878	912	905	902	929	977
Alkalinity, Carbonate as CaCO3	mg/l	--	--	9	7	7	7	10	9	10
Alkalinity (Total as CaCO3)	mg/l	--	--	880	885	918	912	912	938	987
Ammonia Nitrogen	mg/l	--	--	0.64	1.38	1.14	0.68	0.74	1.43	0.71
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	233	114	88	205	98	391	89
Chloride	mg/l	--	250	874	871	909	882	892	855	886
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3815	3748	3999	3702	3308	3860	3411
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	381	324	377	459	368	334	497
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.25 [11]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	2.1	2.8	2.3	1.6	4.8	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.58	7.39	7.89	7.48	7.08	7.44	7.64
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.56	1.32	4.88	3.83	3.42	6.74	2.34
Sulphate	mg/l	--	500 [6]	10	7	7	8	13	8	11
Temperature (Field)	deg c	--	15	8.5	9.8	9.7	11.7	7.5	9.5	6.3
Total Dissolved Solids	mg/l	--	500	2210	2260	2270	2180	2080	2250	1560
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.004	0.003	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.627	0.457	0.775	0.396	0.601	0.455	1.12
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	37.6	45.2	51.6	55	51	50.8	65
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.012	0.008	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0008	0.0007	0.0007	0.0006	0.0009	0.0007	0.0013
Copper, dissolved	mg/l	--	1	<0.0005	0.0007	0.0010	0.0024	0.0011	<0.0005	0.0040
Iron, dissolved	mg/l	--	0.3	0.221	0.293	0.23	0.246	0.214	0.741	0.155
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	69.6	51.3	60.3	78.2	58.4	50.3	81.4
Manganese, dissolved	mg/l	--	0.05	1.62	1.67	2.17	1.78	2	1.82	1.52
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.2	10.4	10.7	8.18	11.7	8.73	16.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	731	498	699	807	675	507	795
Zinc, dissolved	mg/l	--	5	0.008	0.008	<0.005	0.006	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 26-Nov-2015 94-5	94-5 26-May-2016 94-5	94-5 17-Nov-2016 94-5	94-5 24-May-2017 94-5	94-5 29-Nov-2017 94-5	94-5 24-May-2018 94-5	94-5 22-Nov-2018 94-5
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	0.004	<0.002 [10]	<0.002 [12]	<0.002 [10]	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Jun-2019 [33] 94-5	94-5 20-Nov-2019 94-5	94-5 21-May-2020 94-5	94-5 26-Nov-2020 94-5	94-5 26-May-2021 94-5	94-5 30-Nov-2021 94-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	848	819	838	867	857
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	12	9	<25	8	13
Alkalinity (Total as CaCO3)	mg/l	--	--	--	860	828	848	875	870
Ammonia Nitrogen	mg/l	--	--	--	0.94	0.97	0.68	0.91	0.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	159	104	91	60	91
Chloride	mg/l	--	250	--	995	1000	776	721	779
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	3810	2660	3270	3668	3761
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	471	426	416	409	369
Nitrate as N	mg/l	10.0	--	--	0.8	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.1	2.0	1.4	1.4	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.61	8.23	7.86	7.45	7.76
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	4.76	3.96	0.72	1.14	0.83
Sulphate	mg/l	--	500 [6]	--	10	18	13	13	15
Temperature (Field)	deg c	--	15	--	7.7	7.7	6.6	10.4	6.7
Total Dissolved Solids	mg/l	--	500	--	2220	2120	2080	2130	2120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	0.387	0.432	0.463	0.381	0.473
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	--	63.8	57.1	55.3	53.9	49.9
Chromium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	--	0.0008	0.0009	0.0009	0.0008	0.0009
Copper, dissolved	mg/l	--	1	--	0.0014	0.0031	0.0030	0.0011	0.0025
Iron, dissolved	mg/l	--	0.3	--	0.297	1.19	0.292	0.423	<0.1
Lead, dissolved	mg/l	0.01	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	--	75.6	68.7	67.5	66.6	59.2
Manganese, dissolved	mg/l	--	0.05	--	1.81	1.94	2.04	2.32	2.36
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	19	11.9	11.7	9.62	11.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	745	665	665	551	581
Zinc, dissolved	mg/l	--	5	--	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Jun-2019 [33] 94-5	94-5 20-Nov-2019 94-5	94-5 21-May-2020 94-5	94-5 26-Nov-2020 94-5	94-5 26-May-2021 94-5	94-5 30-Nov-2021 94-5
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.005	<0.002 [12]	<0.010 [12]	<0.004 [12]
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 15-Jun-1994	94-6 02-Nov-1994	94-6 28-Jun-1995	94-6 22-Nov-1995	94-6 12-Jun-1996	94-6 12-Oct-1996	94-6 18-Jun-1997
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	322	529	610	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	276	268	434	500	412	420	430
Ammonia Nitrogen	mg/l	--	--	--	0.11	0.01	0.03	0.1	0.04	0.2
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	141	105	80	70	35	33	14
Chloride	mg/l	--	250	245	266	275	236	216	248	347
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1280	1710	1850	1840	1730	2030	1880
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	9.02	6.31	--	--	--	5.05
Hardness, Calcium Carbonate	mg/l	--	--	180	290	254	234	248	191	309
Nitrate as N	mg/l	10.0	--	1.6	0.1	2.7	0.1	0.1	0.3	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	3.3	2.45	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	3.29	2.42	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.2	7.17	6.78	7.29	7.03	6.82	7.02
Phosphate	mg/l	--	--	--	--	--	0.8	--	--	--
Phosphorus	mg/l	--	--	4.39	0.196	1.68	--	--	--	--
Sulphate	mg/l	--	500 [6]	87	105	88	81	76	91	74
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	660	860	930	910	870	1020	930
Total Organic Carbon	mg/l	--	--	15.8	15.9	13.7	13.9	15.8	13	9
Total Suspended Solids	mg/l	--	--	--	--	--	--	1780	1430	953
Metals										
Aluminum, dissolved	mg/l	--	--	--	0.056	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.042	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.15	0.169	0.14	0.02	0.158	0.18	0.22
Cadmium, dissolved	mg/l	0.005	--	--	**0.01**	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	38.4	47.33	51.7	40.4	39.8	31.7	52.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0095	0.01	0.02	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.291	0.14	0.03	0.54	0.811	0.4	0.47
Lead, dissolved	mg/l	0.01	--	0.0006	**0.1**	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	20.4	16.666	30	32	35.5	26.7	42.5
Manganese, dissolved	mg/l	--	0.05	0.108	0.176	0.32	0.24	1.41	0.7	1.57
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.5	0.864	--	6	6.15	6.5	5.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	171	236.1	284	294	353	312	315
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 15-Jun-1994	94-6 02-Nov-1994	94-6 28-Jun-1995	94-6 22-Nov-1995	94-6 12-Jun-1996	94-6 12-Oct-1996	94-6 18-Jun-1997
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.15	0.001	0.001	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 06-Nov-1997	94-6 05-Jun-1998	94-6 29-Oct-1998	94-6 06-May-1999	94-6 19-Oct-1999	94-6 05-May-2000	94-6 24-Oct-2000
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	454	506	366	536	617
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	534	336	372	415	300	439	506
Ammonia Nitrogen	mg/l	--	--	0.88	0.07	0.19	0.09	0.13	0.01	0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	47	37	4	29	92	39	--
Chloride	mg/l	--	250	176	307	260	326	193	315	427
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1870	1720	2080	1770	1240	1750	2520
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.05	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	142	160	161	215	204	304	433
Nitrate as N	mg/l	10.0	--	0.1	1.1	--	--	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	1.58	1.29	--	--	1.16
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.41	--	6.7	6.7	7.8	6.9	6.85
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.63
Sulphate	mg/l	--	500 [6]	2.1	95	80	71	93	131	300
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1030	859	1030	890	620	875	1490
Total Organic Carbon	mg/l	--	--	15.1	11.8	13.5	13.1	27.5	14	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	416	1090	508
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.14	0.21	0.24	0.15	0.27	0.27	0.37
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	25.8	26.7	32.6	37.8	42.1	55.1	61.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.66	0.52	0.31	1.72	1.82	1.43	1.88
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0006	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	18.6	22.3	19.4	29	23.7	40	67.5
Manganese, dissolved	mg/l	--	0.05	0.22	0.21	0.93	0.69	0.55	1.43	0.83
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	2.9	6.4	5.1	1.7	4.5	0.4	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	260	337	287	312	220	371	510
Zinc, dissolved	mg/l	--	5	0.01	0.23	0.01	0.01	0.16	0.24	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 06-Nov-1997	94-6 05-Jun-1998	94-6 29-Oct-1998	94-6 06-May-1999	94-6 19-Oct-1999	94-6 05-May-2000	94-6 24-Oct-2000
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.002
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 14-Jun-2001	94-6 23-Nov-2001	94-6 23-May-2002	94-6 06-Nov-2002	94-6 30-May-2003	94-6 09-Oct-2003	94-6 14-May-2004
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	453	373	462	340	337	--	545
Alkalinity, Carbonate as CaCO3	mg/l	--	--	39	1	17	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	435	306	407	279	276	408	447
Ammonia Nitrogen	mg/l	--	--	0.11	0.08	0.08	0.06	0.06	0.3	0.14
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	7	--
Chemical Oxygen Demand	mg/l	--	--	40	60	46	56	58	92	64
Chloride	mg/l	--	250	268	182	95.8	330	205	357	167
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1850	1290	1060	2140	1440	2150	1560
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	109	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	308	224	205	233	206	259	258
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	0.2	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.61	1.62	1.47	1.33	1.79	2.37	1.83
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	6.91	6.87	7.6	7	7.1	7
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.94	0.59	0.68	0.45	0.39	1.93	0.81
Sulphate	mg/l	--	500 [6]	170	92	30	190	127	146	109
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1130	860	596	1110	720	1221	780
Total Organic Carbon	mg/l	--	--	17.3	28	20	19.4	19.6	18	18.8
Total Suspended Solids	mg/l	--	--	700	716	394	348	442	3610	656
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.2	0.11	0.1	0.3	0.14	0.477	0.394
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	66.8	58.1	54.2	52.3	49.6	43.2	48
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.001	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.007
Iron, dissolved	mg/l	--	0.3	0.46	0.03	0.58	0.02	0.13	0.846	0.022
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0007	0.0013	0.0002	0.0007	0.0008
Magnesium, dissolved	mg/l	--	--	34.2	19.1	16.9	24.9	19.9	36.7	33.7
Manganese, dissolved	mg/l	--	0.05	1.52	0.13	0.57	0.02	0.02	1.41	0.117
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	0.4	0.4	2.8	1.1	2.3	6.2	3.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	301	218	150	299	237	385	267
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.005	0.006

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 14-Jun-2001	94-6 23-Nov-2001	94-6 23-May-2002	94-6 06-Nov-2002	94-6 30-May-2003	94-6 09-Oct-2003	94-6 14-May-2004
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.077	0.001	0.001	0.001	0.001	0.001	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 19-Nov-2004	94-6 24-May-2005	94-6 16-Nov-2005	94-6 25-May-2006	94-6 21-Nov-2006	94-6 15-May-2007	94-6 30-Nov-2007 [21]
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	512	598	259	340	492	452	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	420	490	420	340	492	452	--
Ammonia Nitrogen	mg/l	--	--	0.22	<0.01	<0.01	0.04	<0.01	<0.01	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	54	71	49	52	59	107	--
Chloride	mg/l	--	250	179	149	238	113	155	207	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1670	2200	620	800	1150	950	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	302	287	186	172	275	262	--
Nitrate as N	mg/l	10.0	--	1	0.2	0.1	<0.1	<0.1	0.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.64	1.62	1.49	1.19	1.14	1.99	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7	--	7.5	7.7	7.6	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.68	0.65	0.67	--	--	--	--
Sulphate	mg/l	--	500 [6]	150	75	77	62	53	83	--
Temperature (Field)	deg c	--	15	--	8	--	5	6	7.9	--
Total Dissolved Solids	mg/l	--	500	835	863	820	593	828	881	--
Total Organic Carbon	mg/l	--	--	15	23.8	10.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	434	392	352	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.001	0.0012	0.0014	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.517	0.284	0.15	0.107	0.25	0.22	--
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	--
Calcium, dissolved	mg/l	--	--	55.6	49.2	41.2	39.4	57.4	50.3	--
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	--
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.013	--
Copper, dissolved	mg/l	--	1	0.006	0.002	0.005	0.004	0.004	<0.002	--
Iron, dissolved	mg/l	--	0.3	0.013	0.029	0.012	0.037	0.057	0.051	--
Lead, dissolved	mg/l	0.01	--	0.0003	0.0006	0.0003	0.0002	<0.0001	0.00006	--
Magnesium, dissolved	mg/l	--	--	39.6	39.9	20.2	17.8	31.9	33.1	--
Manganese, dissolved	mg/l	--	0.05	0.081	0.62	0.071	0.368	0.99	0.332	--
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	2.9	3.8	14.6	14.9	13.3	10.5	--
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	242	255	190	156	222	225	--
Zinc, dissolved	mg/l	--	5	0.005	0.01	0.009	0.009	0.021	<0.005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 19-Nov-2004	94-6 24-May-2005	94-6 16-Nov-2005	94-6 25-May-2006	94-6 21-Nov-2006	94-6 15-May-2007	94-6 30-Nov-2007 [21]
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	--
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	0.0008	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 22-May-2008	94-6 10-Nov-2008	94-6 19-May-2009 G-17	94-6 26-Nov-2009 J-3	94-6 25-May-2010 [30] M-22	94-6 20-Oct-2010 [30] G-25	94-6 24-May-2011 [30] G-37
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	309	430	453	501	432	538	490
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [9]	<2 [9]	<2 [9]	<2 [9]	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	309	430	453	501	432	538	490
Ammonia Nitrogen	mg/l	--	--	0.02	<0.01	0.04	0.05	0.04	0.03	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	65	64	45	55	40	80	60
Chloride	mg/l	--	250	71.1	220	190	195	161	124	160
Conductivity	uS/cm	--	--	--	--	1590	1610	1470	1420	1500
Conductivity (Field)	uS/cm	--	--	625	1400	1200	1144	1400	1363	1319
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	105	246	271	282	271	336	332
Nitrate as N	mg/l	10.0	--	0.1	0.2	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	3.09	1.79	0.95	0.65	0.61	0.92	1.34
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	7.34	7.69	7.40	7.53	8.03
pH (Field)	-	--	--	7.4	6.6	--	4.87	6.61	7.67	6.46
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.00	0.55	0.58	0.97	0.59
Sulphate	mg/l	--	500 [6]	26	120	77	56	56	35	42
Temperature (Field)	deg c	--	15	13	5	7	6.7	27.1	11.8	15.0
Total Dissolved Solids	mg/l	--	500	458	960	1030	1050	956	923	975
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0017	0.0016	0.001	0.001	<0.01	<0.001	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.138	0.378	0.35	0.20	0.27	0.23	0.27
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25.2	44.6	54	62	49	77	57
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	0.006	0.004	0.006	0.008	0.009
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0022	0.0010	0.0023	0.0005	0.0027
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.003	0.003	0.002	0.003	0.004
Iron, dissolved	mg/l	--	0.3	0.942	0.423	<0.03	0.06	0.62	0.03	1.12
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	10.3	32.8	33	31	36	35	46
Manganese, dissolved	mg/l	--	0.05	1.64	0.245	1.17	0.75	1.73	0.09	1.88
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.2	11.3	10	15	9	14	7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	108	271	234	208	198	166	224
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.01	0.01	<0.01	0.01	0.02

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 22-May-2008	94-6 10-Nov-2008	94-6 19-May-2009 G-17	94-6 26-Nov-2009 J-3	94-6 25-May-2010 [30] M-22	94-6 20-Oct-2010 [30] G-25	94-6 24-May-2011 [30] G-37
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	<0.0006	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2011 [30]	94-6 31-May-2012	94-6 29-Nov-2012 [31]	94-6 29-May-2013 [35]	94-6 26-Nov-2013	94-6 29-May-2014	94-6 19-Nov-2014 [36]
				94-6	94-6	94-6	94-6	GW-11	94-6	94-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	475	370	360	380	360	310	420
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<1.0	<1.0	1.3	<1.0	<1.0	<1.0
Alkalinity (Total as CaCO3)	mg/l	--	--	475	370	360	380	360	310	420
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.050	0.14	0.25	<0.050	0.099	0.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	76	58	140	39	50	70
Chloride	mg/l	--	250	236	150	160	270	200	140	260
Conductivity	uS/cm	--	--	1740	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1373	1246	1258	1149	1303	960	1311
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	291	280	340	310	330	270	320
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	1.17	1.7	2.6	5.7	2.4	4.7	<2.0 [23]
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.63	7.42	7.44	7.56	7.31	7.36	7.33
pH (Field)	-	--	--	6.62	6.86	6.91	7.49	7.32	6.77	6.74
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.25	0.80	0.96	9.1	0.59	0.55	2.0
Sulphate	mg/l	--	500 [6]	89	120	130	130	150	55	62
Temperature (Field)	deg c	--	15	6.5	11.8	4.1	11.6	5.5	12.1	5.6
Total Dissolved Solids	mg/l	--	500	1130	896	936	934	902	624	1060
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.40	0.29	0.35	0.27	0.31	0.15	0.32
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	54	47	59	52	56	53	58
Chromium, dissolved	mg/l	0.05	--	0.006	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0009	0.00052	0.00073	0.0012	0.00063	0.00050	0.0014
Copper, dissolved	mg/l	--	1	0.002	0.0025	0.0020	0.0020	0.0015	0.0041	0.0010
Iron, dissolved	mg/l	--	0.3	0.90	<0.1	1	0.13	<0.1	<0.1	1.3
Lead, dissolved	mg/l	0.01	--	<0.001	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	38	40	46	43	46	34	43
Manganese, dissolved	mg/l	--	0.05	2.25	0.64	2.3	0.67	1.2	0.61	2.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6	4.7	7.1	4.1	5.7	4.4	6.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	244	240	330	180	290	160	330
Zinc, dissolved	mg/l	--	5	<0.01	<0.0050	0.0055	<0.0050	0.011	0.0065	0.0054

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2011 [30]	94-6 31-May-2012	94-6 29-Nov-2012 [31]	94-6 29-May-2013 [35]	94-6 26-Nov-2013	94-6 29-May-2014	94-6 19-Nov-2014 [36]
				94-6	94-6	94-6	94-6	GW-11	94-6	94-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	0.0072	<0.0010	<0.0010	0.0011
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0025	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.0010	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.0010	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 02-Jun-2015	94-6 26-Nov-2015	94-6 26-May-2016	94-6 17-Nov-2016	94-6 24-May-2017	94-6 29-Nov-2017	94-6 24-May-2018
				94-6	94-6	94-6	94-6	94-6	94-6	94-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	483	521	578	547	436	513	551
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	484	522	579	548	424	514	552
Ammonia Nitrogen	mg/l	--	--	0.52	0.58	0.37	0.27	0.38	0.15	0.43
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	73	156	101	63	58	91	100
Chloride	mg/l	--	250	332	372	459	428	306	396	382
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1405	1598	1517	1736	1574	1555	1737
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	218	276	317	261	364	255	323
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.3	5.3	1.3	0.9	2.3	1.1	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.70	6.91	7.19	7.74	7.03	7.39	6.72
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.35	6.20	0.56	0.35	0.38	0.46	0.43
Sulphate	mg/l	--	500 [6]	64	81	70	81	102	101	87
Temperature (Field)	deg c	--	15	10.0	7.2	12.6	9.2	11.6	5.7	11.7
Total Dissolved Solids	mg/l	--	500	1050	1210	1380	1280	1050	1160	1260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.142	0.202	0.154	0.332	0.185	0.201	0.241
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	39.2	47.8	65.7	51.9	70.2	53.2	67
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.006	0.005	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0015	0.0009	0.0027	<0.0005	0.0007	<0.0005	0.0021
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0018	0.0037	0.0040	0.0019	0.0010
Iron, dissolved	mg/l	--	0.3	0.214	0.131	0.168	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	29.1	38	37.3	31.9	45.7	29.6	37.7
Manganese, dissolved	mg/l	--	0.05	1.28	1.29	1.7	0.148	1.4	0.18	2.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.46	3.72	4.51	3.83	4.03	4.02	4.29
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	147	212	160	182	292	166	202
Zinc, dissolved	mg/l	--	5	0.006	0.012	0.008	0.006	0.006	<0.005	0.007

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 02-Jun-2015 94-6	94-6 26-Nov-2015 94-6	94-6 26-May-2016 94-6	94-6 17-Nov-2016 94-6	94-6 24-May-2017 94-6	94-6 29-Nov-2017 94-6	94-6 24-May-2018 94-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.004 [10]	0.003	<0.001	<0.002 [10]	<0.002 [10]	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2018	94-6 19-Jun-2019	94-6 20-Nov-2019	94-6 21-May-2020	94-6 26-Nov-2020	94-6 26-May-2021	94-6 30-Nov-2021
				94-6	94-6	94-6	94-6	94-6	94-6	94-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	448	461	516	338	364	344	315
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	449	463	518	339	364	345	316
Ammonia Nitrogen	mg/l	--	--	0.04	0.32	0.19	0.06	0.16	0.07	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	62	86	80	52	58	34	63
Chloride	mg/l	--	250	240	263	460	292	276	224	245
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1451	1427	1531	1616	1372	1696	1777
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	394	411	390	331	256	323	349
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	1.8	1.1	0.9	0.7	0.8	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.58	7.22	6.91	7.62	6.93	6.80	7.13
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.77	0.66	0.88	0.39	0.24	0.40	0.40
Sulphate	mg/l	--	500 [6]	150	149	112	271	231	226	325
Temperature (Field)	deg c	--	15	4.3	15.2	6.3	8.9	5.5	12.0	4.3
Total Dissolved Solids	mg/l	--	500	948	1070	1400	1010	1070	972	1170
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.42	0.147	0.262	0.201	0.174	0.157	0.274
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	78.4	96.6	66.3	64.8	51.3	77.9	70.9
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0010	0.0008	0.0007	0.0011	<0.0005	0.0027	<0.0005
Copper, dissolved	mg/l	--	1	0.0018	0.0052	0.0076	0.0047	0.0035	0.0020	0.0022
Iron, dissolved	mg/l	--	0.3	0.918	<0.1	0.64	1.01	0.117	0.329	0.248
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0015	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	48.1	41.2	54.4	41	31	31.2	41.7
Manganese, dissolved	mg/l	--	0.05	0.899	1.11	1.45	1.08	0.368	2.14	0.871
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.01	7.68	9.81	4.6	3.7	5.54	5.09
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	316	218	411	212	151	156	263
Zinc, dissolved	mg/l	--	5	<0.005	0.007	0.006	0.008	0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2018 94-6	94-6 19-Jun-2019 94-6	94-6 20-Nov-2019 94-6	94-6 21-May-2020 94-6	94-6 26-Nov-2020 94-6	94-6 26-May-2021 94-6	94-6 30-Nov-2021 94-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.001	<0.001	0.006	<0.001	0.002	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 28-Jun-1995	95-1 23-Nov-1995	95-1 12-Oct-1996	95-1 06-Nov-1997	95-1 05-Jun-1998	95-1 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1076	1260	--	--	--	1570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	116	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	882	1220	1280	1060	1050	1290
Ammonia Nitrogen	mg/l	--	--	1.27	7.5	9.15	4.42	6.05	2.83
Chemical Oxygen Demand	mg/l	--	--	700	250	115	56	392	1740
Chloride	mg/l	--	250	615	853	836	784	998	925
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3660	4460	4000	4380	4250	4320
Dissolved Oxygen (Field)	mg/l	--	--	2.66	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	175	194	165	185	170	178
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.4	0.1	3.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	19.5	28.8	--	--	--	24.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	18.23	21.3	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.4	8.77	7.96	8.84	--	8.1
Phosphate	mg/l	--	--	--	54.2	--	--	--	--
Phosphorus	mg/l	--	--	2.86	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	10	19	6	1	162	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1830	2250	2000	2200	2110	2170
Total Organic Carbon	mg/l	--	--	31.8	24.5	20.1	23.9	28	26.5
Total Suspended Solids	mg/l	--	--	--	--	106	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.07	1.22	1.19	1.34	1.59	1.52
Cadmium, dissolved	mg/l	0.005	--	0.0009	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.4	24.3	20.2	22.8	20.5	22.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.04	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	4.05	4.96	5.67	3.58	1.39
Lead, dissolved	mg/l	0.01	--	0.0008	0.0013	0.0002	0.0003	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	26.2	31.8	27.4	30.8	28.5	28.8
Manganese, dissolved	mg/l	--	0.05	0.17	0.18	0.18	0.21	0.15	0.11
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	23.9	21.4	26.1	29.3	29.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	639	871	977	896	1200	1080
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.09	0.04
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 28-Jun-1995	95-1 23-Nov-1995	95-1 12-Oct-1996	95-1 06-Nov-1997	95-1 05-Jun-1998	95-1 06-May-1999
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 24-Oct-2000	95-1 14-Jun-2001	95-1 06-Nov-2002	95-1 30-May-2003	95-1 19-Nov-2004	95-1 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1690	1300	1780	1500	1560	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	102	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1390	1240	1460	1230	1280	1140
Ammonia Nitrogen	mg/l	--	--	1.33	3.15	2.4	2.53	2.33	2.14
Chemical Oxygen Demand	mg/l	--	--	--	56	72	71	81	65
Chloride	mg/l	--	250	890	880	820	879	864	731
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4660	4200	4430	4110	4540	3100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	182	170	211	157	158	170
Nitrate as N	mg/l	10.0	--	0.3	0.1	0.2	1	1	0.7
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.49	3.75	4.17	4.3	3.7	3.88
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.26	8.3	8.1	7.2	8.1	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.81	2.29	0.79	2.43	2.78	1.96
Sulphate	mg/l	--	500 [6]	4.5	1	2	1	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2600	2520	2720	2055	2270	2540
Total Organic Carbon	mg/l	--	--	--	19.8	19.6	19.1	16.2	21.8
Total Suspended Solids	mg/l	--	--	1210	127	184	168	380	35
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	0.003	0.001	0.001
Boron, dissolved	mg/l	5	--	1.5	1.59	1.51	1.42	1.47	1.5
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0002
Calcium, dissolved	mg/l	--	--	20.3	23.2	23.8	20.4	20.6	22.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.33	0.23	0.27	2	0.186	0.251
Lead, dissolved	mg/l	0.01	--	**0.022**	0.0002	0.0063	0.0004	0.0028	0.0007
Magnesium, dissolved	mg/l	--	--	31.9	27.2	28.5	25.7	26	27.9
Manganese, dissolved	mg/l	--	0.05	0.09	0.08	0.08	0.1	0.066	0.072
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	17.2	16.2	23	24.2	24.2	27.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	0.001
Sodium, dissolved	mg/l	--	200 [7]	1030	997	978	876	1130	1070
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.009
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.024	0.001	0.001	0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 24-Oct-2000	95-1 14-Jun-2001	95-1 06-Nov-2002	95-1 30-May-2003	95-1 19-Nov-2004	95-1 16-Nov-2005
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 15-May-2007	95-1 10-Nov-2008	95-1 26-Nov-2009 [37] M-10	95-1 24-May-2011 [30] G-13	95-1 28-Nov-2012 95-1	95-1 29-May-2014 [36] 95-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1370	1200	1260	1150	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	27	42	19	38
Alkalinity (Total as CaCO3)	mg/l	--	--	1370	1200	1290	1190	1300	1200
Ammonia Nitrogen	mg/l	--	--	2.15	1.07	2.35	1.35	2.7	2.6
Chemical Oxygen Demand	mg/l	--	--	108	47	70	43	73	67
Chloride	mg/l	--	250	782	650	827	626	810	770
Conductivity	uS/cm	--	--	--	--	4690	3970	--	--
Conductivity (Field)	uS/cm	--	--	2500	3300	3930	2624	3795	3830
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	161	205	142	227	160	130
Nitrate as N	mg/l	10.0	--	<0.1	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	0.047
Nitrogen, Total Kjeldahl	mg/l	--	--	4	2.25	3.40	2.42	3.5	4.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.35	8.59	--	8.53
pH (Field)	-	--	--	8.5	8	7.8	8.10	8.29	8.03
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.13	0.85	2.7	2.0
Sulphate	mg/l	--	500 [6]	1	1	4	1	<1	1
Temperature (Field)	deg c	--	15	8.4	6	8.9	13.3	6.5	9.3
Total Dissolved Solids	mg/l	--	500	2660	2200	3050	2580	2690	2650
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0074	0.0033	0.008	<0.01	0.002	0.0024
Boron, dissolved	mg/l	5	--	1.41	1.03	1.6	0.92	1.6	1.2
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	21.4	25.3	19	30	20	16
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.01	<0.005	0.0004	0.0005	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.001	0.003	0.001	0.0028
Iron, dissolved	mg/l	--	0.3	0.361	0.014	0.15	0.28	0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00017	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	26.3	34.4	23	37	26	20
Manganese, dissolved	mg/l	--	0.05	0.078	0.004	0.06	0.06	0.047	0.035
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	27.1	17.5	23	14	22	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	979	754	1140	873	1000	720
Zinc, dissolved	mg/l	--	5	0.006	<0.005	<0.01	0.02	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 15-May-2007	95-1 10-Nov-2008	95-1 26-Nov-2009 [37] M-10	95-1 24-May-2011 [30] G-13	95-1 28-Nov-2012 95-1	95-1 29-May-2014 [36] 95-1
Semi-VOCs									
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 26-Nov-2015 95-1	95-1 24-May-2017 95-1	95-1 22-Nov-2018 95-1	95-1 21-May-2020 95-1	95-1 30-Nov-2021 [3] 95-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1210	1270	1150	1270	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [28]	<25 [11]	<25 [11]	27	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1230	1280	1170	1300	--
Ammonia Nitrogen	mg/l	--	--	3.78	3.13	3.58	2.46	--
Chemical Oxygen Demand	mg/l	--	--	284	97	306	94	--
Chloride	mg/l	--	250	863	873	760	1050	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	3179	>3999	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	139	163	215	195	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [11]	<0.05	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	9.9	4.5	7.7	3.3	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.25	8.21	8.58	7.96	--
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	12.3	4.02	9.90	1.94	--
Sulphate	mg/l	--	500 [6]	1	<1	1	<1	--
Temperature (Field)	deg c	--	15	6.7	11.6	4.8	15.0	--
Total Dissolved Solids	mg/l	--	500	2880	2700	2440	2790	--
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.002	0.005	0.002	0.002	--
Boron, dissolved	mg/l	5	--	1.55	0.994	1.53	1.58	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	18.5	15.4	33.1	24.6	--
Chromium, dissolved	mg/l	0.05	--	<0.001	0.014	<0.001	<0.001	--
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0006	<0.0005	--
Copper, dissolved	mg/l	--	1	<0.0005	0.0008	0.0011	0.0014	--
Iron, dissolved	mg/l	--	0.3	0.138	<0.1	0.2	0.223	--
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	--
Magnesium, dissolved	mg/l	--	--	22.6	30.2	32	32.4	--
Manganese, dissolved	mg/l	--	0.05	0.053	0.028	0.066	0.063	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	20	15.7	27	24.5	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1050	1010	1010	963	--
Zinc, dissolved	mg/l	--	5	0.01	<0.005	<0.005	<0.005	--
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.004 [10]	<0.001	0.004	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 26-Nov-2015 95-1	95-1 24-May-2017 95-1	95-1 22-Nov-2018 95-1	95-1 21-May-2020 95-1	95-1 30-Nov-2021 [3] 95-1
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Jun-1995	95-2 23-Nov-1995	95-2 12-Jun-1996	95-2 12-Oct-1996	95-2 18-Jun-1997	95-2 06-Nov-1997	95-2 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1139	1400	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	15	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	934	1180	1240	1200	1280	1190	1080
Ammonia Nitrogen	mg/l	--	--	0.88	0.63	1.18	1.49	0.01	0.77	0.68
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	50	18	30	19	62	50
Chloride	mg/l	--	250	528	628	636	656	629	632	615
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3480	4170	4000	4180	3850	3900	3720
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.2	--	--	--	2.36	--	--
Hardness, Calcium Carbonate	mg/l	--	--	214	244	247	231	264	265	239
Nitrate as N	mg/l	10.0	--	0.1	1.7	0.1	0.1	0.1	0.1	2.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.3	4	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.42	3.37	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	8.48	8.08	7.8	8.22	8.5	--
Phosphate	mg/l	--	--	--	1	--	--	--	--	--
Phosphorus	mg/l	--	--	4.39	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	26	8	4	6	3	1	10
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1750	2090	1940	2100	1930	1960	1840
Total Organic Carbon	mg/l	--	--	12.1	14.8	15.5	14.5	16.5	16.7	16.6
Total Suspended Solids	mg/l	--	--	--	--	1480	780	1910	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.79	0.92	0.965	1.01	1.27	1.07	1.17
Cadmium, dissolved	mg/l	0.005	--	0.0009	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	32.4	30.2	30.1	29	34.4	34.1	28.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.09	0.2	0.545	0.62	0.62	0.41	0.96
Lead, dissolved	mg/l	0.01	--	0.0012	0.0002	0.0005	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	32	40.5	41.3	38	42.8	43.1	40.2
Manganese, dissolved	mg/l	--	0.05	0.13	0.09	0.138	0.14	0.16	0.11	0.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	19.4	23	19.3	18.5	19.3	18.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	608	754	777	867	662	789	1000
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.06
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Jun-1995	95-2 23-Nov-1995	95-2 12-Jun-1996	95-2 12-Oct-1996	95-2 18-Jun-1997	95-2 06-Nov-1997	95-2 05-Jun-1998
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 29-Oct-1998	95-2 06-May-1999	95-2 19-Oct-1999	95-2 05-May-2000	95-2 24-Oct-2000	95-2 14-Jun-2001	95-2 23-Nov-2001
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1340	1430	1160	1577	1550	1230	1420
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	91	1	1	67	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1100	1170	1100	1293	1273	1120	1160
Ammonia Nitrogen	mg/l	--	--	0.8	0.12	1.21	0.07	0.2	1.23	0.88
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	36	38	37	47	--	37	31
Chloride	mg/l	--	250	660	690	695	645	703	671	682
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3980	3720	3860	3750	3970	3600	3620
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	195	250	239	227	255	232	254
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.2	0.9	0.3	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.14	2.67	--	--	1.32	2.3	2.51
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.7	7.9	8.1	7.9	8.1	8.1	7.55
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.85	0.95	0.94
Sulphate	mg/l	--	500 [6]	3	1	6	3	4	3	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2000	1870	1130	1875	2230	2060	2200
Total Organic Carbon	mg/l	--	--	17.1	19.4	16.8	16.6	--	14.9	18
Total Suspended Solids	mg/l	--	--	--	--	492	180	90	51	43
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	1.25	1.18	1.29	1.19	1.15	1.11	1.38
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	24.3	32.2	32.6	30	28.6	32.6	30.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.45	0.45	1.1	2.3	0.17	0.08	0.11
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0005	0.0002	0.022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	32.6	40.7	37.9	36.5	44.6	36.5	43.1
Manganese, dissolved	mg/l	--	0.05	0.12	0.11	0.11	0.13	0.11	0.09	0.1
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	20.8	13.6	18	11.2	19.8	9.1	12.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	842	902	926	798	831	782	898
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.1	0.06	0.01	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.054	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 29-Oct-1998	95-2 06-May-1999	95-2 19-Oct-1999	95-2 05-May-2000	95-2 24-Oct-2000	95-2 14-Jun-2001	95-2 23-Nov-2001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 23-May-2002	95-2 06-Nov-2002	95-2 30-May-2003	95-2 09-Oct-2003	95-2 14-May-2004	95-2 19-Nov-2004	95-2 24-May-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1240	1600	1400	--	1379	1410	1450
Alkalinity, Carbonate as CaCO3	mg/l	--	--	110	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1310	1150	1160	1130	1160	1190
Ammonia Nitrogen	mg/l	--	--	1.2	1.33	1.34	1.45	1.23	1.04	1.38
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	5	--	--	--
Chemical Oxygen Demand	mg/l	--	--	43	55	50	52	56	75	51
Chloride	mg/l	--	250	675	646	657	639	687	658	619
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3100	3690	2630	3550	3503	3730	3800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	280	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	242	233	215	214	220	216	228
Nitrate as N	mg/l	10.0	--	0.1	0.3	0.3	0.1	0.2	2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.23	2.47	2.67	2.48	2.69	2.57	2.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.41	8	7.1	7.8	8.2	8	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.89	0.82	1.18	0.89	0.92	2.07	1.34
Sulphate	mg/l	--	500 [6]	2	2	2	--	3	10	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	10
Total Dissolved Solids	mg/l	--	500	2170	2160	1315	2203	1750	1865	2200
Total Organic Carbon	mg/l	--	--	18	16.1	1.2	20	14.1	12.9	15.3
Total Suspended Solids	mg/l	--	--	51	36	164	46	42	40	431
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.001	0.002	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	1.18	1.18	1.03	1.05	1.06	1.11	1.1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	32.3	28.9	28.7	27.4	29	28.9	28.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.001	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.31	0.31	0.49	0.552	0.3	0.391	0.633
Lead, dissolved	mg/l	0.01	--	0.0002	0.0035	0.0005	0.0012	0.0013	0.0005	0.0015
Magnesium, dissolved	mg/l	--	--	39.2	39.1	34.7	35.5	36	35.1	38
Manganese, dissolved	mg/l	--	0.05	0.12	0.1	0.09	0.076	0.097	0.099	0.089
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	18.4	17.2	16.9	17	17.9	18.7	19.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	0.001
Sodium, dissolved	mg/l	--	200 [7]	802	809	719	785	761	770	791
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.005	0.005	0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 23-May-2002	95-2 06-Nov-2002	95-2 30-May-2003	95-2 09-Oct-2003	95-2 14-May-2004	95-2 19-Nov-2004	95-2 24-May-2005
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 16-Nov-2005	95-2 25-May-2006	95-2 21-Nov-2006	95-2 15-May-2007	95-2 30-Nov-2007	95-2 22-May-2008	95-2 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	281	1220	1260	1290	1230	1180	1220
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1150	1220	1260	1290	1230	1180	1215
Ammonia Nitrogen	mg/l	--	--	1.22	1.18	1.24	1.25	1.12	1.05	2.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	68	50	51	54	80	52	67
Chloride	mg/l	--	250	587	689	673	601	679	678	812
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3640	3300	3500	2000	3000	3350	4100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	213	215	197	220	214	143
Nitrate as N	mg/l	10.0	--	1.4	0.2	0.1	0.1	0.2	0.1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.6	2.34	2.42	2.53	2.27	2.52	3.77
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	8	7.4	8.5	8.3	8.1	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.26	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	3	1	1	1	1	<1	<1
Temperature (Field)	deg c	--	15	--	4.5	6.5	6.7	7	12	6
Total Dissolved Solids	mg/l	--	500	2220	2290	2310	2160	2460	2290	2480
Total Organic Carbon	mg/l	--	--	15.8	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	7	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.0035	0.0047	0.0043	0.0039	0.0047
Boron, dissolved	mg/l	5	--	1.14	0.984	1.07	0.962	1.07	1.03	1.18
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	30.3	27.9	26.6	26.6	29.9	28.4	18.9
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.138	0.253	0.304	0.223	0.061	0.317	0.706
Lead, dissolved	mg/l	0.01	--	0.0011	0.0006	<0.0001	0.00009	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	37.4	35	36.1	31.8	35.4	34.8	23.3
Manganese, dissolved	mg/l	--	0.05	0.099	0.092	0.057	0.088	0.101	0.087	0.044
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	20.1	17.4	18.3	17.3	20.2	17.8	29.1
Selenium, dissolved	mg/l	0.05	--	0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	860	801	794	707	963	817	861
Zinc, dissolved	mg/l	--	5	0.01	0.006	0.007	0.006	<0.005	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 16-Nov-2005	95-2 25-May-2006	95-2 21-Nov-2006	95-2 15-May-2007	95-2 30-Nov-2007	95-2 22-May-2008	95-2 10-Nov-2008
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 19-May-2009 G-22	95-2 26-Nov-2009 M-13	95-2 25-May-2010 M-17	95-2 20-Oct-2010 [30] G-16	95-2 24-May-2011 [30] G-20	95-2 29-Nov-2011 [30] 95-2	95-2 31-May-2012 95-2
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1130	1190	1040	1170	1260	1150	1100
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	29	22	<2 [9]	50	<2 [9]	24
Alkalinity (Total as CaCO3)	mg/l	--	--	1130	1220	1060	1170	1309	1150	1100
Ammonia Nitrogen	mg/l	--	--	1.25	0.61	1.40	1.14	2.18	1.27	1.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	73	45	48	50	50	50	50
Chloride	mg/l	--	250	598	652	529	607	797	602	550
Conductivity	uS/cm	--	--	3800	4080	3660	3890	4840	3800	--
Conductivity (Field)	uS/cm	--	--	3300	3370	3920	3857	1476	3506	3330
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	201	176	218	234	166	214	180
Nitrate as N	mg/l	10.0	--	0.19	0.30	<0.10	<0.10	<0.10	<0.10	0.22
Nitrite as N	mg/l	1.0	--	<0.10	0.14	<0.10	<0.10	<0.10	<0.10	0.41
Nitrogen, Total Kjeldahl	mg/l	--	--	2.26	1.47	1.91	2.35	3.32	1.59	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	0.63
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.25	8.41	8.36	8.28	8.63	8.25	8.36
pH (Field)	-	--	--	--	7.47	8.05	8.18	8.06	8.11	8.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.89	0.81	0.99	0.88	2.17	0.84	0.72
Sulphate	mg/l	--	500 [6]	3	4	5	1	<1	2	<1
Temperature (Field)	deg c	--	15	8	8.6	19.7	11.5	20.0	7.7	9.9
Total Dissolved Solids	mg/l	--	500	2470	2650	2380	2530	3150	2470	2230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	0.005	<0.01	<0.01	<0.01	<0.01	0.0019
Boron, dissolved	mg/l	5	--	1.33	1.1	1.6	1.3	1.4	1.12	0.99
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	26	21	28	31	22	28	22
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0003	0.0004	0.0005	0.0004	0.0006	0.0004	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	<0.001	0.003	<0.001	<0.0010
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	0.23	0.27	0.16	0.09	0.27
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	33	30	36	38	27	35	29
Manganese, dissolved	mg/l	--	0.05	0.06	0.02	0.10	0.09	0.05	0.11	0.061
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	16	18	17	23	16	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	791	801	750	842	1110	804	690
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.0050
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 19-May-2009 G-22	95-2 26-Nov-2009 M-13	95-2 25-May-2010 M-17	95-2 20-Oct-2010 [30] G-16	95-2 24-May-2011 [30] G-20	95-2 29-Nov-2011 [30] 95-2	95-2 31-May-2012 95-2
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Nov-2012 95-2	95-2 29-May-2013 [32] 95-2	95-2 26-Nov-2013 GW-8	95-2 29-May-2014 95-2	95-2 19-Nov-2014 95-2	95-2 02-Jun-2015 95-2	95-2 26-Nov-2015 95-2
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1200	1100	1200	1200	1200	934	1130
Alkalinity, Carbonate as CaCO3	mg/l	--	--	18	19	26	31	25	<50	<25 [28]
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1200	1200	1200	1200	947	1150
Ammonia Nitrogen	mg/l	--	--	1.3	1.6	1.3	1.7	1.7	1.66	1.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	54	56	58	53	93	104	99
Chloride	mg/l	--	250	600	650	660	670	640	627	676
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3229	3121	3074	3215	3648	3632	3679
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	230	220	220	250	148	166
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.043	0.57	0.33	0.176	0.055	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.4	2.6	5.1	3.3	4.9	2.9	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.66	0.40	0.23	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.25	8.37	8.46	8.37	--	--
pH (Field)	-	--	--	8.15	7.95	8.14	7.79	8.22	8.16	8.23
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.79	1.1	1.4	1.5	5.2	1.75	1.59
Sulphate	mg/l	--	500 [6]	<10 [38]	<1	<1	<1	<1	2	3
Temperature (Field)	deg c	--	15	6.5	8.9	7.1	8.8	7.3	9.6	7.2
Total Dissolved Solids	mg/l	--	500	2270	2300	2290	2180	2260	2220	2440
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.0012	0.0024	0.0018	0.0022	0.001	0.002
Boron, dissolved	mg/l	5	--	1.3	1.2	1	1.1	1.2	0.782	1.21
Cadmium, dissolved	mg/l	0.005	--	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29	30	27	29	32	20.8	25.1
Chromium, dissolved	mg/l	0.05	--	<0.05	<0.0050	0.0051	0.0057	0.0055	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	0.00053	0.00053	<0.00050	<0.00050	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	<0.01	0.0017	0.0013	0.0035	0.0018	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<1	<0.1	<0.1	<0.1	0.13	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.005	0.00056	<0.00050	<0.00050	<0.00050	0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	39	37	36	37	40	23.2	32.5
Manganese, dissolved	mg/l	--	0.05	0.094	0.092	0.031	0.015	0.11	0.048	0.083
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18	17	16	17	19	11.9	14.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	900	760	750	740	830	716	83.2
Zinc, dissolved	mg/l	--	5	<0.05	0.0065	0.0063	<0.0050	0.0066	0.035	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	0.0018	0.0013	0.0022	0.0022	<0.004 [10]	<0.004 [10]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Nov-2012 95-2	95-2 29-May-2013 [32] 95-2	95-2 26-Nov-2013 GW-8	95-2 29-May-2014 95-2	95-2 19-Nov-2014 95-2	95-2 02-Jun-2015 95-2	95-2 26-Nov-2015 95-2
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	0.00070	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 26-May-2016	95-2 17-Nov-2016	95-2 24-May-2017	95-2 29-Nov-2017	95-2 24-May-2018	95-2 22-Nov-2018	95-2 19-Jun-2019
				95-2	95-2	95-2	95-2	95-2	95-2	95-2
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1020	1090	1120	1040	1050	1220	1060
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [11]	<25 [11]	<25 [11]	<25 [11]	<25 [11]	<25 [11]	<25 [11]
Alkalinity (Total as CaCO3)	mg/l	--	--	1030	1100	1140	1050	1060	1240	1070
Ammonia Nitrogen	mg/l	--	--	2.10	1.68	2.61	1.48	1.81	1.39	2.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	108	89	119	78	97	119	97
Chloride	mg/l	--	250	685	672	644	719	658	699	587
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3727	3843	3661	3404	3905	3391	3560
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	184	204	190	215	203	281	245
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.25 [11]	0.33	0.05	<0.05	0.36
Nitrogen, Total Kjeldahl	mg/l	--	--	3.2	2.7	3.2	2.9	2.8	2.7	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.28	7.86	8.14	8.16	8.10	8.39	8.02
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.17	2.30	3.53	2.74	2.16	1.78	2.57
Sulphate	mg/l	--	500 [6]	3	4	5	4	6	4	3
Temperature (Field)	deg c	--	15	10.7	9.2	10.0	7.3	10.4	6.3	11.4
Total Dissolved Solids	mg/l	--	500	2430	2360	2200	2300	2290	2330	2090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.004	0.005	0.002	0.002	0.002	0.001
Boron, dissolved	mg/l	5	--	0.962	1.35	0.919	1.06	1.03	1.16	0.842
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	24.5	26.1	25.7	27.4	28.2	36	32.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.014	0.012	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005
Copper, dissolved	mg/l	--	1	0.0008	0.0006	0.0008	0.0013	0.0013	0.0050	0.0025
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	0.106	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	29.8	33.8	30.5	35.5	32.3	46.5	39.7
Manganese, dissolved	mg/l	--	0.05	0.081	0.068	0.06	0.049	0.05	0.014	0.048
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.8	15.7	15.2	17.2	16.2	20.4	17.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	627	767	772	806	718	871	720
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	0.006
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.011	<0.002 [10]	<0.004 [10]	<0.002 [10]	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 26-May-2016	95-2 17-Nov-2016	95-2 24-May-2017	95-2 29-Nov-2017	95-2 24-May-2018	95-2 22-Nov-2018	95-2 19-Jun-2019
				95-2	95-2	95-2	95-2	95-2	95-2	95-2
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 20-Nov-2019 95-2	95-2 21-May-2020 95-2	95-2 26-Nov-2020 95-2	95-2 26-May-2021 95-2	95-2 30-Nov-2021 95-2
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1130	1110	1110	1140	1190
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25	26	32	<25	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1150	1140	1140	1160	1200
Ammonia Nitrogen	mg/l	--	--	1.59	1.35	1.34	1.67	1.20
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	132	76	101	70	82
Chloride	mg/l	--	250	720	748	627	574	631
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3810	3269	3288	3668	3545
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	290	269	266	259	227
Nitrate as N	mg/l	10.0	--	0.7	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.07	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.0	2.3	2.2	2.1	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.31	7.97	8.54	8.03	8.07
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.86	0.95	1.17	1.05	0.92
Sulphate	mg/l	--	500 [6]	6	8	3	2	2
Temperature (Field)	deg c	--	15	7.6	12.6	6.6	10.9	5.3
Total Dissolved Solids	mg/l	--	500	2470	2210	2150	2240	2230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.002	0.002	0.001
Boron, dissolved	mg/l	5	--	0.864	0.852	0.849	0.851	0.799
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.4	35.5	31.3	30.2	28.6
Chromium, dissolved	mg/l	0.05	--	<0.001	0.003	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0018	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0016	0.0008	0.0021	0.0016	0.0009
Iron, dissolved	mg/l	--	0.3	0.261	3.11	0.101	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	0.0018	0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	47.1	43.7	45.6	44.7	37.8
Manganese, dissolved	mg/l	--	0.05	0.062	0.183	0.066	0.089	0.041
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.2	18.3	17.1	17.2	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	851	748	813	731	641
Zinc, dissolved	mg/l	--	5	<0.005	0.012	0.006	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.004 [10]	0.007	<0.004 [12]	<0.010 [12]	<0.004 [12]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 20-Nov-2019 95-2	95-2 21-May-2020 95-2	95-2 26-Nov-2020 95-2	95-2 26-May-2021 95-2	95-2 30-Nov-2021 95-2
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Jun-1995	95-3 23-Nov-1995	95-3 12-Jun-1996	95-3 12-Oct-1996	95-3 18-Jun-1997	95-3 06-Nov-1997	95-3 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	700	797	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	574	653	634	651	644	660	650
Ammonia Nitrogen	mg/l	--	--	0.14	0.09	0.19	0.57	0.79	0.07	0.18
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	90	25	23	15	9	17	30
Chloride	mg/l	--	250	269	261	294	272	266	262	248
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2170	2340	2150	4000	2200	2130	2080
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	7.36	--	--	--	2.36	--	--
Hardness, Calcium Carbonate	mg/l	--	--	220	264	221	202	262	239	225
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	0.1	1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	8.5	0.8	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	8.36	0.71	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.03	7.45	7.1	7.96	7.29	7.94	--
Phosphate	mg/l	--	--	--	0.4	--	--	--	--	--
Phosphorus	mg/l	--	--	5.86	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	55	128	119	114	100	52	118
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1090	1170	1080	1120	1110	1070	1019
Total Organic Carbon	mg/l	--	--	19.2	7	7.5	6.8	6.9	7	6.8
Total Suspended Solids	mg/l	--	--	--	--	5070	5530	5010	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.61	0.61	0.618	0.77	0.8	0.74	0.85
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.6	36	30.2	28.6	35.5	34	29.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.05	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.05	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.03	19.9	0.132	0.25	0.16	0.14	1.46
Lead, dissolved	mg/l	0.01	--	0.0048	0.0059	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	31.5	41.7	34.8	31.4	38.1	37	36.2
Manganese, dissolved	mg/l	--	0.05	0.34	0.74	0.477	0.43	0.53	0.5	0.54
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	15.2	11.3	7.8	7.6	12.9	10.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	375	422	428	384	347	362	468
Zinc, dissolved	mg/l	--	5	0.01	0.05	0.01	0.01	0.01	0.01	0.32

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Jun-1995	95-3 23-Nov-1995	95-3 12-Jun-1996	95-3 12-Oct-1996	95-3 18-Jun-1997	95-3 06-Nov-1997	95-3 05-Jun-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 29-Oct-1998	95-3 06-May-1999	95-3 19-Oct-1999	95-3 05-May-2000	95-3 24-Oct-2000	95-3 14-Jun-2001	95-3 23-Nov-2001
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	756	810	813	953	927	753	828
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	25	1
Alkalinity (Total as CaCO3)	mg/l	--	--	620	664	666	781	760	659	679
Ammonia Nitrogen	mg/l	--	--	0.22	0.16	0.25	0.03	0.1	0.23	0.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	8	20	11	--	13	13
Chloride	mg/l	--	250	260	285	287	245	303	251	279
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2120	2050	2370	2000	2310	1900	2100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	186	218	223	240	237	236	243
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.2	0.3	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.06	1.19	--	--	1.22	0.62	0.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	6.8	7.8	7	7.01	7	6.68
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	3.39	0.46	0.67
Sulphate	mg/l	--	500 [6]	117	104	101	101	130	112	110
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1070	1040	1130	1000	1240	1180	1260
Total Organic Carbon	mg/l	--	--	9.6	7	6.5	6.1	--	5.8	7
Total Suspended Solids	mg/l	--	--	--	--	3000	1210	6230	1580	2100
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.95	0.68	1.02	0.77	0.84	0.76	1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.7	29.1	33.8	34	30	36.1	33
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.38	0.28	1.2	2.45	0.08	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0021	0.0002	0.0002	0.0022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	28.9	34.8	33.2	37.1	39.3	35.3	39
Manganese, dissolved	mg/l	--	0.05	0.56	0.52	0.35	0.54	0.4	0.57	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.8	2.2	11.1	4.3	12.6	4.3	7.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	414	437	439	432	550	402	448
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.17	0.26	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 29-Oct-1998	95-3 06-May-1999	95-3 19-Oct-1999	95-3 05-May-2000	95-3 24-Oct-2000	95-3 14-Jun-2001	95-3 23-Nov-2001
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.051	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 23-May-2002	95-3 06-Nov-2002	95-3 30-May-2003	95-3 09-Oct-2003	95-3 14-May-2004	95-3 19-Nov-2004	95-3 24-May-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	837	1050	487	--	802	854	824
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	686	864	399	537	657	700	675
Ammonia Nitrogen	mg/l	--	--	0.27	0.16	0.45	0.12	0.15	0.17	0.06
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	2	--	--	--
Chemical Oxygen Demand	mg/l	--	--	10	22	25	42	57	32	26
Chloride	mg/l	--	250	281	262	256	180	242	215	204
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2030	2260	1740	1930	2010	2160	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	147	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	248	248	225	170	225	213	228
Nitrate as N	mg/l	10.0	--	0.1	0.3	0.3	0.2	0.2	1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.47	0.8	1.69	0.57	1.51	0.57	0.49
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7	6.6	7.3	7.2	7.4	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.47	0.14	3.24	1.56	3.21	2.34	1.16
Sulphate	mg/l	--	500 [6]	111	114	97	131	115	130	126
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	13.5
Total Dissolved Solids	mg/l	--	500	1260	1290	870	1073	1005	1080	1180
Total Organic Carbon	mg/l	--	--	6	5.6	6	12	4.5	5.3	4.6
Total Suspended Solids	mg/l	--	--	1600	4150	9680	8180	5720	2200	2810
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	0.72	0.87	0.62	0.9	0.681	0.867	0.66
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	35.8	36.5	32.1	26.3	32.5	32	32.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.008	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.21	0.35	0.016	0.005	0.027
Lead, dissolved	mg/l	0.01	--	0.001	0.0013	0.0005	0.0005	0.0008	0.0013	0.0012
Magnesium, dissolved	mg/l	--	--	38.4	38	35.2	25.4	34.9	32.4	35.7
Manganese, dissolved	mg/l	--	0.05	0.62	0.17	0.55	0.377	0.63	0.487	0.605
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	6.9	9.7	8.4	7.9	8.6	8.4	8.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	395	441	406	379	412	410	376
Zinc, dissolved	mg/l	--	5	0.02	0.02	0.01	0.014	0.005	0.005	0.006

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 23-May-2002	95-3 06-Nov-2002	95-3 30-May-2003	95-3 09-Oct-2003	95-3 14-May-2004	95-3 19-Nov-2004	95-3 24-May-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 16-Nov-2005	95-3 25-May-2006	95-3 21-Nov-2006	95-3 15-May-2007	95-3 30-Nov-2007	95-3 22-May-2008	95-3 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	172	725	738	687	750	680	725
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	705	725	738	687	750	680	725
Ammonia Nitrogen	mg/l	--	--	<0.01	0.18	<0.01	0.05	0.03	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	32	15	12	63	67	18	<5
Chloride	mg/l	--	250	190	216	203	211	174	187	177
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1900	1700	1800	1400	1000	1750	1650
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	223	211	213	229	200	206	188
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.2	0.1	1.1	0.2	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.28	1.76	0.28	0.58	0.67	0.61	0.48
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.3	7.7	8	7.7	7.1	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.09	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	136	132	134	122	125	122	123
Temperature (Field)	deg c	--	15	--	4	6	5.8	5	8	8
Total Dissolved Solids	mg/l	--	500	1290	1260	1280	1220	1300	1210	1210
Total Organic Carbon	mg/l	--	--	6	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	460	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001	0.001	0.0008	0.0012	0.0005
Boron, dissolved	mg/l	5	--	0.933	0.711	0.881	0.679	0.942	0.736	0.967
Cadmium, dissolved	mg/l	0.005	--	0.0001	<0.005	0.0002	0.00024	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	33.9	30.3	31.6	34.7	30.9	31	28.4
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.046	<0.005	0.014	0.072	0.01	0.011	<0.005
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	<0.0001	0.00012	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	33.7	32.9	32.5	34.7	29.8	31.2	28.5
Manganese, dissolved	mg/l	--	0.05	0.298	0.408	0.282	0.686	0.107	0.331	0.195
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.1	8.1	9.2	8.3	8.8	8.3	8.8
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	470	417	426	396	472	424	409
Zinc, dissolved	mg/l	--	5	0.012	<0.005	0.008	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 16-Nov-2005	95-3 25-May-2006	95-3 21-Nov-2006	95-3 15-May-2007	95-3 30-Nov-2007	95-3 22-May-2008	95-3 10-Nov-2008
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 19-May-2009 G-23	95-3 26-Nov-2009 M-14	95-3 25-May-2010 M-27	95-3 20-Oct-2010 G-17	95-3 24-May-2011 [39] G-32	95-3 29-Nov-2011 [40] 95-3	95-3 31-May-2012 95-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	724	740	707	737	748	739	710
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	<2 [9]	<2 [9]	<2 [9]	2.8
Alkalinity (Total as CaCO3)	mg/l	--	--	724	740	707	737	748	739	720
Ammonia Nitrogen	mg/l	--	--	0.07	0.02	0.11	0.08	0.08	<0.02	<0.050
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	27	20	25	20	15	30
Chloride	mg/l	--	250	173	174	155	158	169	159	140
Conductivity	uS/cm	--	--	2020	2040	1990	1990	2030	1940	--
Conductivity (Field)	uS/cm	--	--	1700	1777	1756	1972	1533	1798	1745
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	192	183	201	197	207	177	190
Nitrate as N	mg/l	10.0	--	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.29	0.15	0.42	1.08	0.19	3.57	0.89
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.61	7.70	7.93	7.77	8.24	8.06	7.61
pH (Field)	-	--	--	--	6.85	6.98	7.22	7.03	7.12	7.32
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.51	0.26	0.87	1.20	0.68	0.23	0.61
Sulphate	mg/l	--	500 [6]	103	101	99	102	96	89	86
Temperature (Field)	deg c	--	15	7	8.3	26.1	11.3	19.5	7.9	9.1
Total Dissolved Solids	mg/l	--	500	1310	1330	1290	1290	1320	1260	1120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	1.21	1.0	0.93	1.3	0.79	1.2	0.87
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	29	27	31	31	27	28	29
Chromium, dissolved	mg/l	0.05	--	0.009	0.007	<0.005	0.005	0.008	0.006	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.0002	<0.0002	0.0005	0.0003	0.0004	0.0004	<0.00050
Copper, dissolved	mg/l	--	1	0.004	0.003	0.003	0.003	0.003	0.002	0.0041
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	29	28	30	29	34	26	30
Manganese, dissolved	mg/l	--	0.05	0.02	0.03	1.16	0.30	0.49	0.51	0.17
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7	8	7	8	7	8	7.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	351	380	368	373	395	358	380
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	<0.01	0.01	<0.01	0.0060

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 19-May-2009 G-23	95-3 26-Nov-2009 M-14	95-3 25-May-2010 M-27	95-3 20-Oct-2010 G-17	95-3 24-May-2011 [39] G-32	95-3 29-Nov-2011 [40] 95-3	95-3 31-May-2012 95-3
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.004	<0.0008	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.01	<0.001	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.04	<0.0080	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.0004	<0.00020

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Nov-2012 95-3	95-3 29-May-2013 MW-W	95-3 26-Nov-2013 GW-7	95-3 29-May-2014 95-3	95-3 19-Nov-2014 [41] MW-W	95-3 02-Jun-2015 95-3	95-3 26-Nov-2015 95-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	720	710	720	720	740	743	747
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5.4	3.7	4.4	5.4	4.4	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	730	710	730	720	740	747	750
Ammonia Nitrogen	mg/l	--	--	0.19	0.35	0.12	0.22	0.33	0.31	0.33
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	31	81	57	35	150	188	348
Chloride	mg/l	--	250	140	160	140	150	160	173	162
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1753	1617	1615	1686	1842	1824	1803
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	200	210	180	190	200	151	154
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.93	3.5	3.6	6.4	4.6	2.8	5.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	7.75	7.81	7.90	7.80	--	--
pH (Field)	-	--	--	7.10	7.62	7.79	7.43	7.19	7.25	7.35
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.4	8.0	3.0	3.0	13	4.47	9.07
Sulphate	mg/l	--	500 [6]	78	83	79	71	83	81	87
Temperature (Field)	deg c	--	15	6.5	9.5	6.5	9.6	6.8	7.9	6.2
Total Dissolved Solids	mg/l	--	500	1150	1160	1150	1140	1140	1010	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1.2	0.85	1	1.1	1.1	0.616	1.19
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29	31	28	28	30	22.6	24.1
Chromium, dissolved	mg/l	0.05	--	<0.005	0.0065	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.00066	0.00066	<0.00050	<0.00050	0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.002	0.0025	0.0023	0.0034	<0.0020	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31	31	27	29	29	22.9	22.6
Manganese, dissolved	mg/l	--	0.05	0.27	0.88	0.45	0.55	0.59	0.637	0.536
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.5	7.1	7.6	7.2	8.1	5.43	6.83
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	410	380	370	370	410	325	426
Zinc, dissolved	mg/l	--	5	0.008	<0.0050	0.036	<0.0050	<0.0050	<0.005	0.013

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Nov-2012 95-3	95-3 29-May-2013 MW-W	95-3 26-Nov-2013 GW-7	95-3 29-May-2014 95-3	95-3 19-Nov-2014 [41] MW-W	95-3 02-Jun-2015 95-3	95-3 26-Nov-2015 95-3
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	0.00088	<0.00020	<0.00040	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 26-May-2016 95-3	95-3 17-Nov-2016 95-3	95-3 24-May-2017 95-3	95-3 29-Nov-2017 95-3	95-3 24-May-2018 95-3	95-3 22-Nov-2018 95-3	95-3 19-Jun-2019 95-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	768	753	785	1030	805	807	750
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	7
Alkalinity (Total as CaCO3)	mg/l	--	--	770	756	789	1040	810	810	757
Ammonia Nitrogen	mg/l	--	--	0.51	0.35	0.31	0.26	0.27	0.10	0.29
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	184	59	289	25	312	183	105
Chloride	mg/l	--	250	187	162	181	65	191	172	189
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1892	1917	1962	1609	1988	1662	1763
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	160	185	178	634	140	232	232
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	2.1	3.4	0.8	1.8	3.1	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.87	7.94	7.45	6.84	7.42	7.74	7.55
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	6.33	4.88	7.14	0.44	3.13	5.58	2.92
Sulphate	mg/l	--	500 [6]	87	89	82	128	84	86	85
Temperature (Field)	deg c	--	15	10.6	9.4	9.2	8.1	8.6	6.1	10.8
Total Dissolved Solids	mg/l	--	500	1170	1080	1140	1140	1190	1050	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.761	1.43	0.826	0.931	0.634	1.12	0.831
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25.2	28.5	27	125	24.4	34.4	36.3
Chromium, dissolved	mg/l	0.05	--	<0.001	0.008	0.006	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0011	0.0025	0.0014	0.0010	0.0037	0.0050	0.0014
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	1.3	0.171	0.123	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	23.7	27.7	26.8	78.2	19.1	35.4	34.3
Manganese, dissolved	mg/l	--	0.05	0.573	0.294	0.658	0.884	0.727	3.41	0.599
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.54	7.96	6.93	12.3	4.98	9.36	8.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	276	399	345	231	249	455	375
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 26-May-2016 95-3	95-3 17-Nov-2016 95-3	95-3 24-May-2017 95-3	95-3 29-Nov-2017 95-3	95-3 24-May-2018 95-3	95-3 22-Nov-2018 95-3	95-3 19-Jun-2019 95-3
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.002 [10]	<0.001	<0.001	0.003	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 20-Nov-2019 95-3	95-3 21-May-2020 95-3	95-3 26-Nov-2020 95-3	95-3 26-May-2021 95-3	95-3 30-Nov-2021 95-3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	698	659	691	696	604
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	6	9	<5	8
Alkalinity (Total as CaCO3)	mg/l	--	--	703	665	699	699	612
Ammonia Nitrogen	mg/l	--	--	0.11	0.11	0.04	0.17	0.21
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	111	37	89	137	96
Chloride	mg/l	--	250	164	184	163	158	150
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1815	1713	1601	1731	1642
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	237	225	179	176	159
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.6	0.7	0.8	1.5	5.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.21	8.26	7.49	6.97	7.14
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.97	0.66	0.67	1.70	16.1
Sulphate	mg/l	--	500 [6]	88	89	90	81	101
Temperature (Field)	deg c	--	15	7.1	10.3	6.2	11.3	4.5
Total Dissolved Solids	mg/l	--	500	1090	998	1000	1090	1000
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.904	0.745	0.889	0.705	0.819
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	36.5	34.9	28.1	26.7	25.2
Chromium, dissolved	mg/l	0.05	--	<0.001	0.002	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0020	<0.0005	0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0016	0.0021	0.0034	0.0011	0.0014
Iron, dissolved	mg/l	--	0.3	<0.1	2.7	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0040	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	35.5	33.5	26.5	26.4	23.2
Manganese, dissolved	mg/l	--	0.05	0.444	0.921	0.069	0.639	0.195
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11.1	7.71	7.25	5.79	6.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	374	377	345	281	320
Zinc, dissolved	mg/l	--	5	<0.005	0.01	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 20-Nov-2019 95-3	95-3 21-May-2020 95-3	95-3 26-Nov-2020 95-3	95-3 26-May-2021 95-3	95-3 30-Nov-2021 95-3
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.003	<0.001	<0.004 [12]	<0.001
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 28-Jun-1995	95-5 22-Nov-1995	95-5 12-Oct-1996	95-5 06-Nov-1997	95-5 05-Jun-1998	95-5 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	1181	1420	--	–	--	1610
Alkalinity, Carbonate as CaCO3	mg/l	–	--	1	1	--	–	--	1
Alkalinity (Total as CaCO3)	mg/l	–	--	968	1160	1250	1250	875	1320
Ammonia Nitrogen	mg/l	–	--	1.59	7.5	4.64	4.65	7.51	4.42
Chemical Oxygen Demand	mg/l	–	--	400	260	148	96	288	61
Chloride	mg/l	–	250	703	1430	1370	1340	1390	1510
Conductivity	uS/cm	–	--	–	--	--	–	--	--
Conductivity (Field)	uS/cm	–	--	5340	6120	2830	6020	5370	5220
Dissolved Oxygen (Field)	mg/l	–	--	3	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	–	--	315	467	337	424	347	369
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	1	--
Nitrite as N	mg/l	1.0	--	–	--	--	–	--	--
Nitrogen, Total Kjeldahl	mg/l	–	--	13.8	19.3	--	–	--	37.1
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	--	--
Nitrogen, Organic	mg/l	–	--	12.21	11.8	--	–	--	--
pH	-	–	--	–	--	--	–	--	--
pH (Field)	-	–	--	7.94	8.33	7.87	8.16	--	7.9
Phosphate	mg/l	–	--	–	41	--	–	--	--
Phosphorus	mg/l	–	--	21	--	--	–	--	--
Sulphate	mg/l	–	500 [6]	14	10	3	9	73	2
Temperature (Field)	deg c	–	15	–	--	--	–	--	--
Total Dissolved Solids	mg/l	–	500	268	320	2830	3020	2670	2710
Total Organic Carbon	mg/l	–	--	26.1	19.9	31.8	20.2	27.7	24.5
Total Suspended Solids	mg/l	–	--	–	--	58.8	–	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	–	--	--	–	--	--
Boron, dissolved	mg/l	5	--	1.02	1.13	1.28	1.41	1.52	1.62
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	–	--	--
Calcium, dissolved	mg/l	–	--	40.4	48.7	35	46.5	35.1	38.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.1	0.01	0.02	0.01	0.01
Cobalt, dissolved	mg/l	–	--	–	--	--	–	--	--
Copper, dissolved	mg/l	–	1	0.02	0.04	0.01	0.01	0.03	0.01
Iron, dissolved	mg/l	–	0.3	0.04	58.1	0.7	13.3	6.37	0.56
Lead, dissolved	mg/l	0.01	--	0.0008	0.007	0.0002	0.001	0.001	0.0002
Magnesium, dissolved	mg/l	–	--	51.2	82.8	59.8	73.8	62.1	65.3
Manganese, dissolved	mg/l	–	0.05	0.31	1.21	0.18	0.4	0.23	0.13
Mercury, dissolved	mg/l	0.001	--	–	--	--	–	--	--
Molybdenum, dissolved	mg/l	–	--	–	--	--	–	--	--
Nickel, dissolved	mg/l	–	--	0.02	0.07	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	–	--	–	41.4	32.1	39.3	36.4	41.1
Selenium, dissolved	mg/l	0.05	--	–	--	--	–	--	--
Sodium, dissolved	mg/l	–	200 [7]	832	1050	1230	1140	1370	1340
Zinc, dissolved	mg/l	–	5	0.01	0.11	0.01	0.04	0.22	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 28-Jun-1995	95-5 22-Nov-1995	95-5 12-Oct-1996	95-5 06-Nov-1997	95-5 05-Jun-1998	95-5 06-May-1999
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	0.001	--	--	–	--	--
Semi-VOCs									
Styrene	mg/l	–	--	–	--	--	–	--	--
VOCs									
1,1-Dichloroethane	mg/l	–	--	–	--	--	–	--	--
Benzene	mg/l	0.001	--	–	--	--	–	--	--
Ethylbenzene	mg/l	0.14	0.0016	–	--	--	–	--	--
m,p-Xylenes	mg/l	–	--	–	--	--	–	--	--
Methylene Chloride	mg/l	0.05	--	–	--	--	–	--	--
o-Xylene	mg/l	–	--	–	--	--	–	--	--
Toluene	mg/l	0.06	0.024	–	--	--	–	--	--
Vinyl Chloride	mg/l	0.001	--	–	--	--	–	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 24-Oct-2000	95-5 14-Jun-2001	95-5 06-Nov-2002	95-5 30-May-2003	95-5 19-Nov-2004	95-5 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	1620	1290	1680	1460	1550	292
Alkalinity, Carbonate as CaCO3	mg/l	–	--	1	85	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	–	--	1320	1200	1380	1200	1270	1200
Ammonia Nitrogen	mg/l	–	--	2.12	4.14	3.95	3.71	3.89	3.62
Chemical Oxygen Demand	mg/l	–	--	–	52	150	81	315	78
Chloride	mg/l	–	250	1520	1480	1430	1470	1500	1300
Conductivity	uS/cm	–	--	–	--	--	–	--	--
Conductivity (Field)	uS/cm	–	--	6090	5000	5890	5040	6200	4200
Dissolved Oxygen (Field)	mg/l	–	--	–	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	–	--	417	370	357	327	340	356
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	1	0.4
Nitrite as N	mg/l	1.0	--	–	--	--	–	--	--
Nitrogen, Total Kjeldahl	mg/l	–	--	4.76	5.13	7.66	5.94	4.82	5.18
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	--	--
Nitrogen, Organic	mg/l	–	--	–	--	--	–	--	--
pH	-	–	--	–	--	--	–	--	--
pH (Field)	-	–	--	8.26	8.1	8	7.2	7.9	--
Phosphate	mg/l	–	--	–	--	--	–	--	--
Phosphorus	mg/l	–	--	3.58	1.6	15.3	3.17	9.54	2.19
Sulphate	mg/l	–	500 [6]	1	1	2	1	10	1
Temperature (Field)	deg c	–	15	–	--	--	–	--	--
Total Dissolved Solids	mg/l	–	500	3450	3250	3390	3330	3100	3470
Total Organic Carbon	mg/l	–	--	–	17.7	18.1	18.9	16.9	19.7
Total Suspended Solids	mg/l	–	--	1830	323	7160	2590	2850	128
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	0.003	0.001	0.002
Boron, dissolved	mg/l	5	--	1.56	1.69	1.52	1.47	1.53	1.6
Cadmium, dissolved	mg/l	0.005	--	–	--	--	–	--	<0.0001
Calcium, dissolved	mg/l	–	--	38.4	43.2	37.1	36.4	37.3	39.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	–	--	–	--	--	–	--	<0.005
Copper, dissolved	mg/l	–	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	–	0.3	0.45	0.4	0.45	0.97	0.324	0.385
Lead, dissolved	mg/l	0.01	--	**0.022**	0.0002	**0.0121**	0.0007	0.0022	0.0017
Magnesium, dissolved	mg/l	–	--	77.9	63.6	64.3	57.3	60.1	62.5
Manganese, dissolved	mg/l	–	0.05	0.12	0.12	0.12	0.1	0.104	0.107
Mercury, dissolved	mg/l	0.001	--	–	--	--	–	--	<0.00006
Molybdenum, dissolved	mg/l	–	--	–	--	--	–	--	<0.01
Nickel, dissolved	mg/l	–	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	–	--	30.8	26.7	31.4	33	34.4	38.4
Selenium, dissolved	mg/l	0.05	--	–	--	--	–	--	<0.001
Sodium, dissolved	mg/l	–	200 [7]	1270	1240	1320	1060	1470	1350
Zinc, dissolved	mg/l	–	5	0.01	0.01	0.02	0.01	0.019	0.007

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 24-Oct-2000	95-5 14-Jun-2001	95-5 06-Nov-2002	95-5 30-May-2003	95-5 19-Nov-2004	95-5 16-Nov-2005
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	0.004	0.029	0.001	0.001	0.001	<0.001
Semi-VOCs									
Styrene	mg/l	–	--	–	--	--	–	--	--
VOCs									
1,1-Dichloroethane	mg/l	–	--	–	--	--	–	--	--
Benzene	mg/l	0.001	--	–	--	--	–	--	--
Ethylbenzene	mg/l	0.14	0.0016	–	--	--	–	--	--
m,p-Xylenes	mg/l	–	--	–	--	--	–	--	--
Methylene Chloride	mg/l	0.05	--	–	--	--	–	--	--
o-Xylene	mg/l	–	--	–	--	--	–	--	--
Toluene	mg/l	0.06	0.024	–	--	--	–	--	--
Vinyl Chloride	mg/l	0.001	--	–	--	--	–	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 15-May-2007	95-5 10-Nov-2008	95-5 26-Nov-2009 [8] M-3	95-5 24-May-2011 [30] G-33	95-5 28-Nov-2012 95-5	95-5 29-May-2014 [32] 95-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	1270	1320	1280	1230	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	–	--	<5	<5	30	43	14	30
Alkalinity (Total as CaCO3)	mg/l	–	--	1270	1320	1310	1270	1200	1300
Ammonia Nitrogen	mg/l	–	--	3.55	3.52	3.72	3.60	3.9	3.9
Chemical Oxygen Demand	mg/l	–	--	181	84	93	70	77	70
Chloride	mg/l	–	250	1410	1510	1690	1390	1300	1500
Conductivity	uS/cm	–	--	–	--	6570	6570	--	--
Conductivity (Field)	uS/cm	–	--	4400	>5000	>3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	–	--	–	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	–	--	326	320	361	365	360	310
Nitrate as N	mg/l	10.0	--	0.1	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	–	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	–	--	5.99	5.37	4.84	4.32	90	9.9
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	<0.10	<0.10
Nitrogen, Organic	mg/l	–	--	–	--	--	–	--	--
pH	-	–	--	–	--	8.39	8.57	--	8.42
pH (Field)	-	–	--	8.5	8	7.42	8.05	8.12	7.51
Phosphate	mg/l	–	--	–	--	--	–	--	--
Phosphorus	mg/l	–	--	–	--	2.78	1.68	2.0	1.7
Sulphate	mg/l	–	500 [6]	2	1	4	<1	<1	<1
Temperature (Field)	deg c	–	15	10.8	7	9.1	19.2	6.8	9.5
Total Dissolved Solids	mg/l	–	500	3470	3590	4270	4270	3460	3460
Total Organic Carbon	mg/l	–	--	–	--	--	–	--	--
Total Suspended Solids	mg/l	–	--	–	--	--	–	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0089	0.0073	<0.01	<0.01	0.002	0.0023 [38]
Boron, dissolved	mg/l	5	--	1.42	1.47	2.1	1.9	1.8	1.5
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	–	--	36.7	35.7	39	39	38	33
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.01
Cobalt, dissolved	mg/l	–	--	<0.005	<0.005	<0.002	0.0008	0.0006	0.00054
Copper, dissolved	mg/l	–	1	<0.002	<0.002	<0.01	0.002	0.001	0.0014
Iron, dissolved	mg/l	–	0.3	0.893	0.225	<0.3	0.36	0.2	0.27
Lead, dissolved	mg/l	0.01	--	0.00019	<0.00002	<0.01	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	–	--	57	56.2	64	65	64	55
Manganese, dissolved	mg/l	–	0.05	0.107	0.09	<0.1	0.09	0.087	0.085
Mercury, dissolved	mg/l	0.001	--	–	--	--	–	--	--
Molybdenum, dissolved	mg/l	–	--	–	--	--	–	--	--
Nickel, dissolved	mg/l	–	--	–	--	--	–	--	--
Potassium, dissolved	mg/l	–	--	37.1	34.4	33	36	33	29
Selenium, dissolved	mg/l	0.05	--	–	--	--	–	--	--
Sodium, dissolved	mg/l	–	200 [7]	1160	1160	1345	1160	1300	1200
Zinc, dissolved	mg/l	–	5	<0.005	<0.005	<0.1	0.02	<0.005	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 15-May-2007	95-5 10-Nov-2008	95-5 26-Nov-2009 [8] M-3	95-5 24-May-2011 [30] G-33	95-5 28-Nov-2012 95-5	95-5 29-May-2014 [32] 95-5
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0011
Semi-VOCs									
Styrene	mg/l	–	--	–	<0.0006	--	–	--	--
VOCs									
1,1-Dichloroethane	mg/l	–	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00020
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	0.00011	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00020
m,p-Xylenes	mg/l	–	--	<0.001	<0.001	<0.0010	<0.0010	0.00018	<0.00020
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.0010
o-Xylene	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00020
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00040
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00040

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 26-Nov-2015 95-5	95-5 24-May-2017 95-5	95-5 22-Nov-2018 [42] 95-5	95-5 21-May-2020 95-5	95-5 30-Nov-2021 95-5
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	1170	1210	1230	1250	1250
Alkalinity, Carbonate as CaCO3	mg/l	–	--	<25 [28]	<25 [11]	38	<25 [13]	<25
Alkalinity (Total as CaCO3)	mg/l	–	--	1190	1230	1270	1280	1250
Ammonia Nitrogen	mg/l	–	--	4.98	5.58	--	3.97	3.60
Chemical Oxygen Demand	mg/l	–	--	277	237	--	126	129
Chloride	mg/l	–	250	1490	1430	1430	1740	1420
Conductivity	uS/cm	–	--	–	--	--	–	--
Conductivity (Field)	uS/cm	–	--	>3999	3999	--	>3999	>3999
Dissolved Oxygen (Field)	mg/l	–	--	–	--	--	–	--
Hardness, Calcium Carbonate	mg/l	–	--	317	282	456	410	355
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.50 [11]	<0.05	<0.05	<1.00 [13]
Nitrogen, Total Kjeldahl	mg/l	–	--	9.1	11.0	--	4.4	5.0
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	--
Nitrogen, Organic	mg/l	–	--	–	--	--	–	--
pH	-	–	--	–	--	--	–	--
pH (Field)	-	–	--	8.14	8.05	--	8.10	8.18
Phosphate	mg/l	–	--	–	--	--	–	--
Phosphorus	mg/l	–	--	7.23	12.2	--	1.63	1.67
Sulphate	mg/l	–	500 [6]	<1	1	6	<1	2
Temperature (Field)	deg c	–	15	7.1	11.9	--	14.5	5.1
Total Dissolved Solids	mg/l	–	500	3420	3630	3600	3700	3580
Total Organic Carbon	mg/l	–	--	–	--	--	–	--
Total Suspended Solids	mg/l	–	--	–	--	--	–	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.002	0.008	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	1.46	1.18	1.59	1.59	1.62
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	–	--	31.3	33.2	52.4	42.4	37.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.021	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	–	--	<0.0005	<0.0005	0.0008	0.0007	0.0005
Copper, dissolved	mg/l	–	1	<0.0005	0.0010	0.0023	0.0023	0.0011
Iron, dissolved	mg/l	–	0.3	0.126	<0.1	0.195	0.263	0.151
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	–	--	58	48.4	79	73.9	63.4
Manganese, dissolved	mg/l	–	0.05	0.068	0.065	0.098	0.093	0.077
Mercury, dissolved	mg/l	0.001	--	–	--	--	–	--
Molybdenum, dissolved	mg/l	–	--	–	--	--	–	--
Nickel, dissolved	mg/l	–	--	–	--	--	–	--
Potassium, dissolved	mg/l	–	--	25.6	30	40.7	34.2	28.8
Selenium, dissolved	mg/l	0.05	--	–	--	--	–	--
Sodium, dissolved	mg/l	–	200 [7]	1110	1140	1140	1170	963
Zinc, dissolved	mg/l	–	5	0.014	<0.005	<0.005	0.009	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 26-Nov-2015 95-5	95-5 24-May-2017 95-5	95-5 22-Nov-2018 [42] 95-5	95-5 21-May-2020 95-5	95-5 30-Nov-2021 95-5
Phenols								
Phenolics, Total Recoverable	mg/l	–	--	<0.002 [10]	<0.010 [12]	--	0.010	<0.004 [12]
Semi-VOCs								
Styrene	mg/l	–	--	–	--	--	–	--
VOCs								
1,1-Dichloroethane	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Jun-1995	95-6 22-Nov-1995	95-6 12-Jun-1996	95-6 12-Oct-1996	95-6 18-Jun-1997	95-6 06-Nov-1997	95-6 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	832	1070	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	8	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	682	886	901	905	914	966	840
Ammonia Nitrogen	mg/l	--	--	1.14	0.89	1.37	1.46	0.01	0.87	0.79
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	115	48	29	25	34	42	64
Chloride	mg/l	--	250	389	825	839	816	783	952	861
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3380	4350	4020	4380	3230	4040	4290
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.45	--	--	--	1.97	--	--
Hardness, Calcium Carbonate	mg/l	--	--	255	338	349	320	387	374	336
Nitrate as N	mg/l	10.0	--	0.1	0.8	0.1	0.1	0.1	0.1	2.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.3	3.5	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.16	2.61	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.89	8.09	7.95	7.56	8.02	7.98	--
Phosphate	mg/l	--	--	--	0.3	--	--	--	--	--
Phosphorus	mg/l	--	--	6.1	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	21	11	9	8	5	3	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1700	2190	2010	2190	1630	2030	2140
Total Organic Carbon	mg/l	--	--	14.1	13.5	14.4	14	15.1	14.6	14
Total Suspended Solids	mg/l	--	--	--	--	2910	1490	1320	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.53	0.59	0.678	0.71	0.91	0.79	0.84
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	38.1	43.6	43.3	40.8	52.4	50.3	41.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	3.06	0.5	0.44	0.39	0.28	0.45
Lead, dissolved	mg/l	0.01	--	0.0008	0.0001	0.0002	0.0002	0.0002	0.0002	0.0018
Magnesium, dissolved	mg/l	--	--	38.4	54.8	57.7	52.2	61.4	59.6	55.7
Manganese, dissolved	mg/l	--	0.05	0.33	0.27	0.213	0.18	0.19	0.19	0.18
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	20.7	25.4	19.7	19.3	21.9	20.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	566	721	753	668	643	788	967
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.16

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Jun-1995	95-6 22-Nov-1995	95-6 12-Jun-1996	95-6 12-Oct-1996	95-6 18-Jun-1997	95-6 06-Nov-1997	95-6 05-Jun-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 30-Oct-1998	95-6 06-May-1999	95-6 19-Oct-1999	95-6 05-May-2000	95-6 24-Oct-2000	95-6 14-Jun-2001	95-6 23-Nov-2001
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1090	1130	936	1369	1280	923	1050
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	55	1	1	62	1
Alkalinity (Total as CaCO3)	mg/l	--	--	892	930	859	1122	1050	861	860
Ammonia Nitrogen	mg/l	--	--	0.99	0.97	1.23	0.05	0.66	1.62	1.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	50	45	36	--	41	37
Chloride	mg/l	--	250	850	890	920	855	900	836	859
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4060	3800	3600	3775	4020	3800	3610
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	278	338	312	337	353	320	344
Nitrate as N	mg/l	10.0	--	--	--	0.1	--	0.4	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.82	2.06	--	0.2	1.83	2.57	2.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7.6	7.8	8	8.01	8	7.55
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	2.01	0.8	0.34
Sulphate	mg/l	--	500 [6]	4	3	1	3	3	3	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2040	2040	1780	1888	2250	2060	2110
Total Organic Carbon	mg/l	--	--	16.8	18.2	17.7	16.2	--	14	20
Total Suspended Solids	mg/l	--	--	--	--	520	360	3200	186	174
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.002
Boron, dissolved	mg/l	5	--	0.94	0.84	0.92	0.93	0.82	0.8	0.99
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	38	41.7	43.8	44.2	41.4	46.5	43.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.22	0.21	0.68	1.14	0.06	0.26	0.19
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0003	0.0002	**0.022**	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	44.5	56.1	48.5	54.3	60.6	49.4	57.4
Manganese, dissolved	mg/l	--	0.05	0.2	0.19	0.17	0.19	0.21	0.2	0.23
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	21.9	22.1	19	13.8	19	12.6	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	803	835	926	810	790	750	850
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.06	0.09	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 30-Oct-1998	95-6 06-May-1999	95-6 19-Oct-1999	95-6 05-May-2000	95-6 24-Oct-2000	95-6 14-Jun-2001	95-6 23-Nov-2001
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.024	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 23-May-2002	95-6 06-Nov-2002	95-6 30-May-2003	95-6 09-Oct-2003	95-6 14-May-2004	95-6 19-Nov-2004	95-6 24-May-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	983	1210	1110	--	1000	1060	1110
Alkalinity, Carbonate as CaCO3	mg/l	--	--	73	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	928	990	910	915	820	870	910
Ammonia Nitrogen	mg/l	--	--	1.24	1.37	2.13	1.91	1.38	1.5	1.58
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	3	--	--	--
Chemical Oxygen Demand	mg/l	--	--	58	54	79	53	52	51	48
Chloride	mg/l	--	250	870	801	895	876	831	826	793
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3520	3990	3600	3900	3750	4310	3400
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	205	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	337	320	302	311	289	270	325
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	0.1	0.3	1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.43	2.57	4.34	2.76	2.53	2.26	2.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.35	7.8	7.2	7.6	8	7.9	7.3
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.51	0.56	2.95	0.57	0.67	0.48	0.33
Sulphate	mg/l	--	500 [6]	2	3	2	2	2	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	10.2
Total Dissolved Solids	mg/l	--	500	2190	2220	2200	2348	1875	2155	2180
Total Organic Carbon	mg/l	--	--	16	14	14.5	30	13.9	14.1	14
Total Suspended Solids	mg/l	--	--	50	228	2670	228	176	950	97
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.003	0.004	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.85	0.85	0.73	0.784	0.692	0.754	0.763
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	45.1	41.6	41.7	41.8	40	38	43.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.001	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.3	0.21	0.79	0.386	0.245	0.268	0.696
Lead, dissolved	mg/l	0.01	--	0.0002	0.0018	0.0009	0.0009	0.001	0.0008	0.0024
Magnesium, dissolved	mg/l	--	--	54.6	52.6	48	50.2	45.9	42.6	52.8
Manganese, dissolved	mg/l	--	0.05	0.22	0.2	0.19	0.146	0.22	0.22	0.207
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	18.4	18.6	17.9	19.6	17.9	18.5	20.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	728	760	688	809	689	690	738
Zinc, dissolved	mg/l	--	5	0.01	0.02	0.01	0.005	0.005	0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 23-May-2002	95-6 06-Nov-2002	95-6 30-May-2003	95-6 09-Oct-2003	95-6 14-May-2004	95-6 19-Nov-2004	95-6 24-May-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 16-Nov-2005	95-6 25-May-2006	95-6 21-Nov-2006	95-6 15-May-2007	95-6 30-Nov-2007	95-6 22-May-2008	95-6 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	222	925	940	980	985	950	1010
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	910	925	940	980	985	950	1010
Ammonia Nitrogen	mg/l	--	--	1.3	1.43	1.63	1.52	1.6	1.22	1.54
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	52	36	69	64	81	50	53
Chloride	mg/l	--	250	808	874	896	804	855	919	927
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3200	3400	3600	2900	3200	3700	3600
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	309	293	288	303	315	292	302
Nitrate as N	mg/l	10.0	--	0.7	0.2	0.2	<0.1	<0.1	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.19	2.3	3.15	2.71	2.55	1.32	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.9	7	8.5	8.4	7.9	7.9
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.33	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	2	1	2	1	<1	1	<1
Temperature (Field)	deg c	--	15	--	6	7	8.9	7.5	9.5	8
Total Dissolved Solids	mg/l	--	500	2260	2260	2280	2210	2500	2360	2380
Total Organic Carbon	mg/l	--	--	38.6	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	244	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.0049	0.0058	0.0049	0.0049	0.0043
Boron, dissolved	mg/l	5	--	0.829	0.673	0.72	0.707	0.794	0.747	0.739
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.005	<0.0001	0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	43.4	40.3	39.1	41.7	44.7	39.6	41.1
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.004	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.024	0.181	0.037	0.46	0.175	0.529	0.006
Lead, dissolved	mg/l	0.01	--	0.0012	0.0002	0.0001	0.00004	<0.00002	0.00012	<0.00002
Magnesium, dissolved	mg/l	--	--	48.8	46.9	46.2	48.4	49.4	47	48.4
Manganese, dissolved	mg/l	--	0.05	0.19	0.168	0.14	0.204	0.194	0.159	0.162
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	21.6	18.5	18.6	18.7	21.9	18.4	18.6
Selenium, dissolved	mg/l	0.05	--	0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	810	745	715	704	934	761	732
Zinc, dissolved	mg/l	--	5	0.01	<0.005	0.012	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 16-Nov-2005	95-6 25-May-2006	95-6 21-Nov-2006	95-6 15-May-2007	95-6 30-Nov-2007	95-6 22-May-2008	95-6 10-Nov-2008
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 19-May-2009 G-27	95-6 26-Nov-2009 [37] J-7	95-6 25-May-2010 [30] M-25	95-6 20-Oct-2010 [30] G-22	95-6 24-May-2011 [30] G-31	95-6 29-Nov-2011 [30] 95-6	95-6 31-May-2012 95-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	927	947	920	935	926	957	880
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	<2 [9]	30	<2 [9]	14
Alkalinity (Total as CaCO3)	mg/l	--	--	927	947	920	935	956	957	900
Ammonia Nitrogen	mg/l	--	--	1.87	1.48	1.55	1.53	1.52	1.49	1.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	55	45	55	45	5	53
Chloride	mg/l	--	250	833	814	773	844	826	854	750
Conductivity	uS/cm	--	--	4190	4230	4210	4200	4300	4270	--
Conductivity (Field)	uS/cm	--	--	3600	3647	3944	7400	3216	3681	3499
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	298	353	331	300	326	304	290
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.16
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.31
Nitrogen, Total Kjeldahl	mg/l	--	--	2.33	2.11	2.17	2.35	2.26	1.86	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	0.47
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.17	8.18	8.27	8.23	8.54	8.16	8.23
pH (Field)	-	--	--	--	7.16	7.92	8.32	7.98	7.92	7.89
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.55	0.48	0.51	0.76	0.57	0.47	0.42
Sulphate	mg/l	--	500 [6]	2	4	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	9	9.0	21.9	9.5	15.4	8.6	12.2
Total Dissolved Solids	mg/l	--	500	2720	2750	2740	2730	2800	2780	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.005	0.007	<0.01	<0.01	<0.01	<0.01	0.0017
Boron, dissolved	mg/l	5	--	0.96	0.95	0.81	1.1	0.80	0.87	0.82
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	40	44	42	41	45	41	40
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0006	0.0008	0.0007	0.0007	0.0007	0.0007	<0.00050
Copper, dissolved	mg/l	--	1	0.001	0.001	<0.001	<0.001	0.002	0.003	<0.0010
Iron, dissolved	mg/l	--	0.3	0.52	0.38	0.36	0.40	0.22	0.26	0.52
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	48	59	55	48	52	49	47
Manganese, dissolved	mg/l	--	0.05	0.16	0.17	0.16	0.19	0.16	0.18	0.14
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16	23	21	17	16	18	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	819	702	800	781	882	746	720
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 19-May-2009 G-27	95-6 26-Nov-2009 [37] J-7	95-6 25-May-2010 [30] M-25	95-6 20-Oct-2010 [30] G-22	95-6 24-May-2011 [30] G-31	95-6 29-Nov-2011 [30] 95-6	95-6 31-May-2012 95-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Nov-2012 95-6	95-6 29-May-2013 [32] 95-6	95-6 26-Nov-2013 GW-5	95-6 29-May-2014 [36] 95-6	95-6 19-Nov-2014 95-6	95-6 02-Jun-2015 95-6	95-6 26-Nov-2015 95-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	910	910	940	870	890	871	936
Alkalinity, Carbonate as CaCO3	mg/l	--	--	13	13	18	21	16	17	16
Alkalinity (Total as CaCO3)	mg/l	--	--	920	920	960	890	910	888	952
Ammonia Nitrogen	mg/l	--	--	1.6	2.0	1.9	2.2	1.9	2.15	2.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	57	65	80	68	77	108	126
Chloride	mg/l	--	250	810	850	860	830	870	790	875
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3493	3061	3154	3272	3749	3819	3954
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	350	340	270	300	320	276	309
Nitrate as N	mg/l	10.0	--	<0.10	0.25	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.41	0.035	0.050	0.032	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.3	3.1	7.6	9.9	3.2	3.4	4.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.65	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.19	8.31	8.41	8.27	--	--
pH (Field)	-	--	--	8.01	7.60	7.67	7.90	8.09	7.87	8.03
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.56	2.0	2.7	4.6	3.7	2.20	3.85
Sulphate	mg/l	--	500 [6]	<1	<1	<1	7	<1	2	1
Temperature (Field)	deg c	--	15	6.2	10.7	6.4	9.9	5.0	10.0	7.8
Total Dissolved Solids	mg/l	--	500	2400	2310	2340	2180	2200	2000	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0016	0.0030	0.0018	0.0025	0.001	0.001
Boron, dissolved	mg/l	5	--	1	0.91	0.69	0.86	0.95	0.563	0.848
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	45	46	36	40	42	34.2	27.1
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	0.0057	0.0065	<0.01 [34]	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.00068	0.00073	0.00054	0.00058	0.0005	0.0006
Copper, dissolved	mg/l	--	1	<0.001	<0.0010	0.0013	0.0024	0.0016	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	0.19	<0.1	<0.1	<0.1	0.16	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	0.00059	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	57	55	45	48	53	46.4	58.5
Manganese, dissolved	mg/l	--	0.05	0.16	0.2	0.14	0.15	0.22	0.125	0.152
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	20	19	17	18	19	13.8	16.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	840	780	750	630	810	686	865
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.0075	<0.0050	0.0070	<0.005	0.009

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Nov-2012 95-6	95-6 29-May-2013 [32] 95-6	95-6 26-Nov-2013 GW-5	95-6 29-May-2014 [36] 95-6	95-6 19-Nov-2014 95-6	95-6 02-Jun-2015 95-6	95-6 26-Nov-2015 95-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 26-May-2016 95-6	95-6 17-Nov-2016 95-6	95-6 24-May-2017 95-6	95-6 29-Nov-2017 95-6	95-6 24-May-2018 95-6	95-6 22-Nov-2018 95-6	95-6 19-Jun-2019 95-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	940	983	932	1030	1060	1030	931
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	14	15	19	20	<25 [11]	11
Alkalinity (Total as CaCO3)	mg/l	--	--	944	997	948	1050	1070	1040	943
Ammonia Nitrogen	mg/l	--	--	2.80	2.08	2.30	1.99	2.53	2.09	1.48
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	131	89	106	69	86	154	75
Chloride	mg/l	--	250	846	902	860	974	899	968	902
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	3836	3566	>3999	3677	3757
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	276	305	261	223	315	399	299
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.25 [11]	0.25	<0.05	<0.05	0.07
Nitrogen, Total Kjeldahl	mg/l	--	--	3.9	2.3	3.3	3.1	3.9	3.1	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.03	7.81	7.99	7.94	7.97	7.92	7.76
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.26	3.02	2.57	2.46	3.22	3.10	0.52
Sulphate	mg/l	--	500 [6]	2	1	1	1	2	1	1
Temperature (Field)	deg c	--	15	11.6	9.5	10.0	5.9	10.2	6.6	10.8
Total Dissolved Solids	mg/l	--	500	2260	2330	2200	2340	2450	2390	2370
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.005	0.005	0.001	0.001	0.002	0.001
Boron, dissolved	mg/l	5	--	0.754	1.06	0.657	0.634	0.843	0.844	0.686
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.5	41.3	38.3	29	45.4	51.5	40.6
Chromium, dissolved	mg/l	0.05	--	<0.001	0.015	0.012	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	<0.0005	<0.0005	0.0005	0.0011	0.0006
Copper, dissolved	mg/l	--	1	0.0017	0.0007	0.0017	0.0010	0.0014	0.0054	0.0023
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.176	0.108
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	43.8	49	40.2	36.4	49.1	65.7	47.9
Manganese, dissolved	mg/l	--	0.05	0.089	0.26	0.096	0.129	0.12	0.132	0.111
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18.9	18.8	15.8	14.4	19	24	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	646	790	733	597	752	839	591
Zinc, dissolved	mg/l	--	5	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 26-May-2016 95-6	95-6 17-Nov-2016 95-6	95-6 24-May-2017 95-6	95-6 29-Nov-2017 95-6	95-6 24-May-2018 95-6	95-6 22-Nov-2018 95-6	95-6 19-Jun-2019 95-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.007	<0.002 [10]	<0.002 [10]	<0.002 [10]	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 20-Nov-2019 95-6	95-6 21-May-2020 95-6	95-6 26-Nov-2020 95-6	95-6 26-May-2021 95-6	95-6 30-Nov-2021 95-6
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	924	880	941	942	950
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25	15	<25	13	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	932	894	963	955	955
Ammonia Nitrogen	mg/l	--	--	2.13	1.59	1.71	1.98	1.47
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	179	66	90	46	72
Chloride	mg/l	--	250	994	1020	862	763	846
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4170	3352	3416	3915	3915
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	409	356	358	405	326
Nitrate as N	mg/l	10.0	--	0.4	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.25 [13]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.9	2.3	2.3	2.2	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.22	8.00	8.47	7.96	8.16
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	5.46	0.95	0.95	0.67	0.54
Sulphate	mg/l	--	500 [6]	2	<1	2	<1	<1
Temperature (Field)	deg c	--	15	6.0	14.9	6.4	11.9	6.0
Total Dissolved Solids	mg/l	--	500	2620	2190	2410	2190	2270
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.614	0.608	0.599	0.684	0.65
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	54.5	47.1	45.1	48.3	43.6
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0007	0.0005	0.0006	0.0007	0.0006
Copper, dissolved	mg/l	--	1	0.0011	0.0030	0.0029	0.0013	0.0010
Iron, dissolved	mg/l	--	0.3	0.124	<0.1	<0.1	0.258	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	66.2	57.9	59.6	69.1	52.7
Manganese, dissolved	mg/l	--	0.05	0.201	0.22	0.206	0.19	0.187
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.8	19.6	18.7	20.3	17.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	882	724	747	764	685
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 20-Nov-2019 95-6	95-6 21-May-2020 95-6	95-6 26-Nov-2020 95-6	95-6 26-May-2021 95-6	95-6 30-Nov-2021 95-6
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	0.004	<0.002 [12]	<0.010 [12]	<0.004 [12]
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 28-Jun-1995	95-7 22-Nov-1995	95-7 13-Oct-1996	95-7 18-Jun-1997	95-7 06-Nov-1997	95-7 05-Jun-1998	95-7 29-Oct-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	583	649	--	--	--	--	644
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	478	538	536	537	440	530	528
Ammonia Nitrogen	mg/l	--	--	0.58	0.38	0.55	0.52	0.35	0.43	0.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	100	55	39	23	29	40	15
Chloride	mg/l	--	250	402	413	420	407	384	399	420
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2210	2380	--	2330	1900	2160	2130
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.42	--	--	2.72	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	202	231	192	243	208	211	172
Nitrate as N	mg/l	10.0	--	0.1	0.7	0.1	0.1	0.1	1.4	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	16.8	5.95	--	--	--	--	1.12
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	16.22	5.57	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.34	7.65	--	7.75	7.81	--	7.1
Phosphate	mg/l	--	--	--	0.5	--	--	--	--	--
Phosphorus	mg/l	--	--	3.21	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	4	3	7	5	12	41	9
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1110	1280	--	1170	950	1080	1070
Total Organic Carbon	mg/l	--	--	14	13.6	14.5	12.3	13.2	13	16.2
Total Suspended Solids	mg/l	--	--	--	--	656	993	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.34	0.31	0.42	0.44	0.42	0.44	0.57
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	31.3	33.6	28.7	37.2	31.6	29.8	26.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.28	0.63	1.09	0.65	1.33	0.52
Lead, dissolved	mg/l	0.01	--	0.0007	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	29.7	35.2	28.9	36	30.6	32.8	25.6
Manganese, dissolved	mg/l	--	0.05	1.86	2.21	1.82	2.14	1.98	2	2.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	10.4	6.5	8.5	7.2	15.3	10.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	366	426	366	338	335	454	400
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.16	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 28-Jun-1995	95-7 22-Nov-1995	95-7 13-Oct-1996	95-7 18-Jun-1997	95-7 06-Nov-1997	95-7 05-Jun-1998	95-7 29-Oct-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-May-1999	95-7 19-Oct-1999	95-7 05-May-2000	95-7 24-Oct-2000	95-7 14-Jun-2001	95-7 23-Nov-2001	95-7 23-May-2002
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	610	732	684	573	540	584	488
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	32	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	500	600	561	552	497	479	400
Ammonia Nitrogen	mg/l	--	--	0.12	0.52	0.01	0.14	0.63	0.27	0.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	26	25	26	--	27	37	20
Chloride	mg/l	--	250	432	314	365	440	420	398	382
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2040	2040	2000	2220	1900	1930	1940
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	222	204	240	199	206	202	207
Nitrate as N	mg/l	10.0	--	--	2.5	0.3	0.5	0.4	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.23	--	--	0.95	1.45	1.52	0.84
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	7.5	7.4	7.44	7.3	7.02	6.97
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.87	0.67	1.94	0.4
Sulphate	mg/l	--	500 [6]	6	14	11	15	13	21	16
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1010	1020	1000	1120	1160	1190	1020
Total Organic Carbon	mg/l	--	--	14.2	15.1	12.7	--	12.8	19	13
Total Suspended Solids	mg/l	--	--	--	624	536	916	528	928	348
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.003	0.001	0.001	0.002
Boron, dissolved	mg/l	5	--	0.38	0.59	0.45	0.47	0.42	0.57	0.4
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	31.6	32.9	36.6	28.3	34.1	29.6	32.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.11	2.82	5.2	0.24	0.39	0.07	0.76
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0022	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	34.3	29.3	35.6	31.2	29.3	31	30.6
Manganese, dissolved	mg/l	--	0.05	2.15	1.78	2	2.07	2.19	2.18	2.26
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	4.1	11.1	6.1	9.7	5.2	5.6	8.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	393	417	410	486	377	402	357
Zinc, dissolved	mg/l	--	5	0.01	0.11	0.17	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-May-1999	95-7 19-Oct-1999	95-7 05-May-2000	95-7 24-Oct-2000	95-7 14-Jun-2001	95-7 23-Nov-2001	95-7 23-May-2002
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.011	0.001	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-Nov-2002	95-7 30-May-2003	95-7 09-Oct-2003	95-7 14-May-2004	95-7 19-Nov-2004	95-7 24-May-2005	95-7 16-Nov-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	662	586	--	531	655	593	132
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	543	480	324	435	537	486	540
Ammonia Nitrogen	mg/l	--	--	0.66	0.47	0.33	0.57	0.65	0.46	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	2	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	2	58	59	351	7	58
Chloride	mg/l	--	250	428	382	298	413	448	369	364
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2240	1970	1620	2090	2290	2500	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	71	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	194	195	176	198	209	230	211
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.2	0.3	1	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.43	1.06	1.49	2.02	1.44	1.63	1.26
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	6.9	7.2	7.3	7.8	7.3	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.66	0.36	0.51	0.91	4.95	0.5	1.86
Sulphate	mg/l	--	500 [6]	17	17	31	13	20	10	28
Temperature (Field)	deg c	--	15	--	--	--	--	--	9.9	--
Total Dissolved Solids	mg/l	--	500	1260	1150	859	1045	1145	1120	1220
Total Organic Carbon	mg/l	--	--	14	13.4	31	17.4	23.5	20.2	23.8
Total Suspended Solids	mg/l	--	--	460	188	417	276	1250	233	319
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003	0.001	0.001	0.001	<0.001	0.001
Boron, dissolved	mg/l	5	--	0.51	0.36	0.512	0.362	0.449	0.363	0.478
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	33.1	30.2	29.9	31.5	32.9	34.9	33.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.016	0.002	0.002	<0.002	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.011	0.006	0.005	<0.002	0.008
Iron, dissolved	mg/l	--	0.3	0.08	0.79	5.78	0.048	0.072	0.097	0.068
Lead, dissolved	mg/l	0.01	--	0.0012	0.0003	0.0007	0.0007	0.0006	0.0011	0.0007
Magnesium, dissolved	mg/l	--	--	29	29	24.6	29	30.8	34.8	31
Manganese, dissolved	mg/l	--	0.05	1.92	2.21	1.13	1.48	1.38	1.59	1.4
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	7.6	7.8	9.2	7.4	8.2	8.4	9.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001	0.001
Sodium, dissolved	mg/l	--	200 [7]	425	368	265	379	405	379	441
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.016	0.005	0.005	0.007	0.008

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-Nov-2002	95-7 30-May-2003	95-7 09-Oct-2003	95-7 14-May-2004	95-7 19-Nov-2004	95-7 24-May-2005	95-7 16-Nov-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	<0.0007	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 25-May-2006	95-7 21-Nov-2006	95-7 15-May-2007	95-7 30-Nov-2007	95-7 22-May-2008	95-7 10-Nov-2008	95-7 19-May-2009 G-19
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	545	615	573	603	540	615	560
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	545	615	573	603	540	615	560
Ammonia Nitrogen	mg/l	--	--	0.52	<0.01	0.15	<0.01	0.23	<0.01	0.21
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	54	91	127	59	45	45
Chloride	mg/l	--	250	430	456	362	439	413	483	397
Conductivity	uS/cm	--	--	--	--	--	--	--	--	2320
Conductivity (Field)	uS/cm	--	--	1800	2150	1600	1750	1300	2100	1900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	211	233	230	221	214	225	221
Nitrate as N	mg/l	10.0	--	0.3	0.5	0.2	0.5	0.1	0.5	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.12	0.93	1.28	2.24	1.93	0.85	0.81
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	7.89
pH (Field)	-	--	--	7.9	7.6	8.2	7.9	7.5	7.6	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.87
Sulphate	mg/l	--	500 [6]	21	9	11	19	21	10	15
Temperature (Field)	deg c	--	15	12.5	7	9.7	4.5	9.5	6	9
Total Dissolved Solids	mg/l	--	500	1250	1370	1190	1420	1250	1400	1510
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0027	0.0033	0.0069	0.0038	0.0044	0.003
Boron, dissolved	mg/l	5	--	0.352	0.466	0.352	0.46	0.37	0.476	0.49
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00006	<0.00002	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	32.3	36.2	35.6	35.3	33.6	35.8	34
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.008	<0.005	<0.005	<0.005	0.0005
Copper, dissolved	mg/l	--	1	0.003	0.005	0.003	0.004	<0.002	0.003	0.006
Iron, dissolved	mg/l	--	0.3	0.089	0.067	0.18	0.084	0.717	0.205	0.11
Lead, dissolved	mg/l	0.01	--	0.0004	<0.0001	0.00011	<0.00002	<0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	31.6	34.7	34.2	32.4	31.8	33	33
Manganese, dissolved	mg/l	--	0.05	1.72	1.56	2	1.6	2.25	0.938	0.63
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.8	9.5	8	10	7.8	9.6	7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	401	452	388	519	417	460	373
Zinc, dissolved	mg/l	--	5	0.012	0.009	<0.005	<0.005	0.008	<0.005	<0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 25-May-2006	95-7 21-Nov-2006	95-7 15-May-2007	95-7 30-Nov-2007	95-7 22-May-2008	95-7 10-Nov-2008	95-7 19-May-2009 G-19
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	<0.0006	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 26-Nov-2009 J-12	95-7 25-May-2010 [30] M-19	95-7 20-Oct-2010 [30] G-21	95-7 24-May-2011 [30] G-29	95-7 29-Nov-2011 [43] 95-7	95-7 31-May-2012 [31] 95-7	95-7 28-Nov-2012 95-7
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	599	552	593	575	579	570	580
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	14	11	4.9	7.0
Alkalinity (Total as CaCO3)	mg/l	--	--	599	552	593	589	590	570	590
Ammonia Nitrogen	mg/l	--	--	0.07	0.52	<0.02	0.28	<0.02	0.33	0.10
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	55	55	50	60	50	59
Chloride	mg/l	--	250	447	383	450	400	430	390	410
Conductivity	uS/cm	--	--	2490	2350	2460	2420	2430	--	--
Conductivity (Field)	uS/cm	--	--	2149	2310	2405	2191	2272	2020	2146
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	214	234	235	258	219	180	240
Nitrate as N	mg/l	10.0	--	0.37	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	0.036	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.64	1.14	0.96	0.76	0.82	1.4	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.20	8.12	8.07	8.42	8.31	7.96	--
pH (Field)	-	--	--	7.21	7.51	7.66	7.40	7.68	7.62	7.71
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.71	3.58	1.19	0.67	1.06	0.66	0.88
Sulphate	mg/l	--	500 [6]	16	15	8	10	9	<1	<1
Temperature (Field)	deg c	--	15	8.5	15.7	12.3	13.5	7.9	12.0	6.2
Total Dissolved Solids	mg/l	--	500	1620	1530	1600	1570	1580	1280	1360
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	<0.01	<0.001	<0.01	<0.01	0.0028	0.001
Boron, dissolved	mg/l	5	--	0.49	0.46	0.56	0.48	0.52	0.36	0.58
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	33	36	38	39	35	28	36
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	0.009	<0.005	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0006	0.0008	0.0009	0.0010	0.0006	0.0012	0.0011
Copper, dissolved	mg/l	--	1	0.004	0.003	0.002	0.003	0.003	0.0026	0.002
Iron, dissolved	mg/l	--	0.3	<0.03	0.52	0.12	0.38	<0.03	0.86	0.15
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	0.00090	<0.0005
Magnesium, dissolved	mg/l	--	--	32	35	34	39	32	26	35
Manganese, dissolved	mg/l	--	0.05	0.31	2.16	1.89	2.15	0.83	5.2	2.8
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	9	9	9	8	6.3	9.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	420	368	445	361	392	320	470
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.01	0.01	<0.01	<0.0050	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 26-Nov-2009 J-12	95-7 25-May-2010 [30] M-19	95-7 20-Oct-2010 [30] G-21	95-7 24-May-2011 [30] G-29	95-7 29-Nov-2011 [43] 95-7	95-7 31-May-2012 [31] 95-7	95-7 28-Nov-2012 95-7
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0080	0.00070	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 29-May-2013 [32] 95-7	95-7 26-Nov-2013 GW-3	95-7 29-May-2014 95-7	95-7 19-Nov-2014 95-7	95-7 02-Jun-2015 95-7	95-7 26-Nov-2015 95-7	95-7 26-May-2016 95-7
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	560	570	560	570	609	593	614
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.3	8.1	6.8	6.4	5	5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	560	580	570	580	614	598	617
Ammonia Nitrogen	mg/l	--	--	0.59	<0.050	0.53	0.084	0.46	0.02	0.75
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	64	55	66	57	93	83	94
Chloride	mg/l	--	250	420	430	420	460	463	433	463
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1975	2066	2046	2362	2292	2362	2385
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	240	230	200	240	158	210	160
Nitrate as N	mg/l	10.0	--	0.12	<0.10	<0.10	0.22	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.092	<0.010	0.019	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.9	1.3	1.7	1.4	1.4	0.9	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.21	<0.10	<0.10	0.22	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.92	8.18	8.11	8.08	--	--	--
pH (Field)	-	--	--	7.75	7.77	7.29	7.67	7.61	7.75	7.86
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.8	2.0	1.5	2.2	1.08	0.73	1.17
Sulphate	mg/l	--	500 [6]	1	2	1	1	10	10	11
Temperature (Field)	deg c	--	15	11.0	6.6	10.2	6.7	10.4	7.4	11.1
Total Dissolved Solids	mg/l	--	500	1340	1370	1300	1310	1330	1350	1400
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.0011	0.0018	0.0013	0.0018	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.45	0.49	0.4	0.52	0.172	0.504	0.305
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	37	35	31	36	24.8	24.7	25
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.00088	0.00096	<0.00050	0.00074	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0041	0.0040	0.0051	0.0036	0.0005	0.0016	0.0020
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.2	<0.1	0.509	<0.1	0.376
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	35	34	30	36	23.4	36	23.8
Manganese, dissolved	mg/l	--	0.05	2.2	1.8	1.3	1.6	1.05	0.117	0.951
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.9	9	6.7	9.1	4.81	7.45	5.96
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	410	450	360	470	322	500	266
Zinc, dissolved	mg/l	--	5	<0.0050	0.039	0.015	<0.0050	<0.005	0.008	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 29-May-2013 [32] 95-7	95-7 26-Nov-2013 GW-3	95-7 29-May-2014 95-7	95-7 19-Nov-2014 95-7	95-7 02-Jun-2015 95-7	95-7 26-Nov-2015 95-7	95-7 26-May-2016 95-7
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	0.005
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	0.00078	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 17-Nov-2016 95-7	95-7 24-May-2017 95-7	95-7 29-Nov-2017 95-7	95-7 24-May-2018 95-7	95-7 22-Nov-2018 95-7	95-7 19-Jun-2019 95-7	95-7 20-Nov-2019 95-7
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	618	643	626	657	667	610	588
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	7	5	6	8	9
Alkalinity (Total as CaCO3)	mg/l	--	--	622	646	633	662	673	618	597
Ammonia Nitrogen	mg/l	--	--	0.11	0.60	0.07	0.63	0.10	0.75	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	72	61	82	96	105	73	85
Chloride	mg/l	--	250	463	480	498	462	460	458	483
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1257	2322	2145	2436	2112	2213	2390
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	228	255	192	167	287	268	292
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.3	0.1	0.5
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.4	1.0	1.7	1.8	1.3	1.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.05	7.48	8.03	7.64	8.2	7.34	7.82
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.07	0.88	1.12	1.30	1.44	0.86	1.59
Sulphate	mg/l	--	500 [6]	8	9	11	10	8	10	13
Temperature (Field)	deg c	--	15	9.6	12.4	6.7	10.1	5.4	13.2	7.1
Total Dissolved Solids	mg/l	--	500	1340	1400	1330	1410	1340	1410	1340
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.002	0.002	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.644	0.361	0.459	0.316	0.558	0.303	0.432
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	35.7	33.9	29.6	28	42.9	41.5	44.7
Chromium, dissolved	mg/l	0.05	--	0.008	0.006	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0006	<0.0005	0.0007	0.0008	0.0006
Copper, dissolved	mg/l	--	1	0.0021	0.0018	0.0026	0.0030	0.0106	0.0023	0.0075
Iron, dissolved	mg/l	--	0.3	<0.1	0.442	<0.1	0.555	<0.1	0.321	0.383
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	33.7	41.3	28.8	23.6	43.8	39.9	43.8
Manganese, dissolved	mg/l	--	0.05	1.75	2.23	2.1	1.65	0.567	4.25	0.626
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.24	6.42	7.89	5.98	11.6	9.46	13
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	473	464	387	304	536	457	455
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.015	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 17-Nov-2016 95-7	95-7 24-May-2017 95-7	95-7 29-Nov-2017 95-7	95-7 24-May-2018 95-7	95-7 22-Nov-2018 95-7	95-7 19-Jun-2019 95-7	95-7 20-Nov-2019 95-7
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.002 [10]	<0.001	<0.001	0.007	<0.001	0.002
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 21-May-2020 95-7	95-7 26-Nov-2020 95-7	95-7 26-May-2021 95-7	95-7 30-Nov-2021 95-7
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	527	619	623	612
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5	<25	6	10
Alkalinity (Total as CaCO3)	mg/l	--	--	532	627	629	622
Ammonia Nitrogen	mg/l	--	--	0.35	0.08	0.42	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	66	79	43	80
Chloride	mg/l	--	250	505	459	416	452
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2018	2170	2246	2425
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	246	255	234	231
Nitrate as N	mg/l	10.0	--	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	0.9	1.0	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.53	8.13	7.56	7.98
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.30	0.50	0.24	0.40
Sulphate	mg/l	--	500 [6]	22	11	13	8
Temperature (Field)	deg c	--	15	10.4	6.8	12.6	6.1
Total Dissolved Solids	mg/l	--	500	1200	1290	1350	1440
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.002	0.001
Boron, dissolved	mg/l	5	--	0.357	0.427	0.353	0.401
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.1	38.4	34.1	36.2
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0008	<0.0005	0.0007	<0.0005
Copper, dissolved	mg/l	--	1	0.0060	0.0055	0.0022	0.0033
Iron, dissolved	mg/l	--	0.3	0.18	<0.1	0.46	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	36.6	38.7	36.2	34.1
Manganese, dissolved	mg/l	--	0.05	2.54	1.05	1.89	0.808
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.31	10	7.71	9.28
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	421	466	372	408
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 21-May-2020 95-7	95-7 26-Nov-2020 95-7	95-7 26-May-2021 95-7	95-7 30-Nov-2021 95-7
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.002 [12]	<0.004 [12]	<0.001
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 28-Jun-1995	95-9 22-Nov-1995	95-9 12-Oct-1996	95-9 06-Nov-1997	95-9 05-Jun-1998	95-9 06-May-1999	95-9 24-Oct-2000
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	834	912	--	--	--	862	1080
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	23	--	--	--	54	1
Alkalinity (Total as CaCO3)	mg/l	--	--	716	785	--	770	663	796	887
Ammonia Nitrogen	mg/l	--	--	1.6	5	--	0.86	0.9	2	1.16
Chemical Oxygen Demand	mg/l	--	--	850	850	--	23	42	15	--
Chloride	mg/l	--	250	380	405	--	358	366	382	442
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2440	2600	2650	2540	2430	2600	2550
Dissolved Oxygen (Field)	mg/l	--	--	1.26	1.26	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	59	71	--	55	57	47	48
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	0.1	1	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	30.3	50	--	--	--	13.8	1.12
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	28.7	45	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.51	8.81	8.38	8.9	--	8.4	8.66
Phosphate	mg/l	--	--	--	2.4	--	--	--	--	--
Phosphorus	mg/l	--	--	1.63	--	--	--	--	--	5.86
Sulphate	mg/l	--	500 [6]	5	10	--	1	44	1	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1230	1230	1330	1270	1192	1360	1440
Total Organic Carbon	mg/l	--	--	37.1	37.1	--	10.5	8.9	11.6	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	4940
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001
Boron, dissolved	mg/l	5	--	0.91	0.91	--	1.02	1.1	1.13	1.16
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	7.97	7.7	--	5.73	7.38	4.65	4.28
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	--	0.01	0.01	0.01	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.03	0.03	--	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.06	0.06	--	3.05	3.25	1	0.16
Lead, dissolved	mg/l	0.01	--	0.0009	0.0009	--	0.0002	0.0002	0.0017	0.022
Magnesium, dissolved	mg/l	--	--	9.3	12.4	--	9.66	9.24	8.46	9.05
Manganese, dissolved	mg/l	--	0.05	0.03	0.03	--	0.06	0.06	0.03	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	0.02	0.03	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	18.6	--	14.4	22.4	20.1	18.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	484	556	--	478	644	573	634
Zinc, dissolved	mg/l	--	5	0.01	0.01	--	0.01	0.04	0.02	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 28-Jun-1995	95-9 22-Nov-1995	95-9 12-Oct-1996	95-9 06-Nov-1997	95-9 05-Jun-1998	95-9 06-May-1999	95-9 24-Oct-2000
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	--	--	--	--	0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 14-Jun-2001	95-9 06-Nov-2002	95-9 30-May-2003	95-9 19-Nov-2004	95-9 16-Nov-2005	95-9 15-May-2007	95-9 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	837	1040	897	1030	200	815	820
Alkalinity, Carbonate as CaCO3	mg/l	--	--	40	1	1	1	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	753	855	735	845	820	815	820
Ammonia Nitrogen	mg/l	--	--	1.94	1.7	1.5	1.59	1.61	1.78	1.6
Chemical Oxygen Demand	mg/l	--	--	23	49	41	30	43	94	28
Chloride	mg/l	--	250	373	355	305	410	320	355	397
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2250	2280	2000	2870	2100	1800	2100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	36	39	130	44	48	39	40
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	<1	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.65	2.33	2.57	2.03	2.43	2.78	2.47
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.7	8.6	7.6	8.4	--	8.8	8.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	7.94	2.11	3.05	0.98	2.84	--	--
Sulphate	mg/l	--	500 [6]	1	2	1	10	<1	<1	<1
Temperature (Field)	deg c	--	15	--	--	--	--	--	11.4	7
Total Dissolved Solids	mg/l	--	500	1420	1410	1310	1435	1500	1390	1470
Total Organic Carbon	mg/l	--	--	9.3	8.6	10.4	9.3	9.3	--	--
Total Suspended Solids	mg/l	--	--	5210	1900	2990	4200	1460	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	0.0015	0.0012
Boron, dissolved	mg/l	5	--	1.05	1.02	0.98	1.13	1.12	0.988	1.01
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	2.76	4.77	31.2	3.62	4.4	2.92	3.25
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.06	0.06	5.07	0.144	0.1	0.173	0.044
Lead, dissolved	mg/l	0.01	--	0.0002	0.0021	0.0029	0.0006	0.0017	0.00013	0.00012
Magnesium, dissolved	mg/l	--	--	7.13	7.67	12.6	8.45	9.08	7.61	7.82
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.18	0.006	0.005	0.005	0.003
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	7.5	13.3	13.8	14.8	16.6	14.3	14.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [7]	535	577	494	567	672	519	548
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.005	0.007	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 14-Jun-2001	95-9 06-Nov-2002	95-9 30-May-2003	95-9 19-Nov-2004	95-9 16-Nov-2005	95-9 15-May-2007	95-9 10-Nov-2008
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.063	0.001	0.001	0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 26-Nov-2009 J-9	95-9 24-May-2011 [30] G-30	95-9 28-Nov-2012 95-9	95-9 29-May-2014 [36] 95-9	95-9 26-Nov-2015 95-9	95-9 24-May-2017 95-9	95-9 22-Nov-2018 95-9
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	760	756	760	770	798	802	824
Alkalinity, Carbonate as CaCO3	mg/l	--	--	29	46	22	36	23	21	25
Alkalinity (Total as CaCO3)	mg/l	--	--	789	802	780	800	821	823	849
Ammonia Nitrogen	mg/l	--	--	1.52	1.59	2.0	2.1	2.03	1.85	1.51
Chemical Oxygen Demand	mg/l	--	--	38	30	35	39	53	78	39
Chloride	mg/l	--	250	337	344	410	490	502	406	429
Conductivity	uS/cm	--	--	2490	2620	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2294	2266	2245	2276	2670	2770	2238
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	34	43	52	44	37.3	43	66
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.78	1.98	2.9	3.4	2.5	2.9	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	<0.10	<0.10	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.61	8.81	--	8.70	--	--	--
pH (Field)	-	--	--	8.25	8.67	8.74	8.47	8.78	8.62	8.81
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.36	1.54	1.6	1.6	0.72	1.21	0.71
Sulphate	mg/l	--	500 [6]	<1	<1	1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	8.8	19.3	6.7	10.4	7.4	11.9	6.4
Total Dissolved Solids	mg/l	--	500	1620	1700	1720	1560	1670	1490	1560
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	<0.01	<0.001	<0.0010	<0.001	0.002	<0.001
Boron, dissolved	mg/l	5	--	0.99	1.3	1.2	1.2	1.09	1.15	1.19
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	2	4	5	3.8	3.32	3.39	10.6
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.0050	<0.001	0.011	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0003	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.001	0.002	<0.001	0.0020	<0.0005	<0.0005	0.0021
Iron, dissolved	mg/l	--	0.3	0.04	0.04	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	7	8	9.6	8.5	7.04	8.42	9.58
Manganese, dissolved	mg/l	--	0.05	<0.01	<0.01	0.005	0.0033	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11	14	15	14	12.3	14.4	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	501	596	700	490	637	584	614
Zinc, dissolved	mg/l	--	5	0.01	0.01	<0.005	<0.0050	0.009	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 26-Nov-2009 J-9	95-9 24-May-2011 [30] G-30	95-9 28-Nov-2012 95-9	95-9 29-May-2014 [36] 95-9	95-9 26-Nov-2015 95-9	95-9 24-May-2017 95-9	95-9 22-Nov-2018 95-9
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	0.002	<0.002 [10]	<0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	0.00015	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	0.00031	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 21-May-2020 95-9	95-9 30-Nov-2021 [3] 95-9
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	723	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	32	--
Alkalinity (Total as CaCO3)	mg/l	--	--	755	--
Ammonia Nitrogen	mg/l	--	--	1.84	--
Chemical Oxygen Demand	mg/l	--	--	35	--
Chloride	mg/l	--	250	523	--
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2480	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	102	--
Nitrate as N	mg/l	10.0	--	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.0	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.71	--
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	0.79	--
Sulphate	mg/l	--	500 [6]	<1	--
Temperature (Field)	deg c	--	15	12.7	--
Total Dissolved Solids	mg/l	--	500	1520	--
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	<0.001	--
Boron, dissolved	mg/l	5	--	0.857	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--
Calcium, dissolved	mg/l	--	--	18.4	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--
Cobalt, dissolved	mg/l	--	--	0.0008	--
Copper, dissolved	mg/l	--	1	0.0015	--
Iron, dissolved	mg/l	--	0.3	1.88	--
Lead, dissolved	mg/l	0.01	--	0.0023	--
Magnesium, dissolved	mg/l	--	--	13.7	--
Manganese, dissolved	mg/l	--	0.05	0.072	--
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.4	--
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	627	--
Zinc, dissolved	mg/l	--	5	0.009	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 21-May-2020 95-9	95-9 30-Nov-2021 [3] 95-9
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	0.002	--
Semi-VOCs					
Styrene	mg/l	--	--	--	--
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Footnotes:

	Tables should be read in conjunction with the accompanying document
<	Indicates parameter not detected above laboratory method detection limit
>	Indicates parameter detected above equipment analytical range
--	Chemical not analyzed or criteria not defined
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020)
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Monitoring location was frozen during this sampling event. No sample was collected
(4)	Monitoring location could not be located during this sampling event
(5)	Monitoring location was not monitored due to dry conditions observed in the area
(6)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L
(7)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(8)	Metals MRL elevated due to matrix interference.
(9)	pH < 8.3. Calculations not available.
(10)	Elevated Reporting Limit due to matrix interference.
(11)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes
(12)	GEN02 Elevated Reporting Limit due to matrix interference
(13)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes
(14)	REV 1 Revision 1 - This report now includes data for Xylenes
(15)	Due to matrix interference 2 X dilution factor required for VOCs. Arsenic MRL elevated due to matrix interference
(16)	Waterra tubing could not be extracted from well. No sample was collected
(17)	N-NO2,N-NO3 MRL elevated due to matrix interference.
(18)	Due to matrix interference 2 X dilution factor required for VOCs. TP MRL elevated due to insufficient sample volume
(19)	N-NO2,N-NO3 MRL elevated due to matrix interference. Sediment was not included in Metals Analysis
(20)	Nitrite/Nitrate: Due to colour interferences, sample required dilution. Detection limits were adjusted accordingly
(21)	Monitoring location was dry during this sampling event. No sample was collected
(22)	Insufficient sample volume was collected for analysis
(23)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(24)	TKN MRL elevated due to matrix interference. Metals MRL elevated due to matrix interference
(25)	Arsenic MRL elevated due to matrix interference. Due to matrix interference 10x dilution factor required for VOCs
(26)	Metal Analysis: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(27)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(28)	Elevated detection limit due to dilution required because of high target analyte concentration
(29)	INOG6 Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions
(30)	Arsenic MRL elevated due to matrix interference.
(31)	Elevated ion balance result was confirmed by re-analysis
(32)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly
(33)	Inadvertently, no sample was collected at this location
(34)	Metal Analysis: Detection Limit was raised due to matrix interferences
(35)	VOC Analysis: Due to high concentrations of non-target analytes, sample required dilution. Detection limits were adjusted accordingly
(36)	Elevated ion balance was confirmed by re-analysis
(37)	TKN results may be biased low due to elevated dissolved salt content
(38)	Detection Limit was raised due to matrix interferences
(39)	Due to matrix interference 10x dilution factor required for VOCs
(40)	Due to matrix interference 2x dilution factor required for VOCs.
(41)	VOC Analysis: Due to high sediment in vials resulting in smaller amounts of sample available for analysis, the sample required dilution. The detection limits were adjusted accordingly
(42)	Insufficient sample volume was collected for analysis. Field Parameters were not measured
(43)	Due to matrix interference 2x dilution factor required for VOCs. Arsenic MRL elevated due to matrix interference

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 18-Sep-1992	L5 19-Oct-1992	L5 11-Nov-1992	L5 08-Jun-1993	L5 15-Nov-1993	L5 15-Jun-1994	L5 02-Nov-1994	L5 28-Jun-1995	L5 24-Nov-1995	L5 12-Jun-1996
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	185	1696	1677	1140	1565	1680	1650	2000
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	0.1	--	0.83	22.6	26.51	19.1	12.38	20	25	31
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	9.6	10.3	3.8	70	81	1.6	31.7	16	15	173
Chemical Oxygen Demand	mg/l	--	--	220	--	69.2	370	331	158	321	202	270	600
Chloride	mg/l	--	250	410	379	76.5	342	533	370	378	312	342	393
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	669	3520	3970	3830	4350	3850	4540	4650
Cyanide	mg/l	0.2	--	0.078	0.012	0.014	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	455	--	--	376	--	16	233
Dissolved Organic Carbon	mg/l	--	5	--	--	17.5	--	107	76	107	74.1	114	131
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	1.6	0.1	2.07	5.77	9.47	--	0.29
Fluoride	mg/l	1.5	--	**1.56**	**1.66**	0.84	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	227	1320	1340	858	1256	1167	1640	2090
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	6.9	0.1	7.18	0.1	0.1	0.1	0.1	--
Nitrite as N	mg/l	1.0	--	--	--	0.15	0.1	0.1	--	0.1	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	37.7	28.7	2.1	32	31.92	23.5	28	25.5	30	38.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	37.6	--	1.27	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.79	7.51	7.65	6.74	7.52	6.99	--	7.25	7.66	6.26
Phosphorus	mg/l	--	--	0.28	0.17	0.26	0.3	0.37	0.11	0.45	0.44	0.43	0.66
Sulphate	mg/l	--	500 [16]	207.3	164	60.7	42.2	83	109	61	247	199	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	--	2572	2344	1920	2120	1930	2270	2330
Total Organic Carbon	mg/l	--	--	--	--	17.5	--	107	76	107	74.1	114	131
Total Suspended Solids	mg/l	--	--	79	25	130	--	--	30	12	39	85	59
Metals													
Aluminum	mg/l	--	--	4.61	0.1	1.79	--	0.293	--	0.37	--	--	--
Antimony	mg/l	0.006	--	0.001	0.001	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.001	0.001	--	--	--	--	--	--	--
Barium	mg/l	1	--	**1.78**	--	0.1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	0.31	0.1	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**11.9**	--	0.37	**11.4**	**10.4**	**8.454**	**6.797**	**9**	**12**	**14.3**
Cadmium	mg/l	0.005	--	**0.051**	**0.008**	0.005	--	--	0.0001	0.0001	0.0001	0.0001	--
Calcium	mg/l	--	--	--	--	63	344	345	177	295	290.6	370	415
Chromium	mg/l	0.05	--	**0.31**	0.05	0.05	**0.064**	0.023	0.01	0.01	0.03	0.02	--
Cobalt	mg/l	--	--	0.05	0.05	--	--	--	--	--	--	--	--
Copper	mg/l	--	1	0.05	0.05	0.05	0.004	0.01	0.0131	0.0036	--	0.0016	0.005
Iron	mg/l	--	0.3	1.92	7.16	1.55	0.003	8.086	1.918	2.44	2.25	2.67	1.66
Lead	mg/l	0.01	--	**0.05**	**0.05**	**0.05**	**0.0104**	**0.1**	0.0021	**0.0127**	0.0008	0.0012	0.0024
Magnesium	mg/l	--	--	--	--	17	112	116	101	126	105.8	171	252
Manganese	mg/l	--	0.05	8.56	1.71	0.13	1.813	1.637	0.688	1.011	1.06	1.08	0.845
Mercury	mg/l	0.001	--	**0.21**	**0.1**	**0.16**	--	--	--	0.0001	--	--	--
Molybdenum	mg/l	--	--	0.05	0.05	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	0.17	0.06	0.05	0.029	0.02	0.02	0.02	0.03	0.02	0.02
Potassium	mg/l	--	--	--	--	11.8	76	68	62	80	67.2	80.4	97.5
Selenium	mg/l	0.05	--	0.001	0.001	--	--	--	--	0.005	--	--	--
Silver	mg/l	--	--	0.05	0.05	--	--	--	--	0.0073	--	--	--
Sodium	mg/l	--	200 [17]	--	--	53.9	367	394	343	372	324.7	476	481
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	0.2	0.7	0.1	--	--	--	--	--	--	--
Titanium	mg/l	--	--	0.1	0.07	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	0.1	0.1	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 18-Sep-1992	L5 19-Oct-1992	L5 11-Nov-1992	L5 08-Jun-1993	L5 15-Nov-1993	L5 15-Jun-1994	L5 02-Nov-1994	L5 28-Jun-1995	L5 24-Nov-1995	L5 12-Jun-1996
Zinc	mg/l	–	5	0.13	0.05	0.05	0.032	0.022	0.031	0.01	0.02	0.01	0.011
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	0.012	0.005	0.003	0.06	0.098	0.055	0.03	0.001	–	0.296
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	–	–	–	–	–	–	–	–	–	–
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 12-Oct-1996	L5 17-Jun-1997	L5 05-Nov-1997	L5 05-Jun-1998	L5 26-Aug-1998	L5 29-Oct-1998	L5 27-Nov-1998	L5 30-Jun-1999	L5 18-Oct-1999	L5 03-May-2000
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1970	2210	1610	1960	1330	1820	1980	1610	1800	1850
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	0.05	0.01	--	--	--
Ammonia Nitrogen	mg/l	--	--	27	5.14	31.4	32.5	18.6	25.8	1.26	30.3	19	28.5
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	27	95	37	40	13	15	14	24	23	38
Chemical Oxygen Demand	mg/l	--	--	350	495	388	328	212	316	270	324	170	240
Chloride	mg/l	--	250	492	525	540	471	281	440	470	528	473	360
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4750	4890	4680	4610	3360	4210	--	4390	3970	4070
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	433	132	407	392	197	308	611	95	469	340
Dissolved Organic Carbon	mg/l	--	5	125	140	111	82	72	90.6	97.2	101	87.2	85.2
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	0.36	1.71	2.85	3.39	2.98	5.49	--	3.59	4.98	2.2
Fluoride	mg/l	1.5	--	--	0.5	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1890	1790	1580	1560	1030	1590	1460	1310	1430	1340
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	0.37	0.08	--	0.34	0.02	--	--
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	--	--	--	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	39.4	34.7	38	33.9	20.7	28.6	17.2	37.8	19.8	28.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.6	6.93	6.75	--	7.39	6.9	--	7.1	6.9	6.67
Phosphorus	mg/l	--	--	0.45	0.8	0.35	0.34	0.3	0.34	0.34	0.31	0.39	0.31
Sulphate	mg/l	--	500 [16]	--	340	--	84	--	--	--	--	--	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2390	2480	--	2310	1690	2100	--	2200	2050	--
Total Organic Carbon	mg/l	--	--	125	--	111	82	72	90.6	97.2	101	87.2	85.2
Total Suspended Solids	mg/l	--	--	2	13	44	23	73	28	19	48	42	54
Metals													
Aluminum	mg/l	--	--	--	0.17	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	0.003	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	--	**0.017**	--	--	--	--	--	--	--	--
Barium	mg/l	1	--	--	0.396	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	14.9	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**16.9**	**14.9**	**14.3**	**14.3**	**9.6**	**14**	**14.9**	**13.3**	**14.5**	**11.6**
Cadmium	mg/l	0.005	--	--	0.0001	--	--	--	--	--	--	--	--
Calcium	mg/l	--	--	383	399	295	290	240	304	297	270	298	267
Chromium	mg/l	0.05	--	--	0.01	--	--	--	--	--	--	--	--
Cobalt	mg/l	--	--	--	0.01	--	--	--	--	--	--	--	--
Copper	mg/l	--	1	0.004	0.02	0.0071	0.0281	0.0051	0.008	0.0005	0.003	0.0042	0.0085
Iron	mg/l	--	0.3	1.21	0.31	2.07	2.07	9.31	9.83	5.57	7.05	7.47	8.27
Lead	mg/l	0.01	--	0.0002	0.0002	0.0019	0.0002	0.0002	0.0002	0.0002	0.0006	0.0002	0.0002
Magnesium	mg/l	--	--	224	189	203	200	104	199	171	153	165	161
Manganese	mg/l	--	0.05	0.84	0.85	1.11	1.39	1.24	1.74	1.33	1.37	1.54	1.56
Mercury	mg/l	0.001	--	--	0.0003	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	0.11	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium	mg/l	--	--	99.2	91.4	96.8	89.4	66.7	79.3	85.6	88.6	83.4	77.9
Selenium	mg/l	0.05	--	--	0.015	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	0.02	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	514	493	486	452	312	532	543	576	520	471
Sulfur	mg/l	--	--	--	--	--	--	0.08	0.02	--	--	0.02	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	0.02	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	0.013	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 12-Oct-1996	L5 17-Jun-1997	L5 05-Nov-1997	L5 05-Jun-1998	L5 26-Aug-1998	L5 29-Oct-1998	L5 27-Nov-1998	L5 30-Jun-1999	L5 18-Oct-1999	L5 03-May-2000
Zinc	mg/l	–	5	0.01	0.08	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.07
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	--	0.94	0.016	0.049	0.001	0.001	0.035	0.001	0.001	0.039
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 25-Oct-2000	L5 13-Jun-2001	L5 20-Sep-2001	L5 21-Nov-2001	L5 22-May-2002	L5 08-Nov-2002	L5 31-May-2003	L5 23-Jul-2003	L5 21-Oct-2003	L5 17-May-2004
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	–	--	2180	1900	--	1890	1820	2190	1890	1820	2120	2080
Ammonia, unionized	mg/l	–	--	--	0.07	--	<0.02	--	--	--	--	--	0.26
Ammonia Nitrogen	mg/l	–	--	29.6	33.6	--	38.3	1.53	35	31.5	37.4	39.4	30.2
Biochemical Oxygen Demand, 5 Day	mg/l	–	--	--	319	207	15	49	507	84	58	53	346
Chemical Oxygen Demand	mg/l	–	--	--	728	490	292	335	986	390	371	416	669
Chloride	mg/l	–	250	516	530	515	500	404	458	419	470	477	439
Conductivity	uS/cm	–	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	--	4430	4300	4080	4710	3500	4900	–	3570	4630	–
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	–	--	--	312	--	265	344	550	440	566	525	137
Dissolved Organic Carbon	mg/l	–	5	--	--	--	139	66	524	141	231	188	203
Dissolved Oxygen	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	--	3.14	--	--	3.6	3.16	4.1	--	2.73	--	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	--	1392	1716	--	1461	1470	1744	1309	1350	1380	1460
Hydrogen Sulfide	mg/l	–	0.05	--	--	--	--	0.44	24.9	11.7	5.7	4.94	5.6
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	–	--	36.3	40	40.2	48.2	31.5	41.1	43.3	41.2	48.9	40.3
Nitrogen, Nitrate-Nitrite	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	–	--	6.97	6.7	7.18	6.53	6.68	--	--	6.83	7	--
Phosphorus	mg/l	–	--	--	0.58	0.41	0.21	0.35	0.68	0.42	0.55	0.47	0.42
Sulphate	mg/l	–	500 [16]	22	357	58	25	107	55	43	30	12	71
Temperature (Field)	deg c	–	15	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	–	500	2820	3030	--	2730	10300	--	2260	3130	2864	--
Total Organic Carbon	mg/l	–	--	--	249	--	139	66	524	141	231	--	--
Total Suspended Solids	mg/l	–	--	60	80	124	76	58	46	30	11	33	30
Metals													
Aluminum	mg/l	–	--	--	--	1.24	--	--	--	--	--	--	0.241
Antimony	mg/l	0.006	--	--	--	0.006	--	--	--	--	--	--	0.001
Arsenic	mg/l	0.01	--	0.001	0.001	--	0.001	0.001	0.003	0.003	0.004	0.007	0.002
Barium	mg/l	1	--	--	--	0.615	--	--	--	--	--	--	0.832
Bismuth	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**18.2**	**13.5**	**14.6**	**17.1**	**13.9**	**13.2**	**12.4**	**15.3**	**15.5**	**12.9**
Cadmium	mg/l	0.005	--	0.0001	0.0001	**0.01**	0.0001	**0.01**	0.0001	0.0001	0.0003	0.0001	<0.005
Calcium	mg/l	–	--	292	387	--	275	300	413	285	285	293	323
Chromium	mg/l	0.05	--	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.006	0.01
Cobalt	mg/l	–	--	0.0352	0.147	0.01	0.0267	0.01	0.0384	0.002	0.0018	0.005	<0.005
Copper	mg/l	–	1	0.0077	0.009	0.01	0.114	0.01	0.0161	0.004	0.254	0.002	0.002
Iron	mg/l	–	0.3	15.2	18.2	8.22	8.61	7.76	11.6	0.02	6.46	0.64	9.84
Lead	mg/l	0.01	--	0.0002	0.0024	**0.1**	0.0041	**0.1**	0.0047	0.0005	0.0031	0.0006	**0.02**
Magnesium	mg/l	–	--	161	182	--	188	175	173	145	154	158	158
Manganese	mg/l	–	0.05	2.38	1.9	1.54	1.43	1.59	1.94	1.24	1.14	1.01	1.22
Mercury	mg/l	0.001	--	0.0001	0.0001	--	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	–
Molybdenum	mg/l	–	--	0.002	0.041	0.02	0.005	0.02	0.042	0.0006	0.0002	0.01	–
Nickel	mg/l	–	--	0.07	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01	0.02
Potassium	mg/l	–	--	77.6	116	--	95.6	82.3	88.2	86.6	95.2	104	93.6
Selenium	mg/l	0.05	--	0.001	0.001	--	0.001	0.001	0.005	0.001	0.006	0.006	0.001
Silver	mg/l	–	--	--	--	0.01	--	--	--	--	--	--	<0.005
Sodium	mg/l	–	200 [17]	590	525	--	542	469	494	463	507	546	505
Sulfur	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	–	--	--	--	0.2	--	--	--	--	--	--	<0.005
Titanium	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	–	--	--	--	0.005	--	--	--	--	--	--	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 25-Oct-2000	L5 13-Jun-2001	L5 20-Sep-2001	L5 21-Nov-2001	L5 22-May-2002	L5 08-Nov-2002	L5 31-May-2003	L5 23-Jul-2003	L5 21-Oct-2003	L5 17-May-2004
Zinc	mg/l	–	5	0.01	0.2	0.06	0.19	0.17	0.34	0.02	0.369	0.23	0.48
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	0.045	0.283	0.197	0.012	0.033	0.638	0.162	0.009	0.066	0.419
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	0.002
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 23-Aug-2004	L5 18-Nov-2004	L5 25-May-2005	L5 09-Sep-2005	L5 28-Nov-2005	L5 25-May-2006	L5 15-Aug-2006	L5 16-Nov-2006	L5 17-May-2007	L5 29-Aug-2007
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	2560	2710	2500	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	<1	<5	<5	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	2190	2330	2100	2220	2050	1940	2150	1820	2180	2210
Ammonia, unionized	mg/l	--	--	--	0.49	0.15	0.16	0.14	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	29.4	37.5	34.3	37.7	32.4	31.3	34.6	26	37.2	36.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	198	237	32	24	45	132	86	40	41	182
Chemical Oxygen Demand	mg/l	--	--	631	698	377	382	342	1170	442	239	309	560
Chloride	mg/l	--	250	386	499	360	454	380	329	348	262	380	546
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3530	2000	4400	3750	--	3690	3600	2800	3400	2200
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	701.2	369	651	710	595	640	538	395	632	553
Dissolved Organic Carbon	mg/l	--	5	29.8	401.1	108.8	202.5	91.8	122	201	135	95.7	165.1
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	4	--	--	2.8	--	--	1.1	2.97	--	1.19
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1550	1690	1630	1370	1370	1390	1340	1130	1320	1500
Hydrogen Sulfide	mg/l	--	0.05	--	8.3	1	1	4	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	<1	0.3	<0.1	0.1	0.1	0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	37.3	45.5	41	51.4	38.9	35.2	43.3	35.6	45.2	46.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.2	6.6	6.9	--	--	6.9	--	7.1	6.7
Phosphorus	mg/l	--	--	0.57	0.46	0.42	0.36	0.38	0.83	0.34	0.33	0.31	0.27
Sulphate	mg/l	--	500 [16]	96	40	30	19	74	97	28	40	47	98
Temperature (Field)	deg c	--	15	--	--	17.8	17	--	--	16.5	13.1	13.5	15.2
Total Dissolved Solids	mg/l	--	500	2940	--	2790	2930	2760	2550	2660	2290	2820	3140
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	45	67	54	16	17	1190	21	66	20	35
Metals													
Aluminum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.001	0.001	0.003	0.003	0.002	0.005	0.003	0.0053	0.005
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**11.5**	**14.9**	**16.3**	**15.1**	**13.2**	**10.9**	**13.3**	**11**	**13.8**	**11.6**
Cadmium	mg/l	0.005	--	<0.0006	<0.001	0.0001	0.0001	0.0003	0.0002	<0.001	<0.001	0.00014	<0.0002
Calcium	mg/l	--	--	369	379	349	288	282	325	296	241	280	311
Chromium	mg/l	0.05	--	0.008	0.012	0.012	0.008	0.005	0.014	0.006	0.008	0.006	0.009
Cobalt	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/l	--	1	<0.002	0.042	0.008	<0.002	<0.002	0.042	<0.002	0.002	<0.002	<0.002
Iron	mg/l	--	0.3	13.4	11.2	11.9	7.62	0.793	27.5	5.54	10.5	6.38	10.2
Lead	mg/l	0.01	--	0.0021	0.0029	0.0065	0.001	<0.001	0.0097	<0.001	<0.001	<0.00002	<0.0002
Magnesium	mg/l	--	--	152	181	185	159	163	139	145	129	151	175
Manganese	mg/l	--	0.05	1.55	1.38	1.62	1.27	0.649	1.52	0.964	1.4	0.957	0.654
Mercury	mg/l	0.001	--	<0.0001	<0.0001	<0.00006	<0.00005	0.00006	--	--	--	--	--
Molybdenum	mg/l	--	--	<0.01	<0.01	<0.01	<0.01	0.02	--	--	--	--	--
Nickel	mg/l	--	--	0.01	0.02	0.01	<0.01	<0.01	--	--	--	--	--
Potassium	mg/l	--	--	88.9	109	106	102	98.6	77.2	89.2	76.1	91.5	90.1
Selenium	mg/l	0.05	--	0.001	<0.001	<0.001	0.001	<0.001	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	<0.005	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	566	589	549	624	592	428	499	408	505	579
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 23-Aug-2004	L5 18-Nov-2004	L5 25-May-2005	L5 09-Sep-2005	L5 28-Nov-2005	L5 25-May-2006	L5 15-Aug-2006	L5 16-Nov-2006	L5 17-May-2007	L5 29-Aug-2007
Zinc	mg/l	–	5	0.12	0.149	0.045	<0.005	<0.005	--	--	--	0.007	0.008
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	0.237	0.31	0.03	0.021	0.08	0.028	0.11	0.007	0.015	0.16
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	0.001	<0.0007	0.007	--	--	--	--	--
Styrene	mg/l	–	--	--	--	<0.0006	<0.0006	<0.006	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	<0.0004	<0.0004	<0.004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	--	--	0.0001	0.0004	<0.001	<0.005	0.0003	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	<0.0002	<0.0002	<0.002	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	0.0001	0.0002	<0.001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	0.0015	0.0016	<0.002	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	**0.0013**	**0.004**	<0.005	<0.03	**0.0021**	--	--	--
Bromodichloromethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	<0.002	<0.002	<0.02	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	<0.0002	<0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	0.0039	0.0049	<0.002	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	<0.0003	<0.0003	<0.003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	0.001	0.0115	0.006	<0.03	0.0075	--	--	--
m,p-Xylenes	mg/l	–	--	--	--	0.0015	0.0175	<0.01	<0.05	0.0108	--	--	--
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	0.0007	0.0027	<0.003	<0.02	0.0021	--	--	--
o-Xylene	mg/l	–	--	--	--	0.0006	0.0082	<0.005	<0.03	0.0037	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	<0.0002	<0.002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	0.0027	0.0115	0.014	<0.03	0.0143	--	--	--
trans-1,2-Dichloroethene	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.002	<0.01	**0.0014**	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 20-Nov-2007	L5 23-May-2008	L5 13-Aug-2008	L5 10-Nov-2008	L5 19-May-2009 [3]	L5 25-Aug-2009 [4]	L5 23-Sep-2009	L5 30-Nov-2009 [4]	L5 25-May-2010 [4]	L5 18-Aug-2010 [5]
								L-1	L-1	L-1	L-1	L-1	L-1
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	–	--	2150	1900	2280	1990	1867	2063	–	1960	1906	2079
Ammonia, unionized	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	–	--	37.9	39.7	44	44.7	56.4	50.1	--	41.8	47.6	40.7
Biochemical Oxygen Demand, 5 Day	mg/l	–	--	<20	447	484	154	662	320	--	10	13	22
Chemical Oxygen Demand	mg/l	–	--	332	863	1120	595	1010	782	–	275	300	250
Chloride	mg/l	–	250	437	448	538	562	569	538	--	397	366	351
Conductivity	uS/cm	–	--	--	--	--	--	5050	5210	--	4410	4190	4080
Conductivity (Field)	uS/cm	–	--	1600	4500	5000	4400	--	>4000	–	>2999	>3999	3366
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	–	--	602	494	499	498	445	462	–	460	352	417
Dissolved Organic Carbon	mg/l	–	5	83.4	226	354	147.2	273	247	--	106	91.6	85.6
Dissolved Oxygen	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	--	2.46	--	--	--	--	--	--	--	--	7.34
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	--	1260	1300	1790	1410	1070	1290	–	1310	1230	1080
Hydrogen Sulfide	mg/l	–	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.20	<0.10	--	<0.10	0.11	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	--	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	–	--	47.9	51.5	58.2	50.5	68.5	59.2	--	43.1	48.4	43.7
Nitrogen, Nitrate-Nitrite	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	–	--	7.9	7.8	8.3	7.7	--	7.29	--	8.5	7.28	7.65
Phosphorus	mg/l	–	--	0.36	0.43	0.54	0.32	0.10	0.34	--	0.24	0.34	0.25
Sulphate	mg/l	–	500 [16]	135	260	72	61	99	108	--	45	16	59
Temperature (Field)	deg c	–	15	6.9	16.5	18	10	--	18.4	--	9	18.2	18.3
Total Dissolved Solids	mg/l	–	500	2930	2930	3310	3040	3260	3390	--	2670	2720	2650
Total Organic Carbon	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	--	124	308	254	152	496	332	–	222	367	366
Metals													
Aluminum	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.004	0.0079	0.0065	0.0042	**0.02**	<0.05	--	<0.05	<0.05	<0.01
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**14**	**12.2**	**14.5**	**14.8**	**14**	**15**	--	**14**	**18**	**17**
Cadmium	mg/l	0.005	--	<0.0002	<0.005	<0.005	<0.0001	<0.001	<0.01	--	<0.01	<0.01	<0.0001
Calcium	mg/l	–	--	261	252	438	316	184	228	–	269	242	192
Chromium	mg/l	0.05	--	0.007	0.011	0.012	0.01	0.015	<0.05	--	<0.02	<0.05	<0.005
Cobalt	mg/l	–	--	<0.005	<0.005	<0.005	<0.005	0.003	<0.01	--	0.005	<0.01	0.0053
Copper	mg/l	–	1	<0.002	0.002	<0.002	0.015	<0.01	0.01	--	<0.01	<0.01	0.002
Iron	mg/l	–	0.3	14.2	8.71	5.43	7.48	7.5	32.4	--	32.7	20.1	25.8
Lead	mg/l	0.01	--	<0.0002	<0.02	<0.02	<0.0001	<0.01	<0.01	--	<0.01	<0.01	<0.001
Magnesium	mg/l	–	--	148	163	168	150	148	175	–	155	152	147
Manganese	mg/l	–	0.05	0.924	1.38	1.07	0.592	0.5	0.91	--	1.65	1.80	1.53
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	–	--	94.7	94.8	105	102	87	99	--	87	86	80
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	–	200 [17]	500	529	555	591	555	601	--	533	474	486
Sulfur	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	–	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 20-Nov-2007	L5 23-May-2008	L5 13-Aug-2008	L5 10-Nov-2008	L5 19-May-2009 [3]	L5 25-Aug-2009 [4]	L5 23-Sep-2009	L5 30-Nov-2009 [4]	L5 25-May-2010 [4]	L5 18-Aug-2010 [5]
								L-1	L-1	L-1	L-1	L-1	L-1
Zinc	mg/l	–	5	0.037	0.12	0.105	0.023	<0.1	0.09	--	<0.05	<0.05	<0.01
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	0.006	0.33	0.438	0.24	0.688	0.469	--	<0.001	<0.001	0.002
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	--	<0.0001	0.0004	<0.0001	<0.0004	--	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	**0.0012**	**0.0017**	**0.0017**	**0.0080**	--	**0.0013**	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	0.0021	0.0038	0.0034	0.0009	--	0.0011	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	--	--	0.0053	0.0086	0.0069	0.0024	--	0.0034	<0.0010	<0.0010	<0.0010
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	0.0052	0.0051	0.0009	<0.0040	--	0.0049	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	–	--	--	0.0023	0.0033	0.0028	0.0019	--	0.0016	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	0.0127	0.0188	0.0103	0.0047	--	0.0067	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 14-Oct-2010 L-1	L5 24-May-2011 [6] L-1	L5 16-Aug-2011 [7] L-1	L5 30-Nov-2011 L5	L5 04-Jun-2012 [8] L5	L5 22-Aug-2012 [8] L - 5	L5 29-Nov-2012 [9] L5	L5 29-May-2013 [10] L5	L5 15-Aug-2013 [10] L-1	L5 26-Nov-2013 [10] LEACHATE
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	–	--	1914	1940	2052	2200	1700	1800	2300	1800	1900	1500
Ammonia, unionized	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	–	--	39.6	45.5	63.2	53.7	57	58	73	72 [20]	70	45
Biochemical Oxygen Demand, 5 Day	mg/l	–	--	18	60	64	45	32	43	45	25	29	13
Chemical Oxygen Demand	mg/l	–	--	275	450	475	275	370	420	480	410	420	230
Chloride	mg/l	–	250	320	421	543	553	470	520	620	510	580	380
Conductivity	uS/cm	–	--	4000	4180	4910	4920	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	--	2256	>3999	>4000	>3999	3787	3655	>3999	3659	>3999	2974
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	–	--	458	453	2.2	79.8	440	450	460	390	420	360
Dissolved Organic Carbon	mg/l	–	5	80.2	112	1.5	103	130	130	150	120	130	74
Dissolved Oxygen	mg/l	–	--	--	--	--	--	--	--	--	--	--	10.4
Dissolved Oxygen (Field)	mg/l	–	--	--	--	1.21	4.45	– [18]	5.98	1.24	--	8.71	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	--	1250	1080	1010	1180	980	920	1100	940	840	830
Hydrogen Sulfide	mg/l	–	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	0.20	0.30
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<1.0	<0.10	0.021	<0.010	<0.010	0.014	0.018	0.037
Nitrogen, Total Kjeldahl	mg/l	–	--	43.3	47.5	69.4	59.9	64	62	81	71 [20]	76	47
Nitrogen, Nitrate-Nitrite	mg/l	–	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	0.21	0.34
Nitrogen, Organic	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	–	--	7.64	7.75	8.31	7.64	8.08	8.25	6.93	8.11	7.26	8.37
Phosphorus	mg/l	–	--	0.30	0.27	0.28	0.28	<0.10 [19]	0.28	0.33	0.28	<0.20 [19]	0.17
Sulphate	mg/l	–	500 [16]	25	102	57	42	99	<1	<1	3	<1	21
Temperature (Field)	deg c	–	15	14.6	16.6	28.5	11.9	16.3	19.4	14.2	17.6	19.7	8.9
Total Dissolved Solids	mg/l	–	500	2600	2720	3190	3200	2670	2940	3400	2810	3030	2220
Total Organic Carbon	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	--	204	310	188	60	96	84	18	100	<2	45
Metals													
Aluminum	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	<0.05	<0.05	<0.05	<0.01	0.0079	0.0090	**0.013**	0.0096	0.0080	0.0021
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**14**	**15**	**16**	**16**	**18**	**23**	**23**	**21**	**25**	**17**
Cadmium	mg/l	0.005	--	<0.01	<0.01	<0.01	<0.001	<0.00010	<0.00010	<0.00020	<0.00010	<0.00010	<0.00010
Calcium	mg/l	–	--	263	142	152	229	140	120	220	170	140	100
Chromium	mg/l	0.05	--	<0.05	<0.05	<0.05	0.008	0.0089	0.011	0.016	0.01	0.012	<0.0050
Cobalt	mg/l	–	--	<0.01	<0.01	<0.01	0.003	0.0028	0.0029	0.0034	0.0033	0.0038	0.0025
Copper	mg/l	–	1	<0.01	<0.01	<0.01	<0.01	0.0017	0.0012	<0.0020	<0.0010	<0.0010	<0.0010
Iron	mg/l	–	0.3	12.1	14.3	7.5	8.3	0.5	6.3	6.7	8.3	5.4	3.8
Lead	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00050
Magnesium	mg/l	–	--	143	177	152	148	180	200	200	170	180	150
Manganese	mg/l	–	0.05	1.18	1.00	0.62	1.1	0.29	0.25	0.87	0.52	0.38	0.27
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	–	--	75	85	94	90	100	110	120	100	120	84
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	–	200 [17]	435	542	790	673	650	760	850	610	760	530
Sulfur	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	–	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 14-Oct-2010 L-1	L5 24-May-2011 [6] L-1	L5 16-Aug-2011 [7] L-1	L5 30-Nov-2011 L5	L5 04-Jun-2012 [8] L5	L5 22-Aug-2012 [8] L - 5	L5 29-Nov-2012 [9] L5	L5 29-May-2013 [10] L5	L5 15-Aug-2013 [10] L-1	L5 26-Nov-2013 [10] LEACHATE
Zinc	mg/l	–	5	<0.05	<0.05	<0.05	<0.1	0.0088	0.0053	<0.01	0.013	0.0055	0.01
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	0.001	0.082	0.049	0.003	0.034	0.094	0.11	0.016	0.0037	0.0069
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	<0.0004	<0.002	<0.0008	<0.0004	<0.0020	<0.0010	<0.00050	<0.0025	<0.0010	<0.0025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.002	<0.001	0.0010	<0.0020	<0.0010	0.0065	<0.0025	<0.0010	<0.0025
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.002	0.001	0.0019	<0.0020	<0.0010	0.011	<0.0025	<0.0010	<0.0025
m,p-Xylenes	mg/l	–	--	<0.0010	<0.0050	<0.0020	0.0040	<0.0020	<0.0010	0.014	<0.0025	<0.0010	<0.0025
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.02	<0.0080	<0.0040	<0.01	<0.0050	<0.0025	<0.013	<0.0050	<0.013
o-Xylene	mg/l	–	--	<0.0005	<0.002	0.001	0.0015	<0.0020	<0.0010	0.0033	<0.0025	<0.0010	<0.0025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.002	0.002	<0.0005	<0.0040	<0.0020	0.0055	<0.0050	<0.0020	<0.0050
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.001	<0.0004	<0.0002	<0.0040	<0.0020	<0.0010	<0.0050	<0.0020	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-May-2014 [11]	L5 27-Aug-2014 [12]	L5 13-Nov-2014 [13]	L5 27-May-2015	L5 25-Aug-2015	L5 25-Nov-2015	L5 24-May-2016	L5 18-Aug-2016	L5 16-Nov-2016	L5 18-May-2017
				L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	–	--	1800	1900	2000	1710	1850	1250	1500	1520	1870	1850
Ammonia, unionized	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	–	--	66	82 [20]	70	66.3	52.3	37.4	73.2	64.9	87.1	101
Biochemical Oxygen Demand, 5 Day	mg/l	–	--	23	29	15	<60 [22]	134	25	210	42	58	495
Chemical Oxygen Demand	mg/l	–	--	360	430	370	378	384	242	647	368	427	1240
Chloride	mg/l	–	250	500	630	550	553	1000	393	654	523	614	689
Conductivity	uS/cm	–	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	--	3765	>3999	3616	>3999	>3999	3742	>3999	>3999	>3999	3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	–	--	380	460	430	372	317	253	262	110	285	158
Dissolved Organic Carbon	mg/l	–	5	120	130	120	134	111	73.1	194	356	125	335
Dissolved Oxygen	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	--	8.25	--	7.44	7.56	7.09	5.10	9.70	8.46	9.02	6.85
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	--	890	970	990	172	980	1250	1220	929	1030	1220
Hydrogen Sulfide	mg/l	–	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.50	<0.50	0.26	<0.1	<0.1	0.7	<0.1	1.3	<0.1	<0.5 [23]
Nitrite as N	mg/l	1.0	--	<0.050	<0.050	0.042	<0.05	<0.05	<0.05	<0.05	<0.25 [24]	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	--	71	81 [20]	77	69.5	53.9	45.7	139	83.8	94.3	127
Nitrogen, Nitrate-Nitrite	mg/l	–	--	<0.50	<0.50	0.30	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	–	--	8.00	8.03	7.55	7.58	8.60	7.87	8.36	8.26	8.00	7.88
Phosphorus	mg/l	–	--	<0.10 [21]	0.33	0.31	0.39	0.25	0.16	0.41	0.33	0.34	0.48
Sulphate	mg/l	–	500 [16]	2	2	<1	41	34	403	124	43	24	76
Temperature (Field)	deg c	–	15	15.7	19.0	12.2	20.4	17.3	7.8	18.5	20	14.5	21.0
Total Dissolved Solids	mg/l	–	500	2960	3230	2920	2850	2820	2310	3290	2620	3130	3930
Total Organic Carbon	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	--	110	63	70	88	130	41	279	13	57	162
Metals													
Aluminum	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	<0.01	<0.02	**0.011**	0.001	0.007	0.003	0.009	0.005	0.004	**0.017**
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**20**	**26**	**22**	4.27	**22.1**	**13.2**	**26.5**	**20.2**	**29.3**	**24.7**
Cadmium	mg/l	0.005	--	<0.0010	<0.0020	<0.0010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	–	--	170	180	160	25.3	154	254	196	139	145	229
Chromium	mg/l	0.05	--	<0.05	<0.1	<0.05	0.002	0.009	0.006	0.012	0.009	0.011	0.024
Cobalt	mg/l	–	--	<0.0050	<0.01	<0.0050	0.0006	0.0032	0.0073	0.0147	0.0034	0.0043	0.0040
Copper	mg/l	–	1	<0.01	<0.02	<0.01	<0.0005	<0.0005	<0.0005	0.0020	<0.0005	<0.0005	0.0060
Iron	mg/l	–	0.3	7.1	7.8	5.4	0.852	7.81	3.47	5.57	7.9	5.8	2.52
Lead	mg/l	0.01	--	<0.0050	<0.01	<0.0050	<0.0001	<0.0001	0.0003	0.0013	<0.0001	<0.0001	0.0005
Magnesium	mg/l	–	--	160	180	160	26.4	145	148	179	141	161	158
Manganese	mg/l	–	0.05	0.61	0.64	0.51	0.064	0.606	0.491	0.948	0.541	0.397	1.21
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	–	--	100	110	110	17.9	94.7	62.9	108	76.2	123	109
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	–	200 [17]	640	750	700	110	571	577	812	576	717	866
Sulfur	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	–	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-May-2014 [11]	L5 27-Aug-2014 [12]	L5 13-Nov-2014 [13]	L5 27-May-2015	L5 25-Aug-2015	L5 25-Nov-2015	L5 24-May-2016	L5 18-Aug-2016	L5 16-Nov-2016	L5 18-May-2017
				L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5
Zinc	mg/l	--	5	<0.05	<0.1	<0.05	<0.005	0.015	0.012	0.01	<0.005	0.009	0.029
Phenols													
Phenolics, Total Recoverable	mg/l	--	--	0.012	0.0058	0.072	0.011	0.032	<0.004 [23]	0.142	0.052	0.025	0.360
Semi-VOCs													
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0019
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.01	<0.0020	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.01	<0.0020	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-Aug-2017 L-5	L5 28-Nov-2017 L-5	L5 23-May-2018 L-5	L5 30-Aug-2018 L-5	L5 11-Nov-2018 [14] L5	L5 19-Dec-2018 [15] L-5	L5 20-Jun-2019 L-5	L5 28-Aug-2019 L-5	L5 21-Nov-2019 L-5	L5 14-May-2020 L-5
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	–	--	1660	2050	1430	975	--	2040	2250	2080	1940	1580
Ammonia, unionized	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	–	--	45.6 [25]	80.1	81.7	74.2	--	90.0	112	69.1 [25]	89.4	45.3 [25]
Biochemical Oxygen Demand, 5 Day	mg/l	–	--	<60 [26]	652	43	27	--	22	178	86	35	24
Chemical Oxygen Demand	mg/l	–	--	269	1210	448	330	--	441	497	414	428	253
Chloride	mg/l	–	250	374	640	572	504	--	662	619	536	658	423
Conductivity	uS/cm	–	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	--	3234	3999	>3999	>3999	--	>3999	>3999	>3999	5640	3883
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	–	--	299	130	302	158	--	368	2.80	818	10.1	310
Dissolved Organic Carbon	mg/l	–	5	82.4	407	123	99.8	--	131	125	129	122	113
Dissolved Oxygen	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	--	7.47	7.69	10.12	8.71	--	7.31	7.86	7.74	7.7	6.67
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	--	1300	1750	1200	976	--	1150	1200	1420	1510	1180
Hydrogen Sulfide	mg/l	–	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.5 [23]	<0.5 [23]	1.1	0.3	--	<0.5 [23]	<0.1	0.2	<0.1	0.6
Nitrite as N	mg/l	1.0	--	<0.25 [24]	<0.05	<0.05	0.12	--	<0.25 [23]	<0.05	0.09	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	--	34.4	94.4	93.7	81.6	--	118	115	68.0	92.6	43.9
Nitrogen, Nitrate-Nitrite	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	–	--	7.79	7.70	7.91	8.45	--	8.26	7.82	7.26	8.24	7.83
Phosphorus	mg/l	–	--	0.14	0.36	0.29	0.18	--	0.58	0.36	0.34	0.25	0.22
Sulphate	mg/l	–	500 [16]	19	41	374	312	--	58	87	135	143	123
Temperature (Field)	deg c	–	15	16.1	10.5	17.6	18.5	--	10.9	17.8	17.2	11.4	16.5
Total Dissolved Solids	mg/l	–	500	2590	3090	3030	2620	--	3040	3120	3020	3320	2240
Total Organic Carbon	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	--	140	96	32	40	--	95	5	48	47	87
Metals													
Aluminum	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	**0.014**	**0.012**	**0.011**	--	0.004	0.007	**0.019**	0.006	0.001
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**14.2**	**13.4**	**16.2**	**10.3**	--	**20.9**	**26.6**	**13.2**	**24.6**	**15.8**
Cadmium	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	–	--	254	382	240	129	--	196	208	287	320	205
Chromium	mg/l	0.05	--	0.006	0.019	0.014	0.011	--	0.011	0.015	0.021	0.019	0.005
Cobalt	mg/l	–	--	0.0028	0.0030	0.0091	0.0051	--	0.0043	0.0055	0.0033	0.0063	0.0020
Copper	mg/l	–	1	<0.0005	0.0018	0.0082	0.0025	--	<0.0005	0.0006	0.0013	0.0005	<0.0005
Iron	mg/l	–	0.3	8.56	2.44	3.44	9.53	--	2.39	1.33	11.2	5.73	10.8
Lead	mg/l	0.01	--	<0.0001	0.0017	0.0019	0.0014	--	0.0001	<0.0001	0.0005	0.0003	0.0002
Magnesium	mg/l	–	--	161	193	147	159	--	161	166	171	172	163
Manganese	mg/l	–	0.05	0.704	1.6	0.541	0.066	--	0.308	0.315	13.2	0.776	0.592
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	–	--	94.7	118	104	96.3	--	123	123	102	132	88.2
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	–	200 [17]	490	622	542	512	--	589	666	503	714	497
Sulfur	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	–	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-Aug-2017	L5 28-Nov-2017	L5 23-May-2018	L5 30-Aug-2018	L5 11-Nov-2018 [14]	L5 19-Dec-2018 [15]	L5 20-Jun-2019	L5 28-Aug-2019	L5 21-Nov-2019	L5 14-May-2020
				L-5	L-5	L-5	L-5	L5	L-5	L-5	L-5	L-5	L-5
Zinc	mg/l	–	5	0.01	0.031	0.016	<0.005	--	<0.005	0.015	0.01	0.006	0.014
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	<0.004 [23]	0.629	0.016	0.009	--	<0.010 [23]	0.008	0.033	0.008	0.006
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0006	0.0009	<0.0005
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0014	<0.0005	<0.0005
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0008	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	0.0268	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0032	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 27-Aug-2020 L-5	L5 25-Nov-2020 L-5	L5 27-May-2021 L-5	L5 24-Aug-2021 L-5	L5 24-Nov-2021 L-5
				--	--	--	--	--
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	–	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	–	--	916	2440	2220	1980	1750
Ammonia, unionized	mg/l	–	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	–	--	33.6	76.9 [25]	90.8 [25]	91.6 [25]	74.4 [25]
Biochemical Oxygen Demand, 5 Day	mg/l	–	--	23	27	37	<60 [26]	30
Chemical Oxygen Demand	mg/l	–	--	236	405	416	392	330
Chloride	mg/l	–	250	648	544	561	542	441
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	--	>3999	>3999	>3999	>3999	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	–	--	180	359	484	468	402
Dissolved Organic Carbon	mg/l	–	5	54.0	119	122	103	94.2
Dissolved Oxygen	mg/l	–	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	--	9.44	9.95	6.32	7.74	10.01
Fluoride	mg/l	1.5	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	--	1530	404	1280	1110	1260
Hydrogen Sulfide	mg/l	–	0.05	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.2	<1.0 [27]	<0.5 [27]	<0.5 [27]	<0.1
Nitrite as N	mg/l	1.0	--	0.27	<0.50	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	--	38.0	72.6	85.5	86.7	73.4
Nitrogen, Nitrate-Nitrite	mg/l	–	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	--	--	--	--	--	--
pH (Field)	-	–	--	7.97	8.37	7.91	7.90	8.53
Phosphorus	mg/l	–	--	0.38	0.19	0.33	0.23	0.35
Sulphate	mg/l	–	500 [16]	128	47	35	28	74
Temperature (Field)	deg c	–	15	17.5	10.1	18.1	22.1	9.9
Total Dissolved Solids	mg/l	–	500	2320	2770	2950	2880	2580
Total Organic Carbon	mg/l	–	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	--	185	59	106	75	219
Metals								
Aluminum	mg/l	–	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.004	0.003	0.002	0.003
Barium	mg/l	1	--	--	--	--	--	--
Bismuth	mg/l	–	--	--	--	--	--	--
Boron	mg/l	5	--	**8.42**	**17.3**	**25.6**	**16.4**	**17.5**
Cadmium	mg/l	0.005	--	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	–	--	384	162	221	161	261
Chromium	mg/l	0.05	--	**0.075**	0.011	0.016	0.012	0.009
Cobalt	mg/l	–	--	0.0085	0.0044	0.0057	0.0048	0.0031
Copper	mg/l	–	1	0.0124	<0.0005	0.0010	<0.0005	0.0014
Iron	mg/l	–	0.3	17.2	3.89	9.37	3.82	1.38
Lead	mg/l	0.01	--	0.0033	<0.0001	0.0002	<0.0001	0.0004
Magnesium	mg/l	–	--	138	171	176	172	149
Manganese	mg/l	–	0.05	2.27	0.296	0.732	0.278	0.538
Mercury	mg/l	0.001	--	--	--	--	--	--
Molybdenum	mg/l	–	--	--	--	--	--	--
Nickel	mg/l	–	--	--	--	--	--	--
Potassium	mg/l	–	--	81.4	106	119	115	106
Selenium	mg/l	0.05	--	--	--	--	--	--
Silver	mg/l	–	--	--	--	--	--	--
Sodium	mg/l	–	200 [17]	410	643	687	645	559
Sulfur	mg/l	–	--	--	--	--	--	--
Tin	mg/l	–	--	--	--	--	--	--
Titanium	mg/l	–	--	--	--	--	--	--
Vanadium	mg/l	–	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 27-Aug-2020	L5 25-Nov-2020	L5 27-May-2021	L5 24-Aug-2021	L5 24-Nov-2021
				L-5	L-5	L-5	L-5	L-5
Zinc	mg/l	--	5	4.54	<0.005	0.009	<0.005	0.015
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.018	0.082	0.009	<0.010 [27]	0.050
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Metals and TP MRL elevated due to matrix interference.
(4)	Metals analysis performed on aqua-regia digest of sample material.
(5)	Arsenic MRL elevated due to matrix interference.
(6)	Metals analysis performed on aqua-regia digest of sample material due to solids present in sample, except for Boron. MRLs may be elevated. TP MRL elevated due to matrix interference. Due to matrix interference 5x dilution factor required for VOCs. TKN and N-NH3 were analysed at SGS Lakefield.
(7)	N-NO2,N-NO3 and TP MRL elevated due to matrix interference. VOC MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.
(8)	VOC Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly
(9)	Metal analysis: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(10)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(11)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Metal Analysis: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly. Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(12)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Nitrite/Nitrate: Due to the colour interferences, some sample required dilution. Detection limits were adjusted accordingly. Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(13)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Nitrite/Nitrate: Due to the sample matrix, some sample required dilution. Detection limits were adjusted accordingly. Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(14)	Leachate pump was not working. No sample could be collected.
(15)	Clarity: slight turbidity, sediments: none, colour: light greyish brownish tint, odour: leachate-like odou
(16)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(17)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(18)	The dissolved oxygen reading was missed during this monitoring session.
(19)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(20)	TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.
(21)	Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly
(22)	Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(23)	Elevated Reporting Limit due to matrix interference.
(24)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(25)	INOG6 Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions
(26)	BOD01 Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(27)	GEN02 Elevated Reporting Limit due to matrix interference.

Parameter	Unit	PWQO [1]	S1 01-Apr-1984	S1 01-May-1987	S1 01-Oct-1987	S1 19-Jun-1990	S1 27-Jun-1990	S1 04-Oct-1990	S1 06-Nov-1990	S1 27-Nov-1990	S1 24-Apr-1991
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	192000	194000	184000	134000	114000	132000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	80	220	150	100	750	180	750	240
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	2000	5000	1000	1000	3000	3000
Chemical Oxygen Demand	ug/l	--	--	--	--	39000	135000	135000	73000	95000	116000
Chloride	ug/l	--	--	173800	158500	57000	326000	113000	45000	46000	114000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	300	996	895	590	1152	849	431	663	622
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	980	74000	74000	33000	27000	31000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	6850	6850	9400	12300	9300
Hardness, Calcium Carbonate	ug/l	--	--	--	--	231000	335000	282000	157000	156000	169000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	1140	940	770	6800
Nitrite as N	ug/l	--	--	--	--	--	--	100	20	1	160
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	980	4000	1460	740	1560	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	330	330	710	560	810	1360
pH (Field)	-	6.5 - 8.5	--	7.34	7.59	7.96	8.06	8.16	8.11	7.9	8.03
Phosphate	ug/l	--	--	--	--	100	430	170	100	100	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	67900	59300	1600	52000	62000	36000	30000	72000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	150000	500000	450000	295000	575000	425000	216000	332000	311000
Total Organic Carbon	ug/l	--	--	--	--	1100	19000	19000	18000	9000	19000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	100	20	20	50	50	50	50	60
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	--	84700	77900	71000	105000	93000	48000	51000	48000
Chromium	ug/l	-- [13]	--	**100**	**10**	--	--	**50**	**50**	**50**	**50**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	--	**1800**	**500**	**430**	**2390**	**210**	**630**	**2550**	**800**
Iron	ug/l	300	--	40	30	30	70	50	50	50	50
Lead	ug/l	-- [14]	--	200	130	**100**	**320**	**90**	**180**	**290**	**180**
Magnesium	ug/l	--	--	19200	16100	13000	17000	12000	9000	7000	12000
Manganese	ug/l	--	--	100	20	--	--	50	50	50	50
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	**50**	**70**	**40**	**50**	**80**	**50**	**80**	**50**
Potassium	ug/l	--	--	--	--	5000	13000	23000	7000	6000	5000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	--	--	31000	157000	102000	32000	78000	55000
Zinc	ug/l	30 [11]	--	--	--	--	--	--	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	--	**2**	**2**	**18**	**5**

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Parameter	Unit	PWQO [1]	S1 06-Sep-1992	S1 08-Jun-1993	S1 04-Nov-1993	S1 15-Jun-1994	S1 02-Nov-1994	S1 28-Jun-1995	S1 14-Nov-1995	S1 12-Jun-1996	S1 12-Oct-1996
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	134000	115000	134000	202000	51000	280000	144000	195000	193000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	<100	100	100	100	130	50	110	40	70
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	2000	2100	1800	4000	1000	2000	4000	1000
Chemical Oxygen Demand	ug/l	--	265000	17000	62200	35000	69000	496000	38000	18000	30000
Chloride	ug/l	--	107000	102000	85000	128000	40000	195000	71500	139000	89000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	744	350	651	908	423	1118	690	850	750
Cyanide	ug/l	5 [6]	<5	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	27300	32200	37400	--	12000	100000	33100	39800	38200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	15900	--	10100	8030	12010	8080	13340	6790	10880
Hardness, Calcium Carbonate	ug/l	--	231650	179000	207000	242000	117000	749000	205000	241000	255000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	2900	7840	960	4500	100	1600	--	--
Nitrite as N	ug/l	--	<100	100	<100	--	100	100	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	840	560	1490	5320	6160	670	1660	650	990
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	740	460	1390	5220	6030	620	1550	610	--
pH (Field)	-	6.5 - 8.5	7.51	8.38	7.67	7.67	7.8	6.88	7.7	7.18	7.36
Phosphate	ug/l	--	260	80	260	10	440	200	110	100	120
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	55000	52900	57000	48000	52000	74000	60000	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	440000	425000	356000	456000	212000	714000	350000	430000	370000
Total Organic Carbon	ug/l	--	10300	8800	13700	16200	15300	11800	14700	9000	12400
Total Suspended Solids	ug/l	--	--	--	--	--	64000	38000	37000	35000	3000
Metals											
Arsenic	ug/l	100 [11]	<1	--	--	--	--	100	--	--	--
Barium	ug/l	--	5	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	**380**	53	30	32	30
Cadmium	ug/l	0.2 [11]	--	--	--	--	0.1	0.1	0.1	--	--
Calcium	ug/l	--	67800	49000	60000	73900	32000	102000	58800	68700	73600
Chromium	ug/l	-- [13]	**<20**	**74**	**<10**	**15**	**10**	**12**	**10**	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**<10**	**12**	3	**6.8**	4.1	**7**	2.6	**50.8**	1.7
Iron	ug/l	300	**1000**	**4906**	**793**	**835**	**1402**	**400**	**1220**	**1220**	**700**
Lead	ug/l	-- [14]	**10**	4.7	**6.6**	1	1.2	2	0.4	0.4	0.2
Magnesium	ug/l	--	15100	14000	14000	14000	8900	23800	14000	16600	16900
Manganese	ug/l	--	50	114	89	124	75	446	90	100	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	<20	20	<20	20	20	20	20	20	20
Potassium	ug/l	--	4300	11000	8100	6300	9900	13000	12200	9930	13900
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	66300	51000	45000	78000	23000	78900	61800	93600	58300
Zinc	ug/l	30 [11]	30	30	**36**	**37**	18	16	20	10	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	**2**	**3**	**5**	1	1	--	1	--

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Parameter	Unit	PWQO [1]	S1 17-Jun-1997	S1 05-Nov-1997	S1 05-Jun-1998	S1 26-Aug-1998	S1 30-Oct-1998	S1 30-Jun-1999	S1 19-Oct-1999	S1 03-May-2000	S1 25-Oct-2000
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	179000	216000	208000	100000	168000	208000	324000	195000	267000
Ammonia, unionized	ug/l	20	--	--	--	--	10	--	--	10	--
Ammonia Nitrogen	ug/l	--	10	60	20	50	50	10	170	70	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	1000	3000	2000	1000	6000	1000	1000	--
Chemical Oxygen Demand	ug/l	--	28000	17000	10000	36000	42000	81000	23000	30000	--
Chloride	ug/l	--	137000	242000	138000	38100	82200	201000	143000	240000	295000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	815	1200	900	360	643	1080	1300	1250	1540
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	33700	40600	39100	17400	39200	27100	84900	31400	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6010	9830	10430	7560	9560	13110	7650	11330	7560
Hardness, Calcium Carbonate	ug/l	--	279000	294000	249000	147000	229000	271000	581000	309000	407000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--	--	--	10
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	1900
Nitrogen, Total Kjeldahl	ug/l	--	900	1050	3120	1240	940	800	570	890	660
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.07	7.8	--	7.69	7.3	8.3	7.2	7.22	7.22
Phosphate	ug/l	--	90	90	40	320	80	60	50	20	130
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--	--	--	103000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	409000	600000	451000	180000	323000	540000	640000	625000	858000
Total Organic Carbon	ug/l	--	11100	10000	5900	11000	14000	13600	8900	9200	--
Total Suspended Solids	ug/l	--	17000	45000	21000	55000	9000	24000	22000	24000	113000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	70	60	30	60	50	30	110	40	**730**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	89500	92600	75700	47500	64600	89200	174000	94600	116000
Chromium	ug/l	-- [13]	--	--	--	--	--	--	--	--	**20**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	0.5	**12.4**	3.2	3.3	2.6	2.5	2	**8.4**	**13.2**
Iron	ug/l	300	**1320**	**1310**	**590**	**1810**	**800**	**390**	**3010**	**350**	**5620**
Lead	ug/l	-- [14]	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	13200	15100	14500	6870	16300	11400	35100	17400	28500
Manganese	ug/l	--	330	220	80	70	80	50	1100	330	440
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	**40**
Potassium	ug/l	--	3800	5600	1200	5200	9100	2800	8700	4900	5700
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	73900	97200	89700	26400	55400	114000	91800	131000	149000
Zinc	ug/l	30 [11]	10	30	20	**250**	10	20	**340**	**240**	**330**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**4**	**2**	1	**19**	1	1	1	**5**	**2**

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Parameter	Unit	PWQO [1]	S1 13-Jun-2001	S1 27-Sep-2001	S1 21-Nov-2001	S1 22-May-2002	S1 08-Nov-2002	S1 31-May-2003	S1 03-Jul-2003	S1 22-Oct-2003	S1 17-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	196000	239000	169000	130000	234000	152000	158000	143000	228000
Ammonia, unionized	ug/l	20	<20	<20	<20	--	--	--	--	--	<10
Ammonia Nitrogen	ug/l	--	50	30	30	50	10	150	70	50	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	1000	1000	1000	1000	2000	2000	3000
Chemical Oxygen Demand	ug/l	--	31000	14000	30000	40000	32000	49000	56000	68000	42000
Chloride	ug/l	--	347000	280000	116000	144000	361000	105000	308000	97300	312000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1250	1290	670	780	1400	740	1310	760	1370
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	30200	52900	23700	26000	64000	39000	58000	34000	38300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10900	9180	11380	9450	11600	7160	5030	10500	9000
Hardness, Calcium Carbonate	ug/l	--	318000	403000	241000	273000	384000	209000	324000	--	340000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	700	1000	700	1200	900	22700	1300	400
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	770	520	690	670	620	1040	1460	5650	2680
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	7.94	6.63	6.75	7	7.6	7.37	7.73	7.4
Phosphate	ug/l	--	70	50	40	50	60	40	430	500	80
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	76000	126000	76000	49000	102000	43000	70000	74000	63000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	846000	868000	496000	492000	700000	397000	1000000	412000	685000
Total Organic Carbon	ug/l	--	11800	8300	15000	9000	10000	22000	13000	16000	9700
Total Suspended Solids	ug/l	--	37000	18000	10000	6000	18000	3000	218000	60000	24000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	2
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	110	50	40	50	60	30	54	47	48
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	92900	124000	72100	59000	123000	63100	103000	69500	107000
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	**10**	3	**12**	2
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**5.5**	3.6	2.3	<1	3.1	3	2	**20**	**16**
Iron	ug/l	300	**1780**	**1280**	**460**	**670**	**1360**	**460**	**4020**	**3460**	**1760**
Lead	ug/l	-- [14]	1.2	0.2	0.2	<1	1.3	0.5	3.7	5.4	0.5
Magnesium	ug/l	--	20900	22600	14900	15300	18700	12400	16300	12100	17400
Manganese	ug/l	--	470	130	60	150	190	50	251	152	358
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	10	10	20
Potassium	ug/l	--	4500	7100	7600	8700	11000	5000	7500	8700	7000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	187000	149000	68700	88700	194000	67400	184000	64000	190000
Zinc	ug/l	30 [11]	**130**	**100**	30	**70**	**150**	20	**270**	**122**	**129**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**15**	1	1	1	1	1	1	1	1

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Parameter	Unit	PWQO [1]	S1 21-Aug-2004	S1 18-Nov-2004	S1 25-May-2005	S1 09-Sep-2005	S1 09-Nov-2005	S1 24-May-2006	S1 15-Aug-2006	S1 16-Nov-2006	S1 08-May-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	268000	334000	273000	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	<5000	<5000	<5000	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	282000	230000	220000	274000	224000	153000	219000	110000	208000
Ammonia, unionized	ug/l	20	<10	<10	<10	<10	<10	<10	<10	--	<10
Ammonia Nitrogen	ug/l	--	60	110	30	40	30	10	<10	80	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	<3000	<3000	6000	<3000	<3000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	32000	29000	35000	27000	23000	40000	38000	45000	35000
Chloride	ug/l	--	281000	195000	167000	273000	195000	121000	284000	28700	228000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1270	1180	1200	1500	730	485	1370	260	900
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	36200	25300	57200	68500	48600	40200	52600	28600	52000
Dissolved Organic Carbon	ug/l	--	--	--	10800	79400	9800	17800	12100	14600	9200
Dissolved Oxygen (Field)	ug/l	-- [7]	7000	6800	6380	6400	10900	9660	**1200**	8280	10340
Hardness, Calcium Carbonate	ug/l	--	351000	306000	298000	390000	342000	207000	295000	86000	273000
Hydrogen Sulfide	ug/l	2 [8]	--	--	<10	<10	<10	--	--	--	--
Nitrate as N	ug/l	--	300	1200	600	200	1800	900	200	1000	600
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	570	720	750	490	820	850	470	1140	570
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	6.9	7.3	7.6	7.7	7.8	7.7	--	8.1
Phosphate	ug/l	--	30	30	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	**40**	20	**70**	**40**	**60**	**210**	**40**
Sulphate	ug/l	--	83000	80000	62000	93000	97000	47000	82000	33000	67000
Temperature (Field)	deg c	-- [10]	--	--	16.8	17.2	1	9	20	8.2	17.2
Total Dissolved Solids	ug/l	--	635000	590000	580000	863000	696000	413000	790000	201000	683000
Total Organic Carbon	ug/l	--	9400	8700	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	5000	<3000	3000	25000	3000	21000	57000	5000
Metals											
Arsenic	ug/l	100 [11]	1	1	<1	1	<1	<1	1.2	1	1.2
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	84	45	61	85	56	31	64	39	55
Cadmium	ug/l	0.2 [11]	--	--	<0.3	<0.1	<0.5	<0.1	<0.1	**<0.5**	<0.1
Calcium	ug/l	--	111000	95000	90400	126000	107000	63100	90600	23900	83300
Chromium	ug/l	-- [13]	1	2	<2	2	4	<2	2	**12**	<2
Cobalt	ug/l	0.9	--	--	**30**	**1.1**	0.6	0.3	0.6	0.9	<0.5
Copper	ug/l	5	2	2	<2	<2	4	<2	4	**40**	**22**
Iron	ug/l	300	**455**	**375**	**543**	**1360**	**1650**	**384**	**978**	**613**	**646**
Lead	ug/l	-- [14]	3.5	0.6	<0.6	<0.5	1	0.6	0.8	3	0.3
Magnesium	ug/l	--	17500	16600	17600	17900	18400	11800	16600	6420	15600
Manganese	ug/l	--	162	135	137	191	129	69	79	102	143
Mercury, dissolved	ug/l	0.2 [15]	--	--	<0.05	<0.06	<0.06	--	--	--	--
Molybdenum	ug/l	40	--	--	5.1	1.4	<5	--	--	--	--
Nickel	ug/l	25	10	10	<10	<10	<10	--	--	--	--
Potassium	ug/l	--	6900	7500	6200	8200	9000	4800	6500	4800	6600
Selenium	ug/l	100	--	--	<1	<1	<1	--	--	--	--
Sodium	ug/l	--	196000	124000	109000	186000	137000	73700	183000	32700	154000
Zinc	ug/l	30 [11]	**70**	**40**	**39**	**82**	**79**	17	28	**36**	29
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	<1	<1	<1	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S1 22-Aug-2007	S1 20-Nov-2007	S1 23-May-2008	S1 12-Aug-2008	S1 06-Nov-2008	S1 13-May-2009 S-3	S1 25-Aug-2009 A-8	S1 27-Nov-2009 S-11	S1 18-May-2010 S-8
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	190000	160000	220000	218000	172000	197000	306000	303000
Ammonia, unionized	ug/l	20	<10	<10	<20	<20	<20	2	4.06	7.67	<0.37
Ammonia Nitrogen	ug/l	--	<10	90	<10	<10	10	50	200	130	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	4000	<3000	<3000	<3000	<1000	1000	2000	<1000
Chemical Oxygen Demand	ug/l	--	45000	42000	48000	29000	19000	48000	48000	38000	30000
Chloride	ug/l	--	340000	203000	127000	335000	163000	130000	258000	234000	254000
Conductivity	uS/cm	--	--	--	--	--	--	900	2010	1980	1860
Conductivity (Field)	uS/cm	--	1250	750	650	1500	900	750	1596	958	1948
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	58700	51300	39500	55200	52400	41400	47100	74400	66800
Dissolved Organic Carbon	ug/l	--	9400	12000	12500	9600	6600	17600	11200	13600	12600
Dissolved Oxygen (Field)	ug/l	-- [7]	6140	9690	11500	7320	9880	9940	9350	12430	**4210**
Hardness, Calcium Carbonate	ug/l	--	283000	277000	178000	265000	294000	230000	525000	598000	559000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	1400	500	200	1200	650	140	1260	<100
Nitrite as N	ug/l	--	--	--	--	--	--	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1060	880	950	520	610	1050	700	840	440
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.4	8.2	8	**8.7**	8	8	7.69	**8.67**	7.74
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**200**	**100**	**50**	20	**40**	**140**	**50**	**90**	20
Sulphate	ug/l	--	70000	87000	33000	73000	98000	63000	420000	397000	296000
Temperature (Field)	deg c	-- [10]	16.4	1.6	13.8	21.3	9.8	20.7	20.9	5.9	18.2
Total Dissolved Solids	ug/l	--	878000	649000	408000	935000	619000	585000	1410000	1390000	1210000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	99000	34000	<3000	3000	4000	32000	15000	18000	5000
Metals											
Arsenic	ug/l	100 [11]	2.5	1.3	2.1	1.6	<0.5	1	2	1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	63	43	24	50	39	40	190	160	120
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	84900	89300	54100	83100	92400	69000	174000	180000	171000
Chromium	ug/l	-- [13]	3	4	<2	<2	<2	5	6	6	6
Cobalt	ug/l	0.9	**1**	**1.2**	<0.5	<0.5	<0.5	0.5	**1.1**	**1.5**	**1.0**
Copper	ug/l	5	5	4	<2	**7**	3	3	2	5	2
Iron	ug/l	300	**1720**	**1840**	**499**	274	**374**	**710**	**1050**	**560**	**420**
Lead	ug/l	-- [14]	1.7	2.8	<0.1	1.2	<0.1	2	<1	<1	<1
Magnesium	ug/l	--	17100	13200	10500	14000	15300	14000	22000	36000	32000
Manganese	ug/l	--	145	140	64	423	87	110	460	320	320
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8200	8400	4300	9700	7900	6000	28000	23000	14000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	214000	123000	80300	285000	106000	96000	208000	199000	182000
Zinc	ug/l	30 [11]	**76**	**75**	8	30	**31**	**60**	20	20	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	<1	**2**

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Parameter	Unit	PWQO [1]	S1 18-Aug-2010 [2] S-9	S1 14-Oct-2010 S-9	S1 19-May-2011 [2] W-11	S1 16-Aug-2011 [2] N-9	S1 30-Nov-2011 [3] S1	S1 30-May-2012 S 1	S1 22-Aug-2012 S-1	S1 29-Nov-2012 [4] S-1	S1 28-May-2013 S1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	316000	331000	270000	372000	198000	310000	360000	360000	320000
Ammonia, unionized	ug/l	20	<0.08	0.37	1.16	1.13	1.38	<1.38	<2.2	0.96	0.69
Ammonia Nitrogen	ug/l	--	<20	30	50	30	130	<50	<50	110	92
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	1000	2000	<1000	6000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	30000	35000	55000	35000	65000	53000	47000	39000	38000
Chloride	ug/l	--	202000	174000	231000	270000	106000	280000	240000	250000	260000
Conductivity	uS/cm	--	1860	1660	1670	1860	1160	--	--	--	--
Conductivity (Field)	uS/cm	--	1680	1357	1562	1482	1062	1699	1526	1769	1732
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	66400	74700	63400	88300	25900	76000	60000	82000	71000
Dissolved Organic Carbon	ug/l	--	14100	14300	12300	14000	7100	17000	86000	14000	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	7560	14300	7270	5960	10950	7310	8160	13250	**3060**
Hardness, Calcium Carbonate	ug/l	--	620000	516000	547000	477000	385000	520000	520000	550000	670000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	830	<100	<100	170	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<10	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	570	430	1180	550	1010	1100	1000	1200	810
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	<100	<100	170	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.96	7.73	7.89	7.92	7.93	7.71	7.93	8.02	7.29
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	**40**	**120**	30	**470**	**85**	**120**	**50**	**53**
Sulphate	ug/l	--	370000	275000	243000	197000	201000	220000	220000	270000	310000
Temperature (Field)	deg c	-- [10]	20.6	12.8	16.5	22.4	5.1	24.6	24.3	0.2	19.8
Total Dissolved Solids	ug/l	--	1300000	1080000	1090000	1210000	754000	1170000	1170000	1250000	1350000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	6000	76000	8000	372000	19000	14000	23000	8000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<10	<10	<50	1.4	1.0	<1.0	1.0
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**230**	140	150	130	100	190	200	150	160
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	0.1	<0.1	**<10**	**0.21**	<0.10	<0.10	<0.10
Calcium	ug/l	--	197000	157000	163000	148000	103000	170000	160000	200000	210000
Chromium	ug/l	-- [13]	7	7	**9**	**9**	**<50**	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.8	0.8	**1.5**	0.5	<10	**1.3**	0.63	<0.50	0.59
Copper	ug/l	5	3	2	**8**	2	**30**	**6.6**	3.0	2.7	2.6
Iron	ug/l	300	**380**	**660**	**1480**	**380**	**13200**	**1500**	**1000**	<100	**450**
Lead	ug/l	-- [14]	<1	<1	5	<1	**30**	0.89	0.61	<0.50	<0.50
Magnesium	ug/l	--	31000	30000	34000	26000	31000	36000	31000	37000	40000
Manganese	ug/l	--	280	430	370	200	570	670	320	120	200
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	14000	14000	14000	10000	15000	18000	18000	19000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	175000	146000	160000	184000	90000	210000	220000	230000	210000
Zinc	ug/l	30 [11]	<10	<10	**40**	<10	**140**	21	16	14	9.6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	**1.2**	<1.0	<1.0	<1.0

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Parameter	Unit	PWQO [1]	S1 15-Aug-2013 S-1	S1 21-Nov-2013 SA-1	S1 28-May-2014 S1	S1 26-Aug-2014 S1	S1 13-Nov-2014 S-1	S1 27-May-2015 S-1	S1 25-Aug-2015 S-1	S1 25-Nov-2015 S-1	S1 24-May-2016 S-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	350000	370000	340000	390000	370000	373000	364000	418000	364000
Ammonia, unionized	ug/l	20	1.84	<0.32	<0.75	2.68	0.26	0.99	4.29	0.73	1.32
Ammonia Nitrogen	ug/l	--	50	<50	<50	120	95	190	30	100	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	2000	<2000	<2000	<2000	5000	15000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	38000	36000	36000	46000	38000	61000	29000	41000	37000
Chloride	ug/l	--	250000	200000	310000	270000	210000	266000	254000	260000	344000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1739	1581	1785	1992	1407	1752	1630	1824	1784
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	83000	92000	78000	98000	88000	76000	79900	83800	76000
Dissolved Organic Carbon	ug/l	--	16000	13000	14000	14000	13000	16400	14800	12600	13200
Dissolved Oxygen (Field)	ug/l	-- [7]	**150**	10580	14290	**360**	9660	7740	**4380**	11330	5570
Hardness, Calcium Carbonate	ug/l	--	550000	580000	650000	590000	560000	579000	408000	838000	582000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	190	<100	<100	100	<100	<100	100	<100
Nitrite as N	ug/l	--	<10	<10	<10	<10	12	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	690	860	950	1900	9800	500	900	700
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	190	<100	<100	110	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.93	7.78	7.68	7.72	7.35	7.10	**8.66**	7.93	7.88
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**48**	28	24	**57**	**88**	**1690**	**50**	**80**	30
Sulphate	ug/l	--	230000	270000	270000	250000	220000	224000	211000	221000	200000
Temperature (Field)	deg c	-- [10]	21.7	3.1	17.1	21.3	4.9	20.7	18.9	0.6	18.6
Total Dissolved Solids	ug/l	--	1280000	1210000	1440000	1320000	1070000	1110000	1060000	1080000	1240000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<1000	7000	12000	7000	88000	266000	9000	38000	30000
Metals											
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	2	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**210**	160	180	200	160	**201**	199	149	146
Cadmium	ug/l	0.2 [11]	<0.10	**1.8**	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	180000	180000	200000	180000	170000	174000	120000	253000	168000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	2	<1	3	1
Cobalt	ug/l	0.9	<0.50	<0.50	0.50	<0.50	0.69	**1.4**	0.5	0.7	<0.5
Copper	ug/l	5	2.6	2.5	1.9	1.7	2.9	3.1	<0.5	0.9	2.4
Iron	ug/l	300	**380**	230	**320**	210	**460**	**3480**	234	**965**	200
Lead	ug/l	-- [14]	0.64	0.52	0.51	<0.50	1.6	**9.0**	<0.1	1.1	0.3
Magnesium	ug/l	--	30000	40000	42000	32000	34000	35100	26500	50000	39200
Manganese	ug/l	--	83	93	120	210	140	638	206	153	42
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	16000	15000	17000	16000	13000	13800	12500	12200	12500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	200000	170000	210000	220000	160000	154000	148000	228000	198000
Zinc	ug/l	30 [11]	6.5	15	16	9.6	30	**33**	13	23	9
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	**1.4**	<1.0	<1.0	**1.7**	<1	**2**	<1	**8**

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Parameter	Unit	PWQO [1]	S1 18-Aug-2016 S-1	S1 16-Nov-2016 S-1	S1 18-May-2017 S-1	S1 28-Aug-2017 S-1	S1 28-Nov-2017 S-1	S1 23-May-2018 S-1	S1 30-Aug-2018 S-1	S1 28-Nov-2018 S-1	S1 20-Jun-2019 S-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	332000	360000	384000	450000	464000	395000	466000	429000	398000
Ammonia, unionized	ug/l	20	0.69	0.37	1.63	0.36	1.18	0.88	1.18	0.8	1.18
Ammonia Nitrogen	ug/l	--	50	60	60	30	140	30	70	170	120
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	3000	<2000	3000	<2000	<2000	4000	2000	<2000
Chemical Oxygen Demand	ug/l	--	34000	33000	32000	36000	29000	35000	49000	56000	36000
Chloride	ug/l	--	213000	224000	342000	443000	275000	328000	442000	269000	338000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1604	1660	1921	1811	1702	1875	2095	1549	1819
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	65200	63000	49000	85400	76000	80900	87700	80400	79300
Dissolved Organic Carbon	ug/l	--	27400	11600	25500	14200	9600	11600	17400	13100	10200
Dissolved Oxygen (Field)	ug/l	-- [7]	**4540**	9380	8480	**3010**	11590	11180	**3680**	13120	7020
Hardness, Calcium Carbonate	ug/l	--	520000	539000	561000	652000	539000	466000	599000	563000	556000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	100	<100	<100	400	200
Nitrite as N	ug/l	--	<50	<50	<50	<250 [18]	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	600	800	600	600	700	700	2400	1300	800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.46	7.6	7.77	7.54	8.00	7.88	7.71	7.72	7.51
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	20	<10	30	10	20	**310**	**140**	10
Sulphate	ug/l	--	305000	211000	215000	200000	202000	166000	133000	157000	168000
Temperature (Field)	deg c	-- [10]	22.9	7.9	22.5	18.2	0.4	20.1	17.7	1.1	16.5
Total Dissolved Solids	ug/l	--	1100000	988000	1330000	1520000	1110000	1150000	1280000	1050000	1140000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	29000	9000	2000	30000	21000	4000	91000	43000	<2000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<5 [17]	<1	<1	<1	1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**250**	161	174	196	171	189	166	118	172
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	148000	164000	158000	204000	154000	141000	186000	152000	160000
Chromium	ug/l	-- [13]	<1	<1	<5 [17]	1	<1	<1	4	**12**	<1
Cobalt	ug/l	0.9	<0.5	0.8	<2.5 [17]	0.5	0.5	<0.5	**1.4**	**2.8**	<0.5
Copper	ug/l	5	2.4	3.5	**5.7**	<0.5	2.0	2.0	**5.2**	**10.7**	2.6
Iron	ug/l	300	282	199	<500 [17]	**495**	**313**	101	**1960**	**3540**	201
Lead	ug/l	-- [14]	0.3	2.5	<0.5 [17]	0.6	0.5	0.3	**5.4**	4.6	0.2
Magnesium	ug/l	--	36300	31700	40600	34800	37400	27700	32800	44700	37800
Manganese	ug/l	--	160	106	170	518	308	49	676	340	222
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	14400	14000	14900	10300	10700	16200	14100	13300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	155000	149000	176000	266000	157000	180000	255000	195000	197000
Zinc	ug/l	30 [11]	7	**35**	<25 [17]	7	14	6	18	**31**	11
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	**6**	<1	<1	<1	<1	**5**	<1	<1

Parameter	Unit	PWQO [1]	S1 28-Aug-2019 S-1	S1 21-Nov-2019 S-1	S1 14-May-2020 S-1	S1 26-Aug-2020 S-1	S1 25-Nov-2020 S-1	S1 27-May-2021 S-1	S1 24-Aug-2021 S-1	S1 24-Nov-2021 S-1
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	167000	409000	342000	406000	404000	399000	404000	462000
Ammonia, unionized	ug/l	20	0.5	1.2	2.8	3.16	2.31	4.04	4.83	1.55
Ammonia Nitrogen	ug/l	--	40	130	80	110	120	140	180	210
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<2000	<2000	<2000	<2000	<2000	<2000	7000
Chemical Oxygen Demand	ug/l	--	53000	34000	29000	52000	30000	34000	38000	31000
Chloride	ug/l	--	251000	383000	445000	320000	279000	387000	376000	169000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1232	2350	2038	1976	1880	2151	2168	1953
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	52800	<500	72000	79400	83700	82500	82800	96100
Dissolved Organic Carbon	ug/l	--	14800	10100	26000	11900	10400	12800	13600	9000
Dissolved Oxygen (Field)	ug/l	-- [7]	6270	13560	11370	9660	14170	**5670**	6800	11850
Hardness, Calcium Carbonate	ug/l	--	325000	660000	611000	646000	586000	631000	630000	651000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	200	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	700	700	400	600	500	600	800	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.53	8.03	8.12	7.76	8.29	8.07	7.83	7.73
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**110**	30	<10	10	10	<10	20	10
Sulphate	ug/l	--	151000	220000	235000	210000	215000	194000	188000	222000
Temperature (Field)	deg c	-- [10]	19.2	0.6	15.1	23.6	2.4	14	20.4	6.3
Total Dissolved Solids	ug/l	--	794000	1180000	1200000	1160000	1190000	1380000	1320000	1050000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	68000	<2000	4000	4000	4000	2000	6000	44000
Metals										
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1	<1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	130	124	112	**216**	117	121	145	119
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	104000	189000	183000	192000	175000	184000	189000	183000
Chromium	ug/l	-- [13]	8	1	<1	<1	<1	2	<1	6
Cobalt	ug/l	0.9	**1.8**	0.6	**1.1**	0.9	<0.5	0.8	0.6	**3.0**
Copper	ug/l	5	**6.8**	4.0	1.6	1.9	1.2	1.3	1.6	**7.6**
Iron	ug/l	300	**2690**	295	**440**	**897**	**845**	**1640**	**2160**	**6440**
Lead	ug/l	-- [14]	3.2	0.3	0.1	0.1	<0.1	0.5	0.3	3.1
Magnesium	ug/l	--	16200	45600	37100	40200	36300	41600	38300	47100
Manganese	ug/l	--	202	409	418	171	300	390	540	1140
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10100	14100	12200	15900	11400	13800	16300	11400
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	142000	261000	194000	216000	172000	218000	251000	106000
Zinc	ug/l	30 [11]	25	11	8	<5	<5	5	<5	28
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	<1	<1	**4**	<4 [19]	**3**	<1	**2**

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Parameter	Unit	PWQO [1]	S3 01-May-1981	S3 01-Apr-1984	S3 01-May-1987	S3 01-Oct-1987	S3 06-Sep-1992	S3 08-Jun-1993	S3 15-Nov-1993	S3 15-Jun-1994	S3 02-Nov-1994
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	--	122000	217000	184000	326000	114000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	80	30	610	100	100	100	--	140
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	--	2000	3000	1800	1900	2000
Chemical Oxygen Demand	ug/l	--	24000	1600	162000	93000	129000	45000	53900	25000	45000
Chloride	ug/l	--	22000	42000	123000	255300	43000	123000	301000	196000	101000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	330	600	761	1794	488	1004	1204	1261	739
Cyanide	ug/l	5 [6]	--	--	--	--	**15**	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	--	24900	59100	50100	--	27000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	12800	--	10300	8970	11460
Hardness, Calcium Carbonate	ug/l	--	96000	--	910000	534000	207670	328000	329000	285000	197000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	840	900	6060	100	2500
Nitrite as N	ug/l	--	--	--	--	--	100	100	100	100	100
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	--	3920	930	1770	3920	5320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	3820	830	1670	1670	5180
pH (Field)	-	6.5 - 8.5	7.9	--	8.15	7.82	**6.4**	8.32	7.84	8.15	7.95
Phosphate	ug/l	--	--	--	--	--	420	100	100	190	240
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	53000	--	39900	305400	41000	112000	93000	56000	70000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	170000	300000	380000	900000	328000	728000	724000	632000	371000
Total Organic Carbon	ug/l	--	--	--	--	--	10100	23700	8400	18100	10600
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	1	--	--	--	--
Barium	ug/l	--	--	--	--	--	80	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	10	--	--	58	48
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	0.1
Calcium	ug/l	--	--	--	252700	100000	50800	81000	102000	76000	61000
Chromium	ug/l	-- [13]	2	--	**100**	**30**	**20**	**51**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	--	--	**100**	**10**	**10**	**6**	4	3	3.9
Iron	ug/l	300	200	--	**700**	**400**	**21330**	**1334**	**2204**	**776**	**1002**
Lead	ug/l	-- [14]	3	--	**10**	**10**	**50**	**7.4**	**9.3**	0.5	1.7
Magnesium	ug/l	--	--	--	56900	56800	19600	31000	18100	23000	11100
Manganese	ug/l	--	--	--	40	140	5600	36	294	70	129
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	1	--	10	**40**	20	20	20	20	20
Potassium	ug/l	--	--	--	--	--	2900	23000	10100	9100	11100
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	--	--	--	20600	54000	119000	121000	51000
Zinc	ug/l	30 [11]	3	--	10	**210**	**60**	10	**39**	28	27
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	**17**	**2**	**2**	**2**	**10**

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Parameter	Unit	PWQO [1]	S3 28-Jun-1995	S3 14-Nov-1995	S3 12-Jun-1996	S3 12-Oct-1996	S3 17-Jun-1997	S3 05-Nov-1997	S3 05-Jun-1998	S3 28-Aug-1998	S3 30-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	226000	210000	235000	239000	193000	220000	285000	240000	256000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	10
Ammonia Nitrogen	ug/l	--	10	120	90	60	10	30	30	30	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	2000	1000	1000	2000	3000	1000	3000
Chemical Oxygen Demand	ug/l	--	58000	28000	24000	18000	24000	14000	40000	29000	35000
Chloride	ug/l	--	195000	172000	177000	188000	136000	226000	183000	229000	112000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	792	1240	1060	1250	854	1375	1343	1290	1480
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	68200	49200	46700	46300	36100	42600	57900	49900	61200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10660	11870	7300	8630	6970	12100	9580	8050	9390
Hardness, Calcium Carbonate	ug/l	--	402000	320000	299000	347000	276000	336000	524000	513000	402000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	2200	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	630	2100	560	850	860	830	1630	1600	610
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	620	1980	470	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.56	7.68	7.44	7.11	7.24	7.9	--	8.04	7.4
Phosphate	ug/l	--	200	90	0.1	100	110	50	120	90	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	166000	106000	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	824000	620000	528000	630	428000	689000	673000	650000	740000
Total Organic Carbon	ug/l	--	14900	9200	10300	9500	11900	9800	10700	11000	10300
Total Suspended Solids	ug/l	--	9000	5000	8000	5000	1000	22000	64000	9000	1000
Metals											
Arsenic	ug/l	100 [11]	100	--	--	--	--	--	--	--	--
Barium	ug/l	--	87	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	200	10	35	50	100	80	80	100	80
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--	--	--
Calcium	ug/l	--	131000	94300	90200	108000	87000	105000	160000	172000	122000
Chromium	ug/l	-- [13]	**10**	**10**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	4	2	4.4	1.8	4	**10.9**	**5.3**	2.8	2.7
Iron	ug/l	300	240	210	**326**	**380**	**340**	260	**1700**	**340**	290
Lead	ug/l	-- [14]	1.1	0.4	0.3	3	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	32100	20100	17700	18500	14000	17700	30100	20000	23200
Manganese	ug/l	--	62	130	305	210	180	100	1070	120	100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	20
Potassium	ug/l	--	27700	12400	11700	12300	8400	11000	8800	10500	6800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	65400	126000	109000	112000	82200	108000	102000	127000	168000
Zinc	ug/l	30 [11]	10	**50**	10	20	10	10	30	**960**	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	**2**	--	**24**	1	1	**4**	1

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Parameter	Unit	PWQO [1]	S3 19-Oct-1999	S3 03-May-2000	S3 25-Oct-2000	S3 13-Jun-2001	S3 27-Sep-2001	S3 21-Nov-2001	S3 22-May-2002	S3 08-Nov-2002	S3 31-May-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	238000	244000	300000	272000	215000	212000	238000	216000	209000
Ammonia, unionized	ug/l	20	--	10	--	<20	<20	<20	--	--	--
Ammonia Nitrogen	ug/l	--	30	20	--	10	20	10	20	120	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	--	1000	1000	1000	1000	2000	1000
Chemical Oxygen Demand	ug/l	--	30000	21000	--	27000	9000	18000	26000	44000	26000
Chloride	ug/l	--	323000	215000	244000	212000	342000	290000	220000	261000	205000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1520	1290	1400	1050	1520	1200	1110	1300	1220
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	62700	38200	--	46400	40900	29700	29000	60000	55000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	9510	11660	8730	11200	8260	11130	10030	12800	9660
Hardness, Calcium Carbonate	ug/l	--	419000	360000	525000	366000	463000	359000	345000	408000	293000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	10	100	100	600	900	1400	900
Nitrite as N	ug/l	--	--	--	200	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	680	510	6180	530	520	420	400	1500	580
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	7.46	6.81	7.8	7.99	7.13	7.16	7	7.8
Phosphate	ug/l	--	40	20	2210	30	50	30	20	400	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	89000	53000	199000	85000	77000	126000	74000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	760000	650000	772000	708000	1030000	791000	696000	650000	657000
Total Organic Carbon	ug/l	--	10100	8800	--	12600	9900	11000	8000	11000	10000
Total Suspended Solids	ug/l	--	14000	32000	570000	63000	1000	9000	7000	244000	6000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	90	50	600	120	90	70	70	100	50
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	133000	111000	143000	108000	147000	114000	109000	126000	93600
Chromium	ug/l	-- [13]	--	--	120	10	10	10	10	10	10
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.2	7.3	62.7	2	2.9	4.8	<1	25.9	4
Iron	ug/l	300	530	320	6240	320	200	80	100	5210	290
Lead	ug/l	-- [14]	0.2	0.2	39.6	0.5	0.2	0.2	<1	11.9	0.5
Magnesium	ug/l	--	20700	19900	40900	23300	23400	18000	17800	22600	14500
Manganese	ug/l	--	260	150	5460	150	110	30	90	420	220
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	80	20	20	20	20	20	20
Potassium	ug/l	--	15400	8600	12000	4800	5500	8400	8300	13100	8000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	174000	126000	122000	113000	169000	154000	136000	154000	132000
Zinc	ug/l	30 [11]	10	10	410	70	50	10	20	60	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	2	4	90	1	1	1	1	1

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Parameter	Unit	PWQO [1]	S3 03-Jul-2003	S3 22-Oct-2003	S3 17-May-2004	S3 21-Aug-2004	S3 18-Nov-2004	S3 25-May-2005	S3 09-Sep-2005 [20]	S3 09-Nov-2005	S3 24-May-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	285000	--	325000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	<5000	--	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	240000	194000	201000	264000	250000	234000	--	266000	233000
Ammonia, unionized	ug/l	20	--	--	<10	<10	<10	<10	--	<10	<10
Ammonia Nitrogen	ug/l	--	10	180	20	10	10	<10	--	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	2000	1000	1000	<3000	--	<3000	<3000
Chemical Oxygen Demand	ug/l	--	24000	29000	38000	29000	26000	21000	--	24000	23000
Chloride	ug/l	--	283000	244000	249000	280000	344000	267000	--	326000	212000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1400	1300	1270	1320	1300	1650	--	980	725
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	61000	48000	37200	29200	36000	58500	--	56500	59600
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	9200	--	9100	12000
Dissolved Oxygen (Field)	ug/l	-- [7]	6040	10400	8600	7400	9760	9540	--	8900	9330
Hardness, Calcium Carbonate	ug/l	--	393000	--	329000	400000	374000	367000	--	405000	311000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	<10	--	<10	--
Nitrate as N	ug/l	--	100	600	300	100	600	200	--	500	500
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	600	710	900	420	360	550	--	460	430
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.94	8.08	7.9	7.6	6.9	7.6	--	7.2	7.9
Phosphate	ug/l	--	70	60	70	20	30	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	20	--	20	20
Sulphate	ug/l	--	99000	86000	76000	83000	95000	75000	--	106000	70000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	18.8	--	1	9.5
Total Dissolved Solids	ug/l	--	913000	710000	635000	660000	650000	799000	--	945000	686000
Total Organic Carbon	ug/l	--	16000	19000	8200	9000	7200	--	--	--	--
Total Suspended Solids	ug/l	--	90000	11000	29000	40000	14000	5000	--	2000000	3000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	<1	--	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	91	52	70	82	53	76	--	70	54
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.5	--	<0.5	<0.1
Calcium	ug/l	--	120000	96900	101000	119000	114000	113000	--	126000	99300
Chromium	ug/l	-- [13]	2	6	1	2	2	<2	--	<2	<2
Cobalt	ug/l	0.9	--	--	--	--	--	**69**	--	**1**	0.5
Copper	ug/l	5	2	**27**	3	3	2	<2	--	<2	<2
Iron	ug/l	300	**488**	231	**894**	128	**828**	239	--	**341**	161
Lead	ug/l	-- [14]	1.4	2	0.8	1.3	0.7	1	--	1.5	0.9
Magnesium	ug/l	--	22600	14200	18400	25000	21700	20600	--	21900	15200
Manganese	ug/l	--	139	80	368	210	250	233	--	153	99
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	<0.05	--	<0.06	--
Molybdenum	ug/l	40	--	--	--	--	--	4	--	<5	--
Nickel	ug/l	25	10	10	10	10	10	<10	--	<10	--
Potassium	ug/l	--	11500	9400	10200	10200	9600	10500	--	10200	7500
Selenium	ug/l	100	--	--	--	--	--	<1	--	<1	--
Sodium	ug/l	--	158000	149000	143000	182000	183000	181000	--	203000	148000
Zinc	ug/l	30 [11]	18	16	21	**64**	15	**35**	--	9	8
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	<1	--	<1	<1

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Parameter	Unit	PWQO [1]	S3 15-Aug-2006	S3 16-Nov-2006	S3 08-May-2007	S3 22-Aug-2007 [20]	S3 20-Nov-2007	S3 23-May-2008	S3 12-Aug-2008 [20]	S3 06-Nov-2008	S3 13-May-2009 S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	302000	171000	232000	--	170000	244000	--	276000	262000
Ammonia, unionized	ug/l	20	<10	--	0.346508	--	<10	<20	--	<20	1.2
Ammonia Nitrogen	ug/l	--	<10	80	<10	--	<10	<10	--	<10	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	--	<3000	<3000	--	<3000	<1000
Chemical Oxygen Demand	ug/l	--	30000	19000	31000	--	29000	26000	--	14000	25000
Chloride	ug/l	--	295000	88600	207000	--	194000	199000	--	259000	174000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	1170
Conductivity (Field)	uS/cm	--	1470	490	900	--	750	1050	--	1200	1000
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	72500	42800	58000	--	44200	57300	--	66800	64900
Dissolved Organic Carbon	ug/l	--	16200	8800	7600	--	10400	5000	--	3700	10200
Dissolved Oxygen (Field)	ug/l	-- [7]	**1600**	8270	8010	--	10890	10590	--	8540	9390
Hardness, Calcium Carbonate	ug/l	--	403000	232000	297000	--	264000	269000	--	346000	313000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	700	200	--	500	200	--	200	300
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	460	820	330	--	580	550	--	470	560
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	--	8.1	--	8.1	8	--	7.5	7.6
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	**140**	<10	--	**150**	30	--	30	**60**
Sulphate	ug/l	--	93000	48000	65000	--	74000	54000	--	75000	53000
Temperature (Field)	deg c	-- [10]	16	8.3	15.5	--	2.1	13.3	--	10.5	17.9
Total Dissolved Solids	ug/l	--	895000	407000	663000	--	594000	642000	--	800000	761000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<3000	58000	<3000	--	46000	<3000	--	3000	16000
Metals											
Arsenic	ug/l	100 [11]	1.1	<1	0.7	--	1.2	1.8	--	0.8	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	102	41	66	--	45	40	--	63	70
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	<0.1	--	<0.1	<0.1	--	<0.1	<0.1
Calcium	ug/l	--	125000	72800	92000	--	83900	87000	--	110000	99000
Chromium	ug/l	-- [13]	<2	8	<2	--	4	<2	--	<2	5
Cobalt	ug/l	0.9	0.4	**1**	<0.5	--	**1.5**	<0.5	--	0.7	0.8
Copper	ug/l	5	2	**38**	**16**	--	5	<2	--	<2	2
Iron	ug/l	300	191	**2130**	252	--	**2120**	**355**	--	**1150**	**1310**
Lead	ug/l	-- [14]	0.5	**6**	0.2	--	**10**	<0.1	--	<0.1	<1
Magnesium	ug/l	--	22000	12100	16300	--	13200	12400	--	17100	16000
Manganese	ug/l	--	170	238	273	--	267	258	--	420	440
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10300	8800	8100	--	8000	6100	--	8000	7000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	177000	68800	134000	--	111000	135000	--	163000	127000
Zinc	ug/l	30 [11]	10	**42**	19	--	**36**	6	--	<5	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	--	<1	<1	--	<1	<1

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Parameter	Unit	PWQO [1]	S3 25-Aug-2009 A-7	S3 27-Nov-2009 [28] S-10	S3 18-May-2010 S-1	S3 18-Aug-2010 S-8	S3 14-Oct-2010 S-12	S3 19-May-2011 W-2	S3 16-Aug-2011 [2] N-8	S3 30-Nov-2011 [22] S3	S3 30-May-2012 S 3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	417000	250000	343000	363000	320000	232000	407000	228000	360000
Ammonia, unionized	ug/l	20	1.51	0.14	0.76	0.64	0.89	0.48	1.85	0.23	0.79
Ammonia Nitrogen	ug/l	--	190	80	140	150	70	50	280	30	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	2000	2000	1000	<1000	<1000	1000	2000	<2000
Chemical Oxygen Demand	ug/l	--	58000	25000	30000	35000	30000	25000	40000	20000	41000
Chloride	ug/l	--	211000	162000	186000	170000	197000	112000	186000	128000	170000
Conductivity	uS/cm	--	1590	1160	1350	1580	1500	914	1630	1080	--
Conductivity (Field)	uS/cm	--	1234	1014	1452	1429	610	879	1313	985	1356
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	107000	61200	73500	79500	89000	55100	90700	28800	91000
Dissolved Organic Carbon	ug/l	--	13300	8900	11800	12400	11400	9500	14500	7800	15000
Dissolved Oxygen (Field)	ug/l	-- [7]	9160	12410	11000	9000	13000	6210	6150	7780	5410
Hardness, Calcium Carbonate	ug/l	--	422000	326000	357000	541000	438000	275000	518000	315000	460000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	600	<100	<100	<100	300	<100	600	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<10
Nitrogen, Total Kjeldahl	ug/l	--	670	380	590	360	580	840	880	880	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.37	7.13	7.37	7.14	7.81	7.61	7.28	7.76	7.20
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	**90**	20	20	20	**40**	20	**40**	**59**
Sulphate	ug/l	--	82000	78000	81000	214000	155000	71000	158000	111000	130000
Temperature (Field)	deg c	-- [10]	18	5.5	12.9	16.8	10.9	13.1	18.3	6.1	22.0
Total Dissolved Solids	ug/l	--	1030000	754000	878000	1030000	975000	594000	1060000	702000	854000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	7000	24000	8000	4000	5000	4000	13000	6000	38000
Metals											
Arsenic	ug/l	100 [11]	1	<1	<1	<1	<1	<1	<10	<50	<1.0
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	90	60	90	110	70	60	100	200	100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	<0.10
Calcium	ug/l	--	131000	104000	110000	172000	139000	87000	158000	93000	150000
Chromium	ug/l	-- [13]	6	4	5	4	5	4	6	**<50**	<5.0
Cobalt	ug/l	0.9	**1.4**	0.7	**1.2**	0.8	0.6	0.4	0.8	<10	**1.1**
Copper	ug/l	5	2	2	2	3	3	2	2	**<10**	3.8
Iron	ug/l	300	**3050**	**1190**	**3840**	**3320**	**1510**	**740**	**4660**	**1300**	**8600**
Lead	ug/l	-- [14]	<1	<1	<1	<1	<1	<1	<1	**<10**	0.57
Magnesium	ug/l	--	23000	16000	20000	27000	22000	14000	30000	20000	27000
Manganese	ug/l	--	1210	490	1290	1020	520	280	1440	370	1500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8000	8000	7000	10000	9000	6000	10000	8000	9600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	119000	143000	153000	141000	81000	142000	89000	150000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<10	<10	<10	<50	20
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	<1	<1.0

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Parameter	Unit	PWQO [1]	S3 22-Aug-2012 S-3	S3 29-Nov-2012 S3	S3 28-May-2013 S15	S3 15-Aug-2013 S3	S3 21-Nov-2013 SA-11	S3 28-May-2014 S3	S3 26-Aug-2014 S3	S3 13-Nov-2014 S-3	S3 27-May-2015 S-3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	450000	340000	320000	510000	330000	340000	440000	330000	327000
Ammonia, unionized	ug/l	20	2.1	0.83	0.86	3.3	0.31	1.47	2.3	0.35	5.8
Ammonia Nitrogen	ug/l	--	350	330	290	1300	63	230	750	140	320
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	2000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	50000	29000	27000	64000	24000	29000	47000	25000	29000
Chloride	ug/l	--	200000	210000	190000	180000	210000	200000	230000	230000	265000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1613	1520	1322	1695	1396	1299	1694	1237	1501
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	93000	76000	73000	130000	84000	77000	120000	79000	70500
Dissolved Organic Carbon	ug/l	--	<200	10000	12000	20000	10000	11000	14000	9500	14400
Dissolved Oxygen (Field)	ug/l	-- [7]	5500	**1990**	9370	**210**	**2090**	**5630**	**1400**	**2930**	5670
Hardness, Calcium Carbonate	ug/l	--	670000	480000	470000	580000	460000	440000	530000	430000	398000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	420	400	100	840	360	130	480	200
Nitrite as N	ug/l	--	<10	<10	<10	<10	<10	<10	<10	18	<50
Nitrogen, Total Kjeldahl	ug/l	--	1400	1500	1100	2100	780	1300	1600	620	900
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	420	400	100	840	360	130	500	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.26	7.48	7.04	6.97	7.71	7.40	6.96	7.31	7.71
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**69**	**42**	**35**	**100**	19	**97**	**32**	21	**60**
Sulphate	ug/l	--	270000	160000	120000	140000	140000	100000	100000	88000	97000
Temperature (Field)	deg c	-- [10]	17.6	0.2	14.9	15.0	1.8	14.2	17.8	4.9	18.7
Total Dissolved Solids	ug/l	--	1290000	994000	832000	1130000	996000	926000	1040000	860000	856000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	31000	8000	8000	<5000	7000	9000	22000	8000	2000
Metals											
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	160	80	77	110	97	76	96	76	96
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Calcium	ug/l	--	220000	170000	140000	210000	150000	140000	160000	140000	120000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1
Cobalt	ug/l	0.9	**0.94**	0.53	0.61	**1.7**	<0.50	0.71	**1.2**	0.57	0.6
Copper	ug/l	5	3.9	2.4	2.0	1.4	2.1	1.8	1.4	1.6	<0.5
Iron	ug/l	300	**7200**	**3300**	**3000**	**22000**	**1300**	**4000**	**11000**	**2000**	**2990**
Lead	ug/l	-- [14]	0.54	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.1
Magnesium	ug/l	--	43000	32000	26000	47000	31000	26000	35000	24000	23600
Manganese	ug/l	--	1500	1300	900	4800	550	1100	2800	760	1050
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	16000	9300	9300	11000	9300	9100	10000	9200	9020
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	180000	180000	150000	150000	170000	140000	160000	150000	147000
Zinc	ug/l	30 [11]	<5.0	<5.0	<5.0	9.7	<5.0	5.1	13	<5.0	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.2**	<1

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Parameter	Unit	PWQO [1]	S3 25-Aug-2015 S-3	S3 25-Nov-2015 S-3	S3 24-May-2016 S-3	S3 18-Aug-2016 S-3	S3 16-Nov-2016 S-3	S3 18-May-2017 S-3	S3 28-Aug-2017 S-3	S3 28-Nov-2017 S-3	S3 23-May-2018 S-3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	547000	352000	367000	595000	351000	302000	425000	317000	330000
Ammonia, unionized	ug/l	20	**36.7**	0.67	2.91	13.86	0.82	3.02	2.81	2.4	0.81
Ammonia Nitrogen	ug/l	--	900	130	410	1830	160	170	410	170	220
Biochemical Oxygen Demand, 5 Day	ug/l	--	13000	<2000	2000	<2000	3000	<2000	4000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	48000	34000	37000	59000	25000	31000	30000	23000	27000
Chloride	ug/l	--	240000	328000	227000	198000	339000	198000	227000	223000	194000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1737	1682	1375	1743	1914	1201	1196	1241	1265
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	134000	70500	74700	111000	64900	40300	77600	51300	69100
Dissolved Organic Carbon	ug/l	--	15500	9800	12600	37900	9000	21900	14600	8400	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	**570**	**550**	5890	**240**	**1140**	5960	**5350**	**4740**	**4480**
Hardness, Calcium Carbonate	ug/l	--	474000	610000	592000	523000	475000	331000	445000	362000	347000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	500	<100	100	<100	200	<100	600	100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1800	700	1000	2800	600	700	600	700	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.14	7.77	7.34	7.32	7.53	7.71	7.41	8.20	7.07
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	20	10	**110**	30	30	20	10	20
Sulphate	ug/l	--	117000	127000	106000	212000	140000	81000	98000	75000	60000
Temperature (Field)	deg c	-- [10]	16.6	0.7	17.4	18.9	7.5	18.4	14.8	1.1	16.9
Total Dissolved Solids	ug/l	--	1060000	961000	872000	1250000	1130000	742000	950000	758000	704000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	47000	8000	13000	70000	6000	9000	12000	<2000	4000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<5 [17]	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	102	85	109	147	101	**444**	95	90	105
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1
Calcium	ug/l	--	132000	204000	173000	145000	147000	99700	139000	110000	107000
Chromium	ug/l	-- [13]	1	<1	2	<1	<1	<5 [17]	<1	<1	<1
Cobalt	ug/l	0.9	**1.1**	<0.5	**1.6**	**1.3**	0.6	<2.5 [17]	0.7	0.6	0.5
Copper	ug/l	5	<0.5	<0.5	1.6	2.7	1.0	4.2	<0.5	1.5	0.7
Iron	ug/l	300	**12700**	**1500**	**19200**	**13200**	**1350**	**4320**	**4860**	**1150**	**1650**
Lead	ug/l	-- [14]	0.2	<0.1	0.4	<0.1	<0.1	<0.5 [17]	0.1	0.1	<0.1
Magnesium	ug/l	--	34600	24300	38800	39300	26300	19800	23900	21200	19200
Manganese	ug/l	--	2780	565	2970	2220	616	520	1210	653	831
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10800	8450	10300	14700	10800	7920	7790	8030	7440
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	199000	149000	147000	187000	106000	138000	137000	119000
Zinc	ug/l	30 [11]	10	5	9	8	6	<25 [17]	<5	7	6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	<1	**4**	**5**	**2**	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S3 30-Aug-2018 S-3	S3 28-Nov-2018 S-3	S3 20-Jun-2019 S-3	S3 28-Aug-2019 S-3	S3 21-Nov-2019 S-3	S3 14-May-2020 S-3	S3 26-Aug-2020 S-3	S3 25-Nov-2020 S-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	784000	358000	318000	208000	311000	281000	385000	321000
Ammonia, unionized	ug/l	20	5.39	0.31	2.03	2.27	0.79	1.38	2.21	2.59
Ammonia Nitrogen	ug/l	--	3490	80	170	250	170	240	390	240
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	<2000	<2000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	68000	26000	28000	52000	24000	27000	20000	33000
Chloride	ug/l	--	203000	370000	160000	234000	322000	303000	336000	340000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1831	1617	1213	1132	1828	1457	1835	41
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	134000	54600	67200	70900	655	59100	77200	67400
Dissolved Organic Carbon	ug/l	--	29400	24900	7400	18600	8400	24400	11700	8600
Dissolved Oxygen (Field)	ug/l	-- [7]	**1400**	11190	**2070**	**1330**	**4540**	**5940**	7240	11430
Hardness, Calcium Carbonate	ug/l	--	733000	445000	315000	322000	528000	361000	493000	468000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	900	800	200	500	500	600	600
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	5400	900	700	1000	600	600	900	600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.73	7.56	7.61	7.46	7.71	7.38	7.32	8.10
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	**50**	30	**70**	20	<10	20	**70**
Sulphate	ug/l	--	31000	97000	146000	117000	120000	103000	114000	108000
Temperature (Field)	deg c	-- [10]	15.7	3.1	16.1	17	1.2	13.4	15	0.6
Total Dissolved Solids	ug/l	--	1100000	978000	764000	762000	926000	780000	972000	1020000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	116000	2000	4000	10000	2000	3000	7000	34000
Metals										
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	54	92	100	76	74	49	79	51
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	197000	128000	85500	98300	155000	111000	148000	141000
Chromium	ug/l	-- [13]	2	1	2	1	<1	<1	<1	1
Cobalt	ug/l	0.9	**2.6**	0.5	0.6	0.6	0.7	<0.5	0.8	0.8
Copper	ug/l	5	0.9	4.3	3.0	3.5	1.9	1.7	1.4	1.8
Iron	ug/l	300	**44700**	**935**	**1870**	**2020**	**2270**	**2160**	**2980**	**3820**
Lead	ug/l	-- [14]	<0.1	0.2	0.2	0.3	0.1	0.1	<0.1	0.5
Magnesium	ug/l	--	58800	30300	24700	18600	34300	20000	29800	28400
Manganese	ug/l	--	6550	269	438	738	885	647	1170	964
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	14100	11300	9230	9830	12400	7520	11100	9700
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	125000	251000	128000	126000	171000	129000	187000	168000
Zinc	ug/l	30 [11]	6	11	<5	10	8	<5	5	<5
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	<1	<1	**5**	<1	<1	**6**	<4 [19]

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Parameter	Unit	PWQO [1]	S3 27-May-2021 S-3	S3 24-Aug-2021 S-3	S3 24-Nov-2021 S-3
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	392000	457000	429000
Ammonia, unionized	ug/l	20	2.67	2.58	0.68
Ammonia Nitrogen	ug/l	--	490	1040	760
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	3000	<2000
Chemical Oxygen Demand	ug/l	--	51000	54000	60000
Chloride	ug/l	--	289000	282000	331000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	1715	1839	2032
Cyanide	ug/l	5 [6]	--	--	--
Dissolved Inorganic Carbon	ug/l	--	86600	91400	40300
Dissolved Organic Carbon	ug/l	--	13700	14400	14500
Dissolved Oxygen (Field)	ug/l	-- [7]	**240**	**470**	**3400**
Hardness, Calcium Carbonate	ug/l	--	470000	540000	569000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	500	300	900
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1300	2100	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.26	6.75	6.81
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**50**	**140**	**40**
Sulphate	ug/l	--	116000	112000	187000
Temperature (Field)	deg c	-- [10]	16.3	21.5	6.4
Total Dissolved Solids	ug/l	--	1000000	1110000	1160000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	24000	52000	22000
Metals					
Arsenic	ug/l	100 [11]	<1	1	<1
Barium	ug/l	--	--	--	--
Boron	ug/l	200 [12]	65	79	174
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	142000	160000	182000
Chromium	ug/l	-- [13]	2	4	1
Cobalt	ug/l	0.9	**1.3**	**1.8**	**1.8**
Copper	ug/l	5	1.8	2.5	1.8
Iron	ug/l	300	**6480**	**13300**	**9860**
Lead	ug/l	-- [14]	0.5	2.0	0.7
Magnesium	ug/l	--	28100	34000	27500
Manganese	ug/l	--	1530	1810	2970
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	9290	12300	11000
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	178000	171000	205000
Zinc	ug/l	30 [11]	28	**90**	**77**
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**7**	<1	**12**

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Parameter	Unit	PWQO [1]	S5 19-Jun-1989	S5 24-Jul-1989	S5 17-Nov-1989	S5 27-Mar-1990	S5 16-Apr-1990	S5 18-May-1990	S5 27-Jun-1990	S5 04-Oct-1990	S5 06-Nov-1990
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	892000	1029000	980000	1330000	1254000	1048000	955000	973000	1008000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4500	1830	3460	10000	530	660	6100	4100	4000
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	6000	5000	27000	14000	6000	35000	2000	8000
Chemical Oxygen Demand	ug/l	--	82000	65000	105000	287000	209000	202000	332000	218000	235000
Chloride	ug/l	--	136000	148000	177000	245000	239000	202000	234000	199000	193000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2199	2203	2200	3207	2614	2570	2213	2323	2196
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	4760	193000	211000	395000	302000	323000	331000	238000	291000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	<1000	500	6600	450	3440	4650
Hardness, Calcium Carbonate	ug/l	--	860000	414000	816000	1669000	1521000	1078000	958000	1045000	1027000
Nitrate as N	ug/l	--	<100	<100	6580	4000	7300	2900	<100	<100	<100
Nitrite as N	ug/l	--	<100	<100	250	<1000	<100	800	<100	<100	30
Nitrogen, Total Kjeldahl	ug/l	--	4760	1870	6470	12690	14000	12000	13000	6050	5590
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	260	40	3010	2690	13470	11340	6900	1950	1590
pH (Field)	-	6.5 - 8.5	7.64	7.63	7.2	7.9	7.28	7.81	8.18	8.01	8.08
Phosphate	ug/l	--	<100	<100	250	100	930	160	470	130	240
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	30000	25000	96000	156000	166000	47000	51000	70000	45000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1100000	1100000	1100000	1600000	1300000	1280000	1100000	1160000	1100000
Total Organic Carbon	ug/l	--	800	--	33900	65000	63000	44000	73000	41000	39000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	277000	83000	238000	526000	453000	309000	243000	281000	284000
Chromium	ug/l	-- [13]	**20**	**240**	**<10**	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**<100**	**<100**	**30**	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**
Iron	ug/l	300	**14900**	**8990**	**9900**	**16970**	**7600**	**10000**	**30010**	**510**	**8430**
Lead	ug/l	-- [14]	**30**	**80**	**70**	**170**	**<50**	**<50**	**90**	**<50**	**<50**
Magnesium	ug/l	--	41000	56000	53600	86000	84000	74000	85000	83000	77000
Manganese	ug/l	--	2370	2030	2460	3120	2300	1700	1800	1930	2480
Nickel	ug/l	25	<100	<100	**30**	<50	<50	<50	<50	<50	<50
Potassium	ug/l	--	19000	31000	24900	51000	43000	14500	32000	46000	26000
Sodium	ug/l	--	127000	176000	173000	217000	235000	192000	215000	291000	224000
Zinc	ug/l	30 [11]	**260**	**120**	**40**	**270**	<50	**70**	**130**	<50	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<2	**8**	**10**	**75**	**17**	**8**	<2	<2	<2

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Parameter	Unit	PWQO [1]	S5 27-Nov-1990	S5 02-Nov-1991	S5 24-Nov-1991	S5 09-Jun-1992	S5 15-Nov-1993	S5 15-Jun-1994	S5 02-Nov-1994	S5 12-Jun-1996	S5 26-Aug-1998
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	718000	1296000	1256000	712000	320000	468000	113000	616000	88000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4600	29000	9290	2630	100	1430	100	500	260
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	16000	6000	1700	4000	1600	4200	7000	2000
Chemical Oxygen Demand	ug/l	--	141000	278000	300000	148000	106000	47000	62000	51000	19000
Chloride	ug/l	--	80000	389000	244000	182000	241000	83000	36000	72000	15500
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2384	6500	2792	2274	2030	1711	756	1640	306
Cyanide	ug/l	5 [6]	--	--	--	**107**	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	270000	--	351000	165700	97200	--	27000	101000	17000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4890	4800	6900	2500	4900	5910	12050	5880	6290
Hardness, Calcium Carbonate	ug/l	--	915000	1068000	1194000	774150	938000	603000	247000	718000	175000
Nitrate as N	ug/l	--	<100	--	7700	600	3350	240	100	--	--
Nitrite as N	ug/l	--	<10	--	140	<100	100	--	100	--	--
Nitrogen, Total Kjeldahl	ug/l	--	6610	31500	13900	7650	3580	5040	4760	1750	820
Nitrogen, Nitrate-Nitrite	ug/l	--	--	1530	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	2010	2500	4610	5020	3480	3610	4660	1250	--
pH (Field)	-	6.5 - 8.5	7.8	7.2	7.62	7.46	7.09	7.19	8.18	**5.92**	7.68
Phosphate	ug/l	--	<100	700	400	<100	200	10	460	1340	960
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	36000	12000	121000	240000	796000	184000	194000	--	80
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1200000	3250000	1400000	1384000	1692000	857000	349000	820000	154000
Total Organic Carbon	ug/l	--	42000	--	50000	28200	17200	20000	9100	16300	6000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	67000	244000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	<1	--	--	--	--	--
Barium	ug/l	--	--	--	--	160	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	**3860**	--	**2372**	**1081**	**1630**	**350**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	**0.3**	--	--
Calcium	ug/l	--	244000	269300	341000	179100	244000	150000	67000	167000	37200
Chromium	ug/l	-- [13]	**<50**	**<10**	**<50**	**<20**	**10**	**11**	**10**	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**<50**	**20**	**<50**	**10**	**6**	3.1	**13.6**	**5.7**	**13.2**
Iron	ug/l	300	**14210**	**450**	**8900**	**22000**	**19170**	**7648**	**15040**	**2740**	**18600**
Lead	ug/l	-- [14]	**<50**	<1	**<50**	**100**	**20.9**	0.5	3.6	1	0.6
Magnesium	ug/l	--	74000	96000	83000	79300	79900	55300	19200	72300	19600
Manganese	ug/l	--	2720	1400	3300	2620	3347	1348	352	2480	240
Nickel	ug/l	25	<50	**50**	<50	<20	**37**	20	20	20	**50**
Potassium	ug/l	--	25000	76000	49000	17100	20700	14900	11800	7420	3500
Sodium	ug/l	--	241000	270000	259000	195800	194000	134000	44000	128000	19000
Zinc	ug/l	30 [11]	<50	20	<50	**230**	**2334**	**53**	**150**	19	**70**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**15**	**9**	**16**	<2	**2**	**12**	1	**163**	**5**

Parameter	Unit	PWQO [1]	S5 25-May-2005 [20]	S5 09-Sep-2005 [20]	S5 09-Nov-2005 [20]	S5 24-May-2006 [20]	S5 15-Aug-2006 [20]	S5 16-Nov-2006	S5 08-May-2007 [20]	S5 22-Aug-2007 [20]	S5 20-Nov-2007 [20]
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	--	--	458000	--	--	--
Ammonia, unionized	ug/l	20	--	--	--	--	--	<10	--	--	--
Ammonia Nitrogen	ug/l	--	--	--	--	--	--	200	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	--	--	6000	--	--	--
Chemical Oxygen Demand	ug/l	--	--	--	--	--	--	105000	--	--	--
Chloride	ug/l	--	--	--	--	--	--	49700	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	--	--	750	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	--	--	119000	--	--	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	31700	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	--	**4990**	--	--	--
Hardness, Calcium Carbonate	ug/l	--	--	--	--	--	--	491000	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	200	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	--	--	3760	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	--	--	--	--	6.7	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	**590**	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	101000	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	7.3	--	--	--
Total Dissolved Solids	ug/l	--	--	--	--	--	--	706000	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	--	--	--	114000	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	<1	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	**526**	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.5	--	--	--
Calcium	ug/l	--	--	--	--	--	--	129000	--	--	--
Chromium	ug/l	-- [13]	--	--	--	--	--	**14**	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	**3**	--	--	--
Copper	ug/l	5	--	--	--	--	--	**52**	--	--	--
Iron	ug/l	300	--	--	--	--	--	**3960**	--	--	--
Lead	ug/l	-- [14]	--	--	--	--	--	**10**	--	--	--
Magnesium	ug/l	--	--	--	--	--	--	40900	--	--	--
Manganese	ug/l	--	--	--	--	--	--	237	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	--	--	43000	--	--	--
Sodium	ug/l	--	--	--	--	--	--	62600	--	--	--
Zinc	ug/l	30 [11]	--	--	--	--	--	**60**	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	--	<1	--	--	--

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S5 23-May-2008 [20]	S5 12-Aug-2008 [20]	S5 06-Nov-2008 [20]	S5 13-May-2009	S5 25-Aug-2009 [20]	S5 27-Nov-2009	S5 18-May-2010 [37]	S5 18-Aug-2010 [2]	S5 14-Oct-2010 [2]
						S-4	S5	S-3	S5	S-2	S-10
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	610000	--	417000	--	220000	566000
Ammonia, unionized	ug/l	20	--	--	--	0.32	--	0.02	--	0.08	0.32
Ammonia Nitrogen	ug/l	--	--	--	--	120	--	80	--	130	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	<1000	--	4000	--	3000	2000
Chemical Oxygen Demand	ug/l	--	--	--	--	33000	--	75000	--	30000	35000
Chloride	ug/l	--	--	--	--	37000	--	53000	--	64000	40000
Conductivity	uS/cm	--	--	--	--	1290	--	1120	--	919	1280
Conductivity (Field)	uS/cm	--	--	--	--	1025	--	992	--	855	1070
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	133000	--	129000	--	50600	141000
Dissolved Organic Carbon	ug/l	--	--	--	--	11400	--	10100	--	15500	11300
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	**2140**	--	**4160**	--	**2920**	**5480**
Hardness, Calcium Carbonate	ug/l	--	--	--	--	573000	--	408000	--	305000	632000
Nitrate as N	ug/l	--	--	--	--	<100	--	300	--	180	<100
Nitrite as N	ug/l	--	--	--	--	<100	--	<100	--	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	1050	--	650	--	1280	760
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	--	--	7.2	--	**6.33**	--	**6.27**	7.19
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**130**	--	**340**	--	**260**	**200**
Sulphate	ug/l	--	--	--	--	78000	--	123000	--	159000	107000
Temperature (Field)	deg c	-- [10]	--	--	--	8.8	--	4.8	--	16.8	10.1
Total Dissolved Solids	ug/l	--	--	--	--	839000	--	728000	--	597000	832000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	--	6000	--	36000	--	21000	27000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	--	<50	--	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	**880**	--	**700**	--	**300**	**560**
Cadmium	ug/l	0.2 [11]	--	--	--	<0.1	--	**<10**	--	<0.1	<0.1
Calcium	ug/l	--	--	--	--	142000	--	104000	--	86000	179000
Chromium	ug/l	-- [13]	--	--	--	6	--	**<20**	--	4	4
Cobalt	ug/l	0.9	--	--	--	**1.0**	--	<5	--	0.4	**1.5**
Copper	ug/l	5	--	--	--	2	--	**20**	--	5	2
Iron	ug/l	300	--	--	--	**770**	--	**2400**	--	260	**1300**
Lead	ug/l	-- [14]	--	--	--	<1	--	**<10**	--	<1	<1
Magnesium	ug/l	--	--	--	--	53000	--	36000	--	22000	45000
Manganese	ug/l	--	--	--	--	420	--	190	--	70	760
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	11000	--	16000	--	17000	15000
Sodium	ug/l	--	--	--	--	78000	--	68000	--	73000	64000
Zinc	ug/l	30 [11]	--	--	--	<10	--	<50	--	<10	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	<1	--	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S5 19-May-2011 [2]	S5 16-Aug-2011 [20]	S5 30-Nov-2011 [20]	S5 30-May-2012 [20]	S5 22-Aug-2012 [20]	S5 29-Nov-2012 [20]	S5 28-May-2013	S5 15-Aug-2013 [20]	S5 21-Nov-2013 [20]
			W-14	S-5	S5	S5	S-5	S5	S5	S5	S-5
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	669000	--	--	--	--	--	540000	--	--
Ammonia, unionized	ug/l	20	0.41	--	--	--	--	--	0.15	--	--
Ammonia Nitrogen	ug/l	--	170	--	--	--	--	--	330	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	--	--	--	--	--	3000	--	--
Chemical Oxygen Demand	ug/l	--	35000	--	--	--	--	--	48000	--	--
Chloride	ug/l	--	24000	--	--	--	--	--	49000	--	--
Conductivity	uS/cm	--	1260	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1181	--	--	--	--	--	1107	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	166000	--	--	--	--	--	110000	--	--
Dissolved Organic Carbon	ug/l	--	12200	--	--	--	--	--	17000	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**2050**	--	--	--	--	--	**1740**	--	--
Hardness, Calcium Carbonate	ug/l	--	615000	--	--	--	--	--	600000	--	--
Nitrate as N	ug/l	--	<100	--	--	--	--	--	<100	--	--
Nitrite as N	ug/l	--	<100	--	--	--	--	--	<10	--	--
Nitrogen, Total Kjeldahl	ug/l	--	810	--	--	--	--	--	2100	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	<100	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.12	--	--	--	--	--	**6.37**	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**140**	--	--	--	--	--	**530**	--	--
Sulphate	ug/l	--	41000	--	--	--	--	--	75000	--	--
Temperature (Field)	deg c	-- [10]	9.7	--	--	--	--	--	10.9	--	--
Total Dissolved Solids	ug/l	--	819000	--	--	--	--	--	748000	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	23000	--	--	--	--	--	12000	--	--
Metals											
Arsenic	ug/l	100 [11]	<10	--	--	--	--	--	1.7	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**520**	--	--	--	--	--	**790**	--	--
Cadmium	ug/l	0.2 [11]	<0.1	--	--	--	--	--	<0.10	--	--
Calcium	ug/l	--	149000	--	--	--	--	--	170000	--	--
Chromium	ug/l	-- [13]	4	--	--	--	--	--	<5.0	--	--
Cobalt	ug/l	0.9	**1.1**	--	--	--	--	--	**1.7**	--	--
Copper	ug/l	5	1	--	--	--	--	--	3.9	--	--
Iron	ug/l	300	**1280**	--	--	--	--	--	**2300**	--	--
Lead	ug/l	-- [14]	<1	--	--	--	--	--	1.2	--	--
Magnesium	ug/l	--	59000	--	--	--	--	--	56000	--	--
Manganese	ug/l	--	510	--	--	--	--	--	900	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10000	--	--	--	--	--	15000	--	--
Sodium	ug/l	--	60000	--	--	--	--	--	77000	--	--
Zinc	ug/l	30 [11]	<10	--	--	--	--	--	21	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	--	--	--	<1.0	--	--

Parameter	Unit	PWQO [1]	S5 28-May-2014 S5	S5 26-Aug-2014 [20] S5	S5 13-Nov-2014 S-5	S5 27-May-2015 [20] S-5	S5 25-Aug-2015 [20] S-5	S5 25-Nov-2015 [20] S5	S5 24-May-2016 [20] S-5	S5 18-Aug-2016 [20] S5	S5 16-Nov-2016 [20] S5
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	470000	--	600000	--	--	--	--	--	--
Ammonia, unionized	ug/l	20	0.45	--	0.02	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	290	--	78	--	--	--	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	<2000	--	--	--	--	--	--
Chemical Oxygen Demand	ug/l	--	42000	--	26000	--	--	--	--	--	--
Chloride	ug/l	--	32000	--	35000	--	--	--	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	994	--	1150	--	--	--	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	100000	--	140000	--	--	--	--	--	--
Dissolved Organic Carbon	ug/l	--	15000	--	9500	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**1160**	--	**3540**	--	--	--	--	--	--
Hardness, Calcium Carbonate	ug/l	--	510000	--	640000	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	--	--	--	--	--	--
Nitrite as N	ug/l	--	17	--	13	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1700	--	910	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	<100	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.81	--	**6.29**	--	--	--	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**230**	--	**130**	--	--	--	--	--	--
Sulphate	ug/l	--	110000	--	160000	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	13.3	--	5.7	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	718000	--	836000	--	--	--	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	--	5000	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	1.9	--	<1.0	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**710**	--	**870**	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	<0.10	--	<0.10	--	--	--	--	--	--
Calcium	ug/l	--	140000	--	190000	--	--	--	--	--	--
Chromium	ug/l	-- [13]	<5.0	--	<5.0	--	--	--	--	--	--
Cobalt	ug/l	0.9	**1.0**	--	**1.6**	--	--	--	--	--	--
Copper	ug/l	5	1.5	--	1.7	--	--	--	--	--	--
Iron	ug/l	300	**710**	--	**1000**	--	--	--	--	--	--
Lead	ug/l	-- [14]	<0.50	--	<0.50	--	--	--	--	--	--
Magnesium	ug/l	--	43000	--	59000	--	--	--	--	--	--
Manganese	ug/l	--	860	--	640	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	--	17000	--	--	--	--	--	--
Sodium	ug/l	--	69000	--	79000	--	--	--	--	--	--
Zinc	ug/l	30 [11]	<5.0	--	6.1	--	--	--	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	--	**3.0**	--	--	--	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S5 18-May-2017 S-5	S5 28-Aug-2017 [20] S5	S5 28-Nov-2017 S-5	S5 23-May-2018 S-5	S5 30-Aug-2018 [20] S-5	S5 28-Nov-2018 S-5	S5 20-Jun-2019 [20] S-5	S5 28-Aug-2019 [20] S-5	S5 21-Nov-2019 [20] S-5
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	557000	--	724000	823000	--	320000	--	--	--
Ammonia, unionized	ug/l	20	0.38	--	0.02	0.25	--	0.03	--	--	--
Ammonia Nitrogen	ug/l	--	60	--	50	80	--	40	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	--	<2000	<2000	--	4000	--	--	--
Chemical Oxygen Demand	ug/l	--	41000	--	28000	33000	--	42000	--	--	--
Chloride	ug/l	--	24000	--	34000	23000	--	58000	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1139	--	1036	1373	--	842	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	73000	--	76000	157000	--	60500	--	--	--
Dissolved Organic Carbon	ug/l	--	28400	--	66100	11400	--	15400	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**3070**	--	**3620**	**2450**	--	8240	--	--	--
Hardness, Calcium Carbonate	ug/l	--	609000	--	730000	579000	--	423000	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	500	--	--	--
Nitrite as N	ug/l	--	<50	--	<50	<50	--	<50	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	900	--	600	800	--	1500	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.32	--	6.66	7.16	--	7.01	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**70**	--	**60**	**90**	--	**190**	--	--	--
Sulphate	ug/l	--	111000	--	163000	40000	--	153000	--	--	--
Temperature (Field)	deg c	-- [10]	16.4	--	0.2	12.2	--	0.4	--	--	--
Total Dissolved Solids	ug/l	--	740000	--	888000	818000	--	558000	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	235000	--	32000	4000	--	11000	--	--	--
Metals											
Arsenic	ug/l	100 [11]	<5 [17]	--	<1	<1	--	1	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**774**	--	**519**	**706**	--	**399**	--	--	--
Cadmium	ug/l	0.2 [11]	<0.5 [17]	--	<0.1	**0.3**	--	<0.1	--	--	--
Calcium	ug/l	--	149000	--	183000	146000	--	118000	--	--	--
Chromium	ug/l	-- [13]	<5 [17]	--	6	<1	--	2	--	--	--
Cobalt	ug/l	0.9	<2.5 [17]	--	**1.2**	0.6	--	0.5	--	--	--
Copper	ug/l	5	4.2	--	2.6	<0.5	--	**8.8**	--	--	--
Iron	ug/l	300	<500 [17]	--	**1070**	**337**	--	284	--	--	--
Lead	ug/l	-- [14]	<0.5 [17]	--	0.8	0.1	--	0.5	--	--	--
Magnesium	ug/l	--	57600	--	66600	51900	--	31400	--	--	--
Manganese	ug/l	--	370	--	377	308	--	16	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	11800	--	12000	8670	--	17800	--	--	--
Sodium	ug/l	--	58300	--	66600	54600	--	59200	--	--	--
Zinc	ug/l	30 [11]	<25 [17]	--	11	7	--	13	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	--	<1	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
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Parameter	Unit	PWQO [1]	S5	S5	S5	S5	S5	S5
			14-May-2020	26-Aug-2020 [20]	25-Nov-2020 [20]	27-May-2021 [20]	24-Aug-2021 [20]	24-Nov-2021
			S-5	S-5	S-5	S-5	S5	S-5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	-- [5]	518000	--	--	--	--	312000
Ammonia, unionized	ug/l	20	0.87	--	--	--	--	0.08
Ammonia Nitrogen	ug/l	--	90	--	--	--	--	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	--	--	--	--	3000
Chemical Oxygen Demand	ug/l	--	122000	--	--	--	--	34000
Chloride	ug/l	--	34000	--	--	--	--	36000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1154	--	--	--	--	1063
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	98100	--	--	--	--	62800
Dissolved Organic Carbon	ug/l	--	39700	--	--	--	--	11900
Dissolved Oxygen (Field)	ug/l	-- [7]	6600	--	--	--	--	332000
Hardness, Calcium Carbonate	ug/l	--	378000	--	--	--	--	457000
Nitrate as N	ug/l	--	<100	--	--	--	--	<100
Nitrite as N	ug/l	--	<50	--	--	--	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	4200	--	--	--	--	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.75	--	--	--	--	7.58
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**540**	--	--	--	--	**110**
Sulphate	ug/l	--	131000	--	--	--	--	216000
Temperature (Field)	deg c	-- [10]	9.1	--	--	--	--	2.6
Total Dissolved Solids	ug/l	--	712000	--	--	--	--	650000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	15000	--	--	--	--	33000
Metals								
Arsenic	ug/l	100 [11]	<1	--	--	--	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**298**	--	--	--	--	**258**
Cadmium	ug/l	0.2 [11]	<0.1	--	--	--	--	<0.1
Calcium	ug/l	--	98700	--	--	--	--	128000
Chromium	ug/l	-- [13]	2	--	--	--	--	**41**
Cobalt	ug/l	0.9	0.6	--	--	--	--	0.6
Copper	ug/l	5	2.9	--	--	--	--	**6.7**
Iron	ug/l	300	**667**	--	--	--	--	**602**
Lead	ug/l	-- [14]	0.8	--	--	--	--	0.9
Magnesium	ug/l	--	32000	--	--	--	--	33100
Manganese	ug/l	--	92	--	--	--	--	41
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	6990	--	--	--	--	13900
Sodium	ug/l	--	39200	--	--	--	--	52200
Zinc	ug/l	30 [11]	17	--	--	--	--	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	--	--	**6**

Parameter	Unit	PWQO [1]	S8 18-May-1990	S8 27-Jun-1990	S8 04-Oct-1990	S8 06-Nov-1990	S8 27-Nov-1990	S8 25-Apr-1991	S8 08-Jun-1992	S8 15-Nov-1993	S8 15-Jun-1994	S8 02-Nov-1994
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	442000	720000	304000	235000	328000	360000	760000	202000	326000	226000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	<100	<100	680	440	2000	2110	950	100	100	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	6000	1000	1000	2000	6000	1900	1800	1900	2100
Chemical Oxygen Demand	ug/l	--	107000	336000	137000	116000	92000	164000	230000	60100	38000	51000
Chloride	ug/l	--	200000	299000	161000	92000	50000	170000	268000	288000	129000	56000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1888	1980	1302	687	1199	1482	2941	890	1117	973
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	**143**	--	--	--
Dissolved Inorganic Carbon	ug/l	--	103000	255000	74000	43000	84000	95000	168200	56000	–	54000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12000	9950	500	8900	10080	10000	6900	10700	7780	12800
Hardness, Calcium Carbonate	ug/l	--	565000	731000	374000	224000	344000	510000	797630	285000	285000	240000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	11000	960	1970	2730	2740	8500	240	3980	100	1600
Nitrite as N	ug/l	--	<100	1000	<100	50	<10	20	<100	20	--	10
Nitrogen, Total Kjeldahl	ug/l	--	6700	6900	1950	1210	3820	4800	5180	1030	3920	5320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	6600	6800	1270	770	1820	2690	4230	930	3820	5220
pH (Field)	-	6.5 - 8.5	8.24	8.19	8.45	8.04	8.1	8.06	7.93	7.04	7.67	7.93
Phosphate	ug/l	--	410	300	190	160	<100	<100	100	180	190	320
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	167000	133000	119000	48000	98000	173000	398000	96000	56000	156000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	--	--	650000	340000	600000	740000	1936000	584000	559000	488000
Total Organic Carbon	ug/l	--	40000	80000	22000	17000	21000	29000	28200	10200	18100	8900
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	2450
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	<1	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	80	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--	**5300**	--	58	142
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--	0.1
Calcium	ug/l	--	127000	139000	95000	60000	85000	130000	144700	80000	76000	55000
Chromium	ug/l	-- [13]	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**	**<20**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**	**<10**	3	3	**13.7**
Iron	ug/l	300	**670**	**13640**	190	**910**	**2410**	**630**	**1500**	**1688**	**776**	**3717**
Lead	ug/l	-- [14]	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**	**70**	**8.2**	0.5	2.5
Magnesium	ug/l	--	60000	93000	33000	18000	32000	46000	105900	21000	23000	24700
Manganese	ug/l	--	300	980	80	170	580	290	920	93	70	216
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	<50	<50	<50	<50	<50	<50	<20	20	20	20
Potassium	ug/l	--	35500	52000	35000	15000	18000	1161000	35300	10100	9100	10000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	**3.4**
Sodium	ug/l	--	202000	335000	188000	76000	132000	161000	329800	103000	121000	97000
Zinc	ug/l	30 [11]	<50	**90**	<50	<50	<50	<50	<20	21	28	10
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<2	<2	<2	<2	**2**	**8**	<2	**2**	**2**	1

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Parameter	Unit	PWQO [1]	S8 12-Jun-1996	S8 12-Oct-1996	S8 17-Jun-1997	S8 05-Nov-1997	S8 30-Oct-1998	S8 30-Jun-1999	S8 19-Oct-1999	S8 03-May-2000	S8 25-Oct-2000	S8 13-Jun-2001
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	260000	235000	229000	278000	358000	662000	208000	537000	1090000	705000
Ammonia, unionized	ug/l	20	--	--	--	--	10	--	--	10	--	<20
Ammonia Nitrogen	ug/l	--	30	190	50	10	20	340	30	190	120	160
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	5000	1000	1000	7000	1000	5000	--	1000
Chemical Oxygen Demand	ug/l	--	31000	49000	63000	34000	40000	97000	38000	38000	--	38000
Chloride	ug/l	--	114000	147000	174000	210000	165000	109000	171000	158000	326000	200000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	930	960	1415	2750	1390	499	1280	1590	2600	1650
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	52300	46600	46600	43500	87400	101000	83200	74500	--	69100
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	2000	7530	6090	7100	8340	8150	7480	7250	3040	2600
Hardness, Calcium Carbonate	ug/l	--	269000	295000	348000	967000	410000	387000	308000	438000	774000	480000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--	--	--	120	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	100	--
Nitrogen, Total Kjeldahl	ug/l	--	960	750	2060	1210	840	2030	830	1100	1520	1210
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	930	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.46	7.11	7.26	7.04	7.1	8.2	7.5	7.28	7.51	7.4
Phosphate	ug/l	--	120	140	220	110	100	100	70	100	180	140
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--	--	--	65000	87000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	470000	480000	710000	1400000	693000	251000	640000	800000	1480000	1110000
Total Organic Carbon	ug/l	--	15300	11800	23400	14700	12600	33500	18800	11000	--	17900
Total Suspended Solids	ug/l	--	3000	4000	42000	26000	29000	19000	10000	56000	128000	53000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	136	90	**1360**	**2800**	**1010**	**2200**	**400**	**450**	**2500**	**1010**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	70800	81700	85100	234000	99500	71400	79600	102000	152000	99300
Chromium	ug/l	-- [13]	--	--	--	--	--	--	--	--	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	4	3.9	0.5	**19**	3.4	3.3	0.5	**6.2**	**7.7**	2.5
Iron	ug/l	300	**360**	**460**	**1690**	**410**	**2390**	**1110**	**340**	**2860**	**3870**	**2090**
Lead	ug/l	-- [14]	0.2	0.5	0.2	0.8	0.2	0.2	0.2	0.6	0.2	1.3
Magnesium	ug/l	--	22100	21900	32400	91700	38800	50000	26100	43900	95700	56400
Manganese	ug/l	--	610	30	160	100	320	760	100	450	4940	1230
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	**40**	20	20	20	20	20	20
Potassium	ug/l	--	10100	13500	10200	20300	11700	15700	12900	10000	14200	7600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	100000	97100	163000	306000	184000	284000	177000	187000	367000	259000
Zinc	ug/l	30 [11]	10	10	10	**40**	10	10	10	10	10	10
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	**43**	1	1	**3**	1	**5**	**6**	**19**

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Parameter	Unit	PWQO [1]	S8 27-Sep-2001	S8 21-Nov-2001	S8 22-May-2002	S8 12-Nov-2002	S8 31-May-2003	S8 03-Jul-2003	S8 22-Oct-2003	S8 17-May-2004	S8 21-Aug-2004	S8 18-Nov-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	375000	342000	396000	228000	411000	612000	387000	470000	726000	462000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--	<10	<10	<10
Ammonia Nitrogen	ug/l	--	400	10	30	150	100	10	20	10	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	1000	1000	1000	12000	2000	2000
Chemical Oxygen Demand	ug/l	--	33000	23000	23000	42000	53000	67000	46000	86000	54000	31000
Chloride	ug/l	--	259000	179000	110000	169000	122000	145000	131000	157000	166000	207000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2400	1090	970	--	1250	1410	1310	1360	1430	1260
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	91000	47900	46000	57000	112000	157000	98000	114000	127800	32300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4190	7200	10770	--	3610	940	7600	8200	3200	--
Hardness, Calcium Carbonate	ug/l	--	852000	327000	331000	292000	323000	350000	--	388000	432000	375000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	100	100	100	100	200	100	100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1100	490	440	750	960	1220	830	2800	950	590
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.39	6.84	7.04	--	7.7	7.55	7.99	7.4	7.4	7.1
Phosphate	ug/l	--	90	30	20	60	30	100	100	340	90	90
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	895000	140000	77000	197000	90000	71000	143000	78000	21000	61000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1930000	772000	642000	750000	750000	1020000	790000	680000	715000	630000
Total Organic Carbon	ug/l	--	14000	12000	8000	18000	22000	34000	22000	13000	17200	9700
Total Suspended Solids	ug/l	--	18000	14000	4000	4000	10000	3000	16000	112000	19000	68000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	2	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1400**	**320**	**370**	**290**	**340**	**422**	**421**	**298**	**388**	155
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	194000	76800	81900	71200	75900	79800	68600	91800	101000	87600
Chromium	ug/l	-- [13]	**20**	**10**	**10**	**10**	**10**	2	**10**	1	4	7
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**19**	2.5	<1	**5.6**	5	2	**30**	5	**81**	**57**
Iron	ug/l	300	**490**	230	90	150	**320**	132	**1520**	278	**1030**	**3010**
Lead	ug/l	-- [14]	0.2	0.2	**<1000**	0.7	0.5	0.5	1.7	0.4	3.2	0.8
Magnesium	ug/l	--	89300	32900	30600	27700	32400	36700	34800	38500	43600	38100
Manganese	ug/l	--	310	10	20	10	30	147	161	293	62	430
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10	10	**60**	10
Potassium	ug/l	--	14300	8300	9600	10100	10300	8500	13500	13100	11300	10400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	360000	200000	152000	169000	166000	246000	178000	184000	286000	203000
Zinc	ug/l	30 [11]	10	10	10	10	10	5	13	5	**195**	**31**
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S8 25-May-2005	S8 09-Sep-2005 [20]	S8 09-Nov-2005	S8 24-May-2006	S8 15-Aug-2006 [20]	S8 16-Nov-2006	S8 08-May-2007	S8 22-Aug-2007 [20]	S8 20-Nov-2007	S8 23-May-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	573000	--	500000	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	<5000	--	<5000	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	470000	--	410000	436000	--	338000	486000	--	310000	260000
Ammonia, unionized	ug/l	20	<10	--	<10	<10	--	<10	0.242165	--	<10	<20
Ammonia Nitrogen	ug/l	--	<10	--	30	50	--	<10	20	--	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	--	<3000	<3000	--	<3000	<3000	--	3000	<3000
Chemical Oxygen Demand	ug/l	--	36000	--	25000	38000	--	32000	80000	--	31000	40000
Chloride	ug/l	--	161000	--	283000	102000	--	39600	95900	--	206000	109000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1700	--	2700	625	--	600	800	--	900	800
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	122000	--	84800	93400	--	84500	122000	--	80600	61500
Dissolved Organic Carbon	ug/l	--	13600	--	12000	19200	--	12700	11100	--	13900	8900
Dissolved Oxygen (Field)	ug/l	-- [7]	6430	--	10100	11300	--	8300	**5760**	--	11090	8410
Hardness, Calcium Carbonate	ug/l	--	354000	--	470000	371000	--	307000	361000	--	329000	232000
Hydrogen Sulfide	ug/l	2 [8]	<10	--	**20**	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	--	400	100	--	500	200	--	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	880	--	630	1070	--	910	840	--	600	1140
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.3	--	7.6	7.2	--	6.9	7.8	--	8.3	7.8
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	--	**90**	**210**	--	**140**	**810**	--	**130**	**140**
Sulphate	ug/l	--	28000	--	119000	69000	--	98000	37000	--	119000	46000
Temperature (Field)	deg c	-- [10]	12.9	--	0	5.5	--	7.1	10.5	--	0.4	10.5
Total Dissolved Solids	ug/l	--	771000	--	1060000	712000	--	554000	734000	--	802000	501000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	11000	--	98000	122000	--	47000	236000	--	8000	<3000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	<1	<1	--	<1	2	--	1.3	1.7
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**225**	--	181	**284**	--	**319**	**218**	--	121	97
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.5	<0.1	--	<0.5	0.1	--	<0.1	<0.1
Calcium	ug/l	--	86200	--	123000	89500	--	80000	85300	--	82800	63500
Chromium	ug/l	-- [13]	6	--	**17**	**30**	--	**12**	**22**	--	<2	<2
Cobalt	ug/l	0.9	**14**	--	**5**	**4.9**	--	**1**	**6.1**	--	0.9	<0.5
Copper	ug/l	5	5	--	**12**	**25**	--	**47**	**37**	--	**10**	4
Iron	ug/l	300	**2330**	--	**7270**	**14300**	--	**2240**	**14400**	--	**1020**	**390**
Lead	ug/l	-- [14]	0.3	--	3.5	**5.7**	--	2	**5.8**	--	1.8	<0.1
Magnesium	ug/l	--	33800	--	39900	35800	--	26000	35900	--	29800	17800
Manganese	ug/l	--	335	--	458	782	--	170	2320	--	54	21
Mercury, dissolved	ug/l	0.2 [15]	<0.05	--	<0.06	--	--	--	--	--	--	--
Molybdenum	ug/l	40	1.1	--	<5	--	--	--	--	--	--	--
Nickel	ug/l	25	<10	--	<10	--	--	--	--	--	--	--
Potassium	ug/l	--	15100	--	18800	17900	--	13700	14900	--	13100	7000
Selenium	ug/l	100	<1	--	<1	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	178000	--	252000	138000	--	89300	156000	--	164000	100000
Zinc	ug/l	30 [11]	7	--	23	**52**	--	27	**58**	--	19	<5
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	--	<1	<1	--	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S8 12-Aug-2008 [20]	S8 06-Nov-2008	S8 13-May-2009	S8 25-Aug-2009 [20]	S8 27-Nov-2009	S8 18-May-2010 [20]	S8 18-Aug-2010 [20]	S8 14-Oct-2010	S8 19-May-2011	S8 16-Aug-2011 [20]
					S-1	S8	S-1	S8	-	S-1	W-3	S-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	320000	290000	--	333000	--	--	455000	422000	--
Ammonia, unionized	ug/l	20	--	<20	<0.12	--	0.2	--	--	0.03	<0.24	--
Ammonia Nitrogen	ug/l	--	--	<10	<20	--	20	--	--	30	<20	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	<3000	2000	--	<1000	--	--	1000	<1000	--
Chemical Oxygen Demand	ug/l	--	--	27000	33000	--	28000	--	--	30000	35000	--
Chloride	ug/l	--	--	172000	101000	--	54000	--	--	121000	62000	--
Conductivity	uS/cm	--	--	--	943	--	1040	--	--	1380	1020	--
Conductivity (Field)	uS/cm	--	--	925	750	--	912	--	--	1342	982	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	73700	70100	--	102000	--	--	109000	95800	--
Dissolved Organic Carbon	ug/l	--	--	6300	12700	--	11800	--	--	13100	15000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	8660	8130	--	10100	--	--	12590	**3000**	--
Hardness, Calcium Carbonate	ug/l	--	--	321000	266000	--	235000	--	--	367000	323000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	200	<100	--	<100	--	--	<100	<100	--
Nitrite as N	ug/l	--	--	--	<100	--	<100	--	--	<100	<100	--
Nitrogen, Total Kjeldahl	ug/l	--	--	550	570	--	530	--	--	530	1100	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	8.1	7.5	--	7.9	--	--	6.73	7.72	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**70**	30	--	**50**	--	--	**90**	**60**	--
Sulphate	ug/l	--	--	84000	48000	--	64000	--	--	114000	47000	--
Temperature (Field)	deg c	-- [10]	--	5.4	10	--	5.1	--	--	8.1	12.8	--
Total Dissolved Solids	ug/l	--	--	713000	613000	--	676000	--	--	897000	663000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	10000	4000	--	11000	--	--	8000	25000	--
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	1.2	<1	--	<1	--	--	<1	<1	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	120	110	--	150	--	--	**220**	**210**	--
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	--
Calcium	ug/l	--	--	87400	72000	--	61000	--	--	96000	80000	--
Chromium	ug/l	-- [13]	--	4	4	--	6	--	--	7	4	--
Cobalt	ug/l	0.9	--	**2.2**	0.3	--	0.5	--	--	0.4	0.5	--
Copper	ug/l	5	--	5	3	--	4	--	--	4	4	--
Iron	ug/l	300	--	**1350**	220	--	**530**	--	--	**330**	**440**	--
Lead	ug/l	-- [14]	--	0.7	<1	--	<1	--	--	<1	<1	--
Magnesium	ug/l	--	--	25000	21000	--	20000	--	--	31000	30000	--
Manganese	ug/l	--	--	39	10	--	80	--	--	40	30	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	9500	8000	--	8000	--	--	10000	10000	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	140000	107000	--	109000	--	--	139000	107000	--
Zinc	ug/l	30 [11]	--	<5	<10	--	<10	--	--	<10	<10	--
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	--	<1	--	--	<1	<1	--

Parameter	Unit	PWQO [1]	S8 30-Nov-2011 [22] S8	S8 30-May-2012 S 8	S8 22-Aug-2012 [20] S-8	S8 29-Nov-2012 [38] S8	S8 28-May-2013 S8	S8 15-Aug-2013 [20] S8	S8 21-Nov-2013 SA-7	S8 28-May-2014 S8	S8 26-Aug-2014 [20] S8	S8 13-Nov-2014 S-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	134000	460000	--	--	360000	--	280000	410000	--	400000
Ammonia, unionized	ug/l	20	<0.1	<0.19	--	--	0.04	--	<0.01	<0.01	--	<0.01
Ammonia Nitrogen	ug/l	--	<20	<50	--	--	110	--	<50	<50	--	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	3000	--	--	<2000	--	2000	<2000	--	<2000
Chemical Oxygen Demand	ug/l	--	25000	61000	--	--	52000	--	66000	42000	--	31000
Chloride	ug/l	--	58000	83000	--	--	120000	--	140000	130000	--	130000
Conductivity	uS/cm	--	737	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	722	1080	--	--	1015	--	1254	1143	--	1222
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	27600	110000	--	--	81000	--	70000	95000	--	93000
Dissolved Organic Carbon	ug/l	--	7800	17000	--	--	13000	--	10000	13000	--	10000
Dissolved Oxygen (Field)	ug/l	-- [7]	8990	**2220**	--	--	**5500**	--	11100	**2570**	--	10220
Hardness, Calcium Carbonate	ug/l	--	210000	320000	--	--	290000	--	340000	320000	--	330000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	890	<100	--	--	<100	--	<100	<100	--	<100
Nitrite as N	ug/l	--	<100	<10	--	--	<10	--	<10	<10	--	<10
Nitrogen, Total Kjeldahl	ug/l	--	480	1800	--	--	1600	--	2200	1700	--	720
Nitrogen, Nitrate-Nitrite	ug/l	--	--	<100	--	--	<100	--	<100	<100	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.59	7.10	--	--	**6.26**	--	**6.48**	**6.06**	--	**6.36**
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**300**	--	--	**210**	--	**290**	**210**	--	**93**
Sulphate	ug/l	--	124000	54000	--	--	38000	--	180000	49000	--	68000
Temperature (Field)	deg c	-- [10]	5.5	16.2	--	--	9.3	--	0.2	13.2	--	2.7
Total Dissolved Solids	ug/l	--	479000	664000	--	--	632000	--	818000	720000	--	698000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	24000	78000	--	--	500000	--	130000	9000	--	4000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<50	1.2	--	--	1.3	--	<1.0	<1.0	--	<1.0
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	100	**280**	--	--	140	--	150	**210**	--	140
Cadmium	ug/l	0.2 [11]	**<10**	<0.10	--	--	<0.10	--	<0.10	<0.10	--	<0.10
Calcium	ug/l	--	56000	87000	--	--	81000	--	94000	86000	--	87000
Chromium	ug/l	-- [13]	**<50**	8.1	--	--	**11**	--	<5.0	<5.0	--	<5.0
Cobalt	ug/l	0.9	<10	**2.3**	--	--	**3.6**	--	<0.50	<0.50	--	<0.50
Copper	ug/l	5	**<10**	**9.5**	--	--	**25**	--	**5.1**	3.7	--	3.6
Iron	ug/l	300	**2000**	**3300**	--	--	**5800**	--	**670**	**410**	--	**590**
Lead	ug/l	-- [14]	**<10**	1.3	--	--	3.1	--	<0.50	<0.50	--	<0.50
Magnesium	ug/l	--	17000	31000	--	--	29000	--	34000	30000	--	34000
Manganese	ug/l	--	30	1800	--	--	1700	--	110	120	--	46
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10000	11000	--	--	10000	--	9600	10000	--	9600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	69000	150000	--	--	140000	--	150000	160000	--	150000
Zinc	ug/l	30 [11]	<50	16	--	--	**33**	--	5.2	<5.0	--	6.3
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1.0	--	--	<1.0	--	<1.0	<1.0	--	**1.8**

Parameter	Unit	PWQO [1]	S8 27-May-2015 S-8	S8 25-Aug-2015 [20] S-8	S8 25-Nov-2015 [20] S8	S8 24-May-2016 S-8	S8 18-Aug-2016 [20] S8	S8 16-Nov-2016 S-8	S8 18-May-2017 S-8	S8 28-Aug-2017 [20] S8	S8 28-Nov-2017 [39] S-8	S8 23-May-2018 S-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	455000	--	--	457000	--	304000	408000	--	--	482000
Ammonia, unionized	ug/l	20	2.77	--	--	0.52	--	0.54	0.33	--	--	0.29
Ammonia Nitrogen	ug/l	--	100	--	--	160	--	80	80	--	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	--	64000	--	7000	15000	--	--	<2000
Chemical Oxygen Demand	ug/l	--	28000	--	--	321000	--	39000	105000	--	--	67000
Chloride	ug/l	--	129000	--	--	120000	--	133000	94000	--	--	85000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1244	--	--	1180	--	1283	1076	--	--	1048
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	110000	--	--	88200	--	55000	53600	--	--	98000
Dissolved Organic Carbon	ug/l	--	16700	--	--	23400	--	15600	29000	--	--	12700
Dissolved Oxygen (Field)	ug/l	-- [7]	**2950**	--	--	**2170**	--	8240	**2090**	--	--	**2650**
Hardness, Calcium Carbonate	ug/l	--	263000	--	--	369000	--	278000	319000	--	--	286000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	--	<100	--	<100	<100	--	--	<100
Nitrite as N	ug/l	--	<50	--	--	<50	--	<50	<50	--	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	900	--	--	8100	--	800	1600	--	--	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.98	--	--	7.16	--	7.75	7.10	--	--	7.53
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	--	--	**1190**	--	**270**	**180**	--	--	**100**
Sulphate	ug/l	--	47000	--	--	62000	--	149000	63000	--	--	25000
Temperature (Field)	deg c	-- [10]	16.2	--	--	12.5	--	4.6	17.6	--	--	11.8
Total Dissolved Solids	ug/l	--	698000	--	--	754000	--	716000	626000	--	--	598000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	--	--	674000	--	112000	159000	--	--	27000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	--	2	--	<1	<5 [17]	--	--	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**235**	--	--	**316**	--	**208**	**357**	--	--	**261**
Cadmium	ug/l	0.2 [11]	<0.1	--	--	0.2	--	<0.1	<0.5 [17]	--	--	<0.1
Calcium	ug/l	--	61800	--	--	87200	--	68700	76400	--	--	71200
Chromium	ug/l	-- [13]	<1	--	--	**26**	--	2	<5 [17]	--	--	<1
Cobalt	ug/l	0.9	<0.5	--	--	**6.2**	--	<0.5	<2.5 [17]	--	--	<0.5
Copper	ug/l	5	<0.5	--	--	**24.9**	--	**5.6**	**6.4**	--	--	1.4
Iron	ug/l	300	<100	--	--	**10900**	--	**308**	**686**	--	--	109
Lead	ug/l	-- [14]	<0.1	--	--	**5.2**	--	0.2	<0.5 [17]	--	--	0.1
Magnesium	ug/l	--	26400	--	--	36700	--	25900	31300	--	--	26300
Manganese	ug/l	--	40	--	--	3160	--	66	168	--	--	387
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	9220	--	--	11900	--	11000	10900	--	--	7670
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	149000	--	--	168000	--	149000	102000	--	--	115000
Zinc	ug/l	30 [11]	<5	--	--	**84**	--	10	<25 [17]	--	--	5
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	**13**	--	**12**	<1	--	--	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S8 30-Aug-2018 [20] S-8	S8 28-Nov-2018 S-8	S8 20-Jun-2019 S-8	S8 28-Aug-2019 [20] S-8	S8 21-Nov-2019 S-8	S8 14-May-2020 S-8	S8 26-Aug-2020 [20] S-8	S8 25-Nov-2020 S-8	S8 27-May-2021 S-8	S8 24-Aug-2021 [20] S8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	377000	395000	--	229000	345000	--	295000	441000	--
Ammonia, unionized	ug/l	20	--	0.04	0.03	--	0.17	0.37	--	0.08	2.9	--
Ammonia Nitrogen	ug/l	--	--	50	60	--	50	70	--	30	300	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	2000	5000	--	<30000 [26]	5000	--	<2000	12000	--
Chemical Oxygen Demand	ug/l	--	--	31000	78000	--	122000	154000	--	34000	112000	--
Chloride	ug/l	--	--	91000	105000	--	176000	124000	--	154000	100000	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	955	1003	--	1271	1077	--	77	1383	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	72700	78600	--	<500	74200	--	62500	92100	--
Dissolved Organic Carbon	ug/l	--	--	12100	11200	--	10500	26300	--	10000	19000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	14740	**1510**	--	7540	**5690**	--	8380	**1600**	--
Hardness, Calcium Carbonate	ug/l	--	--	327000	347000	--	351000	294000	--	305000	528000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	400	<100	--	<100	<100	--	<100	<100	--
Nitrite as N	ug/l	--	--	<50	<50	--	<50	<50	--	<50	<50	--
Nitrogen, Total Kjeldahl	ug/l	--	--	700	1600	--	1400	1600	--	500	2500	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	6.91	**6.14**	--	7.33	7.6	--	7.53	7.60	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**140**	**230**	--	**240**	**160**	--	**40**	**460**	--
Sulphate	ug/l	--	--	99000	24000	--	139000	76000	--	92000	222000	--
Temperature (Field)	deg c	-- [10]	--	2.9	17.4	--	8.3	5.8	--	0	13.6	--
Total Dissolved Solids	ug/l	--	--	596000	560000	--	650000	552000	--	646000	994000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	4000	9000	--	245000	23000	--	15000	64000	--
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	<1	<1	--	<1	<1	--	<1	1	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	136	143	--	93	114	--	74	92	--
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	--	<0.1	<0.1	--	<0.1	<0.1	--
Calcium	ug/l	--	--	73700	88100	--	83800	72200	--	75900	138000	--
Chromium	ug/l	-- [13]	--	1	<1	--	**10**	1	--	<1	3	--
Cobalt	ug/l	0.9	--	<0.5	0.8	--	**4.0**	**1.1**	--	<0.5	**3.1**	--
Copper	ug/l	5	--	**5.3**	2.4	--	**10.5**	4.1	--	2.1	3.2	--
Iron	ug/l	300	--	248	108	--	**3790**	**530**	--	<100	**1050**	--
Lead	ug/l	-- [14]	--	0.1	<0.1	--	1.9	0.5	--	<0.1	0.5	--
Magnesium	ug/l	--	--	34800	30700	--	34400	27700	--	28100	44600	--
Manganese	ug/l	--	--	13	3890	--	3180	1390	--	88	12800	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	11200	9440	--	9730	7270	--	7110	12800	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	122000	122000	--	120000	108000	--	116000	125000	--
Zinc	ug/l	30 [11]	--	10	<5	--	25	14	--	<5	9	--
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	--	<1	<1	--	<1	**10**	--

Parameter	Unit	PWQO [1]	S8 24-Nov-2021 S-8
General Chemistry			
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	525000
Ammonia, unionized	ug/l	20	0.08
Ammonia Nitrogen	ug/l	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000
Chemical Oxygen Demand	ug/l	--	80000
Chloride	ug/l	--	128000
Conductivity	uS/cm	--	--
Conductivity (Field)	uS/cm	--	1548
Cyanide	ug/l	5 [6]	--
Dissolved Inorganic Carbon	ug/l	--	98300
Dissolved Organic Carbon	ug/l	--	25200
Dissolved Oxygen (Field)	ug/l	-- [7]	8400
Hardness, Calcium Carbonate	ug/l	--	470000
Hydrogen Sulfide	ug/l	2 [8]	--
Nitrate as N	ug/l	--	<100
Nitrite as N	ug/l	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	1800
Nitrogen, Nitrate-Nitrite	ug/l	--	--
Nitrogen, Organic	ug/l	--	--
pH (Field)	-	6.5 - 8.5	7.39
Phosphate	ug/l	--	--
Phosphorus	ug/l	-- [9]	**190**
Sulphate	ug/l	--	127000
Temperature (Field)	deg c	-- [10]	0.4
Total Dissolved Solids	ug/l	--	880000
Total Organic Carbon	ug/l	--	--
Total Suspended Solids	ug/l	--	131000
Metals			
Aluminum, dissolved	ug/l	-- [40]	--
Arsenic	ug/l	100 [11]	<1
Barium	ug/l	--	--
Boron	ug/l	200 [12]	132
Cadmium	ug/l	0.2 [11]	<0.1
Calcium	ug/l	--	122000
Chromium	ug/l	-- [13]	4
Cobalt	ug/l	0.9	**1.2**
Copper	ug/l	5	**5.4**
Iron	ug/l	300	**1360**
Lead	ug/l	-- [14]	0.9
Magnesium	ug/l	--	40300
Manganese	ug/l	--	713
Mercury, dissolved	ug/l	0.2 [15]	--
Molybdenum	ug/l	40	--
Nickel	ug/l	25	--
Potassium	ug/l	--	9560
Selenium	ug/l	100	--
Silver	ug/l	0.1	--
Sodium	ug/l	--	140000
Zinc	ug/l	30 [11]	12
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	**3**

Parameter	Unit	PWQO [1]	S9 27-Mar-1990	S9 16-Apr-1990	S9 27-Jun-1990	S9 31-Jul-1990	S9 27-Aug-1990	S9 04-Oct-1990	S9 06-Nov-1990	S9 17-Nov-1990
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	608000	294000	532000	561000	594000	215000	154000	1134000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4090	2200	100	4550	3130	800	320	1380
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	3000	4000	3000	4000	2000	2000	9000
Chemical Oxygen Demand	ug/l	--	112000	62000	287000	95000	160000	67000	137000	76000
Chloride	ug/l	--	123000	83000	163000	204000	216000	81000	43000	186000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1528	951	858	1877	1699	814	457	48.2
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	137000	421000	199000	185000	132000	53000	56000	194000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3000	7400	5050	6150	6160	8840	10300	--
Hardness, Calcium Carbonate	ug/l	--	774000	424000	626000	625000	505000	293000	168000	7940
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	4160	11000	2000	1650	5160	3000	3620	16340
Nitrite as N	ug/l	--	330	100	2900	100	100	100	50	100
Nitrogen, Total Kjeldahl	ug/l	--	5030	5700	270	4720	4970	2340	2420	7080
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	940	3500	170	170	1840	1540	2100	5700
pH (Field)	-	6.5 - 8.5	7.9	7.47	7.92	7.93	8.05	8.2	7.82	7.48
Phosphate	ug/l	--	390	280	180	120	400	160	200	260
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	160000	86000	70000	97000	63000	72000	42000	115000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	--	--	--	--	850000	400000	250000	--
Total Organic Carbon	ug/l	--	28000	20000	39000	35000	31000	18000	17000	51100
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--
Calcium	ug/l	--	247000	135000	181000	176000	128000	86000	44000	234000
Chromium	ug/l	-- [13]	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--
Copper	ug/l	5	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**140**
Iron	ug/l	300	**1720**	**1300**	**1280**	**1340**	**3860**	**720**	**4380**	**3900**
Lead	ug/l	-- [14]	**170**	**50**	**50**	**70**	**50**	**50**	**50**	**9**
Magnesium	ug/l	--	38000	21000	42000	45000	45000	19000	14000	50800
Manganese	ug/l	--	920	400	660	740	530	50	170	1450
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	**50**	**50**	**50**	**50**	**50**	**50**	**50**	7
Potassium	ug/l	--	23000	13000	23000	24000	24000	23000	12000	35500
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	101000	60000	136000	168000	155000	97000	32000	179000
Zinc	ug/l	30 [11]	**130**	**50**	**50**	**50**	**50**	**50**	**50**	**110**
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**20**	**2**	**2**	**14**	**2**	**2**	**2**	**9**

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Parameter	Unit	PWQO [1]	S9 27-Nov-1990	S9 24-Apr-1991	S9 29-Nov-1991	S9 08-Jun-1992	S9 08-Jun-1993	S9 04-Nov-1993	S9 15-Jun-1994	S9 02-Nov-1994	S9 28-Jun-1995
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	420000	266000	1124000	151000	485000	861000	84000	1380000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	1300	3440	300	13940	100	3200	--	290	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	5000	6000	4800	2000	3700	10200	4100	2000
Chemical Oxygen Demand	ug/l	--	56000	94000	30000	180000	26000	108000	131000	64000	172000
Chloride	ug/l	--	69000	196000	224000	243000	220000	221000	107000	43000	94500
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1090	1304	1145	2850	929	1378	2440	478	792
Cyanide	ug/l	5 [6]	--	--	--	123	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	62000	118000	--	259700	41000	126000	--	20000	321000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	9300	7000	6600	10000	9500	11280	12150	10660
Hardness, Calcium Carbonate	ug/l	--	278000	450000	349000	853220	198000	474000	628000	141000	1070000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	2200	26100	--	240	660	7690	340	4000	100
Nitrite as N	ug/l	--	10	1700	--	100	100	100	--	100	100
Nitrogen, Total Kjeldahl	ug/l	--	1960	6500	1400	19710	750	5690	12900	4480	17000
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	2090	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	660	3060	1100	5770	650	2490	12900	4190	16990
pH (Field)	-	6.5 - 8.5	8.1	7.86	7.8	7.72	8.57	7.74	8.09	7.96	7.56
Phosphate	ug/l	--	100	100	200	100	120	180	120	500	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	47000	213000	128000	130000	55900	86000	100000	56000	64000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	550000	650000	--	1853000	560000	816000	1230000	240000	474000
Total Organic Carbon	ug/l	--	16000	25000	--	48100	11800	26200	43800	15000	70000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	--	--	--	--	100
Barium	ug/l	--	--	--	--	210	--	--	--	--	43
Boron	ug/l	200 [12]	--	--	--	7450	--	--	4509	213	11
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	0.1	0.1
Calcium	ug/l	--	80000	147000	100400	210400	51000	124000	145000	37000	70000
Chromium	ug/l	-- [13]	50	50	10	20	59	10	10	10	14
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	50	50	30	10	5	6	16.6	4.8	4.2
Iron	ug/l	300	3930	1200	310	3900	2111	2734	1815	1211	659
Lead	ug/l	-- [14]	50	50	2	70	19	10.8	1.6	1.2	0.8
Magnesium	ug/l	--	19000	20000	23800	79500	17000	39800	64500	11500	20400
Manganese	ug/l	--	320	410	170	1790	76	429	242	74	36
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	50	50	50	20	20	20	20	20	20
Potassium	ug/l	--	12000	108000	9400	42800	10000	18900	39800	9500	10800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	129000	108000	114000	263800	106000	128000	240000	29000	46000
Zinc	ug/l	30 [11]	50	50	10	40	18	49	44	14	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	2	33	2	17	2	3	2	10	1

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Parameter	Unit	PWQO [1]	S9 14-Nov-1995	S9 12-Jun-1996	S9 12-Oct-1996	S9 17-Jun-1997	S9 05-Nov-1997	S9 05-Jun-1998	S9 28-Aug-1998	S9 30-Oct-1998	S9 30-Jun-1999
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	229000	464000	395000	187000	254000	688000	114000	254000	370000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	10	--
Ammonia Nitrogen	ug/l	--	1010	40	940	10	10	70	60	10	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	2000	11000	3000	1000	3000	3000	1000	1000
Chemical Oxygen Demand	ug/l	--	50000	26000	63000	28000	19000	142000	36000	39000	71000
Chloride	ug/l	--	157000	99000	140000	115000	172000	362000	37300	114000	219000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	910	780	1270	7.76	1310	2350	390	890	1410
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	6400	44000	87800	35100	51000	137000	23900	46900	47700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	10390	9410	8920	12360	12460	8520	13440	11360
Hardness, Calcium Carbonate	ug/l	--	277000	230000	441000	236000	302000	618000	132000	325000	354000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1500	--	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	5500	710	3980	1170	770	3950	1180	860	1150
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	4490	670	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.92	7.25	7.63	7.71	8.03	--	7.88	7.8	8.1
Phosphate	ug/l	--	200	120	170	260	50	120	380	60	70
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	77600	--	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	460000	390000	640000	389000	650000	1166000	200000	450000	710000
Total Organic Carbon	ug/l	--	66200	12400	24200	14300	11400	39200	10000	14700	22300
Total Suspended Solids	ug/l	--	116000	36000	20000	126000	24000	15000	180000	5000	6000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**770**	200	**2360**	**320**	**400**	**5210**	**390**	**760**	**2370**
Cadmium	ug/l	0.2 [11]	0.1	--	--	--	--	--	--	--	--
Calcium	ug/l	--	73200	63600	108000	53800	80400	114000	36700	70000	77300
Chromium	ug/l	-- [13]	**10**	--	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	5	**6.1**	2.8	0.5	**12.4**	**5.9**	4.2	3.1	2.4
Iron	ug/l	300	**2650**	**1080**	**1030**	**3970**	**450**	**380**	**2450**	**790**	220
Lead	ug/l	-- [14]	0.8	0.2	0.3	0.2	0.2	0.2	0.5	0.2	0.2
Magnesium	ug/l	--	22500	17100	41200	18400	24300	80800	9670	36100	38700
Manganese	ug/l	--	210	54	140	150	40	40	50	20	40
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**30**	20	**30**	20	20	20	10
Potassium	ug/l	--	15700	11000	16000	5400	8900	19600	4900	6500	14500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	82200	78000	130000	83700	124000	305000	37800	97400	198000
Zinc	ug/l	30 [11]	20	10	10	20	10	**80**	**80**	10	**60**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	1	--	**4**	**3**	1	1	1	1

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Parameter	Unit	PWQO [1]	S9 19-Oct-1999	S9 03-May-2000	S9 25-Oct-2000	S9 13-Jun-2001	S9 27-Sep-2001	S9 21-Nov-2001	S9 22-May-2002	S9 08-Nov-2002	S9 31-May-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	256000	293000	370000	245000	126000	179000	183000	243000	162000
Ammonia, unionized	ug/l	20	--	10	--	<20	<20	<20	--	--	--
Ammonia Nitrogen	ug/l	--	10	20	10	10	40	10	40	10	200
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	3000	--	1000	1000	1000	1000	1000	1000
Chemical Oxygen Demand	ug/l	--	32000	32000	--	32000	11000	29000	34000	26000	43000
Chloride	ug/l	--	198000	162000	248000	239000	82500	104000	110000	305000	77000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1310	1100	1550	1300	1160	610	620	1450	660
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	68900	31300	--	31900	30200	25100	24000	64000	37000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	11620	19920	10300	13200	9930	13350	10230	9200	8220
Hardness, Calcium Carbonate	ug/l	--	350000	286000	417000	334000	439000	248000	261000	402000	195000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	10	100	1600	700	200	300	300
Nitrite as N	ug/l	--	--	--	500	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	580	780	740	760	640	670	640	640	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.2	7.98	7.81	8.4	8.1	7.53	7.39	--	7.7
Phosphate	ug/l	--	40	30	70	30	90	40	20	90	40
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	116000	173000	435000	85000	51000	116000	64000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	650000	650000	858000	798000	910000	492000	416000	725000	389000
Total Organic Carbon	ug/l	--	10300	10000	--	13100	7800	14000	9000	10000	17000
Total Suspended Solids	ug/l	--	16000	22000	49000	5000	29000	17000	4000	56000	3000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**570**	**380**	**1430**	**760**	**940**	80	90	80	70
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	92500	73300	95700	77700	112000	71800	76500	119000	53200
Chromium	ug/l	-- [13]	--	--	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	0.5	**8.2**	**11**	3	**7**	2.9	<1	**5.7**	3
Iron	ug/l	300	**640**	**310**	**2340**	120	20	**530**	200	**1910**	290
Lead	ug/l	-- [14]	0.2	0.2	0.2	0.8	0.2	0.2	<1	3.1	0.5
Magnesium	ug/l	--	28500	24600	43300	34100	38700	16600	17100	25500	13800
Manganese	ug/l	--	30	130	120	20	970	10	30	60	10
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	20
Potassium	ug/l	--	13300	7800	8900	6200	10000	5200	3300	9000	5400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	162000	124000	159000	180000	123000	65900	75300	173000	61700
Zinc	ug/l	30 [11]	20	10	10	10	10	10	10	20	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	**4**	**2**	**15**	1	1	1	1	1

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Parameter	Unit	PWQO [1]	S9 03-Jul-2003	S9 22-Oct-2003	S9 17-May-2004	S9 21-Aug-2004	S9 18-Nov-2004	S9 25-May-2005	S9 09-Sep-2005	S9 09-Nov-2005	S9 24-May-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	276000	343000	339000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	<5000	<5000	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	237000	142000	241000	291000	240000	226000	281000	278000	168000
Ammonia, unionized	ug/l	20	--	--	<10	<10	<10	<10	<10	<10	<10
Ammonia Nitrogen	ug/l	--	10	30	10	10	10	<10	<10	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	1000	1000	1000	<3000	<3000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	22000	31000	42000	30000	21000	35000	33000	35000	41000
Chloride	ug/l	--	124000	84600	176000	198000	152000	128000	191000	140000	101000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1600	820	1030	1070	820	1200	860	500	480
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	56000	34000	55500	30500	22300	54200	67400	56500	35800
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	11700	79400	9500	16200
Dissolved Oxygen (Field)	ug/l	-- [7]	6880	9100	8800	10800	7200	11800	8400	9100	11340
Hardness, Calcium Carbonate	ug/l	--	809000	--	299000	330000	261000	264000	354000	448000	216000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	<10	<10	**30**	--
Nitrate as N	ug/l	--	100	800	100	100	300	600	<100	200	500
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	650	1720	640	540	350	690	570	1210	830
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	8.1	7.7	8.3	7.5	7.7	8.1	7.3	8.3
Phosphate	ug/l	--	40	110	30	40	30	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	**40**	20	**360**	**60**
Sulphate	ug/l	--	840000	173000	49000	50000	95000	53000	53000	147000	58000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	21.9	20	1	12
Total Dissolved Solids	ug/l	--	1630000	503000	515000	535000	410000	509000	656000	717000	406000
Total Organic Carbon	ug/l	--	14000	15000	10500	9700	6800	--	--	--	--
Total Suspended Solids	ug/l	--	8000	21000	7000	6000	4000	6000	<3000	208000	10000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	<1	2	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**292**	67	84	166	127	94	113	200	51
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.3	<0.1	<0.5	<0.1
Calcium	ug/l	--	229000	77200	86100	97800	73100	74600	104000	109000	63100
Chromium	ug/l	-- [13]	2	8	2	2	2	<2	<2	**90**	2
Cobalt	ug/l	0.9	--	--	--	--	--	**30**	0.5	**10**	0.4
Copper	ug/l	5	2	**35**	3	3	3	2	3	**38**	3
Iron	ug/l	300	**378**	**1190**	291	**543**	**630**	**337**	128	**35700**	**869**
Lead	ug/l	-- [14]	0.5	1.9	0.3	0.3	0.6	<0.6	<0.5	**5.5**	0.5
Magnesium	ug/l	--	57500	18700	20400	20900	19000	18800	22900	42700	14100
Manganese	ug/l	--	22	28	63	22	48	17	4	710	69
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	<0.05	<0.06	<0.06	--
Molybdenum	ug/l	40	--	--	--	--	--	20	2	<5	--
Nickel	ug/l	25	10	10	10	10	10	<10	<10	**50**	--
Potassium	ug/l	--	17600	9300	5600	6700	6500	6400	8900	20600	5500
Selenium	ug/l	100	--	--	--	--	--	<1	1	<1	--
Sodium	ug/l	--	182000	59100	115000	154000	117000	95800	117000	110000	66500
Zinc	ug/l	30 [11]	5	9	5	5	5	**33**	15	**121**	11
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S9 15-Aug-2006	S9 16-Nov-2006	S9 08-May-2007	S9 22-Aug-2007	S9 20-Nov-2007	S9 23-May-2008	S9 12-Aug-2008	S9 06-Nov-2008	S9 13-May-2009 S-5
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	274000	130000	226000	366000	250000	180000	200000	226000	197000
Ammonia, unionized	ug/l	20	<10	<10	0.933832	<10	<10	<20	<20	<20	<0.05
Ammonia Nitrogen	ug/l	--	<10	90	<10	730	80	<10	<10	<10	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	5000	9000	<3000	<3000	<3000	1000
Chemical Oxygen Demand	ug/l	--	34000	23000	29000	51000	25000	44000	26000	15000	38000
Chloride	ug/l	--	233000	25000	140000	200000	173000	100000	156000	139000	99000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	847
Conductivity (Field)	uS/cm	--	1270	310	800	1250	800	650	900	800	700
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	65800	32500	54200	87600	168000	40100	50800	54800	46700
Dissolved Organic Carbon	ug/l	--	16500	12200	9000	19400	10300	11700	8800	6100	15300
Dissolved Oxygen (Field)	ug/l	-- [7]	**1800**	9270	12680	**990**	9650	13980	5310	**6210**	17710
Hardness, Calcium Carbonate	ug/l	--	332000	101000	273000	310000	304000	209000	226000	279000	242000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	1100	<100	100	500	<100	200	1400	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	610	1260	600	2240	850	890	470	710	810
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.2	7.2	8.4	7.3	8	8.5	8.1	7.9	6.8
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	**600**	30	**280**	**110**	**80**	**90**	**80**	**60**
Sulphate	ug/l	--	56000	52000	85000	40000	76000	59000	54000	82000	76000
Temperature (Field)	deg c	-- [10]	20.5	7.6	20.4	14.1	0.3	14.1	19.9	8.2	20
Total Dissolved Solids	ug/l	--	734000	246000	571000	743000	636000	420000	527000	571000	551000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	14000	332000	10000	75000	19000	7000	16000	42000	8000
Metals											
Arsenic	ug/l	100 [11]	2.1	<1	0.9	3.2	1	2	1	0.5	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	80	63	88	181	85	82	61	54	70
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	99400	24900	73100	78400	88500	59700	64900	82200	69000
Chromium	ug/l	-- [13]	<2	**30**	<2	7	3	<2	4	5	4
Cobalt	ug/l	0.9	**1**	**6.6**	<0.5	**1.9**	0.7	<0.5	0.8	**1.2**	0.5
Copper	ug/l	5	**45**	**56**	**17**	3	2	3	3	5	4
Iron	ug/l	300	**718**	**2710**	**350**	**2880**	**1060**	**1060**	**1930**	**2230**	**550**
Lead	ug/l	-- [14]	0.8	**6**	0.2	1	<0.1	<0.1	0.8	0.7	<1
Magnesium	ug/l	--	20300	9330	21900	27600	20200	14500	15600	17800	17000
Manganese	ug/l	--	113	243	74	213	152	123	57	46	50
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7500	8200	7200	17700	9500	5900	5400	7600	7000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	160000	41100	108000	156000	115000	72800	109000	97600	84000
Zinc	ug/l	30 [11]	26	**65**	**49**	22	16	7	7	10	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	**3**	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S9 25-Aug-2009 A-3	S9 27-Nov-2009 S-4	S9 18-May-2010 S-3	S9 18-Aug-2010 [29] S-4	S9 14-Oct-2010 S-3	S9 19-May-2011 [41] W-7	S9 16-Aug-2011 [2] N-3	S9 30-Nov-2011 [42] S9	S9 30-May-2012 S 9
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	256000	211000	306000	183000	265000	203000	204000	132000	260000
Ammonia, unionized	ug/l	20	0.11	0.1	0.17	0.15	<0.02	<0.84	0.32	0.6	<0.71
Ammonia Nitrogen	ug/l	--	30	40	30	110	<20	<20	30	50	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	2000	2000	4000	2000	2000	2000	3000	<2000
Chemical Oxygen Demand	ug/l	--	63000	33000	35000	35000	35000	45000	35000	28000	46000
Chloride	ug/l	--	141000	57000	142000	43000	94000	47000	93000	33000	130000
Conductivity	uS/cm	--	1270	786	1240	896	1030	665	907	594	--
Conductivity (Field)	uS/cm	--	1088	709	1337	826	856	634	758	557	969
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	62800	51600	63800	40000	61100	49800	46500	26900	63000
Dissolved Organic Carbon	ug/l	--	15200	11500	14900	16800	13600	13700	11500	7300	17000
Dissolved Oxygen (Field)	ug/l	-- [7]	5900	9730	**5080**	**610**	7970	6250	**4060**	9040	**2880**
Hardness, Calcium Carbonate	ug/l	--	344000	231000	375000	256000	327000	219000	263000	177000	320000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	1040	<100	1030	480	200	<100	1950	<100
Nitrite as N	ug/l	--	<100	<100	<100	330	<100	<100	<100	<100	<10
Nitrogen, Total Kjeldahl	ug/l	--	1060	760	1070	1290	600	400	570	790	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.97	7.31	7.40	6.58	6.82	8.20	7.41	7.95	7.54
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**70**	**200**	**110**	**310**	**120**	**120**	**170**	**440**	**92**
Sulphate	ug/l	--	163000	100000	119000	199000	118000	69000	106000	101000	84000
Temperature (Field)	deg c	-- [10]	19.9	5.0	12.2	18.8	9.5	15.2	20.7	6.2	20.7
Total Dissolved Solids	ug/l	--	825000	511000	806000	582000	670000	432000	590000	386000	618000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	15000	47000	24000	46000	14000	86000	78000	80000	31000
Metals											
Arsenic	ug/l	100 [11]	2	<50	2	<1	<1	<50	<10	<50	1.7
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	140	<100	150	**250**	90	<100	110	100	130
Cadmium	ug/l	0.2 [11]	<0.1	**<10**	<0.1	<0.1	<0.1	**<10**	<0.1	**<10**	<0.10
Calcium	ug/l	--	103000	61000	104000	71000	98000	58000	79000	46000	92000
Chromium	ug/l	-- [13]	4	**<20**	7	6	6	**<50**	6	**<50**	5.4
Cobalt	ug/l	0.9	0.5	<5	**1.4**	**1.3**	0.9	<10	**1.1**	<10	**1.2**
Copper	ug/l	5	3	**20**	4	**6**	4	**<10**	5	**10**	**6.4**
Iron	ug/l	300	**440**	**4800**	**1690**	**1420**	**770**	**4900**	**1250**	**7000**	**1800**
Lead	ug/l	-- [14]	<1	**<10**	<1	1	<1	**<10**	1	**<10**	0.75
Magnesium	ug/l	--	21000	19000	28000	19000	20000	18000	16000	15000	24000
Manganese	ug/l	--	110	110	980	210	90	160	110	140	220
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	8000	12000	30000	10000	8000	9000	12000	9400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	119000	67000	118000	81000	80000	58000	65000	49000	100000
Zinc	ug/l	30 [11]	10	**100**	10	<10	10	<50	<10	<50	15
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	1	1	<1	<1	<1	<1.0

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Parameter	Unit	PWQO [1]	S9 22-Aug-2012 S-9	S9 29-Nov-2012 S9	S9 28-May-2013 S9	S9 15-Aug-2013 S9	S9 21-Nov-2013 SA-4	S9 28-May-2014 S9	S9 26-Aug-2014 S9	S9 13-Nov-2014 S-9	S9 27-May-2015 S-9
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	290000	330000	200000	220000	220000	240000	220000	240000	295000
Ammonia, unionized	ug/l	20	<0.25	0.26	0.37	0.52	<0.06	<0.14	1.08	<0.04	12.62
Ammonia Nitrogen	ug/l	--	<50	120	130	62	<50	<50	90	<50	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	6000	<2000	3000	<2000	2000	2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	41000	46000	42000	47000	32000	38000	41000	28000	27000
Chloride	ug/l	--	150000	90000	83000	120000	90000	140000	120000	81000	189000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1218	1030	670	993	808	885	915	803	1443
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	66000	74000	45000	52000	54000	55000	57000	60000	70800
Dissolved Organic Carbon	ug/l	--	16000	14000	17000	17000	11000	15000	12000	11000	11600
Dissolved Oxygen (Field)	ug/l	-- [7]	**4920**	**6460**	**3400**	**5050**	12960	7060	**2950**	**5630**	**270**
Hardness, Calcium Carbonate	ug/l	--	460000	360000	250000	300000	290000	300000	250000	300000	316000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	270	<100	<100	440	<100	<100	<100	300
Nitrite as N	ug/l	--	<10	<10	<10	<10	10	<10	<10	<10	<50
Nitrogen, Total Kjeldahl	ug/l	--	960	1800	1400	1200	740	1400	1100	650	500
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	270	<100	<100	450	<100	<100	<100	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.13	7.41	6.99	7.35	7.13	7.00	7.40	6.84	**8.55**
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**110**	**160**	**72**	**150**	**72**	**74**	**79**	**52**	**80**
Sulphate	ug/l	--	220000	120000	55000	130000	110000	64000	79000	110000	206000
Temperature (Field)	deg c	-- [10]	19.4	0.1	15.8	19.4	1.1	15.2	22.8	4.2	18.9
Total Dissolved Solids	ug/l	--	942000	660000	426000	646000	562000	614000	544000	548000	858000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	39000	83000	8000	<1000	14000	13000	11000	12000	3000
Metals											
Arsenic	ug/l	100 [11]	1.4	<1.0	1.2	<1.0	<1.0	1.2	1.1	<1.0	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**240**	120	58	180	85	82	130	110	**255**
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	**0.33**	<0.10	<0.10	<0.10	<0.10	<0.1
Calcium	ug/l	--	130000	110000	74000	87000	84000	79000	69000	88000	67400
Chromium	ug/l	-- [13]	<5.0	**11**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	1
Cobalt	ug/l	0.9	**1.4**	**2.3**	0.69	<0.50	0.60	0.66	<0.50	<0.50	<0.5
Copper	ug/l	5	**7.9**	**7.0**	**6.0**	**14**	3.4	3.5	2.5	2.5	<0.5
Iron	ug/l	300	**1800**	**4500**	**1100**	**570**	**1000**	**1200**	**580**	**600**	**598**
Lead	ug/l	-- [14]	1.1	1.5	<0.50	<0.50	0.58	<0.50	<0.50	<0.50	0.3
Magnesium	ug/l	--	37000	37000	20000	29000	23000	22000	19000	27000	35800
Manganese	ug/l	--	95	310	110	120	63	130	98	110	234
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	16000	14000	6800	15000	11000	7900	8500	10000	12300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	110000	74000	110000	75000	110000	100000	82000	190000
Zinc	ug/l	30 [11]	12	17	8.0	<5.0	9.7	9.1	8.3	9.9	14
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	**24**	<1.0	<1.0	<1.0	<1.0	<1.0	**11**	<1

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Parameter	Unit	PWQO [1]	S9 25-Aug-2015 S-9	S9 25-Nov-2015 S-9	S9 24-May-2016 S-9	S9 18-Aug-2016 S-9	S9 16-Nov-2016 S-9	S9 18-May-2017 S-9	S9 28-Aug-2017 S-9	S9 28-Nov-2017 S-9	S9 23-May-2018 S-9
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	258000	250000	308000	179000	236000	210000	337000	253000	320000
Ammonia, unionized	ug/l	20	0.73	0.21	0.86	0.1	0.26	1.48	0.43	0.34	**42.92**
Ammonia Nitrogen	ug/l	--	40	60	70	50	80	50	90	270	3700
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	2000	3000	<2000	<2000	<2000	2000	<2000
Chemical Oxygen Demand	ug/l	--	63000	45000	42000	37000	20000	42000	30000	41000	67000
Chloride	ug/l	--	131000	164000	137000	135000	162000	140000	114000	101000	230000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1179	250	1062	974	1148	837	872	140	1285
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	53300	54800	64400	13900	47500	24500	66800	17400	72500
Dissolved Organic Carbon	ug/l	--	14300	11900	14100	42000	6600	24600	11500	44600	17900
Dissolved Oxygen (Field)	ug/l	-- [7]	**3570**	**7740**	**2420**	**4580**	9810	**2400**	**4510**	14070	9540
Hardness, Calcium Carbonate	ug/l	--	278000	368000	335000	247000	292000	238000	331000	340000	373000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	1200	<100	<100	700	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	800	800	900	500	800	900	1100	4500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.72	7.63	7.56	6.64	7.40	7.83	7.29	7.19	7.63
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**80**	**80**	**130**	30	**50**	**110**	**40**	**50**
Sulphate	ug/l	--	220000	102000	115000	151000	106000	57000	126000	74000	55000
Temperature (Field)	deg c	-- [10]	18.4	0	18.0	21.9	5.7	21.8	13.5	0	15.1
Total Dissolved Solids	ug/l	--	772000	648000	680000	620000	638000	516000	712000	514000	756000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	7000	31000	7000	8000	7000	14000	43000	16000	<2000
Metals											
Arsenic	ug/l	100 [11]	1	<1	1	3	<1	<5 [17]	<1	<1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**423**	92	144	185	109	**220**	127	**231**	13
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1
Calcium	ug/l	--	64800	114000	84700	63600	86700	66100	93300	93600	102000
Chromium	ug/l	-- [13]	1	4	2	2	<1	<5 [17]	2	3	2
Cobalt	ug/l	0.9	<0.5	0.8	0.6	<0.5	<0.5	<2.5 [17]	<0.5	**1.2**	**1.2**
Copper	ug/l	5	<0.5	0.8	2.3	1.2	0.8	4.8	0.7	3.3	1.4
Iron	ug/l	300	**670**	**1510**	**879**	**677**	298	**861**	**732**	**1070**	**909**
Lead	ug/l	-- [14]	<0.1	0.6	0.4	0.4	0.1	<0.5 [17]	0.4	0.5	0.2
Magnesium	ug/l	--	28300	20400	30000	21400	18300	17800	23800	25700	29000
Manganese	ug/l	--	341	88	791	164	59	177	189	155	292
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	11700	8970	8170	9180	5270	6190	7710	8390	11600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	111000	135000	135000	110000	114000	98800	94900	84300	155000
Zinc	ug/l	30 [11]	7	16	7	8	6	<25 [17]	6	12	5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	<1	**9**	**4**	**4**	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S9 30-Aug-2018 [20] S-9	S9 28-Nov-2018 S-9	S9 20-Jun-2019 S-9	S9 28-Aug-2019 [39] S-9	S9 21-Nov-2019 S-9	S9 14-May-2020 S-9	S9 26-Aug-2020 S-9	S9 25-Nov-2020 S-9
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	209000	259000	--	252000	225000	250000	283000
Ammonia, unionized	ug/l	20	--	0.09	0.32	--	0.17	0.28	0.72	0.17
Ammonia Nitrogen	ug/l	--	--	120	110	--	40	20	50	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	3000	<2000	--	4000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	--	34000	32000	--	41000	41000	37000	31000
Chloride	ug/l	--	--	141000	208000	--	185000	171000	199000	192000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	462	1150	--	1405	1011	1253	13
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	37500	53900	--	<500	47500	51800	65300
Dissolved Organic Carbon	ug/l	--	--	12800	12000	--	9100	22100	12600	11700
Dissolved Oxygen (Field)	ug/l	-- [7]	--	**4570**	**4750**	--	14560	11710	8110	13440
Hardness, Calcium Carbonate	ug/l	--	--	279000	306000	--	386000	270000	362000	355000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	900	200	--	<100	<100	<100	100
Nitrite as N	ug/l	--	--	<50	<50	--	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	--	1100	1000	--	800	500	700	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	6.93	6.93	--	7.71	7.90	7.74	7.83
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**130**	**80**	--	**60**	20	**50**	**40**
Sulphate	ug/l	--	--	105000	86000	--	159000	97000	164000	134000
Temperature (Field)	deg c	-- [10]	--	0.2	18.2	--	0	9.4	14.7	0
Total Dissolved Solids	ug/l	--	--	544000	692000	--	690000	542000	670000	732000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	8000	2000	--	12000	<2000	3000	6000
Metals										
Arsenic	ug/l	100 [11]	--	<1	1	--	<1	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	118	**391**	--	200	54	**220**	88
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	--	76700	82100	--	103000	75600	87800	97800
Chromium	ug/l	-- [13]	--	4	2	--	2	<1	1	1
Cobalt	ug/l	0.9	--	0.9	0.7	--	0.5	<0.5	<0.5	<0.5
Copper	ug/l	5	--	**6.3**	3.2	--	3.3	2.0	2.0	1.9
Iron	ug/l	300	--	**1020**	**781**	--	**511**	187	**305**	**315**
Lead	ug/l	-- [14]	--	0.6	0.3	--	0.2	0.1	0.1	0.2
Magnesium	ug/l	--	--	21400	24400	--	31100	19600	34600	26900
Manganese	ug/l	--	--	91	294	--	88	86	73	44
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	10700	8520	--	10900	4820	11100	8050
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	116000	133000	--	129000	87500	149000	122000
Zinc	ug/l	30 [11]	--	15	7	--	8	<5	7	<5
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	--	<1	**4**	**3**	<1

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Parameter	Unit	PWQO [1]	S9 27-May-2021 S-9	S9 24-Aug-2021 S-9	S9 24-Nov-2021 S-9
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	337000	324000	274000
Ammonia, unionized	ug/l	20	1.88	0.78	0.15
Ammonia Nitrogen	ug/l	--	90	40	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	65000	41000	29000
Chloride	ug/l	--	127000	53000	75000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	1203	1246	1244
Cyanide	ug/l	5 [6]	--	--	--
Dissolved Inorganic Carbon	ug/l	--	69900	55300	57200
Dissolved Organic Carbon	ug/l	--	13900	12800	11700
Dissolved Oxygen (Field)	ug/l	-- [7]	**200**	**4350**	12810
Hardness, Calcium Carbonate	ug/l	--	423000	627000	592000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	<100	<100	400
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	900	700	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.98	7.68	7.66
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**100**	**70**	20
Sulphate	ug/l	--	150000	332000	302000
Temperature (Field)	deg c	-- [10]	12.4	20.7	0
Total Dissolved Solids	ug/l	--	744000	876000	804000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	35000	30000	3000
Metals					
Arsenic	ug/l	100 [11]	<1	<1	<1
Barium	ug/l	--	--	--	--
Boron	ug/l	200 [12]	112	126	83
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	112000	185000	187000
Chromium	ug/l	-- [13]	4	3	<1
Cobalt	ug/l	0.9	**1.0**	0.7	<0.5
Copper	ug/l	5	3.4	2.5	1.6
Iron	ug/l	300	**1470**	**883**	174
Lead	ug/l	-- [14]	0.5	0.4	0.1
Magnesium	ug/l	--	34900	39700	30600
Manganese	ug/l	--	145	69	34
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	8920	13300	10900
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	115000	55600	60400
Zinc	ug/l	30 [11]	8	5	<5
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**4**	<1	**2**

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Parameter	Unit	PWQO [1]	S10 28-Jun-1995	S10 14-Nov-1995	S10 13-Jun-1996	S10 12-Oct-1996	S10 17-Jun-1997	S10 05-Nov-1997	S10 05-Jun-1998	S10 26-Aug-1998	S10 30-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	237000	312000	212000	193000	145000	8000	100000	67000	202000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	10
Ammonia Nitrogen	ug/l	--	10	60	20	130	10	10	70	60	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	7000	2000	1000	10000	1000	14000	4000	1000
Chemical Oxygen Demand	ug/l	--	291000	120000	75000	67000	51000	43000	232000	106000	100000
Chloride	ug/l	--	121000	118000	43000	68000	19400	58000	25400	33800	87900
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1026	1230	520	640	431	950	360	371	659
Dissolved Inorganic Carbon	ug/l	--	87700	18200	46300	39400	31000	1000	32600	16700	52000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3950	--	4780	3840	2800	6390	6220	6250	8070
Hardness, Calcium Carbonate	ug/l	--	200000	257000	148000	178000	112000	287000	87000	157000	193000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1250	12000	980	830	2050	1280	4370	1600	1320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	1240	11940	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.79	7.08	7.55	6.56	6.85	6.89	--	7.33	7.2
Phosphate	ug/l	--	900	540	380	150	180	90	590	180	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	13000	91200	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	636000	620000	260000	320000	216000	480000	183000	191000	331000
Total Organic Carbon	ug/l	--	31500	92400	24100	21200	37800	16600	41600	20000	31400
Total Suspended Solids	ug/l	--	39000	165000	11000	4000	18000	14000	234000	30000	16000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**2000**	**1630**	**1060**	**1300**	**1360**	**1120**	**790**	**1120**	**800**
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--	--	--
Calcium	ug/l	--	66800	50900	35200	37500	27400	76800	22300	46800	46000
Chromium	ug/l	-- [13]	**11**	**10**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	1.7	3.2	1.9	1.5	0.5	**10.6**	4.2	1.5	0.6
Iron	ug/l	300	**570**	**5840**	**503**	**2890**	**660**	**600**	**5330**	**2160**	**1050**
Lead	ug/l	-- [14]	1.3	1.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	28100	31100	14300	20100	10500	22700	7710	9590	18700
Manganese	ug/l	--	740	680	217	580	310	780	850	120	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	**30**	20
Potassium	ug/l	--	15200	16600	7730	1300	800	10800	400	1500	14500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	87100	182000	64800	94000	53300	47700	36100	43400	78400
Zinc	ug/l	30 [11]	10	20	10	10	10	**120**	30	**460**	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**2**	**2**	1	**19**	1

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Parameter	Unit	PWQO [1]	S10 30-Jun-1999	S10 19-Oct-1999	S10 03-May-2000	S10 25-Oct-2000	S10 13-Jun-2001	S10 27-Sep-2001	S10 21-Nov-2001	S10 22-May-2002	S10 12-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	94000	38000	98000	151000	166000	54000	78000	181000	29000
Ammonia, unionized	ug/l	20	--	--	10	--	<20	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	410	40	20	1	20	40	10	40	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	24000	5000	3000	--	5000	1000	1000	1000	7000
Chemical Oxygen Demand	ug/l	--	280000	80000	43000	--	84000	71000	84000	55000	190000
Chloride	ug/l	--	86000	57500	24100	112000	59000	87300	93400	29300	26700
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	199.1	650	383	667	500	680	650	370	--
Dissolved Inorganic Carbon	ug/l	--	23100	61000	18100	--	28900	10100	10900	2000	4000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4910	6880	6600	2100	3400	5060	2030	6370	--
Hardness, Calcium Carbonate	ug/l	--	105000	200000	99000	179000	142000	160000	155000	149000	180000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	100	100	100	100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	10500	1510	250	17700	1720	2020	1550	2470	5960
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	**6.1**	7.2	6.62	7.4	7	6.66	**5.94**	7.02	--
Phosphate	ug/l	--	1440	110	30	--	270	260	260	300	720
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	42000	12000	188000	188000	60000	180000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	98900	320000	190000	414000	326000	540000	538000	276000	360000
Total Organic Carbon	ug/l	--	50100	19200	16300	--	28100	25500	27000	13000	23000
Total Suspended Solids	ug/l	--	22000	14000	22000	352000	198000	7000	90000	14000	251000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	1	1	1	1	1
Boron	ug/l	200 [12]	**750**	**1240**	**460**	**1230**	**590**	**1330**	**1450**	**620**	**510**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	30100	51600	25000	45800	35900	42000	34000	36400	49400
Chromium	ug/l	-- [13]	--	--	--	**10**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**13.4**	3.1	0.5	**11**	1.5	4.4	3.8	<1	5
Iron	ug/l	300	**13600**	**4790**	300	**26200**	**3330**	**3060**	**12100**	**390**	**3560**
Lead	ug/l	-- [14]	**6.6**	0.2	0.2	2.2	1.1	0.2	0.6	<1	4.3
Magnesium	ug/l	--	7130	17100	8700	15600	12600	13500	17000	14000	13700
Manganese	ug/l	--	740	450	40	2700	420	670	240	40	500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	20
Potassium	ug/l	--	800	3400	4600	9700	4700	4500	5500	7500	4900
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	18300	69000	39700	69800	61100	93400	120000	54200	35500
Zinc	ug/l	30 [11]	30	10	10	30	10	10	10	10	**60**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**9**	**15**	**35**	1	1	1	1

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Parameter	Unit	PWQO [1]	S10 31-May-2003	S10 03-Jul-2003	S10 22-Oct-2003	S10 17-May-2004	S10 21-Aug-2004	S10 18-Nov-2004	S10 25-May-2005	S10 09-Sep-2005 [20]	S10 09-Nov-2005
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	168000	--	77000
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	<5000	--	<5000
Alkalinity (Total as CaCO3)	ug/l	-- [5]	104000	136000	47000	175000	156000	180000	140000	--	63000
Ammonia, unionized	ug/l	20	--	--	--	<10	<10	<10	<10	--	<10
Ammonia Nitrogen	ug/l	--	240	110	40	20	30	10	<10	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	9000	7000	7000	8000	20000	<3000	--	9000
Chemical Oxygen Demand	ug/l	--	75000	138000	245000	132000	230000	891000	77000	--	227000
Chloride	ug/l	--	97000	25500	56000	48100	40400	69000	41900	--	52600
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	500	400	820	470	380	550	400	--	380
Dissolved Inorganic Carbon	ug/l	--	24000	35000	12000	39300	37200	36500	43400	--	20600
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	23200	--	26000
Dissolved Oxygen (Field)	ug/l	-- [7]	7400	1930	9100	2400	1800	--	**4200**	--	**3950**
Hardness, Calcium Carbonate	ug/l	--	125000	85000	--	148000	133000	166000	121000	--	142000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	**20**	--	**400**
Nitrate as N	ug/l	--	100	100	200	100	100	100	300	--	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1700	5880	6040	3930	4970	7090	1200	--	5500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	6.69	8.1	7.2	6.7	7	7.2	--	6.9
Phosphate	ug/l	--	160	1320	880	770	900	1440	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	**100**	--	**810**
Sulphate	ug/l	--	92000	28000	106000	31000	15000	54000	13000	--	152000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	10	--	1
Total Dissolved Solids	ug/l	--	297000	315000	289000	235000	190000	275000	225000	--	371000
Total Organic Carbon	ug/l	--	27000	46000	25000	21100	24800	17300	--	--	--
Total Suspended Solids	ug/l	--	25000	224000	294000	84000	156000	1630000	13000	--	320000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	3	<1	--	1
Boron	ug/l	200 [12]	**580**	**645**	**631**	**248**	**413**	**374**	**237**	--	**513**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	<0.1	--	<0.5
Calcium	ug/l	--	29800	19600	33800	39500	33900	41700	31200	--	35200
Chromium	ug/l	-- [13]	**10**	5	**9**	1	3	**48**	<2	--	**11**
Cobalt	ug/l	0.9	--	--	--	--	--	--	**4**	--	**3**
Copper	ug/l	5	3	2	**20**	**17**	**58**	**103**	<2	--	**17**
Iron	ug/l	300	**1280**	**6170**	270	**2050**	**502**	**593**	**816**	--	**2610**
Lead	ug/l	-- [14]	0.5	3.7	0.5	0.6	3	2.6	0.2	--	**6**
Magnesium	ug/l	--	12200	8860	10800	12000	11700	15000	10500	--	13100
Manganese	ug/l	--	70	1030	4	258	1750	4710	39	--	1080
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	<0.05	--	<0.06
Molybdenum	ug/l	40	--	--	--	--	--	--	<0.5	--	<5
Nickel	ug/l	25	20	10	10	20	**50**	**40**	<10	--	<10
Potassium	ug/l	--	5600	1100	8000	7800	3200	4800	7400	--	4100
Selenium	ug/l	100	--	--	--	--	--	--	<1	--	<1
Sodium	ug/l	--	54300	55300	53100	62300	50200	76500	43900	--	79200
Zinc	ug/l	30 [11]	10	12	**45**	**46**	**153**	**154**	<5	--	**64**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	**3**	<1	--	<1

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Parameter	Unit	PWQO [1]	S10 24-May-2006	S10 15-Aug-2006	S10 16-Nov-2006	S10 08-May-2007	S10 22-Aug-2007	S10 20-Nov-2007	S10 23-May-2008	S10 12-Aug-2008	S10 06-Nov-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	123000	127000	158000	107000	56000	103000	174000	160000	140000
Ammonia, unionized	ug/l	20	<10	<10	<10	0.251849	<10	<10	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	30	<10	<10	90	60	<10	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	21000	<3000	<3000	13000	13000	4000	3000	<3000
Chemical Oxygen Demand	ug/l	--	52000	361000	52000	66000	342000	308000	88000	71000	98000
Chloride	ug/l	--	28200	22000	29400	20000	8200	60200	45700	64800	80600
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	280	520	320	300	425	390	480	500	500
Dissolved Inorganic Carbon	ug/l	--	23900	39400	41100	26800	15100	26800	38400	42200	35600
Dissolved Organic Carbon	ug/l	--	20700	35800	20700	14300	28100	19400	20300	21700	13000
Dissolved Oxygen (Field)	ug/l	-- [7]	11450	**2200**	**6290**	--	**2340**	**2950**	**3840**	**960**	**6240**
Hardness, Calcium Carbonate	ug/l	--	129000	106000	168000	96000	33000	156000	150000	167000	169000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	100	<100	200	<100	200	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	960	7980	1450	1650	11200	6620	1620	1610	1280
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	**5.9**	6.6	8.3	7.3	8.1	7.3	7	7.5
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**1470**	**100**	**180**	**310**	**1120**	**150**	**320**	**130**
Sulphate	ug/l	--	42000	17000	37000	8000	9000	72000	20000	12000	69000
Temperature (Field)	deg c	-- [10]	4.5	16	6.5	5.4	11.3	0.2	9.1	15.6	5
Total Dissolved Solids	ug/l	--	225000	189000	279000	161000	84600	316000	277000	308000	367000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	34000	345000	11000	32000	476000	320000	20000	45000	9000
Metals											
Arsenic	ug/l	100 [11]	<1	0.9	<1	0.6	2.7	1.6	1.2	0.7	0.5
Boron	ug/l	200 [12]	192	**232**	**223**	105	76	162	200	124	113
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	35300	21600	45100	25400	8370	40800	40500	48500	45600
Chromium	ug/l	-- [13]	<2	**21**	8	<2	**26**	8	<2	<2	<2
Cobalt	ug/l	0.9	0.4	**3.3**	<0.5	0.6	**6.5**	**2.5**	<0.5	<0.5	<0.5
Copper	ug/l	5	2	**46**	**44**	**11**	**17**	**8**	<2	**6**	<2
Iron	ug/l	300	**1360**	**1190**	**793**	**1630**	**2310**	**7560**	**658**	**4390**	192
Lead	ug/l	-- [14]	0.8	4.5	0.9	1.4	**8**	3.4	<0.1	1	<0.1
Magnesium	ug/l	--	9930	12600	13400	7980	2820	13100	11900	11200	13400
Manganese	ug/l	--	392	1470	27	141	725	704	184	441	22
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5000	4800	16300	5200	1000	7200	5900	4100	8800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	33500	36700	42200	28000	18700	51900	47200	64600	65000
Zinc	ug/l	30 [11]	7	**76**	26	23	**103**	**36**	8	**38**	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S10 13-May-2009 S-6	S10 25-Aug-2009 A-1	S10 27-Nov-2009 S-2	S10 18-May-2010 S-7	S10 18-Aug-2010 [2] S-1	S10 14-Oct-2010 S-2	S10 19-May-2011 W-1	S10 16-Aug-2011 [21] N-2	S10 30-Nov-2011 [22] S10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	176000	230000	158000	266000	135000	178000	167000	145000	90000
Ammonia, unionized	ug/l	20	<0.12	0.03	0.02	0.03	<0.01	<0.02	0.18	0.05	<0.09
Ammonia Nitrogen	ug/l	--	<20	30	20	20	<20	<20	30	30	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	3000	1000	3000	2000	1000	<1000	3000	2000
Chemical Oxygen Demand	ug/l	--	48000	99000	53000	60000	70000	40000	50000	95000	40000
Chloride	ug/l	--	54000	61000	57000	41000	36000	42000	30000	19000	39000
Conductivity	uS/cm	--	587	635	610	622	568	605	477	354	432
Conductivity (Field)	uS/cm	--	500	510	550	702	528	530	464	349	428
Dissolved Inorganic Carbon	ug/l	--	44600	60400	39800	57000	29100	43900	41600	37900	17800
Dissolved Organic Carbon	ug/l	--	18800	26900	13800	25900	27500	14900	18500	33600	14700
Dissolved Oxygen (Field)	ug/l	-- [7]	**3480**	**5770**	**5820**	**5420**	**1610**	9070	**2260**	**4250**	**5740**
Hardness, Calcium Carbonate	ug/l	--	173000	191000	158000	193000	175000	183000	165000	127000	116000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	110	<100	<100	<100	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1050	1370	160	2620	1310	1020	1060	1820	590
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	6.59	6.84	6.93	**6.26**	6.86	7.37	6.66	7.54
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	**970**	30	**750**	**80**	**170**	**70**	**80**	<10
Sulphate	ug/l	--	36000	2000	63000	<1000	90000	61000	31000	12000	56000
Temperature (Field)	deg c	-- [10]	10	15.6	4.3	11.0	15.5	7.2	14.0	18.3	5.3
Total Dissolved Solids	ug/l	--	382000	413000	397000	404000	369000	393000	310000	230000	281000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	38000	4000	43000	8000	12000	52000	18000	<2000
Metals											
Arsenic	ug/l	100 [11]	<1	2	<1	2	<1	<1	<1	<50	<50
Boron	ug/l	200 [12]	130	90	110	170	**330**	110	100	100	200
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	**<10**
Calcium	ug/l	--	46000	55000	42000	51000	47000	50000	43000	36000	30000
Chromium	ug/l	-- [13]	2	3	3	3	3	3	2	**<50**	**<50**
Cobalt	ug/l	0.9	<0.2	0.7	<0.2	**1.1**	0.4	0.5	<0.2	<10	<10
Copper	ug/l	5	<1	<1	1	1	1	1	<1	**<10**	**<10**
Iron	ug/l	300	170	**4660**	220	**8840**	**930**	**1610**	200	**1600**	100
Lead	ug/l	-- [14]	<1	<1	<1	<1	<1	<1	<1	**<10**	**<10**
Magnesium	ug/l	--	14000	13000	13000	16000	14000	14000	14000	9000	10000
Manganese	ug/l	--	40	780	50	2080	470	580	40	320	30
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	6000	9000	8000	8000	7000	10000	5000	<1000	5000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	57000	53000	50000	59000	50000	45000	39000	26000	38000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<10	<10	<10	<50	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	**2**	<1	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S10 30-May-2012 S 10	S10 22-Aug-2012 S-10	S10 29-Nov-2012 S10	S10 28-May-2013 S10	S10 15-Aug-2013 S10	S10 21-Nov-2013 SA-6	S10 28-May-2014 [23] S10 (SW-W)	S10 26-Aug-2014 [24] S10	S10 13-Nov-2014 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	230000	44000	250000	150000	200000	160000	210000	200000	180000
Ammonia, unionized	ug/l	20	<0.12	<0.01	0.07	0.04	0.09	<0.03	<0.09	0.2	<0.02
Ammonia Nitrogen	ug/l	--	<50	<50	180	97	210	<50	<50	160	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	<2000	4000	<2000	5000	<2000	2000	4000	6000
Chemical Oxygen Demand	ug/l	--	130000	160000	600000	79000	690000	150000	190000	410000	180000
Chloride	ug/l	--	33000	43000	83000	48000	42000	78000	55000	58000	62000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	518	759	894	524	548	725	571	603	558
Dissolved Inorganic Carbon	ug/l	--	56000	9200	52000	33000	57000	43000	48000	52000	43000
Dissolved Organic Carbon	ug/l	--	35000	27000	22000	23000	31000	18000	22000	23000	21000
Dissolved Oxygen (Field)	ug/l	-- [7]	**2250**	**560**	**1410**	**2770**	**1050**	**7580**	**680**	**600**	**3660**
Hardness, Calcium Carbonate	ug/l	--	200000	280000	280000	160000	170000	200000	200000	180000	160000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<500	<500	<100
Nitrite as N	ug/l	--	<10	<10	<10	<10	<10	<10	<50	<50	<10
Nitrogen, Total Kjeldahl	ug/l	--	2400	4000	16000	2300	16000	2400	11000	12000	7400
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	<100	<100	<100	<100	<100	<500	<500	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.91	**5.87**	6.66	**6.41**	**6.23**	6.86	6.87	6.57	6.61
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**330**	**390**	**1900**	**270**	**4200**	**240**	**1100**	**1200**	**680**
Sulphate	ug/l	--	<1000	280000	100000	41000	<1000	100000	29000	31000	21000
Temperature (Field)	deg c	-- [10]	16.4	15.2	0	9.0	14	0.2	13.1	17.9	2.1
Total Dissolved Solids	ug/l	--	328000	628000	560000	352000	378000	476000	408000	440000	334000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	62000	57000	380000	160000	380000	120000	120000	280000	93000
Metals											
Arsenic	ug/l	100 [11]	2.0	2.3	5.2	<1.0	5.9	<1.0	2.6	3.0	1.3
Boron	ug/l	200 [12]	130	**340**	160	170	190	190	160	170	160
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	58000	82000	87000	44000	63000	60000	60000	56000	47000
Chromium	ug/l	-- [13]	<5.0	<5.0	**17**	<5.0	<5.0	<5.0	<5.0	8.0	<5.0
Cobalt	ug/l	0.9	**1.1**	**2.0**	**4.5**	<0.50	**2.3**	0.55	**1.2**	**2.6**	**1.3**
Copper	ug/l	5	2.6	2.9	**17**	<1.0	**7.2**	3.3	3.0	**7.3**	2.8
Iron	ug/l	300	**5100**	**12000**	**43000**	**1900**	**59000**	**4400**	**10000**	**23000**	**7500**
Lead	ug/l	-- [14]	<0.50	0.66	**6.6**	<0.50	**6.3**	2.2	2.4	4.8	1.3
Magnesium	ug/l	--	15000	23000	29000	14000	17000	20000	16000	16000	15000
Manganese	ug/l	--	1900	730	1500	280	1100	220	1100	1300	1100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5300	4100	7400	6600	2900	8700	11000	4300	9000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	46000	73000	87000	62000	59000	76000	59000	57000	60000
Zinc	ug/l	30 [11]	7.9	12	**51**	<5.0	**42**	11	25	30	19
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**3.0**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.6**	**11**

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Parameter	Unit	PWQO [1]	S10 27-May-2015 S-10	S10 25-Aug-2015 S-10	S10 25-Nov-2015 S-10	S10 24-May-2016 S-10	S10 18-Aug-2016 S-10	S10 16-Nov-2016 S-10	S10 18-May-2017 S-10	S10 28-Aug-2017 S-10	S10 28-Nov-2017 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	204000	199000	183000	163000	21000	147000	192000	179000	189000
Ammonia, unionized	ug/l	20	1.34	0.11	0.01	0.71	0.07	0.4	0.3	0.06	0.02
Ammonia Nitrogen	ug/l	--	100	30	30	150	80	70	30	40	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	<20000 [25]	<30000 [25]	6000	74000	12000	4000	4000	35000	<100000 [26]
Chemical Oxygen Demand	ug/l	--	115000	171000	126000	671000	100000	52000	64000	153000	526000
Chloride	ug/l	--	77000	75000	108000	43000	33000	117000	75000	63000	64000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	619	602	39	458	864	942	673	520	656
Dissolved Inorganic Carbon	ug/l	--	45900	38300	43300	20200	900	29800	11000	36300	8800
Dissolved Organic Carbon	ug/l	--	38100	38900	19900	50500	25400	12800	42000	21400	43800
Dissolved Oxygen (Field)	ug/l	-- [7]	**930**	**1380**	**1940**	**1700**	**1310**	9270	**1660**	**2850**	**5580**
Hardness, Calcium Carbonate	ug/l	--	43000	137000	232000	193000	332000	229000	208000	202000	237000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2400	2300	2900	17400	4100	900	2300	4500	1700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.63	7.13	6.56	7.38	**6.43**	7.71	7.52	6.83	6.51
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**390**	**420**	**420**	**2500**	**650**	**120**	**260**	**540**	**480**
Sulphate	ug/l	--	12000	3000	87000	10000	398000	130000	51000	37000	67000
Temperature (Field)	deg c	-- [10]	17.0	15.5	0	10.8	17.9	3.7	16.3	12.3	0.4
Total Dissolved Solids	ug/l	--	358000	397000	488000	324000	668000	518000	408000	360000	390000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	97000	46000	129000	1160000	96000	36000	49000	410000	1000000
Metals											
Arsenic	ug/l	100 [11]	<1	1	<1	6	4	<1	<5 [17]	<1	2
Boron	ug/l	200 [12]	32	199	174	182	**489**	124	**255**	161	162
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.5 [17]	<0.1	**0.3**
Calcium	ug/l	--	13000	34300	71000	56300	91300	61900	55400	57600	66300
Chromium	ug/l	-- [13]	<1	1	2	**9**	2	<1	<5 [17]	2	**11**
Cobalt	ug/l	0.9	<0.5	0.6	<0.5	**6.3**	**3.4**	<0.5	<2.5 [17]	0.6	**3.6**
Copper	ug/l	5	<0.5	<0.5	<0.5	**8.7**	3.3	<0.5	<2.5 [17]	0.7	**13.1**
Iron	ug/l	300	**801**	**9020**	**3000**	**43300**	**4450**	**2580**	**1880**	**4090**	**17900**
Lead	ug/l	-- [14]	0.2	0.1	0.8	**11.7**	1.9	0.2	0.5	1.0	4.9
Magnesium	ug/l	--	2560	12500	18900	12800	25200	18000	16900	14200	17500
Manganese	ug/l	--	179	683	179	7530	1080	52	984	400	648
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	1180	3050	4830	8370	9080	5850	8190	3670	6080
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	13000	61700	106000	52200	57000	88700	66000	57500	52400
Zinc	ug/l	30 [11]	<5	10	13	**86**	**82**	18	<25 [17]	14	**70**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**5**	<1	**29**	**10**	**7**	<1	<1	<1

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Parameter	Unit	PWQO [1]	S10 23-May-2018 S-10	S10 30-Aug-2018 S-10	S10 28-Nov-2018 S-10	S10 20-Jun-2019 S-10	S10 28-Aug-2019 [20] S-10	S10 21-Nov-2019 S-10	S10 14-May-2020 S-10	S10 26-Aug-2020 [20] S-10	S10 25-Nov-2020 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	243000	267000	175000	218000	--	89000	138000	--	191000
Ammonia, unionized	ug/l	20	0.11	0.05	0.02	0.05	--	0.01	0.02	--	0.05
Ammonia Nitrogen	ug/l	--	30	40	30	30	--	30	20	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	18000	4000	<12000 [26]	--	<20000 [26]	8000	--	<60000 [26]
Chemical Oxygen Demand	ug/l	--	106000	280000	66000	91000	--	178000	89000	--	361000
Chloride	ug/l	--	32000	118000	89000	62000	--	113000	59000	--	91000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	510	799	649	560	--	1091	505	--	23
Dissolved Inorganic Carbon	ug/l	--	50800	43000	32000	47100	--	<500	31100	--	45900
Dissolved Organic Carbon	ug/l	--	21500	37600	22400	23100	--	21800	31500	--	27600
Dissolved Oxygen (Field)	ug/l	-- [7]	**1920**	**1170**	13250	**1010**	--	**2980**	**5970**	--	**3000**
Hardness, Calcium Carbonate	ug/l	--	177000	230000	212000	217000	--	328000	120000	--	201000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	--	<100	<100	--	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	--	<50	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	2300	9900	900	1600	--	3200	1500	--	6600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.20	6.60	6.9	6.69	--	6.51	6.95	--	7.22
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1190**	**1220**	**90**	**110**	--	**430**	**210**	--	**1470**
Sulphate	ug/l	--	4000	3000	73000	1000	--	243000	28000	--	40000
Temperature (Field)	deg c	-- [10]	12.3	17.3	0.9	17.6	--	0.2	6.0	--	0
Total Dissolved Solids	ug/l	--	314000	484000	424000	352000	--	612000	278000	--	442000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	47000	346000	13000	16000	--	106000	25000	--	428000
Metals											
Arsenic	ug/l	100 [11]	1	2	<1	1	--	1	<1	--	<1
Boron	ug/l	200 [12]	141	**222**	124	197	--	**246**	83	--	99
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	<0.1
Calcium	ug/l	--	47200	64700	55300	59400	--	85000	31500	--	53000
Chromium	ug/l	-- [13]	<1	3	<1	1	--	2	<1	--	<1
Cobalt	ug/l	0.9	0.8	**1.2**	<0.5	**2.3**	--	**2.1**	<0.5	--	<0.5
Copper	ug/l	5	<0.5	3.8	1.1	1.4	--	2.9	0.6	--	1.0
Iron	ug/l	300	**11200**	**15500**	**2070**	**13500**	--	**8400**	**1080**	--	**1050**
Lead	ug/l	-- [14]	0.6	2.0	0.3	2.3	--	1.3	0.1	--	<0.1
Magnesium	ug/l	--	14400	16600	17800	16600	--	28200	9940	--	16600
Manganese	ug/l	--	1400	773	476	2990	--	1600	215	--	324
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5600	3290	6910	4480	--	10700	4450	--	10800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	42500	86700	79100	65900	--	90200	43800	--	67700
Zinc	ug/l	30 [11]	9	19	11	18	--	20	9	--	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**6**	<1	<1	--	**5**	<1	--	**10**

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Parameter	Unit	PWQO [1]	S10 27-May-2021 S-10	S10 24-Aug-2021 S-10	S10 24-Nov-2021 S-10
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	215000	156000	185000
Ammonia, unionized	ug/l	20	0.17	0.03	0.02
Ammonia Nitrogen	ug/l	--	90	90	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<150000 [26]	<150000 [26]	<100000 [26]
Chemical Oxygen Demand	ug/l	--	766000	834000	518000
Chloride	ug/l	--	71000	54000	82000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	660	501	799
Dissolved Inorganic Carbon	ug/l	--	52500	42500	42100
Dissolved Organic Carbon	ug/l	--	30700	41200	24300
Dissolved Oxygen (Field)	ug/l	-- [7]	**1090**	**1450**	**3660**
Hardness, Calcium Carbonate	ug/l	--	279000	169000	235000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	11100	12600	7700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.93	**5.88**	6.86
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**2920**	**1500**	**1430**
Sulphate	ug/l	--	2000	4000	96000
Temperature (Field)	deg c	-- [10]	12.5	19.7	0
Total Dissolved Solids	ug/l	--	416000	358000	486000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	221000	330000	404000
Metals					
Arsenic	ug/l	100 [11]	6	2	2
Boron	ug/l	200 [12]	143	112	143
Cadmium	ug/l	0.2 [11]	**0.3**	<0.1	<0.1
Calcium	ug/l	--	76700	48000	65400
Chromium	ug/l	-- [13]	**33**	6	3
Cobalt	ug/l	0.9	**9.1**	**1.5**	**2.7**
Copper	ug/l	5	**23.7**	**8.7**	5.0
Iron	ug/l	300	**54200**	**15400**	**20000**
Lead	ug/l	-- [14]	**13.6**	**6.9**	3.3
Magnesium	ug/l	--	21300	11900	17400
Manganese	ug/l	--	1970	819	2140
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	11300	2430	7480
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	71800	45300	70400
Zinc	ug/l	30 [11]	**108**	27	**32**
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**12**	**2**	**8**

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Parameter	Unit	PWQO [1]	S11 28-Jun-1995	S11 14-Nov-1995	S11 13-Jun-1996	S11 12-Oct-1996	S11 17-Jun-1997	S11 05-Nov-1997	S11 05-Jun-1998	S11 26-Aug-1998	S11 30-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	300000	57000	78000	82000	71000	32000	72000	88000	218000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	10
Ammonia Nitrogen	ug/l	--	18000	330	50	190	10	10	730	90	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	15000	15000	5000	1000	3000	2000	5000	16000	1000
Chemical Oxygen Demand	ug/l	--	620000	130000	94000	50000	82000	51000	69000	116000	96000
Chloride	ug/l	--	75000	56500	42000	61000	68300	51000	120000	63400	120000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	790	500	320	710	706	770	1347	522	830
Dissolved Inorganic Carbon	ug/l	--	96800	7300	19100	16100	37000	6000	11400	23300	65700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4800	--	7700	4850	4700	4500	10520	5580	7860
Hardness, Calcium Carbonate	ug/l	--	234000	113000	70000	224000	190000	182000	397000	135000	223000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	19500	25800	1720	1660	2120	1080	1840	1640	1320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	1500	25470	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.73	6.93	**5.05**	**6.25**	**6.44**	7.27	--	7.6	**6.4**
Phosphate	ug/l	--	5920	1070	200	210	150	80	170	360	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	7000	46000	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	400000	250000	160000	350	354000	380000	673000	261000	410000
Total Organic Carbon	ug/l	--	56100	36700	29700	16500	36800	19800	22800	23000	32700
Total Suspended Solids	ug/l	--	--	625000	26000	16000	8000	12000	40000	28000	5000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1450**	**570**	**652**	**1270**	**2350**	**1340**	**3350**	**1100**	**810**
Cadmium	ug/l	0.2 [11]	**1.3**	**0.4**	--	--	--	--	--	--	--
Calcium	ug/l	--	57590	27600	18600	56500	52000	47300	102000	34400	52100
Chromium	ug/l	-- [13]	**90**	**20**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**14**	**11.1**	3.5	4.2	0.5	**10.8**	2	3.2	0.7
Iron	ug/l	300	**24210**	**14500**	**1860**	**2060**	**1650**	150	**3040**	**1210**	**740**
Lead	ug/l	-- [14]	**37.6**	**16.5**	0.6	0.2	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	21200	10600	5520	19800	14300	15400	34600	11700	22300
Manganese	ug/l	--	650	270	111	280	100	70	450	90	80
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	**30**	20	22	20	20	20	20	20	20
Potassium	ug/l	--	10430	7500	792	2900	400	1700	400	7600	17000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	74380	63200	45400	72800	81800	46400	153000	57800	103000
Zinc	ug/l	30 [11]	**120**	**80**	10	20	10	20	30	10	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**2**	**6**	1	1	1

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Parameter	Unit	PWQO [1]	S11 19-Oct-1999	S11 03-May-2000	S11 25-Oct-2000	S11 13-Jun-2001	S11 21-Nov-2001	S11 22-May-2002	S11 12-Nov-2002	S11 31-May-2003	S11 22-Oct-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	46000	67000	210000	198000	80000	135000	44000	89000	42000
Ammonia, unionized	ug/l	20	--	10	--	<20	<20	--	--	--	--
Ammonia Nitrogen	ug/l	--	70	50	--	30	20	30	40	120	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	4000	--	3000	2000	1000	13000	9000	3000
Chemical Oxygen Demand	ug/l	--	118000	72000	--	66000	60000	49000	355000	150000	84000
Chloride	ug/l	--	70600	30400	149000	90400	79600	70700	89200	43200	80800
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	520	339	861	650	420	410	--	600	600
Dissolved Inorganic Carbon	ug/l	--	21300	13800	--	38300	11200	21000	9000	19000	10000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6400	8740	2270	2000	6110	6380	--	5000	5000
Hardness, Calcium Carbonate	ug/l	--	133000	67000	291000	192000	166000	186000	295000	98000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	100	100	100	200	100	500
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1460	1140	20800	1520	1200	740	8700	3460	1360
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.7	6.76	7.19	6.9	**6.15**	7.02	--	8.15	8.15
Phosphate	ug/l	--	200	140	--	410	140	40	970	530	170
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	61000	53000	107000	36000	300000	44000	110000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	260000	170000	258000	438000	380000	340000	672000	196000	333000
Total Organic Carbon	ug/l	--	24700	20100	--	22700	15000	11000	28000	35000	23000
Total Suspended Solids	ug/l	--	29000	30000	1340000	43000	106000	4000	427000	232000	28000
Metals											
Arsenic	ug/l	100 [11]	--	--	5	1	1	1	1	1	1
Boron	ug/l	200 [12]	**880**	**280**	**1430**	**550**	**690**	110	**1260**	**260**	**455**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	34800	17700	70400	49100	43700	48800	77400	25900	34600
Chromium	ug/l	-- [13]	--	--	**80**	**10**	**10**	**10**	**10**	**10**	8
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	0.5	0.5	**53**	0.5	3.5	<1	**10.9**	5	**21**
Iron	ug/l	300	**2620**	**1260**	**37200**	**1990**	**5340**	220	**4940**	**2860**	**922**
Lead	ug/l	-- [14]	0.3	0.2	**51**	5	0.3	<1	**8.3**	1.3	1.9
Magnesium	ug/l	--	11100	5370	28000	16900	13700	12800	24800	8010	11600
Manganese	ug/l	--	290	390	2420	540	430	20	530	790	153
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**50**	20	20	20	20	20	10
Potassium	ug/l	--	8000	8500	9600	2200	5700	4800	7800	4400	10600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	60600	30800	95900	85600	62300	51300	95400	44100	67700
Zinc	ug/l	30 [11]	20	10	**320**	20	10	10	**110**	**40**	18
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**31**	**17**	**7**	**43**	1	1	1	1	1

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Parameter	Unit	PWQO [1]	S11 17-May-2004	S11 21-Aug-2004	S11 18-Nov-2004	S11 25-May-2005	S11 09-Sep-2005 [20]	S11 09-Nov-2005	S11 24-May-2006	S11 15-Aug-2006	S11 16-Nov-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	149000	--	110000	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	<5000	--	<5000	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	155000	183000	250000	120000	--	90000	82000	191000	63000
Ammonia, unionized	ug/l	20	<10	<10	<10	<10	--	<10	<10	<10	<10
Ammonia Nitrogen	ug/l	--	10	40	80	<10	--	50	<10	20	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	7000	84000	10000	--	15000	13000	6000	<3000
Chemical Oxygen Demand	ug/l	--	76000	187000	2850000	64000	--	372000	264000	95000	48000
Chloride	ug/l	--	86500	72300	109000	62700	--	61200	39700	99300	19200
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	550	500	740	480	--	220	220	750	190
Dissolved Inorganic Carbon	ug/l	--	42300	38800	54100	38400	--	36800	29100	47800	17000
Dissolved Organic Carbon	ug/l	--	--	--	--	20100	--	22800	56800	29200	18900
Dissolved Oxygen (Field)	ug/l	-- [7]	3900	5800	--	**4800**	--	**7300**	10510	**1200**	**4340**
Hardness, Calcium Carbonate	ug/l	--	189000	164000	273000	121000	--	203000	40000	194000	32000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	**20**	--	**700**	--	--	--
Nitrate as N	ug/l	--	100	200	200	200	--	100	<100	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2040	4330	48400	1180	--	7720	5460	2480	990
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.2	7	7	7.2	--	7.2	7.3	6.9	7.6
Phosphate	ug/l	--	260	640	11800	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**120**	--	**1440**	**900**	**1180**	**130**
Sulphate	ug/l	--	30000	28000	79000	20000	--	174000	17000	20000	28000
Temperature (Field)	deg c	-- [10]	--	--	--	12.5	--	0.5	5	16	7.2
Total Dissolved Solids	ug/l	--	275000	250000	370000	252000	--	439000	175000	375000	139000
Total Organic Carbon	ug/l	--	17700	19200	17200	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	40000	172000	10400000	14000	--	1790000	253000	248000	67000
Metals											
Arsenic	ug/l	100 [11]	1	1	9	<1	--	1	<1	1.1	<1
Boron	ug/l	200 [12]	109	**223**	**410**	181	--	**758**	164	107	104
Cadmium	ug/l	0.2 [11]	--	--	--	<0.1	--	<0.5	**0.2**	<0.1	**<0.5**
Calcium	ug/l	--	53600	44200	74500	32000	--	52600	7280	45400	7250
Chromium	ug/l	-- [13]	2	7	**462**	<2	--	**45**	7	**33**	**13**
Cobalt	ug/l	0.9	--	--	--	**2**	--	**15**	**1.6**	**4.6**	0.9
Copper	ug/l	5	**17**	**96**	**370**	<2	--	**42**	**41**	**50**	**38**
Iron	ug/l	300	**922**	297	**1260**	**724**	--	**1390**	**1670**	**1110**	**1730**
Lead	ug/l	-- [14]	1.8	4.9	**22.5**	<0.2	--	**28**	**4.7**	**5.8**	1
Magnesium	ug/l	--	13400	12900	21200	10100	--	17400	5200	19600	3490
Manganese	ug/l	--	196	799	5760	69	--	1720	652	736	88
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	<0.05	--	<0.06	--	--	--
Molybdenum	ug/l	40	--	--	--	<0.5	--	<5	--	--	--
Nickel	ug/l	25	20	**80**	**300**	<10	--	**40**	--	--	--
Potassium	ug/l	--	6400	7700	9400	6200	--	5600	2000	7600	3600
Selenium	ug/l	100	--	--	--	<1	--	<1	--	--	--
Sodium	ug/l	--	73600	81100	100000	52500	--	77400	54900	73500	36900
Zinc	ug/l	30 [11]	**42**	**244**	**1080**	9	--	**145**	**46**	**78**	**31**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**7**	<1	--	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S11 08-May-2007	S11 22-Aug-2007 [20]	S11 20-Nov-2007	S11 23-May-2008	S11 12-Aug-2008	S11 06-Nov-2008	S11 13-May-2009 S-7	S11 25-Aug-2009 [27] A-2	S11 27-Nov-2009 [28] S-5
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	138000	--	182000	80000	170000	150000	181000	202000	157000
Ammonia, unionized	ug/l	20	0.120151	--	<10	<20	<20	<20	<0.16	0.3	3.35
Ammonia Nitrogen	ug/l	--	<10	--	60	<10	200	20	<20	190	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	--	14000	<3000	10000	<3000	<1000	14000	16000
Chemical Oxygen Demand	ug/l	--	55000	--	366000	115000	222000	42000	45000	95000	60000
Chloride	ug/l	--	53200	--	131000	56800	69200	104000	77000	79000	66000
Conductivity	uS/cm	--	--	--	--	--	--	--	710	734	654
Conductivity (Field)	uS/cm	--	400	--	600	370	500	600	600	640	--
Dissolved Inorganic Carbon	ug/l	--	34500	--	49100	20000	42600	38700	44500	53400	38600
Dissolved Organic Carbon	ug/l	--	13100	--	18100	8700	26200	13400	17200	26100	20100
Dissolved Oxygen (Field)	ug/l	-- [7]	**5150**	--	**2750**	**2330**	**460**	**2430**	6570	**4160**	**700**
Hardness, Calcium Carbonate	ug/l	--	155000	--	215000	70000	116000	181000	192000	188000	187000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	--	100	100	100	<100	<100	<100	220
Nitrite as N	ug/l	--	--	--	--	--	--	--	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1500	--	7620	2150	7340	1020	860	2910	1070
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	--	7.8	7.2	7.1	7.6	7.4	6.70	**8.68**
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**180**	--	**2330**	**210**	**2510**	**140**	**60**	**1210**	**250**
Sulphate	ug/l	--	25000	--	118000	16000	2000	71000	55000	44000	68000
Temperature (Field)	deg c	-- [10]	10.4	--	0.3	11.3	16.5	7.8	17.5	17.1	4.9
Total Dissolved Solids	ug/l	--	271000	--	575000	201000	283000	417000	462000	477000	425000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	30000	--	2020000	11000	93000	3000	5000	398000	112000
Metals											
Arsenic	ug/l	100 [11]	0.9	--	4.1	1.7	1.4	0.9	<1	<50	<50
Boron	ug/l	200 [12]	53	--	**205**	167	125	81	60	<100	<100
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	**<10**
Calcium	ug/l	--	41900	--	53100	18200	25800	46900	54000	52000	50000
Chromium	ug/l	-- [13]	<2	--	**86**	<2	5	<2	3	**<50**	**<20**
Cobalt	ug/l	0.9	0.8	--	**21.7**	<0.5	**1.8**	0.9	0.3	<10	<5
Copper	ug/l	5	**21**	--	**42**	<2	**8**	<2	3	**20**	**10**
Iron	ug/l	300	**1300**	--	**40600**	**1020**	**979**	**676**	**470**	**18900**	**3800**
Lead	ug/l	-- [14]	0.8	--	**14.8**	<0.1	2.1	<0.1	<1	**<10**	**<10**
Magnesium	ug/l	--	12300	--	19900	5950	12500	15400	14000	14000	15000
Manganese	ug/l	--	136	--	1040	156	1110	191	40	560	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5200	--	8000	3300	5000	9100	6000	11000	12000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	48100	--	92800	51100	64500	78200	65000	64000	56000
Zinc	ug/l	30 [11]	21	--	**161**	6	**44**	<5	<10	**60**	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	<1	<1	<1	**2**	**4**

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Parameter	Unit	PWQO [1]	S11 18-May-2010 S-6	S11 18-Aug-2010 [29] S-3	S11 14-Oct-2010 S-6	S11 19-May-2011 [30] W-5	S11 16-Aug-2011 [2] N-6	S11 30-Nov-2011 [22] S11	S11 30-May-2012 S 11	S11 22-Aug-2012 S-11	S11 29-Nov-2012 S11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	139000	134000	140000	197000	110000	190000	1400000	250000
Ammonia, unionized	ug/l	20	0.12	0.18	0.03	<0.1	0.32	<0.07	0.53	<0.02	0.05
Ammonia Nitrogen	ug/l	--	30	170	30	<20	50	<20	120	<50	150
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	8000	5000	3000	68000	3000	6000	<2000	4000
Chemical Oxygen Demand	ug/l	--	58000	53000	83000	60000	175000	40000	160000	47000	180000
Chloride	ug/l	--	66000	46000	37000	34000	45000	44000	46000	62000	99000
Conductivity	uS/cm	--	708	754	461	452	637	562	--	--	--
Conductivity (Field)	uS/cm	--	767	709	205	447	543	537	498	1111	998
Dissolved Inorganic Carbon	ug/l	--	48900	31000	33900	34900	47700	22300	44000	10000	56000
Dissolved Organic Carbon	ug/l	--	23800	21500	28000	18900	25300	10300	32000	13000	24000
Dissolved Oxygen (Field)	ug/l	-- [7]	**3630**	**5780**	**3780**	**1990**	**1760**	6740	**300**	**2280**	**1550**
Hardness, Calcium Carbonate	ug/l	--	212000	201000	140000	138000	198000	146000	150000	530000	340000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	100	<100	<100	1290	<100	<100	160
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	1450	1870	920	1760	3300	660	3200	1300	6200
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	<100	<100	160
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.25	6.55	6.83	7.26	7.23	7.40	7.13	**6.15**	6.62
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**250**	**160**	**110**	**290**	**90**	**340**	**140**	**1600**
Sulphate	ug/l	--	27000	163000	37000	34000	57000	91000	<1000	480000	170000
Temperature (Field)	deg c	-- [10]	12.9	15.88	9	15.4	19.3	6.3	17.4	15.5	0
Total Dissolved Solids	ug/l	--	460000	490000	300000	294000	414000	365000	320000	990000	678000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	14000	69000	17000	33000	517000	65000	60000	10000	460000
Metals											
Arsenic	ug/l	100 [11]	1	<1	<1	<50	<10	<50	1.3	<1.0	4.5
Boron	ug/l	200 [12]	100	**270**	60	<100	190	100	150	**650**	150
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	**<10**	<0.1	**<10**	<0.10	<0.10	**0.24**
Calcium	ug/l	--	57000	54000	38000	37000	53000	37000	42000	150000	96000
Chromium	ug/l	-- [13]	3	5	7	**<50**	4	**<50**	<5.0	<5.0	**29**
Cobalt	ug/l	0.9	0.5	0.7	**1.4**	<10	0.6	<10	0.53	<0.50	**12**
Copper	ug/l	5	1	3	5	**<10**	1	**<10**	2.6	1.8	**14**
Iron	ug/l	300	**990**	**1660**	**2540**	**2000**	**1860**	**4400**	**2200**	**640**	**34000**
Lead	ug/l	-- [14]	<1	1	<1	**<10**	<1	**<10**	0.79	<0.50	**9.3**
Magnesium	ug/l	--	17000	16000	11000	11000	16000	13000	13000	41000	35000
Manganese	ug/l	--	170	250	80	100	370	130	230	110	3400
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8000	13000	7000	5000	6000	10000	6800	8800	10000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	67000	67000	33000	36000	56000	55000	52000	88000	99000
Zinc	ug/l	30 [11]	<10	<10	<10	<50	<10	<50	<5.0	9.8	**53**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<5	<1	<1	1.0	<1.0	**2.6**

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Parameter	Unit	PWQO [1]	S11 28-May-2013 S11	S11 15-Aug-2013 S11	S11 21-Nov-2013 SA-5	S11 28-May-2014 [23] S11 (SW-C)	S11 26-Aug-2014 [24] S11	S11 13-Nov-2014 S-11	S11 27-May-2015 S-11	S11 25-Aug-2015 S-11	S11 25-Nov-2015 S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	160000	190000	180000	120000	150000	140000	120000	136000	186000
Ammonia, unionized	ug/l	20	0.2	0.22	<0.04	<0.35	0.51	<0.06	1.88	0.12	0.2
Ammonia Nitrogen	ug/l	--	98	130	<50	<50	96	<50	120	30	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	2000	5000	3000	3000	<2000	<6000 [25]	<6000 [25]	<10000 [25]
Chemical Oxygen Demand	ug/l	--	50000	140000	73000	79000	81000	50000	79000	64000	107000
Chloride	ug/l	--	66000	56000	82000	59000	57000	60000	78000	100000	134000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	590	563	770	439	508	478	498	750	62
Dissolved Inorganic Carbon	ug/l	--	35000	50000	46000	28000	40000	34000	30700	29900	42800
Dissolved Organic Carbon	ug/l	--	20000	23000	15000	22000	21000	19000	27300	22300	20400
Dissolved Oxygen (Field)	ug/l	-- [7]	**3680**	**1260**	**4510**	**2430**	**300**	**3130**	**560**	**1560**	**3080**
Hardness, Calcium Carbonate	ug/l	--	190000	170000	220000	120000	130000	130000	22900	176000	270000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<500	<500	<100	<100	<100	<100
Nitrite as N	ug/l	--	<10	<10	<10	<50	<50	11	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1100	2700	1500	2200	2000	880	2100	1000	1300
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	<100	<100	<500	<500	<100	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.94	6.77	6.90	7.44	7.13	7.00	7.61	7.12	7.49
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**58**	**900**	**270**	**310**	**300**	**55**	**240**	**100**	**160**
Sulphate	ug/l	--	58000	23000	110000	23000	16000	20000	17000	117000	75000
Temperature (Field)	deg c	-- [10]	13.1	15.6	1.1	14.0	19.9	3.7	19.8	17.0	0
Total Dissolved Solids	ug/l	--	390000	368000	544000	320000	330000	282000	178000	461000	510000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<1000	120000	40000	90000	38000	3000	4000	8000	31000
Metals											
Arsenic	ug/l	100 [11]	<1.0	2.0	<1.0	1.4	1.7	<1.0	<1	<1	<1
Boron	ug/l	200 [12]	88	**220**	120	81	97	74	23	134	85
Cadmium	ug/l	0.2 [11]	<0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Calcium	ug/l	--	49000	54000	63000	27000	35000	32000	5910	42600	79300
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	1	3
Cobalt	ug/l	0.9	<0.50	**2.4**	<0.50	0.72	0.77	<0.50	<0.5	<0.5	<0.5
Copper	ug/l	5	1.6	5.0	2.0	1.7	2.0	1.0	<0.5	<0.5	<0.5
Iron	ug/l	300	**550**	**12000**	**1200**	**2500**	**4300**	**990**	216	**772**	**1210**
Lead	ug/l	-- [14]	<0.50	1.8	0.65	1.7	1.7	<0.50	0.1	<0.1	0.7
Magnesium	ug/l	--	16000	17000	23000	9700	12000	12000	1970	16800	17500
Manganese	ug/l	--	42	3400	210	130	260	87	44	157	90
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5900	9200	10000	4600	6700	5200	859	5860	7960
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	65000	57000	88000	54000	55000	55000	12900	76600	121000
Zinc	ug/l	30 [11]	<5.0	20	5.8	<5.0	7.3	6.6	<5	6	9
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	**1.8**	<1.0	<1.0	**7.3**	<1	**2**	<1

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Parameter	Unit	PWQO [1]	S11 24-May-2016 S-11	S11 18-Aug-2016 S-11	S11 16-Nov-2016 S-11	S11 18-May-2017 S-11	S11 28-Aug-2017 S-11	S11 28-Nov-2017 S-11	S11 23-May-2018 S-11	S11 30-Aug-2018 S-11	S11 28-Nov-2018 S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	136000	32000	136000	150000	159000	110000	121000	249000	65000
Ammonia, unionized	ug/l	20	0.76	0.02	0.27	0.56	0.35	0.07	0.2	0.52	0.04
Ammonia Nitrogen	ug/l	--	100	50	70	40	160	100	30	140	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	10000	3000	3000	2000	34000	4000	3000	<40000 [26]	7000
Chemical Oxygen Demand	ug/l	--	122000	45000	38000	69000	128000	49000	76000	355000	83000
Chloride	ug/l	--	99000	95000	125000	97000	62000	51000	81000	112000	62000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	579	1354	974	648	414	228	530	771	462
Dissolved Inorganic Carbon	ug/l	--	31300	6600	27900	8400	28400	8400	32100	41000	7100
Dissolved Organic Carbon	ug/l	--	20600	15400	11000	34700	48700	32300	21200	37600	26200
Dissolved Oxygen (Field)	ug/l	-- [7]	**3520**	**1650**	**2950**	**930**	**640**	**3090**	**1800**	**1630**	**4570**
Hardness, Calcium Carbonate	ug/l	--	137000	510000	229000	167000	180000	89000	88000	212000	116000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2500	1100	600	900	3200	2500	1600	12600	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.47	**6.05**	7.47	7.55	7.00	6.94	7.42	7.08	6.93
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**490**	**170**	**80**	**80**	**330**	**480**	**140**	**1570**	**160**
Sulphate	ug/l	--	31000	630000	147000	51000	15000	37000	24000	38000	84000
Temperature (Field)	deg c	-- [10]	14.3	19.3	5.6	20.1	12.0	0.3	13.9	16.6	0.2
Total Dissolved Solids	ug/l	--	382000	1090000	540000	394000	348000	268000	298000	500000	308000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	159000	23000	5000	11000	208000	466000	22000	138000	41000
Metals											
Arsenic	ug/l	100 [11]	2	2	<1	<5 [17]	1	<1	<1	3	<1
Boron	ug/l	200 [12]	**207**	**542**	109	**201**	**230**	92	109	**435**	115
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	**0.6**	<0.1
Calcium	ug/l	--	36100	139000	60100	43400	52400	22200	21400	59900	27000
Chromium	ug/l	-- [13]	**10**	2	<1	<5 [17]	5	6	1	8	2
Cobalt	ug/l	0.9	**1.5**	**1.5**	<0.5	<2.5 [17]	**1.7**	**1.1**	<0.5	**2.9**	0.9
Copper	ug/l	5	3.2	1.3	<0.5	<2.5 [17]	**7.7**	2.8	<0.5	4.7	2.3
Iron	ug/l	300	**5170**	**821**	**778**	**1310**	**3450**	**2650**	**1040**	**5120**	**1360**
Lead	ug/l	-- [14]	4.4	2.0	0.3	0.5	1.4	1.8	0.2	2.8	0.7
Magnesium	ug/l	--	11500	39800	19200	14200	12000	8250	8300	15100	11900
Manganese	ug/l	--	342	1000	121	194	525	304	250	2850	213
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5020	9180	6630	5510	4650	3290	2500	13500	5200
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	85600	106000	92400	78500	67500	50400	60300	70700	57200
Zinc	ug/l	30 [11]	**33**	**33**	<5	<25 [17]	18	13	7	17	13
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**13**	**8**	**5**	<1	<1	<1	<1	**6**	<1

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Parameter	Unit	PWQO [1]	S11 20-Jun-2019 S-11	S11 28-Aug-2019 [20] S-11	S11 21-Nov-2019 S-11	S11 14-May-2020 S-11	S11 26-Aug-2020 [20] S-11	S11 25-Nov-2020 S-11	S11 27-May-2021 S-11	S11 24-Aug-2021 S-11	S11 24-Nov-2021 S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	117000	--	66000	96000	--	80000	204000	240000	207000
Ammonia, unionized	ug/l	20	0.13	--	0.05	0.08	--	0.06	0.39	2.54	0.04
Ammonia Nitrogen	ug/l	--	50	--	180	20	--	40	90	1590	70
Biochemical Oxygen Demand, 5 Day	ug/l	--	12000	--	<60000 [26]	<2000	--	2000	11000	<40000 [26]	<40000 [26]
Chemical Oxygen Demand	ug/l	--	78000	--	137000	64000	--	76000	103000	317000	231000
Chloride	ug/l	--	75000	--	121000	92000	--	113000	104000	91000	101000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	502	--	1317	594	--	15	731	760	961
Dissolved Inorganic Carbon	ug/l	--	24700	--	<500	19400	--	20000	50000	48100	49400
Dissolved Organic Carbon	ug/l	--	19600	--	22500	26600	--	20700	29900	32200	23100
Dissolved Oxygen (Field)	ug/l	-- [7]	**1310**	--	**2040**	**4800**	--	**4260**	**1220**	**570**	**1970**
Hardness, Calcium Carbonate	ug/l	--	111000	--	404000	127000	--	194000	204000	226000	262000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	--	<50	<50	--	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1800	--	6500	900	--	1500	1500	20500	1300
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.87	--	**6.49**	7.31	--	7.25	7.28	6.59	6.85
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**130**	--	**1270**	**40**	--	**210**	**170**	**5270**	**80**
Sulphate	ug/l	--	19000	--	371000	84000	--	162000	16000	5000	127000
Temperature (Field)	deg c	-- [10]	18.1	--	0.2	10.0	--	-0.1	12.7	20.5	0.7
Total Dissolved Solids	ug/l	--	282000	--	720000	306000	--	514000	436000	448000	546000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	38000	--	394000	4000	--	16000	4000	17000	48000
Metals											
Arsenic	ug/l	100 [11]	<1	--	2	<1	--	<1	1	4	<1
Boron	ug/l	200 [12]	111	--	**238**	97	--	137	117	143	94
Cadmium	ug/l	0.2 [11]	<0.1	--	0.1	<0.1	--	<0.1	<0.1	**0.5**	0.1
Calcium	ug/l	--	28400	--	108000	31600	--	50200	53600	59100	71600
Chromium	ug/l	-- [13]	1	--	**13**	5	--	1	2	**43**	8
Cobalt	ug/l	0.9	<0.5	--	**7.7**	<0.5	--	**1.4**	**1.1**	**7.6**	**1.4**
Copper	ug/l	5	0.8	--	**6.4**	1.2	--	1.2	0.7	**19.3**	4.0
Iron	ug/l	300	**706**	--	**11800**	**621**	--	**1660**	**1180**	**18300**	**2810**
Lead	ug/l	-- [14]	0.1	--	4.5	0.3	--	0.6	0.3	**15.9**	3.0
Magnesium	ug/l	--	9840	--	32600	11700	--	16600	16900	19100	20300
Manganese	ug/l	--	195	--	2650	68	--	594	1130	1110	206
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	2650	--	10900	3100	--	6860	8230	10300	7540
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	61700	--	89900	64200	--	75700	79200	70900	82100
Zinc	ug/l	30 [11]	6	--	**37**	<5	--	6	6	**69**	14
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	**5**	<1	--	**9**	**3**	<1	**7**

Parameter	Unit	PWQO [1]	S12 28-Jun-1995	S12 14-Nov-1995	S12 13-Jun-1996	S12 12-Oct-1996	S12 17-Jun-1997	S12 05-Nov-1997	S12 05-Jun-1998	S12 30-Jun-1998	S12 26-Aug-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	735000	186000	67000	288000	231000	232000	576000	436000	102000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	840	810	40	570	10	100	30	70	470
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	4000	3000	7000	23000	2000	5000	7000	6000
Chemical Oxygen Demand	ug/l	--	167000	70000	65000	75000	90000	41000	122000	170000	10000
Chloride	ug/l	--	157000	60000	37000	113000	127000	181000	317000	242000	28900
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1276	890	530	920	793	1350	1920	1530	341
Dissolved Inorganic Carbon	ug/l	--	166000	6600	15700	66800	43600	46300	118000	61400	23800
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	5750	--	9750	9580	10590	7850	17570	9570	6520
Hardness, Calcium Carbonate	ug/l	--	449000	203000	133000	328000	235000	326000	507000	295000	150000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	400	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	3000	10000	1910	2650	6160	1420	4140	2280	1220
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	2160	9190	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.07	7.63	7.09	7.34	7.74	7.52	--	7.9	7.88
Phosphorus	ug/l	-- [9]	**300**	**140**	**320**	**180**	**970**	**130**	**150**	**250**	**450**
Sulphate	ug/l	--	45000	51000	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	736000	450000	270000	460000	398000	680000	950000	770000	171000
Total Organic Carbon	ug/l	--	50300	64200	20100	28000	30200	17100	42900	38600	8000
Total Suspended Solids	ug/l	--	38000	79000	7000	26000	116000	48000	22000	21000	103000
Metals											
Arsenic	ug/l	100 [11]	100	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**2600**	**710**	**678**	**1600**	**1870**	**1180**	**4480**	**3900**	**390**
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--	--	--
Calcium	ug/l	--	78200	53000	32900	81100	53400	82100	93800	44800	44900
Chromium	ug/l	-- [13]	**24**	**10**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.6	2.4	**4300**	2.6	0.5	**10.4**	4.6	1.8	**5.8**
Iron	ug/l	300	**1300**	**1550**	**1240**	**1510**	**6090**	**910**	**390**	**550**	**3680**
Lead	ug/l	-- [14]	1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.6
Magnesium	ug/l	--	35100	17000	12300	29900	24200	28900	66100	43800	8960
Manganese	ug/l	--	425	150	114	110	480	160	20	640	70
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**34**	20	20	20	**30**	20	20
Potassium	ug/l	--	26800	17600	10100	16800	11800	12900	21100	23900	5300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	103000	66000	51900	92700	107000	131000	268000	238000	33000
Zinc	ug/l	30 [11]	10	20	10	10	20	**80**	20	10	**330**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**14**	1	1	1	1

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Parameter	Unit	PWQO [1]	S12 30-Oct-1998	S12 19-Oct-1999	S12 03-May-2000	S12 25-Oct-2000	S12 13-Jun-2001	S12 27-Sep-2001	S12 21-Nov-2001	S12 22-May-2002	S12 12-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	62000	24000	98000	145000	137000	38000	112000	131000	52000
Ammonia, unionized	ug/l	20	10	--	10	--	<20	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	40	130	60	--	20	50	10	20	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	5000	3000	--	8000	1000	1000	1000	3000
Chemical Oxygen Demand	ug/l	--	202000	120000	84000	--	66000	46000	38000	45000	71000
Chloride	ug/l	--	45800	55000	45500	82000	61600	119000	89200	34200	78200
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	342	410	319	487	500	960	500	250	--
Dissolved Inorganic Carbon	ug/l	--	43200	20500	16600	--	21500	5200	16000	16000	11000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	5080	7710	5830	1720	4500	3570	7540	7330	--
Hardness, Calcium Carbonate	ug/l	--	84000	89000	53000	192000	141000	373000	176000	109000	281000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	100	100	100	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	3690	2210	620	20800	1300	1060	770	760	1700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.5	7.2	6.9	7.15	7.3	6.9	6.56	7.03	--
Phosphorus	ug/l	-- [9]	**2850**	**770**	**50**	--	**370**	**160**	**100**	**50**	**330**
Sulphate	ug/l	--	--	--	--	20000	33000	355000	105000	19000	225000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	172000	200000	160000	318000	314000	830000	391000	212000	528000
Total Organic Carbon	ug/l	--	41600	31100	23600	--	25500	17000	19000	13000	22000
Total Suspended Solids	ug/l	--	19000	13000	34000	1580000	67000	5000	58000	4000	62000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	7	1	1	1	1	1
Boron	ug/l	200 [12]	120	**260**	40	**920**	**300**	**790**	**280**	110	**450**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	18600	22500	11900	49000	36400	101000	46400	30900	77400
Chromium	ug/l	-- [13]	--	--	--	**50**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	2.3	0.5	**5.5**	**39**	1	3.5	2.1	<1	4.3
Iron	ug/l	300	**6860**	**1990**	**440**	**97300**	**1520**	**740**	**2470**	**380**	**1890**
Lead	ug/l	-- [14]	0.2	0.8	0.2	**19**	0.9	0.2	0.2	<1	1.7
Magnesium	ug/l	--	8990	7960	5590	16900	12200	29300	14600	7650	21200
Manganese	ug/l	--	430	810	20	2790	150	230	90	10	120
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	**30**	20	20	20	20	20	20	20	20
Potassium	ug/l	--	12000	14100	4000	5600	1900	13400	5300	4800	8500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	41000	45800	48000	48400	59000	95800	65200	29700	59900
Zinc	ug/l	30 [11]	**50**	30	10	**250**	10	10	10	10	**40**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**7**	1	**17**	**13**	**37**	1	1	1	1

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Parameter	Unit	PWQO [1]	S12 31-May-2003	S12 03-Jul-2003	S12 22-Oct-2003	S12 17-May-2004	S12 21-Aug-2004	S12 18-Nov-2004	S12 25-May-2005	S12 09-Sep-2005 [20]	S12 09-Nov-2005
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	134000	--	116000
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	<5000	--	<5000
Alkalinity (Total as CaCO3)	ug/l	-- [5]	122000	176000	78000	137000	153000	111000	110000	--	95000
Ammonia, unionized	ug/l	20	--	--	--	<10	<10	<10	<10	--	<10
Ammonia Nitrogen	ug/l	--	160	20	20	10	40	10	<10	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	3000	2000	13000	16000	8000	--	10000
Chemical Oxygen Demand	ug/l	--	52000	87000	56000	66000	253000	517000	74000	--	245000
Chloride	ug/l	--	53600	29100	70200	44500	41600	56600	51300	--	63700
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	540	450	520	350	360	330	440	--	100
Dissolved Inorganic Carbon	ug/l	--	26000	43000	18000	33800	48000	23300	34100	--	26500
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	17500	--	37400
Dissolved Oxygen (Field)	ug/l	-- [7]	6200	2660	5800	9400	3400	--	6500	--	11200
Hardness, Calcium Carbonate	ug/l	--	169000	138000	--	118000	121000	102000	131000	--	101000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	**80**	--	<300
Nitrate as N	ug/l	--	100	100	200	100	100	200	200	--	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1020	1660	820	1150	5420	9630	1530	--	3520
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.4	6.79	6.8	7.4	7.5	7.1	7.3	--	7
Phosphorus	ug/l	-- [9]	**70**	**210**	**110**	**90**	**4700**	**4720**	**250**	--	**1280**
Sulphate	ug/l	--	88000	15000	58000	12000	3000	17000	24000	--	51000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	10	--	0
Total Dissolved Solids	ug/l	--	338000	340000	275000	175000	180000	165000	234000	--	270000
Total Organic Carbon	ug/l	--	21000	38000	22000	18200	22000	16800	--	--	--
Total Suspended Solids	ug/l	--	5000	12000	84000	10000	346000	1660000	121000	--	400000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	10	10	<1	--	1
Boron	ug/l	200 [12]	130	**319**	195	121	**241**	**240**	106	--	158
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	<0.1	--	<0.5
Calcium	ug/l	--	46600	36600	33700	32100	31900	26100	35300	--	25800
Chromium	ug/l	-- [13]	**10**	4	8	2	**9**	**100**	4	--	**9**
Cobalt	ug/l	0.9	--	--	--	--	--	--	**2**	--	**5**
Copper	ug/l	5	2	2	**15**	**15**	**86**	**111**	<2	--	**18**
Iron	ug/l	300	**540**	**2270**	**617**	**1110**	**2700**	**2480**	**3660**	--	**1390**
Lead	ug/l	-- [14]	0.5	1.2	1.3	0.2	**9.6**	**6.7**	0.7	--	5
Magnesium	ug/l	--	12800	11400	10700	9210	10100	8850	10500	--	8790
Manganese	ug/l	--	50	394	41	137	9	15800	151	--	894
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	<0.05	--	<0.06
Molybdenum	ug/l	40	--	--	--	--	--	--	<0.5	--	<5
Nickel	ug/l	25	20	10	10	20	**50**	**50**	<10	--	<10
Potassium	ug/l	--	5700	1600	13200	5600	3800	6600	4500	--	5400
Selenium	ug/l	100	--	--	--	--	--	--	<1	--	<1
Sodium	ug/l	--	49600	49600	54000	50200	51000	40700	42000	--	62000
Zinc	ug/l	30 [11]	10	5	11	26	**190**	**278**	16	--	**128**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	**3**	<1	--	<1

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Parameter	Unit	PWQO [1]	S12 24-May-2006	S12 15-Aug-2006	S12 16-Nov-2006	S12 08-May-2007	S12 22-Aug-2007 [20]	S12 20-Nov-2007	S12 23-May-2008	S12 12-Aug-2008	S12 06-Nov-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	114000	172000	65000	89000	--	89000	97000	110000	84000
Ammonia, unionized	ug/l	20	<10	<10	<10	0.0901869	--	<10	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	20	30	<10	--	20	<10	<10	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	17000	<3000	<3000	--	5000	<3000	4000	<3000
Chemical Oxygen Demand	ug/l	--	72000	367000	42000	49000	--	234000	44000	108000	67000
Chloride	ug/l	--	34300	35300	18000	34900	--	48900	38600	27900	47500
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	407	670	170	300	--	290	335	315	385
Dissolved Inorganic Carbon	ug/l	--	27100	43000	17600	22300	--	24000	24300	33300	22500
Dissolved Organic Carbon	ug/l	--	18100	29400	14600	14200	--	32900	17900	32900	21700
Dissolved Oxygen (Field)	ug/l	-- [7]	9400	**1600**	7360	**5330**	--	**7620**	6990	**110**	**2490**
Hardness, Calcium Carbonate	ug/l	--	103000	116000	35000	103000	--	91000	94000	73000	103000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	--	1000	<100	100	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2040	7190	980	640	--	5400	800	1870	1740
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.9	6.7	6.9	7.6	--	7.8	7.3	7.1	6.8
Phosphorus	ug/l	-- [9]	**470**	**8350**	**170**	**50**	--	**1160**	**70**	**1750**	**380**
Sulphate	ug/l	--	41000	2000	19000	18000	--	28000	16000	1000	28000
Temperature (Field)	deg c	-- [10]	5	15.5	7	12.6	--	0	10.9	17	7
Total Dissolved Solids	ug/l	--	218000	229000	122000	185000	--	216000	183000	170000	207000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	390000	645000	81000	4000	--	196000	<3000	55000	23000
Metals											
Arsenic	ug/l	100 [11]	<1	6.9	1	0.6	--	3.4	1.3	2.7	1.2
Boron	ug/l	200 [12]	72	139	47	48	--	77	42	89	157
Cadmium	ug/l	0.2 [11]	0.2	<0.1	**<0.5**	<0.1	--	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	18200	27500	8550	28500	--	17600	26400	16800	25800
Chromium	ug/l	-- [13]	**22**	**10**	6	<2	--	**18**	<2	<2	2
Cobalt	ug/l	0.9	**6.7**	**5.5**	<0.5	<0.5	--	**5.2**	<0.5	**1.8**	**2**
Copper	ug/l	5	**225**	**35**	**38**	**19**	--	**17**	<2	**6**	<2
Iron	ug/l	300	228	**2620**	**860**	**800**	--	**812**	**497**	**2690**	**2500**
Lead	ug/l	-- [14]	**10.5**	2.8	0.6	0.3	--	**5.9**	<0.1	0.7	<0.1
Magnesium	ug/l	--	13900	11600	3320	7700	--	11400	6720	7530	9280
Manganese	ug/l	--	3550	4150	45	26	--	803	13	1200	871
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7000	4000	3600	3600	--	7800	3700	2800	2400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	38400	42100	28900	37500	--	42900	33400	42700	40300
Zinc	ug/l	30 [11]	**146**	**50**	20	16	--	**65**	<5	**32**	6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	--	<1	<1	<1	**3**

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Parameter	Unit	PWQO [1]	S12 13-May-2009 S-9	S12 25-Aug-2009 [27] A-5	S12 27-Nov-2009 S-12	S12 18-May-2010 S-4	S12 18-Aug-2010 [31] S-6	S12 14-Oct-2010 S-5	S12 19-May-2011 [32] W-9	S12 16-Aug-2011 [20] S-12	S12 30-Nov-2011 [22] S12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	108000	146000	81000	117000	107000	94000	105000	--	81000
Ammonia, unionized	ug/l	20	<0.68	0.24	0.01	0.11	0.07	0.07	<0.11	--	<0.07
Ammonia Nitrogen	ug/l	--	<20	150	20	30	30	30	<20	--	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	12000	2000	3000	4000	6000	2000	--	2000
Chemical Oxygen Demand	ug/l	--	50000	133000	118000	58000	88000	450000	50000	--	63000
Chloride	ug/l	--	41000	28000	37000	28000	28000	24000	21000	--	33000
Conductivity	uS/cm	--	373	373	324	316	336	274	269	--	330
Conductivity (Field)	uS/cm	--	340	405	246	355	318	530	285	--	325
Dissolved Inorganic Carbon	ug/l	--	27300	43300	20900	26600	24000	19600	26300	--	14500
Dissolved Organic Carbon	ug/l	--	19800	35900	17900	21400	38000	21100	21900	--	17400
Dissolved Oxygen (Field)	ug/l	-- [7]	**4870**	**330**	**4660**	**4330**	**2680**	8740	**2990**	--	**6790**
Hardness, Calcium Carbonate	ug/l	--	100000	105000	72000	91000	96000	80000	86000	--	86000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	--	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	870	2740	1700	2710	2700	5620	1180	--	710
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.1	6.64	6.76	7.27	6.92	7.13	7.33	--	7.40
Phosphorus	ug/l	-- [9]	**160**	**1720**	**690**	**840**	**600**	**4210**	**60**	--	**40**
Sulphate	ug/l	--	12000	1000	16000	1000	16000	4000	2000	--	26000
Temperature (Field)	deg c	-- [10]	15.3	18.9	4.7	11.1	16.1	8.5	14.8	--	6.0
Total Dissolved Solids	ug/l	--	242000	242000	211000	205000	218000	178000	175000	--	214000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	50000	69000	111000	62000	54000	408000	<2000	--	72000
Metals											
Arsenic	ug/l	100 [11]	1	<50	<50	<1	<50	<50	<1	--	<50
Boron	ug/l	200 [12]	50	100	<100	70	200	100	50	--	<100
Cadmium	ug/l	0.2 [11]	<0.1	**<10**	**<10**	<0.1	**<10**	**<10**	<0.1	--	**<10**
Calcium	ug/l	--	27000	29000	19000	25000	27000	22000	23000	--	23000
Chromium	ug/l	-- [13]	2	**<50**	**20**	2	**<50**	**<50**	2	--	**<50**
Cobalt	ug/l	0.9	0.7	<10	<5	0.6	<10	<10	<0.2	--	<10
Copper	ug/l	5	3	**<10**	**20**	1	**<10**	**<10**	<1	--	**<10**
Iron	ug/l	300	**1260**	**22000**	**9300**	**3380**	**15200**	**30900**	**530**	--	**2600**
Lead	ug/l	-- [14]	4	**<10**	**<10**	<1	**<10**	**<10**	<1	--	**<10**
Magnesium	ug/l	--	8000	8000	6000	7000	7000	6000	7000	--	7000
Manganese	ug/l	--	80	890	220	240	400	1090	30	--	80
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5000	6000	5000	5000	4000	4000	4000	--	4000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	38000	31000	29000	29000	31000	21000	23000	--	29000
Zinc	ug/l	30 [11]	**40**	<50	**60**	<10	**800**	<50	<10	--	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	1	<5	--	<1

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Parameter	Unit	PWQO [1]	S12 30-May-2012 S12	S12 22-Aug-2012 [20] S-12	S12 29-Nov-2012 [20] S12	S12 28-May-2013 S12	S12 15-Aug-2013 [20] S12	S12 21-Nov-2013 SA-9	S12 28-May-2014 [23] S12 (SW-E)	S12 26-Aug-2014 [24] S12	S12 13-Nov-2014 [24] S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	140000	--	--	90000	--	73000	120000	140000	61000
Ammonia, unionized	ug/l	20	<0.16	--	--	0.43	--	<0.12	0.28	0.53	<0.13
Ammonia Nitrogen	ug/l	--	<50	--	--	100	--	<50	62	150	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	10000	--	--	<2000	--	2000	2000	6000	<2000
Chemical Oxygen Demand	ug/l	--	270000	--	--	74000	--	210000	130000	200000	91000
Chloride	ug/l	--	22000	--	--	29000	--	31000	46000	32000	27000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	328	--	--	274	--	295	393	396	240
Dissolved Inorganic Carbon	ug/l	--	30000	--	--	20000	--	21000	29000	39000	14000
Dissolved Organic Carbon	ug/l	--	42000	--	--	22000	--	31000	20000	29000	30000
Dissolved Oxygen (Field)	ug/l	-- [7]	**3910**	--	--	**3510**	--	**5240**	**4180**	**1080**	9290
Hardness, Calcium Carbonate	ug/l	--	120000	--	--	87000	--	80000	110000	120000	63000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	--	<100	--	<100	<500	<500	<500
Nitrite as N	ug/l	--	<10	--	--	<10	--	<10	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	5000	--	--	2000	--	5200	13000	3800	920
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	--	<100	--	<100	<500	<500	<500
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.92	--	--	7.27	--	7.45	7.29	7.02	7.39
Phosphorus	ug/l	-- [9]	**1500**	--	--	**360**	--	**480**	**780**	**2400**	**520**
Sulphate	ug/l	--	<1000	--	--	<1000	--	13000	<1000	<1000	<1000
Temperature (Field)	deg c	-- [10]	19.3	--	--	12.9	--	0.3	13.0	18.0	2.9
Total Dissolved Solids	ug/l	--	272000	--	--	166000	--	244000	284000	262000	148000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	120000	--	--	44000	--	150000	23000	250000	33000
Metals											
Arsenic	ug/l	100 [11]	3.7	--	--	1.3	--	1.4	1.2	3.0	<1.0
Boron	ug/l	200 [12]	96	--	--	62	--	56	52	65	46
Cadmium	ug/l	0.2 [11]	<0.10	--	--	<0.10	--	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	36000	--	--	23000	--	25000	32000	35000	18000
Chromium	ug/l	-- [13]	5.6	--	--	<5.0	--	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	**5.3**	--	--	**1.3**	--	**1.7**	**1.3**	**5.1**	0.77
Copper	ug/l	5	4.1	--	--	1.4	--	2.9	1.5	1.9	1.1
Iron	ug/l	300	**22000**	--	--	**4500**	--	**6000**	**3800**	**19000**	**4300**
Lead	ug/l	-- [14]	1.7	--	--	<0.50	--	1.4	0.56	0.97	<0.50
Magnesium	ug/l	--	9300	--	--	7100	--	8400	9400	10000	6100
Manganese	ug/l	--	2200	--	--	500	--	320	460	2600	260
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	3500	--	--	4100	--	4600	5000	1700	2900
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	29000	--	--	30000	--	29000	43000	36000	23000
Zinc	ug/l	30 [11]	15	--	--	7.4	--	12	11	13	5.6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**1.6**	--	--	<1.0	--	**2.2**	<1.0	<1.0	**9.5**

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Parameter	Unit	PWQO [1]	S12 27-May-2015 S-12	S12 25-Aug-2015 S-12	S12 25-Nov-2015 S-12	S12 24-May-2016 S-12	S12 18-Aug-2016 S-12	S12 16-Nov-2016 S-12	S12 18-May-2017 S-12	S12 28-Aug-2017 S-12	S12 28-Nov-2017 S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	104000	116000	103000	123000	65000	158000	139000	115000	139000
Ammonia, unionized	ug/l	20	1.69	0.85	0.04	0.59	0.24	0.39	0.61	0.04	0.08
Ammonia Nitrogen	ug/l	--	110	20	30	90	90	80	40	20	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<20000 [25]	<75000 [25]	2000	13000	18000	4000	20000	<200000 [26]	3000
Chemical Oxygen Demand	ug/l	--	143000	321000	83000	192000	120000	59000	76000	1120000	53000
Chloride	ug/l	--	54000	52000	58000	66000	74000	100000	48000	35000	57000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	362	399	191	439	686	811	434	264	62
Dissolved Inorganic Carbon	ug/l	--	18500	4500	27100	9600	12800	31300	2300	<500	12000
Dissolved Organic Carbon	ug/l	--	37500	59500	27800	46500	30400	16200	40300	94900	35700
Dissolved Oxygen (Field)	ug/l	-- [7]	**2680**	**1060**	**4250**	**710**	**3500**	**3610**	**810**	**1710**	**2330**
Hardness, Calcium Carbonate	ug/l	--	17600	116000	289000	144000	161000	214000	138000	163000	139000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2800	6200	1100	4400	3000	800	900	7100	2100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.65	8.18	7.26	7.50	6.86	7.57	7.67	6.90	7.23
Phosphorus	ug/l	-- [9]	**960**	**3130**	**90**	**2000**	**1110**	**130**	**130**	**7620**	**750**
Sulphate	ug/l	--	4000	<1000	19000	5000	168000	72000	20000	2000	38000
Temperature (Field)	deg c	-- [10]	18.3	15.9	0	11.5	19	5.6	17.5	13.1	0
Total Dissolved Solids	ug/l	--	222000	275000	266000	306000	482000	458000	268000	212000	306000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	114000	220000	39000	272000	49000	15000	62000	2020000	508000
Metals											
Arsenic	ug/l	100 [11]	<1	6	<1	3	3	<1	<5 [17]	3	2
Boron	ug/l	200 [12]	16	95	54	63	**354**	117	154	83	69
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1
Calcium	ug/l	--	4760	30400	18500	41900	42700	58300	38800	49400	37800
Chromium	ug/l	-- [13]	<1	8	2	5	4	2	<5 [17]	3	4
Cobalt	ug/l	0.9	0.7	**4.4**	<0.5	**2.5**	**1.3**	<0.5	<2.5 [17]	**4.3**	**1.9**
Copper	ug/l	5	<0.5	<0.5	<0.5	3.2	3.4	0.7	3.2	1.8	1.9
Iron	ug/l	300	**1610**	**59200**	**845**	**47000**	**7760**	**1050**	**2810**	**52400**	**12000**
Lead	ug/l	-- [14]	0.5	4.3	0.2	2.7	1.2	1.0	0.6	1.2	1.1
Magnesium	ug/l	--	1400	9720	8850	9620	13100	16600	10000	9560	10900
Manganese	ug/l	--	278	1330	39	824	404	111	371	1860	706
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	643	2070	4380	4480	8380	6040	4600	1240	4400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	8050	41300	49400	49400	64300	86400	42800	39000	43000
Zinc	ug/l	30 [11]	5	28	6	24	**34**	27	<25 [17]	19	9
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**6**	<1	**23**	**9**	**9**	<1	<10 [33]	<1

Parameter	Unit	PWQO [1]	S12 23-May-2018 S-12	S12 30-Aug-2018 [20] S-12	S12 28-Nov-2018 S-12	S12 20-Jun-2019 S-12	S12 28-Aug-2019 S-12	S12 21-Nov-2019 S-12	S12 14-May-2020 S-12	S12 26-Aug-2020 S-12	S12 25-Nov-2020 S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	118000	--	51000	164000	10000	85000	72000	83000	118000
Ammonia, unionized	ug/l	20	0.15	--	0.27	0.34	0.02	0.01	0.07	0.24	1.97
Ammonia Nitrogen	ug/l	--	30	--	100	130	30	30	30	200	160
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	4000	203000	6000	<20000 [26]	4000	16000	<400000 [26]
Chemical Oxygen Demand	ug/l	--	52000	--	107000	807000	73000	101000	82000	697000	1400000
Chloride	ug/l	--	67000	--	40000	54000	3000	92000	54000	109000	69000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	446	--	161	482	84	767	326	723	8
Dissolved Inorganic Carbon	ug/l	--	28700	--	5500	34400	<500	<500	17300	<500	27200
Dissolved Organic Carbon	ug/l	--	17400	--	15700	24800	9300	15400	21300	20200	19500
Dissolved Oxygen (Field)	ug/l	-- [7]	**4900**	--	**6430**	**4610**	5570	9800	**5330**	**2030**	**1420**
Hardness, Calcium Carbonate	ug/l	--	92000	--	75000	124000	30600	215000	76000	230000	298000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1200	--	2200	10900	1100	1500	1100	14300	61700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.37	--	7.51	6.96	**6.22**	6.63	7.00	6.64	8.18
Phosphorus	ug/l	-- [9]	**140**	--	**530**	**8390**	**300**	**370**	**190**	**3360**	**19100**
Sulphate	ug/l	--	9000	--	13000	2000	17000	127000	19000	130000	44000
Temperature (Field)	deg c	-- [10]	11.8	--	0	15.7	18.7	0.1	13.0	15.1	0
Total Dissolved Solids	ug/l	--	258000	--	144000	328000	50000	384000	154000	436000	330000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	18000	--	198000	1110000	113000	189000	59000	986000	7970000
Metals											
Arsenic	ug/l	100 [11]	<1	--	1	9	<1	1	<1	5	5
Boron	ug/l	200 [12]	86	--	46	109	63	127	48	145	115
Cadmium	ug/l	0.2 [11]	<0.1	--	**0.2**	0.2	<0.1	<0.1	<0.1	**0.3**	**0.6**
Calcium	ug/l	--	25900	--	21300	34200	8860	56600	20300	58700	89800
Chromium	ug/l	-- [13]	<1	--	**20**	6	**12**	3	6	**64**	**18**
Cobalt	ug/l	0.9	<0.5	--	**2.1**	**9.3**	**1.2**	0.8	0.7	**10.5**	**39.8**
Copper	ug/l	5	<0.5	--	**6.4**	**17.8**	4.4	2.4	2.7	**25.9**	**31.9**
Iron	ug/l	300	**604**	--	**6530**	**132000**	**3630**	**5020**	**2840**	**26400**	**83300**
Lead	ug/l	-- [14]	<0.1	--	**6.6**	**5.6**	**4.0**	0.8	**3.1**	**15.5**	**14.3**
Magnesium	ug/l	--	6750	--	5160	9310	2070	17900	6170	20400	17800
Manganese	ug/l	--	30	--	165	3240	55	313	121	428	11200
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	3580	--	3290	2240	1620	5410	3170	16000	8500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	43400	--	30600	51500	8130	75500	34100	78500	52300
Zinc	ug/l	30 [11]	7	--	23	**40**	22	13	8	**92**	**145**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	**2**	<1	**3**	**4**	**31**	**15**	**25**

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Parameter	Unit	PWQO [1]	S12 27-May-2021 S-12	S12 24-Aug-2021 S-12	S12 24-Nov-2021 S-12
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	166000	180000	98000
Ammonia, unionized	ug/l	20	0.16	0.14	0.03
Ammonia Nitrogen	ug/l	--	60	40	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	6000	3000
Chemical Oxygen Demand	ug/l	--	149000	114000	112000
Chloride	ug/l	--	47000	56000	42000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	468	549	417
Dissolved Inorganic Carbon	ug/l	--	44400	37800	24400
Dissolved Organic Carbon	ug/l	--	29600	25400	34000
Dissolved Oxygen (Field)	ug/l	-- [7]	**4260**	**320**	**2470**
Hardness, Calcium Carbonate	ug/l	--	146000	150000	96300
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	3800	2600	1500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.06	6.87	6.82
Phosphorus	ug/l	-- [9]	**1800**	**390**	**230**
Sulphate	ug/l	--	<1000	15000	28000
Temperature (Field)	deg c	-- [10]	12.8	22.0	0.8
Total Dissolved Solids	ug/l	--	284000	346000	256000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	59000	68000	33000
Metals					
Arsenic	ug/l	100 [11]	2	1	<1
Boron	ug/l	200 [12]	63	92	42
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	40100	40900	25900
Chromium	ug/l	-- [13]	3	7	5
Cobalt	ug/l	0.9	**2.3**	0.8	0.5
Copper	ug/l	5	1.3	2.0	1.8
Iron	ug/l	300	**9170**	**3710**	**1920**
Lead	ug/l	-- [14]	0.6	2.2	1.5
Magnesium	ug/l	--	11100	11700	7720
Manganese	ug/l	--	684	371	102
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	5860	5190	4890
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	43500	46000	31200
Zinc	ug/l	30 [11]	9	9	6
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**7**	**5**	**11**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S15 13-Jun-2001	S15 27-Sep-2001	S15 21-Nov-2001	S15 22-May-2002	S15 08-Nov-2002	S15 31-May-2003	S15 03-Jul-2003	S15 22-Oct-2003	S15 17-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	241000	189000	177000	199000	225000	168000	253000	189000	214000
Ammonia, unionized	ug/l	20	<20	<20	<20	--	--	--	--	--	<10
Ammonia Nitrogen	ug/l	--	30	30	20	20	30	240	10	250	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	1000	1000	2000	1000	2000
Chemical Oxygen Demand	ug/l	--	30000	27000	26000	28000	35000	48000	27000	58000	37000
Chloride	ug/l	--	200000	282000	191000	173000	275000	146000	232000	221000	203000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1000	1340	910	860	1400	880	1240	1280	1140
Dissolved Inorganic Carbon	ug/l	--	37800	45900	24800	7000	63000	18000	63000	45000	33700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12800	9600	12190	11110	9700	9160	6630	10400	9800
Hardness, Calcium Carbonate	ug/l	--	312000	428000	263000	298000	427000	228000	362000	--	308000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	300	200	1300	600	1000	700	200	1300	300
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	810	760	610	560	1170	1090	620	1740	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.96	7.23	7.22	7.1	7.9	7.92	7.98	7.9
Phosphate	ug/l	--	90	80	30	40	160	70	30	220	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	40000	157000	80000	56000	140000	58000	68000	75000	56000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	594000	904000	600000	558000	700000	495000	810000	672000	570000
Total Organic Carbon	ug/l	--	12200	11800	15000	9000	12000	42000	18000	24000	10100
Total Suspended Solids	ug/l	--	40000	7000	13000	9000	75000	8000	3000	40000	18000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	1
Boron	ug/l	200 [12]	100	90	60	60	90	40	71	54	53
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	90500	131000	81200	91800	130000	70200	108000	92500	92300
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	**10**	2	**10**	1
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.5	3.5	2	<1	**6.4**	4	2	**15**	3
Iron	ug/l	300	**1600**	250	200	**380**	**1690**	**400**	147	**1810**	**344**
Lead	ug/l	-- [14]	1.2	0.2	0.2	<1	3.9	0.5	0.5	2.3	0.3
Magnesium	ug/l	--	21000	24400	14700	16700	24800	12900	22500	15900	18800
Manganese	ug/l	--	160	160	90	140	380	100	161	194	199
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	10	10	10
Potassium	ug/l	--	8400	19700	9500	12000	18300	11200	14400	24200	11200
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	107000	145000	96000	107000	152000	85300	138000	146000	125000
Zinc	ug/l	30 [11]	10	10	10	20	30	10	5	25	5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**50**	1	1	1	1	1	1	1	1

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Parameter	Unit	PWQO [1]	S15 21-Aug-2004	S15 18-Nov-2004	S15 25-May-2005	S15 09-Sep-2005	S15 09-Nov-2005	S15 24-May-2006	S15 15-Aug-2006	S15 16-Nov-2006	S15 08-May-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	332000	913000	366000	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	<5000	<5000	<5000	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	336000	250000	272000	748000	300000	95000	354000	121000	236000
Ammonia, unionized	ug/l	20	<10	<10	20	**340**	10	<10	<10	--	0.6242
Ammonia Nitrogen	ug/l	--	60	60	2160	8300	150	30	<10	80	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	21000	9000	<3000	<3000	<3000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	32000	32000	94000	212000	25000	44000	29000	41000	30000
Chloride	ug/l	--	207000	252000	194000	171000	341000	61000	281000	48300	181000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1160	1070	1550	1800	970	290	1550	320	800
Dissolved Inorganic Carbon	ug/l	--	28500	25400	73400	180000	61400	25400	85000	30300	56600
Dissolved Organic Carbon	ug/l	--	--	--	19800	99200	10600	21800	18600	15100	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	8700	8270	**4690**	**2700**	10100	8900	**1800**	9600	9990
Hardness, Calcium Carbonate	ug/l	--	410000	337000	363000	604000	453000	129000	410000	93000	290000
Hydrogen Sulfide	ug/l	2 [8]	--	--	<10	<300	**10**	--	--	--	--
Nitrate as N	ug/l	--	200	700	100	3400	800	300	300	500	400
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	830	730	5380	15600	760	870	580	1020	560
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.2	7.5	7.9	7	7.8	7.5	--	8.3
Phosphate	ug/l	--	20	40	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	**710**	**1130**	30	**60**	30	**180**	10
Sulphate	ug/l	--	67000	80000	45000	45000	101000	31000	80000	34000	57000
Temperature (Field)	deg c	-- [10]	--	--	19.1	18.2	0	11	17	8	17.6
Total Dissolved Solids	ug/l	--	580000	535000	665000	1050000	1020000	234000	904000	244000	614000
Total Organic Carbon	ug/l	--	10000	9800	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	13000	10000	12000	16000	3000	9000	58000	3000
Metals											
Arsenic	ug/l	100 [11]	1	1	<1	2	<1	<1	1.1	1	0.9
Boron	ug/l	200 [12]	78	48	65	109	65	27	73	32	52
Cadmium	ug/l	0.2 [11]	--	--	<0.1	0.2	<0.5	0.2	<0.1	**<0.5**	<0.1
Calcium	ug/l	--	119000	99800	110000	154000	136000	38800	120000	26800	84700
Chromium	ug/l	-- [13]	1	3	<2	3	<2	<2	<2	8	<2
Cobalt	ug/l	0.9	--	--	**24**	**4.3**	**1**	0.5	0.4	**1**	0.5
Copper	ug/l	5	3	3	<2	**13**	<2	<2	2	**40**	**20**
Iron	ug/l	300	283	**1070**	**1730**	**5190**	**525**	**790**	200	**1270**	**362**
Lead	ug/l	-- [14]	1.6	0.6	0.3	1.8	0.5	0.8	0.5	5	0.2
Magnesium	ug/l	--	27200	21200	21300	53300	27400	7770	26800	6390	19000
Manganese	ug/l	--	402	271	734	2120	517	102	246	185	336
Mercury, dissolved	ug/l	0.2 [15]	--	--	<0.05	<0.06	<0.06	--	--	--	--
Molybdenum	ug/l	40	--	--	5.1	0.9	<5	--	--	--	--
Nickel	ug/l	25	10	10	<10	<10	<10	--	--	--	--
Potassium	ug/l	--	11100	14000	28200	151000	15800	4100	11600	7000	8900
Selenium	ug/l	100	--	--	<1	<1	<1	--	--	--	--
Sodium	ug/l	--	146000	144000	125000	143000	231000	36800	183000	44900	120000
Zinc	ug/l	30 [11]	12	8	**127**	**49**	<5	8	<5	**48**	13
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**14**	<1	<1	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S15 22-Aug-2007 [20]	S15 20-Nov-2007	S15 23-May-2008	S15 12-Aug-2008	S15 06-Nov-2008	S15 13-May-2009 S-2	S15 25-Aug-2009 A-6	S15 27-Nov-2009 S-8	S15 18-May-2010 S-2
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	202000	180000	339000	252000	212000	437000	177000	378000
Ammonia, unionized	ug/l	20	--	<10	<20	<20	<20	1.43	1.2	1.43	1
Ammonia Nitrogen	ug/l	--	--	50	<10	<10	70	50	50	80	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	3000	<3000	<3000	<3000	2000	<1000	2000	<1000
Chemical Oxygen Demand	ug/l	--	--	21000	38000	42000	23000	40000	60000	38000	30000
Chloride	ug/l	--	--	201000	111000	262000	193000	139000	199000	85000	209000
Conductivity	uS/cm	--	--	--	--	--	--	930	1520	719	1430
Conductivity (Field)	uS/cm	--	--	750	625	1500	1000	800	1226	697	1515
Dissolved Inorganic Carbon	ug/l	--	--	56600	42500	82000	60900	51300	108000	42800	77900
Dissolved Organic Carbon	ug/l	--	--	12400	11300	14000	6400	14500	15600	12600	13700
Dissolved Oxygen (Field)	ug/l	-- [7]	--	10820	11190	8730	6920	11130	9150	13530	12740
Hardness, Calcium Carbonate	ug/l	--	--	281000	193000	346000	306000	257000	417000	192000	393000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	600	200	200	400	480	290	290	240
Nitrite as N	ug/l	--	--	--	--	--	--	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	--	710	800	710	740	720	580	680	680
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	7.8	8.1	8.5	8.1	7.9	7.83	8.16	7.60
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**150**	**40**	10	20	**40**	30	**130**	<10
Sulphate	ug/l	--	--	75000	33000	49000	66000	40000	58000	49000	52000
Temperature (Field)	deg c	-- [10]	--	1.5	14.2	22.6	9.7	19.1	18.8	5.1	14.1
Total Dissolved Solids	ug/l	--	--	635000	396000	819000	660000	605000	988000	467000	930000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	58000	<3000	9000	4000	2000	5000	31000	9000
Metals											
Arsenic	ug/l	100 [11]	--	1.3	1.3	0.8	<0.5	<1	<1	<1	<1
Boron	ug/l	200 [12]	--	44	29	66	61	50	80	50	80
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	--	85100	58500	96300	94300	78000	124000	57000	116000
Chromium	ug/l	-- [13]	--	8	<2	<2	<2	4	6	6	5
Cobalt	ug/l	0.9	--	**2.1**	<0.5	<0.5	0.9	0.5	0.9	0.7	**1.0**
Copper	ug/l	5	--	**6**	<2	<2	2	2	2	2	2
Iron	ug/l	300	--	**3420**	**664**	263	**381**	**690**	**420**	**1730**	**410**
Lead	ug/l	-- [14]	--	**7.8**	<0.1	<0.1	<0.1	<1	<1	<1	<1
Magnesium	ug/l	--	--	16500	11400	25500	17100	15000	26000	12000	25000
Manganese	ug/l	--	--	506	234	73	476	330	1490	510	1460
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	9500	6100	9800	8500	7000	10000	7000	9000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	120000	68900	172000	127000	96000	145000	57000	152000
Zinc	ug/l	30 [11]	--	28	<5	<5	<5	<10	<10	<10	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	<1	**2**	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S15 18-Aug-2010 S-7	S15 14-Oct-2010 S-11	S15 19-May-2011 W-13	S15 16-Aug-2011 [2] N-7	S15 30-Nov-2011 [22] S15	S15 30-May-2012 S 15	S15 22-Aug-2012 S-15	S15 29-Nov-2012 S15	S15 28-May-2013 S3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	422000	332000	189000	413000	213000	370000	520000	420000	330000
Ammonia, unionized	ug/l	20	0.11	0.57	0.82	1.5	0.75	<1.44	<0.74	1.38	0.63
Ammonia Nitrogen	ug/l	--	40	70	70	60	80	<50	<50	360	200
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<1000	2000	1000	3000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	40000	33000	55000	50000	28000	54000	55000	33000	36000
Chloride	ug/l	--	169000	186000	80000	158000	114000	190000	190000	200000	220000
Conductivity	uS/cm	--	1560	1430	700	1370	968	--	--	--	--
Conductivity (Field)	uS/cm	--	1401	1174	672	1114	890	1358	1515	1506	1294
Dissolved Inorganic Carbon	ug/l	--	93200	78200	45200	95200	37400	94000	110000	95000	74000
Dissolved Organic Carbon	ug/l	--	16100	12500	16000	18000	9400	18000	21000	13000	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	8830	14430	7180	6970	11190	10160	**4640**	11760	**530**
Hardness, Calcium Carbonate	ug/l	--	527000	417000	223000	438000	283000	440000	650000	500000	440000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	260	290	220	230	630	150	270	660	430
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	16	12	<10	15
Nitrogen, Total Kjeldahl	ug/l	--	520	630	760	1030	870	1200	900	1600	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	160	280	660	450
pH (Field)	-	6.5 - 8.5	6.93	7.62	7.68	7.85	7.86	7.82	7.62	7.67	7.07
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	20	**60**	30	**80**	**64**	19	25	**42**
Sulphate	ug/l	--	157000	124000	40000	91000	88000	89000	160000	120000	81000
Temperature (Field)	deg c	-- [10]	16.9	10.7	13.7	18.8	5.6	21.7	18.8	0	14.9
Total Dissolved Solids	ug/l	--	1010000	930000	455000	890000	629000	872000	1130000	986000	820000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	3000	7000	26000	23000	5000	21000	6000	2000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<1	<10	<50	<1.0	<1.0	<1.0	<1.0
Boron	ug/l	200 [12]	100	60	40	70	100	84	110	73	55
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	**<10**	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	160000	129000	68000	126000	82000	140000	180000	170000	130000
Chromium	ug/l	-- [13]	5	6	3	7	**<50**	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.8	0.6	0.5	0.7	<10	0.53	0.79	0.68	0.55
Copper	ug/l	5	3	2	2	2	**<10**	3.1	2.4	2.6	2.4
Iron	ug/l	300	210	**310**	**740**	**600**	**2300**	**790**	**630**	**550**	**650**
Lead	ug/l	-- [14]	<1	<1	<1	<1	**<10**	<0.50	<0.50	<0.50	<0.50
Magnesium	ug/l	--	31000	23000	13000	30000	19000	30000	48000	39000	28000
Manganese	ug/l	--	1340	710	280	710	570	800	1500	1800	850
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	12000	10000	9000	11000	11000	15000	17000	11000	12000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	143000	135000	62000	122000	81000	170000	160000	170000	160000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<50	<5.0	<5.0	<5.0	<5.0
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0

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Parameter	Unit	PWQO [1]	S15 15-Aug-2013 S15	S15 21-Nov-2013 SA-12	S15 28-May-2014 S15	S15 26-Aug-2014 S15	S15 13-Nov-2014 S-15	S15 27-May-2015 S-15	S15 25-Aug-2015 S-15	S15 25-Nov-2015 S-15	S15 24-May-2016 S-15
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	540000	360000	360000	480000	270000	353000	538000	411000	408000
Ammonia, unionized	ug/l	20	1.34	0.31	<0.31	2.43	0.28	1.06	4.22	1.55	2.74
Ammonia Nitrogen	ug/l	--	67	77	<50	100	110	120	30	290	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	<2000	<2000	<2000	18000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	54000	34000	38000	52000	32000	33000	45000	40000	38000
Chloride	ug/l	--	200000	190000	260000	220000	150000	325000	335000	280000	207000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1648	1370	1419	1674	945	1704	1888	1769	1364
Dissolved Inorganic Carbon	ug/l	--	130000	89000	78000	120000	64000	83600	115000	81900	82100
Dissolved Organic Carbon	ug/l	--	22000	12000	14000	18000	14000	16600	19700	13100	15300
Dissolved Oxygen (Field)	ug/l	-- [7]	**5150**	**3130**	11320	6830	11400	10240	**4570**	13590	10400
Hardness, Calcium Carbonate	ug/l	--	570000	480000	440000	540000	320000	416000	504000	620000	490000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	320	720	410	200	300	200	<100	200	200
Nitrite as N	ug/l	--	<10	<10	<10	<10	23	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	840	860	1000	730	700	900	1100	900
Nitrogen, Nitrate-Nitrite	ug/l	--	320	720	410	200	320	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.75	7.65	7.36	7.76	7.34	7.34	**8.69**	7.81	7.87
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	14	**33**	20	21	**32**	<10	20	30	<10
Sulphate	ug/l	--	58000	120000	74000	79000	57000	71000	77000	106000	101000
Temperature (Field)	deg c	-- [10]	18.8	1.1	15.0	21.2	4.3	20.4	17.7	0.1	22.6
Total Dissolved Solids	ug/l	--	1030000	908000	1010000	978000	636000	994000	1160000	987000	868000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<1000	31000	2000	6000	4000	<2000	3000	21000	2000
Metals											
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<1	<1	<1
Boron	ug/l	200 [12]	82	91	80	100	57	84	91	80	110
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	170000	140000	130000	150000	99000	117000	133000	191000	129000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<1	1	<1
Cobalt	ug/l	0.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5	0.5	0.6	<0.5
Copper	ug/l	5	1.4	2.2	2.1	1.4	1.6	<0.5	<0.5	<0.5	1.5
Iron	ug/l	300	<100	**650**	290	180	**860**	262	197	**527**	254
Lead	ug/l	-- [14]	<0.50	1.1	<0.50	<0.50	<0.50	<0.1	<0.1	0.1	<0.1
Magnesium	ug/l	--	45000	35000	30000	38000	23000	29800	41100	34900	40500
Manganese	ug/l	--	360	470	790	370	560	520	1370	1220	614
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	14000	12000	13000	13000	10000	11400	12900	10900	12300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	160000	150000	180000	170000	110000	169000	176000	205000	161000
Zinc	ug/l	30 [11]	<5.0	<5.0	<5.0	5.5	<5.0	<5	5	8	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	**3.8**	<1	**2**	<1	**6**

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Parameter	Unit	PWQO [1]	S15 18-Aug-2016 S-15	S15 16-Nov-2016 S-15	S15 18-May-2017 S-15	S15 28-Aug-2017 S-15	S15 28-Nov-2017 S-15	S15 23-May-2018 S-15	S15 30-Aug-2018 S-15	S15 28-Nov-2018 S-15	S15 20-Jun-2019 S-15
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	508000	417000	331000	520000	324000	343000	664000	323000	344000
Ammonia, unionized	ug/l	20	4.73	0.92	4.01	1.23	5.37	2.79	2.05	0.41	3.21
Ammonia Nitrogen	ug/l	--	190	180	100	60	280	160	70	120	210
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	3000	<2000	6000	<2000	<2000	2000	3000	<2000
Chemical Oxygen Demand	ug/l	--	67000	32000	39000	44000	24000	37000	75000	35000	43000
Chloride	ug/l	--	258000	346000	159000	250000	171000	162000	253000	214000	154000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1792	1981	1140	1288	1141	1124	1724	1213	1177
Dissolved Inorganic Carbon	ug/l	--	84600	75500	42500	97400	15300	70400	115000	62000	72300
Dissolved Organic Carbon	ug/l	--	45500	12100	25100	17000	53000	13400	29300	11800	10400
Dissolved Oxygen (Field)	ug/l	-- [7]	6340	11590	9890	7240	13660	10480	**2020**	14410	8880
Hardness, Calcium Carbonate	ug/l	--	580000	518000	324000	683000	341000	312000	647000	385000	345000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	100	200	200	500	200	400	1000	400
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1600	700	800	900	900	800	2400	1200	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.79	7.53	7.96	7.85	8.35	7.70	7.94	7.55	7.69
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	20	30	20	10	20	**40**	**90**	**50**
Sulphate	ug/l	--	204000	120000	80000	63000	70000	45000	13000	117000	113000
Temperature (Field)	deg c	-- [10]	20.6	7.5	22.0	16.0	0.7	18.5	18.2	2	17
Total Dissolved Solids	ug/l	--	1210000	1140000	708000	1010000	670000	666000	1040000	764000	712000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	7000	7000	3000	7000	4000	17000	6000	21000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<5 [17]	<1	<1	<1	<1	<1	<1
Boron	ug/l	200 [12]	134	94	**252**	87	76	76	61	83	100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	147000	150000	87600	211000	96600	92500	168000	102000	90700
Chromium	ug/l	-- [13]	<1	<1	<5 [17]	1	<1	<1	2	4	1
Cobalt	ug/l	0.9	<0.5	0.6	<2.5 [17]	0.6	0.6	<0.5	**1.1**	**1.0**	0.7
Copper	ug/l	5	0.7	0.8	**5.5**	<0.5	1.7	<0.5	1.4	**5.1**	2.2
Iron	ug/l	300	223	**328**	**647**	**325**	**894**	**634**	**1170**	**938**	**1730**
Lead	ug/l	-- [14]	<0.1	<0.1	<0.5 [17]	0.1	0.2	<0.1	0.4	0.4	0.5
Magnesium	ug/l	--	51600	34600	25600	38100	24100	19700	55200	31400	28700
Manganese	ug/l	--	488	1250	554	1100	956	503	1800	388	830
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	24200	14400	10300	15300	9660	8070	21800	14400	11000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	185000	186000	115000	171000	110000	94200	152000	161000	119000
Zinc	ug/l	30 [11]	<5	<5	<25 [17]	12	5	<5	6	8	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	**5**	<1	<1	<1	<1	**5**	<1	<1

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Parameter	Unit	PWQO [1]	S15 28-Aug-2019 S-15	S15 21-Nov-2019 S-15	S15 14-May-2020 S-15	S15 26-Aug-2020 S-15	S15 25-Nov-2020 S-15	S15 27-May-2021 S-15	S15 24-Aug-2021 S-15	S15 24-Nov-2021 S-15
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	371000	377000	323000	526000	387000	298000	513000	446000
Ammonia, unionized	ug/l	20	1.77	3.01	2.54	2.95	2.05	1.93	1.04	1.73
Ammonia Nitrogen	ug/l	--	150	350	130	120	260	80	70	340
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	4000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	54000	32000	45000	57000	30000	34000	54000	39000
Chloride	ug/l	--	168000	308000	271000	259000	246000	86000	291000	224000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1149	1883	1382	1715	54	1297	1854	1651
Dissolved Inorganic Carbon	ug/l	--	125000	<500	65800	102000	80600	67400	103000	87900
Dissolved Organic Carbon	ug/l	--	27400	11000	29900	21000	11800	10600	17400	13600
Dissolved Oxygen (Field)	ug/l	-- [7]	7230	14600	10890	7640	12760	9220	**2690**	11680
Hardness, Calcium Carbonate	ug/l	--	385000	544000	374000	537000	454000	601000	543000	471000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	300	400	700	300	400	<100	400
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	900	600	1100	700	600	900	1000
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.55	8.00	7.86	7.92	7.98	7.96	7.49	7.68
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	20	10	20	20	<10	30	<10
Sulphate	ug/l	--	59000	92000	84000	47000	91000	317000	61000	129000
Temperature (Field)	deg c	-- [10]	17.8	0.6	15.1	16.4	-0.1	14.9	22.9	3.1
Total Dissolved Solids	ug/l	--	724000	976000	780000	948000	942000	892000	1110000	918000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	4000	5000	2000	2000	5000	3000	4000	<2000
Metals										
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1	<1	<1
Boron	ug/l	200 [12]	64	69	45	59	62	66	76	106
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	101000	150000	110000	145000	125000	179000	158000	132000
Chromium	ug/l	-- [13]	1	1	<1	1	<1	<1	1	<1
Cobalt	ug/l	0.9	0.8	**1.0**	0.5	0.8	<0.5	<0.5	0.7	0.6
Copper	ug/l	5	2.1	1.5	1.6	1.0	0.8	1.0	1.3	0.9
Iron	ug/l	300	**1070**	**1260**	**882**	**373**	**502**	**415**	**683**	**567**
Lead	ug/l	-- [14]	0.3	0.1	0.1	0.2	<0.1	0.2	0.2	<0.1
Magnesium	ug/l	--	31900	41000	24400	42600	34500	37100	36000	34500
Manganese	ug/l	--	1240	1670	775	1090	895	509	1480	1500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	12900	15800	10700	21800	12600	12200	11600	15100
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	96300	164000	127000	148000	144000	66000	177000	152000
Zinc	ug/l	30 [11]	5	5	<5	<5	<5	6	<5	9
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**6**	**10**	<1	**9**	<4 [19]	**2**	<1	**4**

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Parameter	Unit	PWQO [1]	S16 27-Sep-2001	S16 21-Nov-2001	S16 22-May-2002	S16 08-Nov-2002	S16 31-May-2003	S16 03-Jul-2003	S16 22-Oct-2003	S16 17-May-2004	S16 21-Aug-2004 [20]
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	153000	86000	176000	156000	103000	210000	93000	194000	--
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--	<10	--
Ammonia Nitrogen	ug/l	--	670	30	30	1070	180	240	30	50	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	4000	1000	2000	2000	7000	--
Chemical Oxygen Demand	ug/l	--	70000	29000	36000	31000	63000	44000	40000	55000	--
Chloride	ug/l	--	394000	63300	83000	300000	56000	340000	92500	158000	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1580	450	490	1400	480	1490	680	910	--
Dissolved Inorganic Carbon	ug/l	--	39700	12000	20000	39000	25000	57000	24000	37200	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	2920	7410	8200	3000	3860	2000	8400	7000	--
Hardness, Calcium Carbonate	ug/l	--	386000	191000	211000	303000	161000	292000	--	250000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	2600	600	200	600	200	1600	300	--
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2460	920	640	1980	1220	1500	850	1310	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.37	**6.4**	**6.15**	7.4	7.5	7.03	7.5	7.1	--
Phosphate	ug/l	--	280	70	40	130	60	150	130	160	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	154000	76000	37000	134000	42000	37000	75000	24000	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1050000	328000	340000	700000	266000	937000	347000	455000	--
Total Organic Carbon	ug/l	--	9600	15000	11000	10000	23000	15000	13000	12800	--
Total Suspended Solids	ug/l	--	186000	22000	2000	34000	3000	77000	6000	31000	--
Metals											
Arsenic	ug/l	100 [11]	2	1	1	1	1	2	1	1	--
Boron	ug/l	200 [12]	50	30	40	70	20	46	34	25	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	131000	57000	64700	104000	48300	96700	56300	76000	--
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	3	7	1	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**8.2**	2.1	<1	2.9	3	2	**11**	5	--
Iron	ug/l	300	**2400**	**410**	**650**	**1150**	**870**	**2970**	**437**	**4610**	--
Lead	ug/l	-- [14]	**8**	0.2	<1	3.9	0.5	3.6	1.8	1.1	--
Magnesium	ug/l	--	14400	11700	11800	10600	9740	12300	10300	14600	--
Manganese	ug/l	--	390	40	240	860	160	1060	60	1270	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10	10	--
Potassium	ug/l	--	7100	9000	7000	9100	5500	5600	11300	4800	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	208000	30300	50900	176000	38800	209000	49500	101000	--
Zinc	ug/l	30 [11]	30	**500**	20	20	10	13	16	15	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	1	1	--

Parameter	Unit	PWQO [1]	S16 18-Nov-2004	S16 25-May-2005	S16 09-Sep-2005 [20]	S16 09-Nov-2005	S16 24-May-2006	S16 15-Aug-2006 [20]	S16 16-Nov-2006	S16 08-May-2007 [20]	S16 22-Aug-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	215000	--	327000	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	<5000	--	<5000	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	150000	180000	--	268000	183000	--	72000	--	452000
Ammonia, unionized	ug/l	20	<10	<10	--	20	<10	--	--	--	<10
Ammonia Nitrogen	ug/l	--	10	<10	--	570	60	--	20	--	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<3000	--	<3000	3000	--	<3000	--	9000
Chemical Oxygen Demand	ug/l	--	36000	52000	--	45000	48000	--	38000	--	200000
Chloride	ug/l	--	68500	73000	--	666000	147000	--	12800	--	1140000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	480	595	--	1600	550	--	160	--	3300
Dissolved Inorganic Carbon	ug/l	--	19700	50400	--	60000	40200	--	20200	--	108000
Dissolved Organic Carbon	ug/l	--	--	17700	--	11700	19200	--	18800	--	11900
Dissolved Oxygen (Field)	ug/l	-- [7]	6600	**4600**	--	**6700**	11050	--	7550	--	**4480**
Hardness, Calcium Carbonate	ug/l	--	196000	212000	--	395000	230000	--	49000	--	645000
Hydrogen Sulfide	ug/l	2 [8]	--	<10	--	<10	--	--	--	--	--
Nitrate as N	ug/l	--	300	200	--	400	600	--	300	--	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	680	1040	--	1200	970	--	900	--	7360
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.8	7.2	--	7.5	7.5	--	--	--	7.3
Phosphate	ug/l	--	60	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**70**	--	**50**	**60**	--	**160**	--	**3130**
Sulphate	ug/l	--	56000	23000	--	133000	52000	--	23000	--	158000
Temperature (Field)	deg c	-- [10]	--	16.8	--	3	9	--	8.1	--	14.7
Total Dissolved Solids	ug/l	--	240000	327000	--	1550000	489000	--	123000	--	2540000
Total Organic Carbon	ug/l	--	9500	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	13000	5000	--	13000	6000	--	94000	--	1160000
Metals											
Arsenic	ug/l	100 [11]	1	<1	--	<1	<1	--	1	--	6
Boron	ug/l	200 [12]	23	38	--	39	39	--	22	--	49
Cadmium	ug/l	0.2 [11]	--	<0.3	--	<0.5	<0.1	--	**<0.5**	--	<0.1
Calcium	ug/l	--	57900	60800	--	125000	70300	--	13900	--	195000
Chromium	ug/l	-- [13]	2	<2	--	<2	<2	--	6	--	**12**
Cobalt	ug/l	0.9	--	<3	--	0.7	0.7	--	0.6	--	**3.9**
Copper	ug/l	5	2	<2	--	<2	3	--	**28**	--	**11**
Iron	ug/l	300	**1400**	**1610**	--	**5060**	**748**	--	**894**	--	**10200**
Lead	ug/l	-- [14]	1.2	<0.6	--	1	0.8	--	2	--	**17.7**
Magnesium	ug/l	--	12400	14500	--	19800	13300	--	3580	--	38100
Manganese	ug/l	--	167	268	--	1710	212	--	68	--	1730
Mercury, dissolved	ug/l	0.2 [15]	--	<0.05	--	<0.06	--	--	--	--	--
Molybdenum	ug/l	40	--	4.5	--	<5	--	--	--	--	--
Nickel	ug/l	25	10	<10	--	<10	--	--	--	--	--
Potassium	ug/l	--	5900	6100	--	5000	8400	--	4600	--	6600
Selenium	ug/l	100	--	<1	--	<1	--	--	--	--	--
Sodium	ug/l	--	40000	47900	--	442000	92600	--	19800	--	726000
Zinc	ug/l	30 [11]	9	21	--	<5	7	--	**37**	--	**237**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	<1	--	<1	<1	--	<1	--	<1

Parameter	Unit	PWQO [1]	S16 20-Nov-2007	S16 23-May-2008	S16 12-Aug-2008	S16 06-Nov-2008	S16 13-May-2009 S-10	S16 25-Aug-2009 [34] A-10	S16 27-Nov-2009 S-7	S16 18-May-2010 S-9	S16 18-Aug-2010 [2] S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	99000	435000	120000	128000	458000	93000	338000	415000
Ammonia, unionized	ug/l	20	<10	<20	<20	<20	0.44	2.15	<0.07	0.85	0.71
Ammonia Nitrogen	ug/l	--	60	<10	180	<10	50	340	<20	180	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	<3000	<3000	<3000	<1000	3000	2000	4000	2000
Chemical Oxygen Demand	ug/l	--	173000	55000	40000	33000	43000	73000	45000	28000	33000
Chloride	ug/l	--	222000	38600	790000	93900	79000	486000	25000	570000	593000
Conductivity	uS/cm	--	--	--	--	--	566	2520	342	2540	2780
Conductivity (Field)	uS/cm	--	875	320	3500	525	470	2018	335	2555	2485
Dissolved Inorganic Carbon	ug/l	--	54000	22300	107000	30100	31600	115000	23600	153000	90400
Dissolved Organic Carbon	ug/l	--	13200	18200	9400	13000	18400	16400	16100	11600	13200
Dissolved Oxygen (Field)	ug/l	-- [7]	8520	8220	**1070**	7230	**2780**	**180**	9730	**1800**	**1420**
Hardness, Calcium Carbonate	ug/l	--	271000	112000	432000	160000	164000	358000	114000	428000	437000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1000	200	100	600	250	<100	<100	<100	<100
Nitrite as N	ug/l	--	--	--	--	--	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	5120	1040	980	750	780	1940	540	1650	990
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.4	7.7	7.6	7.4	7.19	7.47	7.16	7.34
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**2450**	**80**	**40**	**40**	**90**	**400**	20	**110**	**130**
Sulphate	ug/l	--	97000	18000	84000	57000	25000	51000	31000	44000	79000
Temperature (Field)	deg c	-- [10]	2.8	15	22.2	8.7	18.3	20.5	5.0	17.5	18.9
Total Dissolved Solids	ug/l	--	713000	188000	1780000	357000	368000	1640000	222000	1650000	1810000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	432000	<3000	25000	5000	4000	43000	4000	49000	33000
Metals											
Arsenic	ug/l	100 [11]	1.6	1.5	2.2	<0.5	<1	<50	<1	1	<1
Boron	ug/l	200 [12]	56	20	48	34	30	<100	20	30	70
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	<0.1	<0.1	<0.1
Calcium	ug/l	--	86500	32700	134000	49900	49000	112000	34000	135000	142000
Chromium	ug/l	-- [13]	5	<2	<2	<2	3	**<50**	3	8	<5
Cobalt	ug/l	0.9	**1.5**	<0.5	<0.5	<0.5	0.6	<10	0.3	**1.9**	0.8
Copper	ug/l	5	**10**	<2	<2	3	1	**<10**	2	2	2
Iron	ug/l	300	**3430**	**866**	**1760**	**491**	**1480**	**16200**	**680**	**4040**	**1690**
Lead	ug/l	-- [14]	4.6	<0.1	<0.1	<0.1	<1	**<10**	<1	<1	<1
Magnesium	ug/l	--	13300	7440	23900	8610	10000	19000	7000	22000	20000
Manganese	ug/l	--	438	78	1840	187	220	3240	60	2540	1240
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7100	4300	4400	4900	4000	6000	6000	4000	6000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	159000	25800	477000	66800	52000	365000	22000	295000	408000
Zinc	ug/l	30 [11]	**138**	<5	<5	5	<10	<50	10	20	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	**3**	<1	<1	<1

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Parameter	Unit	PWQO [1]	S16 14-Oct-2010 S-14	S16 19-May-2011 [2] W-12	S16 16-Aug-2011 [2] N-10	S16 30-Nov-2011 [22] S16	S16 30-May-2012 S 16	S16 22-Aug-2012 [20] S-16	S16 29-Nov-2012 S16	S16 28-May-2013 S16	S16 15-Aug-2013 [20] S16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	151000	411000	97000	340000	--	370000	240000	--
Ammonia, unionized	ug/l	20	0.77	0.39	1.19	<0.16	4.56	--	0.77	1.09	--
Ammonia Nitrogen	ug/l	--	70	30	130	<20	230	--	530	160	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	1000	2000	4000	--	3000	<2000	--
Chemical Oxygen Demand	ug/l	--	38000	50000	45000	25000	58000	--	86000	140000	--
Chloride	ug/l	--	225000	48000	551000	58000	620000	--	480000	400000	--
Conductivity	uS/cm	--	1350	506	2650	477	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1038	496	1423	482	2451	--	1903	1607	--
Dissolved Inorganic Carbon	ug/l	--	55000	35900	33500	18600	85000	--	86000	53000	--
Dissolved Organic Carbon	ug/l	--	13500	18900	10800	7900	17000	--	9400	14000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	7240	6720	**3500**	9120	**1780**	--	**1200**	5330	--
Hardness, Calcium Carbonate	ug/l	--	261000	174000	468000	141000	480000	--	410000	360000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	260	640	<100	440	380	--	<100	<100	--
Nitrite as N	ug/l	--	<100	<100	<100	<100	56	--	<10	<10	--
Nitrogen, Total Kjeldahl	ug/l	--	780	1290	750	540	1300	--	1700	5600	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	430	--	<100	<100	--
pH (Field)	-	6.5 - 8.5	7.72	7.64	7.24	7.81	7.58	--	7.18	7.25	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**50**	30	**210**	**130**	--	**57**	**350**	--
Sulphate	ug/l	--	75000	28000	62000	42000	56000	--	70000	38000	--
Temperature (Field)	deg c	-- [10]	11.7	16.2	24.1	5.0	24.1	--	1.9	19.7	--
Total Dissolved Solids	ug/l	--	878000	329000	1720000	310000	1580000	--	1440000	942000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	25000	8000	11000	26000	73000	--	14000	120000	--
Metals											
Arsenic	ug/l	100 [11]	<1	<10	<10	<50	1.8	--	<1.0	2.6	--
Boron	ug/l	200 [12]	30	20	40	<100	50	--	32	17	--
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	**<10**	<0.10	--	<0.10	<0.10	--
Calcium	ug/l	--	83000	50000	146000	45000	170000	--	160000	110000	--
Chromium	ug/l	-- [13]	6	3	<5	**<50**	<5.0	--	<5.0	7.0	--
Cobalt	ug/l	0.9	0.7	0.4	0.6	<10	**1.9**	--	0.65	**2.8**	--
Copper	ug/l	5	2	2	1	**<10**	4.3	--	1.2	5.0	--
Iron	ug/l	300	**1370**	**600**	**580**	**6100**	**5000**	--	**8100**	**14000**	--
Lead	ug/l	-- [14]	<1	<1	<1	**<10**	3.0	--	<0.50	**5.2**	--
Magnesium	ug/l	--	13000	12000	25000	7000	24000	--	29000	19000	--
Manganese	ug/l	--	350	70	550	160	1700	--	2700	1300	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5000	4000	14000	6000	5300	--	4100	5000	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	170000	40000	183000	38000	440000	--	440000	250000	--
Zinc	ug/l	30 [11]	<10	10	<10	<50	26	--	10	**39**	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1.0	--	<1.0	<1.0	--

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Parameter	Unit	PWQO [1]	S16 21-Nov-2013 SA-3	S16 28-May-2014 S16	S16 26-Aug-2014 S16	S16 13-Nov-2014 S-16	S16 27-May-2015 S-16	S16 25-Aug-2015 S-16	S16 25-Nov-2015 S-16	S16 24-May-2016 S-16	S16 18-Aug-2016 S-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	330000	280000	390000	140000	255000	446000	392000	357000	430000
Ammonia, unionized	ug/l	20	0.56	1.2	14.2	0.29	0.35	**30.59**	0.5	2.1	5.22
Ammonia Nitrogen	ug/l	--	90	130	1500	62	120	440	180	120	350
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	<2000	9000	17000	3000	24000	18000
Chemical Oxygen Demand	ug/l	--	150000	48000	2000000	160000	86000	74000	80000	95000	90000
Chloride	ug/l	--	350000	560000	800000	88000	402000	1100000	288000	1010000	791000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1653	2054	3177	502	1782	3767	3549	3437	3144
Dissolved Inorganic Carbon	ug/l	--	85000	64000	100000	34000	62400	77800	76200	54900	22700
Dissolved Organic Carbon	ug/l	--	10000	13000	11000	18000	16600	19100	10000	32100	78500
Dissolved Oxygen (Field)	ug/l	-- [7]	10510	**4300**	**300**	9690	**110**	**60**	**1780**	**4630**	**2610**
Hardness, Calcium Carbonate	ug/l	--	330000	430000	470000	160000	67700	512000	733000	616000	651000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	250	<100	<100	<100	<100	<100	<100	300
Nitrite as N	ug/l	--	<10	21	21	<10	<50	<50	<50	<50	<250 [18]
Nitrogen, Total Kjeldahl	ug/l	--	3200	1600	65000	4400	2800	3100	3100	4400	1900
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	270	<100	<100	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.80	7.48	7.31	7.61	6.74	8.33	7.51	7.40	7.51
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1300**	**200**	**4800**	**2200**	**810**	**920**	**1400**	**1550**	**450**
Sulphate	ug/l	--	81000	41000	52000	25000	45000	55000	96000	58000	252000
Temperature (Field)	deg c	-- [10]	2.2	16.6	22.3	4.1	24.1	18.3	0.6	28.2	22.3
Total Dissolved Solids	ug/l	--	1130000	1360000	1770000	346000	982000	2220000	1840000	2130000	2150000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	1100000	410000	11000000	130000	363000	170000	203000	382000	99000
Metals											
Arsenic	ug/l	100 [11]	7.8	1.5	52	2.7	<1	7	3	2	6
Boron	ug/l	200 [12]	36	110	110	26	12	56	34	150	132
Cadmium	ug/l	0.2 [11]	**0.25**	0.13	**3.1**	0.18	<0.1	**0.4**	0.2	0.1	0.1
Calcium	ug/l	--	130000	150000	290000	54000	21800	160000	243000	196000	216000
Chromium	ug/l	-- [13]	**27**	<5.0	**250**	**11**	1	**23**	**12**	7	7
Cobalt	ug/l	0.9	**7.6**	**2.8**	**78**	**2.7**	<0.5	**6.5**	**2.8**	**2.4**	**2.7**
Copper	ug/l	5	**17**	3.5	**180**	**9.4**	<0.5	**12.6**	**7.7**	**5.7**	**5.3**
Iron	ug/l	300	**60000**	**6700**	**430000**	**14000**	**1560**	**42500**	**20100**	**10300**	**8310**
Lead	ug/l	-- [14]	**19**	3.9	**190**	**9.8**	1.0	**18.3**	**9.7**	**6.4**	**5.6**
Magnesium	ug/l	--	23000	22000	63000	12000	3230	27600	30700	30600	27200
Manganese	ug/l	--	1900	2200	11000	280	137	2020	1430	3490	3500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	6200	5200	22000	7600	917	7060	5260	5940	6760
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	290000	310000	530000	55000	52900	584000	663000	670000	503000
Zinc	ug/l	30 [11]	**130**	26	**1200**	**57**	7	**121**	**66**	**59**	**46**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**2.3**	<1.0	**4.8**	**11**	<1	**3**	<1	**16**	<2 [19]

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Parameter	Unit	PWQO [1]	S16 16-Nov-2016 S-16	S16 18-May-2017 S-16	S16 28-Aug-2017 S-16	S16 28-Nov-2017 S-16	S16 23-May-2018 S-16	S16 30-Aug-2018 S-16	S16 28-Nov-2018 S-16	S16 20-Jun-2019 S-16	S16 28-Aug-2019 S-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	369000	186000	468000	155000	164000	429000	246000	222000	227000
Ammonia, unionized	ug/l	20	2.3	0.76	3.34	0.47	0.76	6.16	0.35	1	2.27
Ammonia Nitrogen	ug/l	--	190	60	340	80	70	600	160	130	300
Biochemical Oxygen Demand, 5 Day	ug/l	--	16000	3000	16000	4000	<2000	<30000 [26]	<2000	<12000 [26]	4000
Chemical Oxygen Demand	ug/l	--	94000	51000	98000	48000	52000	169000	56000	67000	46000
Chloride	ug/l	--	815000	184000	802000	<1000	109000	995000	1410000	335000	505000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	3185	880	2483	609	717	3400	>3999	1322	1893
Dissolved Inorganic Carbon	ug/l	--	66100	15100	85100	10200	37300	67400	45900	45000	75700
Dissolved Organic Carbon	ug/l	--	10800	35600	14800	34900	18200	25800	8700	10700	14800
Dissolved Oxygen (Field)	ug/l	-- [7]	**4330**	**2860**	**990**	**7660**	**730**	**630**	7770	**430**	**280**
Hardness, Calcium Carbonate	ug/l	--	461000	205000	577000	145000	158000	605000	555000	310000	284000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	200	200	<100
Nitrite as N	ug/l	--	<50	<50	<250 [18]	<50	<50	<250 [18]	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	3400	900	2900	1000	1100	2400	700	1300	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.84	7.42	7.46	7.83	7.49	7.45	7.35	7.41	7.31
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1470**	**50**	**970**	**150**	**60**	**290**	**80**	**210**	**140**
Sulphate	ug/l	--	89000	27000	58000	36000	12000	31000	113000	43000	36000
Temperature (Field)	deg c	-- [10]	9.4	22.9	18.1	0.6	18.5	19.0	2.2	16.3	19.2
Total Dissolved Solids	ug/l	--	1790000	550000	1780000	340000	366000	2060000	2720000	832000	1130000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	44000	12000	970000	49000	11000	268000	11000	41000	62000
Metals											
Arsenic	ug/l	100 [11]	2	<5 [17]	2	<1	<1	3	<1	<1	<1
Boron	ug/l	200 [12]	93	166	49	24	34	34	27	36	24
Cadmium	ug/l	0.2 [11]	0.1	<0.5 [17]	0.1	<0.1	<0.1	**0.3**	<0.1	<0.1	<0.1
Calcium	ug/l	--	148000	61900	188000	43300	47700	189000	176000	99100	92900
Chromium	ug/l	-- [13]	7	<5 [17]	6	1	<1	**27**	**9**	3	5
Cobalt	ug/l	0.9	**1.9**	<2.5 [17]	**1.9**	<0.5	<0.5	**7.0**	**2.2**	**2.0**	**1.4**
Copper	ug/l	5	**5.9**	2.9	3.8	1.9	<0.5	**17.0**	**6.0**	**6.1**	4.8
Iron	ug/l	300	**10300**	**924**	**11100**	**1260**	**943**	**28800**	**3180**	**2670**	**3640**
Lead	ug/l	-- [14]	**7.3**	<0.5 [17]	**6.6**	0.6	0.3	**20.1**	1.7	4.3	2.9
Magnesium	ug/l	--	22300	12200	26300	9010	9460	32200	27900	15200	12700
Manganese	ug/l	--	1750	413	2030	190	233	2930	626	1020	843
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5630	4530	5560	4530	3980	8500	9200	3390	3750
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	504000	101000	497000	38400	58700	440000	883000	147000	268000
Zinc	ug/l	30 [11]	**58**	<25 [17]	**42**	12	11	**103**	24	22	22
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**11**	<1	**2**	<1	<1	**4**	<1	<1	**5**

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Parameter	Unit	PWQO [1]	S16 21-Nov-2019 S-16	S16 14-May-2020 S-16	S16 26-Aug-2020 S-16	S16 25-Nov-2020 S-16	S16 27-May-2021 S-16	S16 24-Aug-2021 [35] S16	S16 24-Nov-2021 S-16
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	352000	182000	350000	354000	256000	--	366000
Ammonia, unionized	ug/l	20	0.52	0.13	2.41	0.41	1.08	--	0.26
Ammonia Nitrogen	ug/l	--	300	40	550	130	60	--	180
Biochemical Oxygen Demand, 5 Day	ug/l	--	<30000 [26]	5000	9000	<40000 [26]	<2000	--	16000
Chemical Oxygen Demand	ug/l	--	70000	67000	213000	44000	28000	--	67000
Chloride	ug/l	--	1030000	260000	758000	1070000	35000	--	598000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	4110	1104	2924	2	1147	--	2670
Dissolved Inorganic Carbon	ug/l	--	<500	39400	69300	73600	56200	--	74300
Dissolved Organic Carbon	ug/l	--	11300	22300	10900	10100	9700	--	10500
Dissolved Oxygen (Field)	ug/l	-- [7]	**4420**	**1060**	**120**	**4200**	6710	--	**7000**
Hardness, Calcium Carbonate	ug/l	--	673000	271000	521000	556000	615000	--	733000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	100	<100	400	--	<100
Nitrite as N	ug/l	--	<50	<50	<50	<250 [18]	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	6600	2000	4200	1200	600	--	2800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.31	7.03	7.10	7.58	7.85	--	7.20
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**3660**	**640**	**1620**	**440**	30	--	**1750**
Sulphate	ug/l	--	114000	41000	23000	116000	370000	--	127000
Temperature (Field)	deg c	-- [10]	0.3	16.2	18.3	0	14.3	--	1.3
Total Dissolved Solids	ug/l	--	2080000	588000	828000	2380000	834000	--	1570000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	208000	171000	454000	292000	24000	--	896000
Metals									
Arsenic	ug/l	100 [11]	4	1	2	<1	<1	--	7
Boron	ug/l	200 [12]	30	16	31	18	69	--	25
Cadmium	ug/l	0.2 [11]	0.2	<0.1	<0.1	<0.1	<0.1	--	**0.3**
Calcium	ug/l	--	198000	82100	169000	167000	188000	--	234000
Chromium	ug/l	-- [13]	**28**	5	7	2	2	--	**46**
Cobalt	ug/l	0.9	**6.2**	**1.5**	**2.5**	**1.1**	**1.0**	--	**11.5**
Copper	ug/l	5	**18.3**	5.0	**5.2**	2.8	1.7	--	**38.3**
Iron	ug/l	300	**31700**	**3770**	**14400**	**3190**	**1260**	--	<100
Lead	ug/l	-- [14]	**12.8**	4.0	4.7	2.6	0.7	--	**44.4**
Magnesium	ug/l	--	43200	16100	24000	33500	35500	--	36300
Manganese	ug/l	--	2450	418	2430	1440	216	--	3240
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	10300	4480	6340	5980	10400	--	9330
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	544000	121000	479000	601000	30300	--	394000
Zinc	ug/l	30 [11]	**82**	23	26	15	6	--	**147**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**12**	**6**	**9**	<10 [19]	**2**	--	**6**

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Parameter	Unit	PWQO [1]	S17 27-Sep-2001	S17 21-Nov-2001	S17 22-May-2002	S17 08-Nov-2002	S17 31-May-2003	S17 03-Jul-2003	S17 22-Oct-2003	S17 17-May-2004	S17 21-Aug-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	240000	151000	158000	186000	151000	234000	106000	196000	264000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--	<10	<10
Ammonia Nitrogen	ug/l	--	150	30	60	450	170	100	90	120	360
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	2000	1000	2000	3000	5000	6000
Chemical Oxygen Demand	ug/l	--	29000	25000	44000	23000	59000	45000	58000	59000	92000
Chloride	ug/l	--	83600	83300	90000	406000	75500	371000	66900	192000	337000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1230	510	580	1600	425	1320	640	1050	1410
Dissolved Inorganic Carbon	ug/l	--	59400	21100	17000	46000	39000	59000	26000	47200	42300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3550	10270	8350	9300	6020	3390	11800	4000	2700
Hardness, Calcium Carbonate	ug/l	--	367000	226000	221000	277000	187000	304000	--	260000	297000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1600	900	600	1600	900	1100	1100	1200	900
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1720	630	890	1070	1260	1210	1400	1450	3120
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.18	6.81	7.1	7.9	7.7	6.8	7.32	7.3	7.2
Phosphate	ug/l	--	190	40	50	60	50	190	350	100	740
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	430000	70000	37000	69000	38000	57000	56000	42000	63000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	842000	394000	362000	800000	334000	997000	294000	525000	705000
Total Organic Carbon	ug/l	--	10600	15000	12000	11000	22000	15000	16000	12300	9200
Total Suspended Solids	ug/l	--	11000	7000	14000	31000	3000	82000	20000	32000	148000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	3
Boron	ug/l	200 [12]	100	40	30	160	30	61	36	51	78
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	124000	65200	65600	92300	54700	100000	47100	81800	98000
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	3	**9**	2	6
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.2	1.9	<1	**39.7**	2	4	**25**	**16**	**84**
Iron	ug/l	300	**500**	220	**380**	**1370**	**460**	**1360**	**1540**	**1110**	129
Lead	ug/l	-- [14]	0.2	0.2	<1	**34.1**	0.5	3.2	3.4	0.8	**5.8**
Magnesium	ug/l	--	13900	15300	14000	11400	12300	13200	9500	13600	12600
Manganese	ug/l	--	140	20	90	290	40	344	70	341	528
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10	10	**90**
Potassium	ug/l	--	9300	5900	4800	9200	4800	7700	7600	6400	6800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	162000	56300	37200	240000	49700	230000	44500	146000	254000
Zinc	ug/l	30 [11]	20	10	20	**50**	20	26	29	**34**	**164**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	0.1	1	1	1

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Parameter	Unit	PWQO [1]	S17 18-Nov-2004	S17 25-May-2005	S17 09-Sep-2005 [20]	S17 09-Nov-2005	S17 24-May-2006	S17 15-Aug-2006	S17 16-Nov-2006	S17 08-May-2007	S17 22-Aug-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	264000	--	237000	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	<5000	--	<5000	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	216000	--	190000	150000	260000	90000	212000	302000
Ammonia, unionized	ug/l	20	<10	<10	--	<10	<10	<10	--	<10	<10
Ammonia Nitrogen	ug/l	--	170	40	--	50	20	40	100	<10	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	6000	--	<3000	<3000	<3000	<3000	<3000	3000
Chemical Oxygen Demand	ug/l	--	35000	50000	--	60000	63000	28000	38000	38000	37000
Chloride	ug/l	--	122000	139000	--	174000	102000	434000	21200	252000	494000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	790	845	--	610	430	1700	210	1000	1450
Dissolved Inorganic Carbon	ug/l	--	25300	56100	--	40800	39700	62400	24300	50900	72300
Dissolved Organic Carbon	ug/l	--	--	14000	--	10500	20900	13800	15700	10100	10000
Dissolved Oxygen (Field)	ug/l	-- [7]	7200	7110	--	12500	8620	**800**	7880	8020	**1890**
Hardness, Calcium Carbonate	ug/l	--	245000	259000	--	290000	196000	314000	69000	279000	351000
Hydrogen Sulfide	ug/l	2 [8]	--	<10	--	<10	--	--	--	--	--
Nitrate as N	ug/l	--	1600	400	--	1800	900	1000	1100	1200	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	880	1160	--	730	860	640	1190	2110	1790
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.7	7.3	--	7.5	7.8	7.6	--	7.9	7.4
Phosphate	ug/l	--	60	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**80**	--	**120**	**40**	**50**	**230**	**70**	**310**
Sulphate	ug/l	--	68000	31000	--	79000	40000	63000	24000	47000	46000
Temperature (Field)	deg c	-- [10]	--	18.8	--	2	11	18	8.1	18	14
Total Dissolved Solids	ug/l	--	395000	485000	--	598000	370000	1030000	158000	700000	1190000
Total Organic Carbon	ug/l	--	9800	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	6000	4000	--	16000	3000	<3000	45000	4000	30000
Metals											
Arsenic	ug/l	100 [11]	1	<1	--	<1	<1	1.6	2	1.4	3.3
Boron	ug/l	200 [12]	39	39	--	34	23	47	24	41	41
Cadmium	ug/l	0.2 [11]	--	<0.5	--	<0.5	<0.1	<0.1	**<0.5**	**0.7**	<0.1
Calcium	ug/l	--	73700	75200	--	89800	59200	103000	18400	88400	115000
Chromium	ug/l	-- [13]	2	<2	--	<2	<2	<2	8	<2	<2
Cobalt	ug/l	0.9	--	**83**	--	0.6	0.2	0.4	0.5	0.5	**1.1**
Copper	ug/l	5	2	<2	--	<2	<2	<2	**39**	**20**	4
Iron	ug/l	300	**519**	**436**	--	**453**	**303**	**355**	**399**	**858**	**1740**
Lead	ug/l	-- [14]	1.2	<1	--	2.5	<0.5	0.5	2	0.7	1
Magnesium	ug/l	--	14900	17200	--	15900	11800	13800	5570	14000	15200
Manganese	ug/l	--	95	85	--	56	40	342	80	204	772
Mercury, dissolved	ug/l	0.2 [15]	--	<0.05	--	<0.06	--	--	--	--	--
Molybdenum	ug/l	40	--	8	--	<5	--	--	--	--	--
Nickel	ug/l	25	10	<10	--	<10	--	--	--	--	--
Potassium	ug/l	--	7100	5300	--	8400	4700	6900	4300	6600	8700
Selenium	ug/l	100	--	<1	--	<1	--	--	--	--	--
Sodium	ug/l	--	80600	90800	--	115000	62700	256000	25000	158000	323000
Zinc	ug/l	30 [11]	14	14	--	**56**	14	25	28	19	**49**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	<1	--	<1	<1	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S17 20-Nov-2007	S17 23-May-2008	S17 12-Aug-2008	S17 06-Nov-2008	S17 13-May-2009 S-11	S17 25-Aug-2009 A-9	S17 27-Nov-2009 S-9	S17 18-May-2010 S-10	S17 18-Aug-2010 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	180000	142000	280000	190000	165000	285000	152000	223000	283000
Ammonia, unionized	ug/l	20	<10	<20	<20	<20	1.72	3.39	1.08	1.17	1.06
Ammonia Nitrogen	ug/l	--	380	<10	110	20	60	500	100	60	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	<3000	<3000	<3000	<1000	<1000	2000	10000	4000
Chemical Oxygen Demand	ug/l	--	30000	19000	42000	22000	50000	50000	45000	53000	40000
Chloride	ug/l	--	193000	108000	455000	123000	113000	296000	80000	262000	277000
Conductivity	uS/cm	--	--	--	--	--	757	1620	660	1400	1630
Conductivity (Field)	uS/cm	--	750	550	1800	750	600	1291	795	1475	1487
Dissolved Inorganic Carbon	ug/l	--	48600	34900	70400	46500	40900	69600	37400	53700	63200
Dissolved Organic Carbon	ug/l	--	13200	15400	9800	8300	20000	12100	13900	18500	15600
Dissolved Oxygen (Field)	ug/l	-- [7]	9250	10540	**1780**	8710	8490	**2190**	10560	8840	**4010**
Hardness, Calcium Carbonate	ug/l	--	248000	148000	290000	252000	194000	260000	189000	267000	298000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1500	300	900	1100	750	880	950	1860	3710
Nitrite as N	ug/l	--	--	--	--	--	<100	130	<100	<100	170
Nitrogen, Total Kjeldahl	ug/l	--	1310	1130	1100	650	1300	1180	880	2600	1050
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.8	7.9	7.9	7.8	7.22	7.93	7.80	7.38
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**100**	**100**	**130**	**40**	**50**	**50**	**90**	**110**	**60**
Sulphate	ug/l	--	80000	21000	57000	74000	27000	45000	51000	51000	75000
Temperature (Field)	deg c	-- [10]	1.9	14.6	18.7	9.4	22.3	20.5	5.3	16.9	20.3
Total Dissolved Solids	ug/l	--	620000	341000	1070000	494000	492000	1050000	429000	910000	1060000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	40000	45000	4000	3000	11000	17000	67000	15000
Metals											
Arsenic	ug/l	100 [11]	1.6	1.9	1.1	0.9	1	1	<1	1	<1
Boron	ug/l	200 [12]	34	17	55	29	30	50	30	140	180
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	83300	42900	90600	76200	58000	86000	61000	87000	103000
Chromium	ug/l	-- [13]	3	<2	<2	<2	3	7	4	7	**9**
Cobalt	ug/l	0.9	**1.6**	<0.5	<0.5	0.8	0.4	0.6	0.8	0.7	0.6
Copper	ug/l	5	5	<2	<2	2	3	1	3	5	4
Iron	ug/l	300	**1260**	**726**	145	279	**430**	**1140**	**780**	**830**	**770**
Lead	ug/l	-- [14]	3.2	<0.1	<0.1	<0.1	<1	<1	2	1	<1
Magnesium	ug/l	--	9720	9900	15400	14900	12000	11000	9000	12000	10000
Manganese	ug/l	--	179	72	107	70	90	640	130	340	70
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8800	3200	7600	6900	4000	8000	6000	8000	10000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	126000	68900	277000	80400	81000	211000	69000	195000	212000
Zinc	ug/l	30 [11]	**50**	5	15	<5	10	<10	**40**	**60**	**70**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	**2**	<1

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Parameter	Unit	PWQO [1]	S17 14-Oct-2010 S-13	S17 19-May-2011 W-10	S17 16-Aug-2011 [2] N-11	S17 30-Nov-2011 [22] S17	S17 30-May-2012 S 17	S17 22-Aug-2012 S-17	S17 29-Nov-2012 S17	S17 28-May-2013 S17	S17 15-Aug-2013 [20] S17
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	208000	107000	148000	97000	190000	250000	250000	180000	--
Ammonia, unionized	ug/l	20	0.42	<0.1	8.79	0.5	<5.18	2.31	0.52	2.57	--
Ammonia Nitrogen	ug/l	--	30	<20	420	60	<50	93	180	140	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	<1000	6000	3000	2000	3000	6000	4000	--
Chemical Oxygen Demand	ug/l	--	35000	55000	48000	30000	64000	40000	43000	44000	--
Chloride	ug/l	--	102000	36000	97000	41000	160000	290000	240000	140000	--
Conductivity	uS/cm	--	864	362	716	442	--	--	--	--	--
Conductivity (Field)	uS/cm	--	650	363	617	439	927	1357	1272	771	--
Dissolved Inorganic Carbon	ug/l	--	52000	25800	35400	18700	45000	55000	54000	40000	--
Dissolved Organic Carbon	ug/l	--	13000	20800	11500	8500	18000	12000	9500	17000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	11690	**3070**	**3610**	**4550**	6030	**3520**	**6940**	11360	--
Hardness, Calcium Carbonate	ug/l	--	228000	128000	174000	138000	230000	310000	300000	250000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	2210	<100	1010	1210	980	480	4400	900	--
Nitrite as N	ug/l	--	<100	<100	<100	<100	28	80	48	<10	--
Nitrogen, Total Kjeldahl	ug/l	--	820	1270	1800	1190	2400	1500	2700	1000	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	1000	560	4500	900	--
pH (Field)	-	6.5 - 8.5	7.84	7.26	7.61	7.83	8.26	7.72	7.51	7.77	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**80**	**190**	**200**	**320**	**160**	**280**	**56**	--
Sulphate	ug/l	--	52000	15000	50000	50000	43000	59000	65000	36000	--
Temperature (Field)	deg c	-- [10]	11.3	14.7	23.9	5.0	26.6	22.8	0.9	17.0	--
Total Dissolved Solids	ug/l	--	562000	235000	465000	287000	556000	852000	722000	462000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	3000	31000	13000	4000	12000	24000	<1000	--
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<10	<50	1.6	1.3	<1.0	<1.0	--
Boron	ug/l	200 [12]	30	20	60	<100	50	71	45	19	--
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	**<10**	<0.10	<0.10	<0.10	<0.10	--
Calcium	ug/l	--	70000	38000	58000	42000	78000	110000	110000	74000	--
Chromium	ug/l	-- [13]	4	2	7	**<50**	<5.0	<5.0	<5.0	<5.0	--
Cobalt	ug/l	0.9	0.4	0.5	0.8	<10	0.68	0.65	0.51	<0.50	--
Copper	ug/l	5	2	1	4	**<10**	4.4	3.1	4.4	1.8	--
Iron	ug/l	300	260	**1280**	**1370**	**900**	**920**	**990**	**620**	**410**	--
Lead	ug/l	-- [14]	<1	<1	4	**<10**	1.1	1.2	0.83	<0.50	--
Magnesium	ug/l	--	13000	8000	7000	8000	13000	12000	16000	13000	--
Manganese	ug/l	--	70	110	470	40	170	150	220	150	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7000	4000	11000	8000	6400	9700	8400	4900	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	63000	25000	70000	29000	120000	230000	190000	85000	--
Zinc	ug/l	30 [11]	20	<10	20	<50	30	15	**73**	21	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	**2.2**	<1.0	<1.0	<1.0	--

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Parameter	Unit	PWQO [1]	S17 21-Nov-2013 SA-2	S17 28-May-2014 S17	S17 26-Aug-2014 [20] S17	S17 13-Nov-2014 S-17	S17 27-May-2015 S-17	S17 25-Aug-2015 S-17	S17 25-Nov-2015 S-17	S17 24-May-2016 S-17	S17 18-Aug-2016 S-17
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	230000	210000	--	190000	244000	257000	245000	201000	119000
Ammonia, unionized	ug/l	20	<0.47	1.45	--	<0.31	0.3	19.16	0.51	4.47	1.86
Ammonia Nitrogen	ug/l	--	<50	69	--	<50	170	440	80	280	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<2000	--	<2000	3000	14000	16000	3000	4000
Chemical Oxygen Demand	ug/l	--	32000	45000	--	42000	60000	88000	63000	45000	47000
Chloride	ug/l	--	100000	240000	--	75000	654000	347000	246000	317000	154000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	862	1122	--	584	2387	1513	1272	1286	933
Dissolved Inorganic Carbon	ug/l	--	57000	48000	--	44000	58700	62000	52600	43600	4700
Dissolved Organic Carbon	ug/l	--	10000	16000	--	16000	22500	16000	15900	15500	36800
Dissolved Oxygen (Field)	ug/l	-- [7]	10550	8150	--	**6620**	**4980**	**730**	**6900**	**110**	7180
Hardness, Calcium Carbonate	ug/l	--	300000	290000	--	230000	375000	224000	363000	297000	191000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1800	580	--	770	<100	200	600	<100	200
Nitrite as N	ug/l	--	16	34	--	13	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	940	1000	--	960	1600	3000	1200	1300	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	1800	620	--	780	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.98	7.85	--	7.74	6.62	8.07	7.83	7.38	7.75
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**140**	**66**	--	**86**	**150**	**650**	**150**	**60**	**150**
Sulphate	ug/l	--	78000	37000	--	56000	20000	43000	55000	28000	144000
Temperature (Field)	deg c	-- [10]	2.2	16.4	--	3.8	20.9	19.7	1.8	27.5	25
Total Dissolved Solids	ug/l	--	554000	744000	--	394000	1410000	872000	667000	776000	592000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	10000	12000	--	230000	8000	61000	6000	11000	18000
Metals											
Arsenic	ug/l	100 [11]	1.4	1.1	--	<1.0	2	2	<1	1	3
Boron	ug/l	200 [12]	40	32	--	25	33	53	33	34	43
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	--	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	100000	97000	--	68000	108000	72300	119000	98700	61700
Chromium	ug/l	-- [13]	<5.0	<5.0	--	<5.0	2	6	3	1	1
Cobalt	ug/l	0.9	0.80	<0.50	--	<0.50	0.7	**1.6**	0.7	0.6	<0.5
Copper	ug/l	5	4.7	1.5	--	2.3	<0.5	0.7	0.8	1.7	1.6
Iron	ug/l	300	**1700**	**620**	--	**880**	**1110**	**4140**	**1330**	**970**	**864**
Lead	ug/l	-- [14]	3.2	<0.50	--	0.85	0.5	**5.4**	2.6	0.5	1.4
Magnesium	ug/l	--	20000	16000	--	18000	25800	10600	16100	12300	8850
Manganese	ug/l	--	74	320	--	110	753	542	137	641	109
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7300	5700	--	5400	7530	8850	6440	6310	5840
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	70000	160000	--	52000	306000	183000	159000	199000	87000
Zinc	ug/l	30 [11]	**47**	19	--	24	8	**48**	**39**	9	13
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**1.2**	<1.0	--	**5.7**	<1	**2**	<1	**9**	**7**

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Parameter	Unit	PWQO [1]	S17 16-Nov-2016 S-17	S17 18-May-2017 S-17	S17 28-Aug-2017 S-17	S17 28-Nov-2017 S-17	S17 23-May-2018 S-17	S17 30-Aug-2018 S-17	S17 28-Nov-2018 S-17	S17 20-Jun-2019 S-17	S17 28-Aug-2019 S-17
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	163000	246000	185000	183000	334000	133000	211000	86000
Ammonia, unionized	ug/l	20	2.93	3.96	3.73	0.73	1.89	11.14	0.06	2.28	0.97
Ammonia Nitrogen	ug/l	--	80	60	370	100	60	930	50	160	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<2000	25000	20000	<2000	3000	2000	<2000	4000
Chemical Oxygen Demand	ug/l	--	28000	49000	38000	79000	53000	56000	34000	65000	44000
Chloride	ug/l	--	183000	199000	273000	106000	274000	488000	151000	300000	192000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1104	907	1000	705	1225	1931	351	1256	884
Dissolved Inorganic Carbon	ug/l	--	39200	16000	50700	14800	41400	63000	23800	44800	27300
Dissolved Organic Carbon	ug/l	--	9300	30300	12200	43100	18600	13900	11900	13000	12900
Dissolved Oxygen (Field)	ug/l	-- [7]	8560	10440	**1690**	8240	11540	**1360**	12320	9810	**2950**
Hardness, Calcium Carbonate	ug/l	--	275000	193000	294000	216000	216000	400000	192000	285000	153000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	900	<100	400	1100	100	<100	1200	300	500
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<250 [18]	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	600	900	2400	1300	1100	2800	1000	1400	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.38	8.08	7.42	7.93	7.86	7.55	7.13	7.64	7.49
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	**50**	**490**	**220**	**60**	**510**	**150**	**70**	**150**
Sulphate	ug/l	--	68000	30000	43000	48000	19000	24000	54000	31000	101000
Temperature (Field)	deg c	-- [10]	8.0	25.5	19.7	0.6	21.7	18.0	1.0	17.6	20.1
Total Dissolved Solids	ug/l	--	598000	552000	738000	428000	710000	1090000	438000	770000	548000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	51000	10000	76000	63000	<2000	85000	3000	<2000	43000
Metals											
Arsenic	ug/l	100 [11]	<1	<5 [17]	1	<1	1	2	<1	1	<1
Boron	ug/l	200 [12]	125	141	158	29	33	32	26	32	34
Cadmium	ug/l	0.2 [11]	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	88900	58600	97200	64200	66100	131000	57100	86600	51700
Chromium	ug/l	-- [13]	2	<5 [17]	2	3	<1	5	2	<1	4
Cobalt	ug/l	0.9	0.6	<2.5 [17]	0.6	0.7	<0.5	**1.3**	0.6	0.7	**1.0**
Copper	ug/l	5	3.0	4.5	0.6	3.2	0.9	3.8	3.4	2.1	**6.8**
Iron	ug/l	300	**1130**	**811**	**2200**	**1330**	**738**	**5700**	**489**	**821**	**1550**
Lead	ug/l	-- [14]	1.5	<0.5 [17]	1.3	2.0	0.3	3.8	0.5	0.2	2.5
Magnesium	ug/l	--	13000	11300	12400	13600	12500	17500	11900	16600	5720
Manganese	ug/l	--	149	160	751	120	208	1380	125	484	140
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8600	4450	7590	4760	4340	11500	6310	5900	6120
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	121000	113000	181000	57600	145000	241000	86500	165000	101000
Zinc	ug/l	30 [11]	**42**	<25 [17]	18	24	10	27	21	13	27
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**6**	<1	<1	<1	<1	<1	<1	<1	**4**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S17 21-Nov-2019 S-17	S17 14-May-2020 S-17	S17 26-Aug-2020 S-17	S17 25-Nov-2020 S-17	S17 27-May-2021 S-17	S17 24-Aug-2021 S-17	S17 24-Nov-2021 S-17
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	143000	224000	246000	247000	360000	258000
Ammonia, unionized	ug/l	20	0.21	2.35	1.62	0.31	2.47	0.6	0.21
Ammonia Nitrogen	ug/l	--	50	30	130	70	210	40	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	28000	<2000	4000	<2000	9000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	76000	33000	39000	38000	45000	38000	37000
Chloride	ug/l	--	275000	183000	339000	208000	533000	33000	60000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1499	836	1557	10	2199	1308	1244
Dissolved Inorganic Carbon	ug/l	--	1380	33100	46400	56300	56600	56600	58300
Dissolved Organic Carbon	ug/l	--	17600	16800	10600	12500	13700	13300	10900
Dissolved Oxygen (Field)	ug/l	-- [7]	10230	14450	**0** [36]	10070	6590	286000	9410
Hardness, Calcium Carbonate	ug/l	--	352000	194000	280000	293000	416000	704000	659000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	<100	<100	600	<100	<100	600
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	800	500	1300	600	1100	600	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.67	8.35	7.56	7.72	7.59	7.54	7.56
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	30	**300**	**70**	**90**	20	<10
Sulphate	ug/l	--	104000	48000	106000	69000	99000	376000	357000
Temperature (Field)	deg c	-- [10]	0.9	19.4	18.2	0.3	16.5	21.4	4.4
Total Dissolved Solids	ug/l	--	772000	426000	866000	688000	1300000	962000	826000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	3000	47000	11000	5000	59000	<2000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	1	<1	<1	<1	<1
Boron	ug/l	200 [12]	37	17	73	24	47	103	73
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	104000	59800	89100	88600	127000	221000	214000
Chromium	ug/l	-- [13]	1	1	2	1	1	1	<1
Cobalt	ug/l	0.9	0.6	<0.5	**1.0**	<0.5	0.6	0.6	0.7
Copper	ug/l	5	2.9	1.7	2.3	2.0	1.3	2.6	1.5
Iron	ug/l	300	**391**	**515**	**1660**	**575**	**844**	**841**	227
Lead	ug/l	-- [14]	0.3	0.3	1.3	0.7	0.3	0.5	0.1
Magnesium	ug/l	--	22400	10900	14000	17400	24100	37300	30100
Manganese	ug/l	--	169	158	292	88	438	154	108
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	8110	3620	9020	6720	9390	13700	11400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	152000	88000	201000	119000	300000	33600	45200
Zinc	ug/l	30 [11]	29	8	13	7	<5	13	11
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**9**	<1	**6**	<4 [19]	**5**	<1	**3**

Parameter	Unit	PWQO [1]	S18 16-Nov-2006
General Chemistry			
Alkalinity (Total as CaCO3)	ug/l	-- [5]	145000
Ammonia, unionized	ug/l	20	<10
Ammonia Nitrogen	ug/l	--	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000
Chemical Oxygen Demand	ug/l	--	28000
Chloride	ug/l	--	33400
Conductivity (Field)	uS/cm	--	300
Dissolved Inorganic Carbon	ug/l	--	37700
Dissolved Organic Carbon	ug/l	--	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	6800
Hardness, Calcium Carbonate	ug/l	--	147000
Nitrate as N	ug/l	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	780
pH (Field)	-	6.5 - 8.5	6.9
Phosphorus	ug/l	-- [9]	**40**
Sulphate	ug/l	--	35000
Temperature (Field)	deg c	-- [10]	6.2
Total Dissolved Solids	ug/l	--	262000
Total Suspended Solids	ug/l	--	13000
Metals			
Arsenic	ug/l	100 [11]	<1
Boron	ug/l	200 [12]	177
Cadmium	ug/l	0.2 [11]	<0.5
Calcium	ug/l	--	39000
Chromium	ug/l	-- [13]	**10**
Cobalt	ug/l	0.9	<0.5
Copper	ug/l	5	**37**
Iron	ug/l	300	**880**
Lead	ug/l	-- [14]	0.6
Magnesium	ug/l	--	12000
Manganese	ug/l	--	38
Potassium	ug/l	--	5300
Sodium	ug/l	--	49700
Zinc	ug/l	30 [11]	26
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	<1

Parameter	Unit	PWQO [1]	S19 16-Nov-2006
General Chemistry			
Alkalinity (Total as CaCO3)	ug/l	-- [5]	170000
Ammonia, unionized	ug/l	20	<10
Ammonia Nitrogen	ug/l	--	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000
Chemical Oxygen Demand	ug/l	--	34000
Chloride	ug/l	--	82600
Conductivity (Field)	uS/cm	--	450
Dissolved Inorganic Carbon	ug/l	--	42500
Dissolved Organic Carbon	ug/l	--	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	7930
Hardness, Calcium Carbonate	ug/l	--	197000
Nitrate as N	ug/l	--	1200
Nitrogen, Total Kjeldahl	ug/l	--	960
Phosphorus	ug/l	-- [9]	**200**
Sulphate	ug/l	--	38000
Temperature (Field)	deg c	-- [10]	8.6
Total Dissolved Solids	ug/l	--	379000
Total Suspended Solids	ug/l	--	82000
Metals			
Arsenic	ug/l	100 [11]	<1
Boron	ug/l	200 [12]	38
Cadmium	ug/l	0.2 [11]	<0.5
Calcium	ug/l	--	57100
Chromium	ug/l	-- [13]	8
Cobalt	ug/l	0.9	**1**
Copper	ug/l	5	**42**
Iron	ug/l	300	**1850**
Lead	ug/l	-- [14]	4
Magnesium	ug/l	--	13300
Manganese	ug/l	--	88
Potassium	ug/l	--	4900
Sodium	ug/l	--	73900
Zinc	ug/l	30 [11]	**40**
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	<1

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than PWQO
(1)	Provincial Water Quality Objectives (July 1994, reprinted February 1999)
(2)	Arsenic MRL elevated due to matrix interference.
(3)	TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated
(4)	Sampling location was slightly moved due to ditch alterations.
(5)	Alkalinity should not be decreased by more than 25% of the natural concentration.
(6)	PWQO is for free cyanide in an unfiltered water sample.
(7)	Objective depends on water temperature and biota. Dissolved oxygen concentrations should not be less than the values specified in the PWQO document for cold water biota (e.g. salmonid fish communities) and warm water biota (e.g. centrarchid fish communities).
(8)	Undissociated hydrogen sulphide.
(9)	guidelines which should be supplemented by site-specific studies: To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L; A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to all lakes naturally below this value; Excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L.
(10)	(1) General: The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed. (2) Waste Heat Discharge: (a) Ambient Temperature Changes: The temperature at the edge of a mixing zone shall not exceed the natural ambient water temperature at a representative control location by more than 10°C (18°F). However, in special circumstances, local conditions may require a significantly lower temperature difference than 10°C (18°F). Potential dischargers are to apply to the MOEE for guidance as to the allowable temperature rise for each thermal discharge. This ministry will also specify the nature of the mixing zone and the procedure for the establishment of a representative control location for temperature recording on a case-by-case basis. (b) Discharge Temperature Permitted: The maximum temperature of the receiving body of water, at any point in the thermal plume outside a mixing zone, shall not exceed 30°C (86°F) or the temperature of a representative control location plus 10°C (18°F) or the allowed temperature difference, which ever is the lesser temperature. These maximum temperatures are to be measured on a mean daily basis from continuous records. (c) Taking and Discharging of Cooling Water: Users of cooling water shall meet both the Objectives for temperature outlined above and the "Procedures for the Taking and Discharge of Cooling Water" as outlined in the MOEE publication Deriving Receiving-Water Based, Point-Source Effluent Requirements for Ontario Waters(1994).
(11)	An Interim PWQO also exists for this parameter. See Section 1.10 of the PWQO - Where both a PWQO and an Interim PWQO exist.
(12)	See Section 1.2.3. of PWQO. This Interim PWQO was set for emergency purposes based on the best information readily available. Employ due caution when applying this value.
(13)	PWQO values exist for Cr(III) and Cr(VI)
(14)	If alkalinity as CaCO3 < 20 mg/L, PWQO = 5 µg/L; if alkalinity as CaCO3 from 20 to 40 mg/L, PWQO = 10 µg/L; if alkalinity as CaCO3 from 40 to 80 mg/L, PWQO = 20 µg/L; if alkalinity as CaCO3 > 80 mg/L, PWQO = 25 ug/L. An Interim PWQO also exists for this parameter. See Section 1.10 of the PWQO - Where both a PWQO and an Interim PWQO exist.
(15)	In a filtered water sample.
(16)	Determined by the total reactive phenols test - the 4-AAP (4-amino-antipyrine) test. This objective should be used primarily as a screening tool. The isomer specific PWQOs for various phenolics should be employed where possible.
(17)	INOG12 Water sample required digestion for Total metals analysis, which resulted in elevated detection limits.
(18)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(19)	GEN02 Elevated Reporting Limit due to matrix interference.
(20)	Monitoring location was dry during this sampling event. No sample was collected.
(21)	Metals analysis performed on aqua-regia digest of sample material except for Boron.
(22)	Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.
(23)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

(24) Nitrite/Nitrate: Due to the colour interferences, some sample required dilution. Detection limits were adjusted accordingly.
(25) Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(26) BOD01 Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(27) Metals analysis performed on aqua-regia digest of sample material.
(28) TP MRL elevated due to matrix interference.
(29) Arsenic and TP MRL elevated due to matrix interference.
(30) Metals analysis performed on aqua-regia digest of sample material, except for Boron. Phenols MRL elevated due to matrix interference
(31) Metals analysis performed on aqua-regia digest of sample material except for Boron.
(32) Phenols MRL elevated due to matrix interference.
(33) GEN09 Elevated detection limits due to the nature of the sample matrix.
(34) TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material.
(35) Insufficient water at monitoring location to sample. No sample was collected.
(36) Parameter was not measured.
(37) Monitoring location was stagnant during sampling event. No sample was collected.
(38) Monitoring location was frozen during this sampling event. No sample was collected.
(39) Insufficient sample volume was collected for analysis.
(40) At pH 4.5 to 5.5 the Interim PWQO is 15 µg/L based on inorganic monomeric aluminum measure in clay-free samples; At pH > 5.5 to 6.5, no condition should be permitted which would increase the acid soluble inorganic aluminum concentration in clay-free samples to more than 10% above natural background concentrations for waters representative of that geological area of the Province that are unaffected by man-made inputs. At pH > 6.5 to 9.0, the Interim PWQO is 75 µg/L based on total aluminum measured in clay-free samples. If natural background aluminum concentrations in water bodies unaffected by man-made inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level. Note: pH values of < 6.5 and > 8.5 are outside the range considered acceptable by the PWQO for pH. See the Scientific Criteria Document for Development of Provincial Water Quality Objectives and Guidelines - Aluminum for a discussion of analytical procedures.
(41) Metals analysis performed on aqua-regia digest of sample material, except for Boron.
(42) TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated

Ontario

Ministry of the Environment, Conservation and Parks

Freedom of Information Request for Property Information

Instructions

Use this form to:

- submit and pay for a new FOI request for access to records/information about a property
- pay for a deposit or a final fee on an existing FOI request

Fields marked with an asterisk (*) are mandatory.

Are you: *

☑ Submitting a new FOI Request for Property Information

☐ Paying a deposit or final fee for an existing FOI Request for Property Information

Section 1 – Description of Records Requested

Time Period for Records Requested

From (yyyy/mm/dd) * 2019/01/01

To (yyyy/mm/dd) * 2022/12/07

Type of Record(s) *

☐ All environmental records relating to the identified property/site exclusive of Environmental Approvals and Registrations

☐ Environmental Approvals and Registrations (e.g. Environmental Compliance Approvals; Certificate of Approval; Renewable Energy Approvals; Environmental Activity and Sector Registry Registrations)

Select only if you are seeking access to an Approval or Registration that is not publicly available or if you are also seeking supporting documents relating to the Approval or Registration.

Operator and vendor Pesticide Licenses from September 4, 2018, final Approvals and Registrations are publicly available on the Access Environment website at:
https://www.accessenvironment.ene.gov.on.ca/AEWeb/ae/GoSearch.action?search=basic&lang=en.

Records of Site Condition (RSC) records are publicly available on the Brownfields Environmental Site Registry (BSER).

- RSC records between 2004 to June 30, 2011 are available at: https://www.lrcsde.lrc.gov.on.ca/besrWebPublic/generalSearch
- RSC records filed after July 2011 are available at: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/earchFiledRsc_search?request_locale=en

☑ Other Specific Document(s)

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Specific Documents

List of Documents. Please list the specific documents you are asking for and be as detailed as possible in your description. *

Waste Connections of Canada Ottawa (Navan Road) Landfill Monitoring and Operating Report (Most Recent). This report would include on and off-site monitoring of groundwater and surface water quality on the landfill and neighboring properties. The report would have been completed by a third party consultant.

List any record(s) that should be excluded from the scope of your request (e.g. email correspondences; records originating from your organization/business; records already in your possession, prior year(s) annual reports for approvals)

Please provide the most recent annual monitoring report for the above mentioned landfill.

Please provide any additional relevant information relating to your request. For example, does your request relate to any other ministry business? Please note that this information is being requested only in order to provide contextual information to the Access and Privacy Office and will not in any way affect or expedite the status of any related ministry business identified.

Section 2 – Requester Information

Last Name * | First Name * | Middle Initial

Berube | Samuel |

Business/Organization Name (if applicable or indicate “N/A”) *

Paterson Group Inc.

Project/Reference Number (if applicable)

PE4588

Are you submitting this request on behalf of a client? *

☐ Yes ☑ No

Mailing Address

Unit Number | Street Number * | Street Name *

| 9 | Auriga Drive

PO Box | City/Town * | Province * | Postal Code *

| Ottawa | ON | K2E 7T9

Telephone Number * | ext. | Email Address *

613-226-7381 | | sberube@patersongroup.ca

Is there an alternate contact (e.g. office admin)? *

☐ Yes ☑ No

Section 3 – Current Property Address Information

Is the property a:

☐ Park ☐ Lake ☐ First Nation Band ☐ Wind Farm ☐ Federal Land ☐ Island ☐ Unsurveyed Land

Are you requesting information about multiple addresses? *

☐ Yes ☑ No

Property Address

Unit Number | Street Number | Street Name

3354 | Navan Road

Full Lot Number | Concession | Geographic Township

City/Town/Village *

Ottawa

Closest Intersection

Section 4 – Previous Property Address Information

Do you want the ministry to search all prior historical addresses for this property/site for the time period of the records requested? *

☐ Yes ☑ No

Section 5 – Supporting Documents

Please upload any documents (e.g. Maps) that are relevant to your FOI request.

The total size of all attachments must not be more than 8 MB.

1. File Name

   Total File Size

Payment confirmation number: 24900013

GOLDER

REPORT

2019 Landfill Monitoring

Waste Connections of Canada
Navan Waste Recycling and Disposal Facility
Ottawa, Ontario

Submitted to:

Waste Connections of Canada
Waste Connections of Canada
3354 Navan Road
Ottawa, Ontario
K4B 1H9

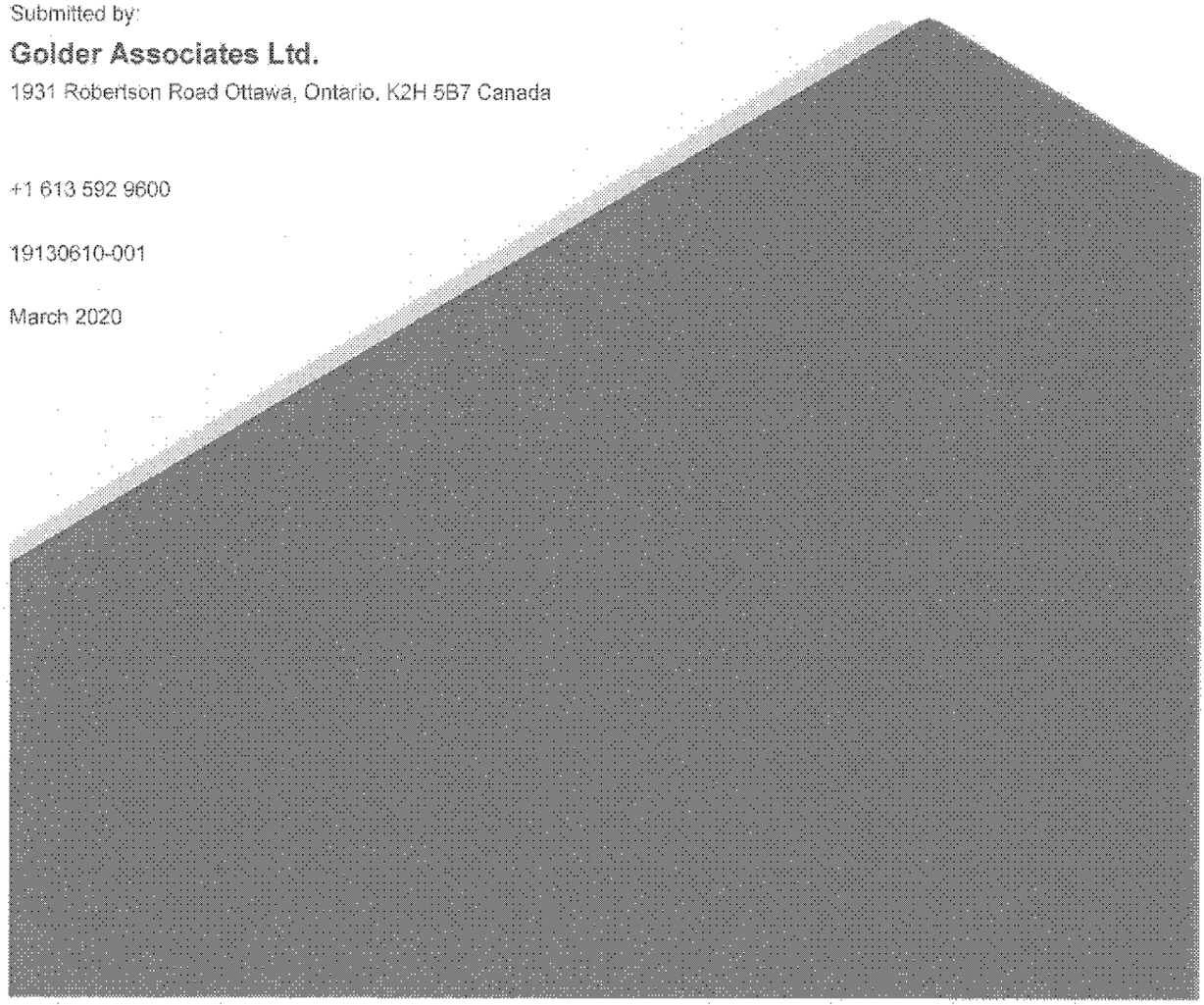
Submitted by:

Golder Associates Ltd.
1931 Robertson Road Ottawa, Ontario, K2H 5B7 Canada

+1 613 592 9600

19130610-001

March 2020



Appendix D-Monitoring and Screening Checklist
General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.

Instructions: A complete checklist consists of:

(a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.

(b) completed contact information for the Competent Environmental Practitioner (CEP)

(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

(a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or

(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

Definition of Surface water CEP:

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site (WDS) Name	Navan Waste Recycling and Disposal Facility
Location (e.g. street address, lot, concession)	3354 Navan Road. Parts of Lots 2, 3 and 4, Concession IV
GPS Location (taken within the property boundary at front gate/ front entry)	460569.6m E 5030570.0m N (Zone 18)
Municipality	City of Ottawa (formerly City of Gloucester)
Client and/or Site Owner	Waste Connections of Canada
Monitoring Period (Year)	2019
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval (ECA) Number (formerly "Certificate of Approval" (C of A)) :	No. A460702
Director's Order No.:	N/A
Provincial Officer's Order No.:	N/A

Other:	N/A		
Report Submission Frequency	(•) **Annual** ( ) **Other**	Due March 31	
The site is: **(Operation Status)**	(•) **Open** ( ) **Inactive** ( ) **Closed**		
Is there an active waste transfer station at the site?	( ) **Yes** (•) **No**		
Does this WDS have a Closure Plan?	(•) **Not yet submitted** ( ) **Submitted and under review** ( ) **Submitted and approved**		
Total Approved Capacity	7,600,000 (excl. final cover)	*Units*	Cubic Metres
Maximum Approved Fill Rate	1,500	*Units*	Tonnes per Day
Total Waste Received within Monitoring Period (Year)	222,976	*Units*	Tonnes
Total Waste Received within Monitoring Period (Year) *Describe the methodology used to determine this quantity*	Weighed		
Estimated Remaining Capacity	1,896,722	*Units*	Cubic Metres
Estimated Remaining Capacity *Describe the methodology used to determine this quantity*	Estimation		
Estimated Remaining Capacity *Date Last Determined*	1-Jan-2020		
Non-Hazardous Approved Waste Types	[X] Domestic [X] Industrial, Commercial & Institutional (IC&I) [ ] Source Separated Organics (Green Bin) [ ] Tires	[X] Contaminated Soil [X] Wood Waste [ ] Blue Box Material [ ] Processed Organics [ ] Leaf and Yard Waste	[ ] Food Processing/Preparation Operations Waste [ ] Hauled Sewage Other: Asbestos waste. Petruscible waste are not accepted for landfilling.
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*	None		

Year Site Opened *(enter the Calendar Year only)*	1960	**Current ECA Issue Date**	April 16, 2009, not incl. notices
Is your Site required to submit Financial Assurance?		◉ **Yes** ○ **No**	
Describe how your WDS is designed.		○ Natural Attenuation only ◉ Fully engineered Facility ○ Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		○ **Yes** ◉ **No**	
If closed, specify ECA, control or authorizing document closure date:		N/A	
Has the nature of the operations at the site changed during this monitoring period?		○ **Yes** ◉ **No**	
If yes, provide details:			

Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)	○ Yes ◉ No

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) **The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:**	◉ **Yes** ○ **No**	
2) **All groundwater, leachate and landfill gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by ECA or other relevant authorizing/ control document(s):**	○ **Yes** ◉ **No** ○ **Not Applicable**	If no, list exceptions below or attach information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
94-2 and 94-5	Monitoring wells 94-2 and 94-5 were inadvertently excluded during the June 2019 monitoring session.	
MW09-1A, 1B, 1C, and 1D	Those groundwater monitoring locations were not sampled during the winter of 2020 due to historical conditions of frozen water in the monitoring wells. Instead, they were monitored in November 2019. MW09-1A was frozen at the time and no sample was collected at this location.	

3) a) Some or all groundwater, leachate and landfill gas sampling and monitoring requirements have been established or defined outside of a ministry ECA, authorizing, or control document, *or Ministry concurrence.*	○ Yes ◉ No ○ Not Applicable	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	○ Yes ○ No ◉ Not Applicable	If no, list exceptions below or attach additional information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

4) **All field work for groundwater investigations was done in accordance with Standard Operating Procedures (SOP) as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):**	○ Yes ◉ No	Golder Associates Ltd. standard practices were followed as described in the report.
Sampling and Monitoring Program Results/WDS Conditions and Assessment:		
5) **The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/ or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.**	◉ Yes ○ No	
6) **The site meets compliance and assessment criteria.**	○ Yes ◉ No	In 2019, only one trigger exceedance of the background range was reported: it was for magnesium at MW92-10, in the weathered clay stratigraphic unit. No other continued increase in concentration for other parameters beyond the background range was reported in 2019 in the sand stratigraphic unit or the weathered clay stratigraphic unit.
7) **The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.**	○ Yes ◉ No	Exceedances of background range were reported at many downgradient monitoring wells for several parameters in 2019. Additional data in the intact clay and glacial till/upper bedrock units to be collected in 2020 is needed to evaluate trends in leachate indicator parameters concentrations in these units.

1) Is one or more of the following risk reduction practices in place at the site: *(a)* There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or *(b)* There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or *(c)* The site meets the following two conditions (typically achieved after 15 years or longer of site operation): *i.*The site has developed stable leachate mound(s) and stable leachate plume geometry/ concentrations; and *ii.*Seasonal and annual water levels and water quality fluctuations are well understood.	◉ Yes ○ No	Note which practice(s):	☒ (a) ☒ (b) ☐ (c)
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	◉ Yes ○ No ○ Not Applicable	In 2019, only one trigger exceedance of the background range was reported: it was for magnesium at MW92-10, in the weather clay unit. The MECP was informed of this exceedance. WCC intends to maintain low leachate level in the landfill and be proactive in maintaining the leachate forcemain. A spare leachate pump was acquired in 2019 as a contingency.	

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

○ **No changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/ are recommended:**	Due to on-going inability to collect water samples in monitoring wells MW09-1A through D located in Mer Bleue because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer). It is also proposed to remove VOCs from the list of parameters of the groundwater monitoring program as well as discontinue sediment monitoring (see rationale in Section 9.0).
◉ **No Changes to site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/are recommended:**	
Name:	Trish Edmond, M.E.Sc., P.Eng.
Seal:	Add Image

Signature:		**Date:**	11-Mar-2019
CEP Contact Information:			
Company:	Golder Associates Ltd.		
Address:	1931 Robertson Road, Ottawa, Ontario, K2H 5B7		
Telephone No.:	613-592-9600	Fax No. :	613-592-9601
E-mail Address:	Trish_Edmond@golder.com		
Co-signers for additional expertise provided:			
Signature:		**Date:**	Select Date
Signature:		**Date:**	Select Date

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):	
Name (s)	See Attachment A.

Distance(s)	N/A

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	(•) **Yes** ( ) **No**	
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the ECA or relevant authorizing/control document(s) (if applicable):	(•) **Yes** ( ) **No** ( ) **Not applicable**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry ECA or authorizing/control document *or Ministry concurrence.*	( ) **Yes** (•) **No** ( ) **Not Applicable**	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:	( ) **Yes** ( ) **No** (•) **Not Applicable**	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

) All field work for surface water investigations was done in accordance with SOP, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	◯ Yes ◉ No	Golder Associates Ltd. standard practices were followed as described in the report.

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):	◉ Yes ◯ No

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table on the following page or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. ECA limit, PWQO, background	e.g. X% above PWQO
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	(•) **Yes** ( ) **No**	There are no exceedances as there is no surface water-related compliance criteria (see question 7).

7) **All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.**	(•) **Yes** ( ) **No**	The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility. The MECP has agreed that this is the preferred approach for the WCC Navan Facility.
8) **For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g. , PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):**	( ) Yes ( ) No ( ) Not Known (•) Not Applicable	
9) **Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):**	( ) **Yes** ( ) **No** (•) **Not Applicable**	

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

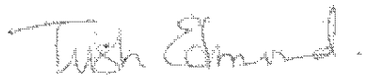
I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement*, the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

(•) No Changes to the monitoring program are recommended	
( ) The following change(s) to the monitoring program is/are recommended:	
(•) No changes to the site design and operation are recommended	
( ) The following change(s) to the site design and operation is/ are recommended:	

CEP Signature	
Relevant Discipline	P.Eng. with demonstrated relevant experience.
Date:	11-Mar-2019
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Telephone No.:	613-592-9600
Fax No. :	613-592-9601
E-mail Address:	Trish_Edmond@golder.com

Save As | Print Form

Attachment A

In the event that leachate-impacted water was to reach either stormwater management ponds or ditches on the site, the source of the impact would be determined and then intercepted, as required. If necessary, the affected pond and/or ditches could then be emptied through a temporary pumping operation and the pumped water could be combined with the leachate and directed for off-site treatment. Therefore, there are no surface water bodies potentially receiving waste disposal site effluent.

Distribution List

10 copies	Waste Connections of Canada
1 copy	National Capital Commission
1 e-copy	Golder Associates Ltd.

Executive Summary

This report serves as the annual environmental monitoring portion of the 2019 site operations and monitoring report and presents the results of groundwater, surface water, leachate and sediment monitoring activities carried out during 2019 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility). This report has been prepared to fulfill the reporting requirements outlined in Conditions 135 and 136 of Environmental Compliance Approval (ECA) No. A460702.

The following executive summary highlights key points only; for complete information and findings it is necessary for the reader to examine the complete report.

Based on the groundwater levels obtained during the 2019 monitoring program, no significant change in groundwater flow patterns has been observed.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (un-weathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present up-gradient, at the down-gradient edge (used to assess compliance) and further down-gradient of the landfill in each of these units.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2018 background range.

Leachate quality monitoring results for 2019 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Trigger concentrations exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

In 2019, only one trigger exceedance of the background range was reported: it was for magnesium at MW92-10, in the weathered clay stratigraphic unit. No other continued increase in concentration for other parameters beyond the background range was reported in 2019 in the sand stratigraphic unit or the weathered clay stratigraphic unit, due to stabilizing or decreasing concentrations following WCC actions.

In a continuing effort to achieve a drained state in the leachate collection system, WCC intends to proactively maintain the forcemain in good working condition and acquired in 2019 a spare leachate pump to reduce down time when a pump requires servicing. Discharge pumps were already upgraded in the fall of 2011 from 20 horsepower to 35 horsepower in an effort to achieve and maintain a discharge of 17 litres per second. Treatment modifications were commissioned in 2012, increasing pumping capability, which resulted in the ability to maintain the leachate collection system in as much a drained state as possible and to better manage the peak discharge periods. A similar course of action is proposed to be followed in 2020.

Results from the upcoming spring 2020 monitoring session will be analyzed to determine if the effect of these actions are detected in groundwater quality with a decrease in concentrations of Leachate Indicator Parameters at trigger locations, including in the intact clay and glacial till/upper bedrock units. At that point, the need for a formal contingency plan will be assessed in collaboration with the MECP.

The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

The proposed 2020 Environmental Monitoring Program is the same as was conducted in 2019, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (see Section 9.0). As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as has been done between 2014 and 2018 (due to dry conditions in the summer of 2019, they were sampled in the fall where possible).

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the November 2018 monitoring session and will be monitored again in the spring of 2020.

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1.0 INTRODUCTION

This report serves as the 2019 annual monitoring report and presents the results of monitoring activities carried out during 2019 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility).

The WCC Navan Facility is a 91.87 hectare (ha) waste management facility that includes a 40 ha landfill, as well as processing (recycling). The site is located on parts of Lots 2, 3 and 4, of Concession IV, Ottawa Front in the City of Ottawa (formerly the city of Gloucester), Ontario (see Key Plan, Figure 1). This site has been in operation since 1960 and operates under Environmental Compliance Approval (ECA) No. A460702. In April 2009, WCC received *Environmental Protection Act* approval for the expansion of the WCC Navan Facility.

The monitoring program undertaken in 2019 by Golder Associates Ltd. (Golder) is outlined in Tables 1a through 1c. Monitoring to date at the WCC Navan Facility consists of water quality analysis of surface water, groundwater and leachate. The 2019 monitoring program was a continuation of the monitoring program carried out in 2018 and followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and Condition 10.1 of the Conditions of Environmental Assessment Approval. As per Condition 109 of ECA No. A460702, the monitoring program includes sampling of the monitoring wells located in BH09-1, in order to assess the groundwater quality in the Mer Bleue Bog. The original monitoring program indicated that the wells would be sampled during the winter, when the Mer Bleue Bog is frozen and the wells are accessible. However, the groundwater in the monitoring wells has frequently been frozen during these events. In the 2013 monitoring report (Golder, 2014), it was proposed to sample them during the summer, rather than winter, and this recommendation has carried forward to present. Due to dry conditions in the vicinity of the Mer Bleue Bog, groundwater samples were instead successfully collected at monitoring well MW09-1B, MW09-C, and MW09-D on November 14, 2019 (no sample was collected from monitoring well MW09-1A in November due to frozen conditions).

In addition, sediment quality monitoring which started in 2000 at the request of the National Capital Commission (NCC) at three locations within the Mer Bleue Bog is also documented in this report. Results of landfill gas, noise and odour monitoring undertaken in 2019 are provided under separate covers in Attachments 2 and 3.

A site inspection was conducted by the MECP at the site on September 12, 2019. No non-compliance issues were identified at the time of the inspection. A copy of the inspection report is provided in Appendix H.

2.0 FIELD PROCEDURES

2.1 Objectives

The objectives of the 2019 water quality monitoring program were:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

2.2 Environmental Monitoring Program

2.2.1 Groundwater Component

The 2019 groundwater monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and satisfies objectives listed above. Water quality monitoring at the WCC Navan Facility was initiated in 1981. Since 1991, semi-annual monitoring programs were undertaken. Observation wells were added in 1992, 1994, 1995, 1998, 2000, 2005, 2007, 2009, 2010 and 2011. Groundwater monitoring sessions were carried out on June 19 and November 20-21, 2019. The groundwater monitors are outlined in Tables 1a, 1b and 1c and illustrated on the Site Plan (Figure 2). Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected in November 2018. The monitoring wells screened in the intact clay deposit and in the glacial till/upper bedrock zone will be sampled again in the spring of 2020.

The approved groundwater monitoring program was followed, except that as discussed in Section 1.0, groundwater monitoring locations BH09-1A, BH09-1B, BH09-1C and BH09-1D were not sampled during the winter of 2020 due to historical conditions of frozen water in the monitoring wells. Due to dry conditions in the summer, monitoring wells BH09-1B, BH09-1C, and BH09-1D were sampled instead during the fall session on November 21, 2019 (monitoring well BH09-1A was frozen and therefore no sample could be collected at the time). In addition, monitoring wells OW-94-2 and OW-94-5 were inadvertently confused with two other wells that were not part of the monitoring program and no samples were collected in the spring at these locations.

Detailed logs of the subsurface conditions encountered in each borehole are provided on the Record of Borehole sheets in Appendix A for most of the groundwater monitors included in the 2019 groundwater monitoring program. The top of pipe and ground surface elevations at each groundwater monitor location were surveyed with reference to geodetic datum following completion of the corresponding borehole drilling and groundwater installation program. The top of pipe for each of the monitoring wells included in the groundwater monitoring program were re-surveyed by WCC during November 2011 to account for any movement of the monitors over time.

The groundwater levels in the monitors included in the sampling sessions were measured on June 13, 2019 and November 14, 2019.

All monitors sampled during 2019 were developed through the removal of at least one standing volume of water using dedicated samplers which have been provided in each groundwater monitor. Sampling of groundwater was generally performed one week after monitor development, because the wells recover slowly.

As part of the Quality Assurance/Quality Control (QA/QC) program, a total of 3 field groundwater samples duplicates were prepared (2 in the spring and 1 in the fall) along with one field blank and one trip blank prepared during the fall sampling session.

The temperature, pH and electrical conductivity of the groundwater samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private certified analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol provided below was followed for the groundwater samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
total dissolved solids (TDS), alkalinity, sulphate, nitrate, nitrite, chloride, bicarbonate, carbonate, hardness (calcium and magnesium), potassium and sodium	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with sodium bisulphate

Notes: * Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.

Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario performed all laboratory chemical and physical analyses on the groundwater samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The reportable detection limits (RDLs) for the specific groundwater analyses were generally commensurate with the standards established in the Ontario Drinking Water Quality Standards, Objectives and Guidelines (referred to as ODWQS, MOE, 2006, revised January 1, 2018).

2.2.2 Leachate Component

The leachate monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702. Leachate quality analysis was undertaken on samples obtained from the pump station (L5) during the June 20, August 28 and November 21 monitoring sessions as outlined in Tables 1a through 1c. The location of the leachate monitor is illustrated on the Site Plan (Figure 2).

As part of the QA/QC program, one field blank and one trip blank for the volatile organic compounds (VOCs) was prepared during the August sampling session.

The temperature, pH, electrical conductivity and dissolved oxygen of the collected leachate samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All leachate samples were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2.

The sample preparation and preservation protocol outlined below was followed for the leachate samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, total suspended solids (TSS), biochemical oxygen demand (BOD), hardness (calcium and magnesium), potassium and sodium	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)**, dissolved organic carbon (DOC)	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with sodium bisulphate

Notes:
* Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.
** Dissolved inorganic carbon (DIC) calculated based on laboratory dissolved organic carbon (DOC) and total dissolved carbon

Paracel performed all laboratory chemical and physical analyses on the leachate samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific leachate analyses were commensurate with the standards established in the ODWQS (MOE, 2006, revised January 1, 2018).

2.2.3 Surface Water

The 2019 surface water monitoring program followed the program outlined in Condition 109 of ECA No. A460702. The 2019 surface water monitoring program is outlined in Tables 1a through 1c and monitoring stations are illustrated on Figure 2. Surface water samples were obtained on June 20, August 28, and November 21, 2019.

The only deviations from the approved surface water monitoring program were due to dry or stagnant conditions. Surface water monitoring stations S5, S8, S9, S10, and S11 were not sampled in August 2019 and station S5 in June and November 2019.

The estimation of surface water flow was obtained concurrently with surface water sampling on June 20, August 28 and November 21, 2019.

One field duplicate was prepared during the June and November sampling sessions as part of the QA/QC program.

The temperature, pH, electrical conductivity and dissolved oxygen of the surface water samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The same preparation and preservation protocol below was followed for each of the surface water samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese and zinc	plastic bottle, unfiltered and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, TSS, BOD, dissolved organic carbon (DOC), hardness (calcium and magnesium), potassium and sodium	plastic bottle, unfiltered and unpreserved
ammonia*, total phosphorus, phenols, COD and TKN	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)	amber glass bottle, unfiltered and unpreserved

Notes: * Unionized ammonia calculated based on laboratory ammonia concentration, field temperature and pH measurements.

Paracel performed all laboratory chemical and physical analyses on the surface water samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific surface water analyses were generally commensurate with the standards established in the Provincial Water Quality Objectives (referred to as PWQO, MOE, 1994, reprinted 1999).

2.3 Sediments

Sediment quality was monitored at three locations within the Mer Bleue Bog. The sampling locations are the same as the surface water sampling stations located within the bog, i.e., SED-W was obtained at SW-W, SED-C at SW-C and SED-E at SW-E (refer to Figure 2). Sediment quality monitoring in the Mer Bleue Bog was added to the monitoring program in 2000 and sediment samples were obtained in 2019 at three locations on June 20 and November 21.

All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol outlined below was followed for the sediment samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium and zinc	glass jar, with a plastic lid

Paracel performed all laboratory chemical and physical analyses on the sediment samples. The Report of Analyses sheets from Paracel are provided in Appendix B.

2.4 Status of Monitoring Well Network

During the spring monitoring session, the condition of each well within the monitoring well network at the site was assessed. A summary of the findings of the 2019 monitoring well network condition survey (properly cased, capped and locked) are provided in Table 3. At the time of the condition survey it was observed that all monitoring wells were in good condition noting that MW05-1D could use some new tubing.

3.0 WATER LEVEL DATA

3.1 Groundwater Levels

Records of monitoring well water elevations obtained in June and November 2019 are provided in Tables C-1 and C-2, Appendix C and are shown graphically on Figures C1 through C10. Water level changes for 2019 are discussed in the following sub-sections. It should be noted that all of the monitoring wells were resurveyed in 2011 which resulted in an increase in water elevations at some locations. This is a reflection of the more accurate survey data and does not necessarily reflect changes in the groundwater elevations.

3.1.1 Up-Gradient Control Wells

The results of water levels measured at the up-gradient wells are shown graphically on Figure C1 through Figure C4 in Appendix C. There are no significant changes indicated in groundwater levels measured at these locations. The results indicate the shallow water table to be typically located approximately 1 to 2 metres (m) below ground surface at up-gradient wells OW-92-12 to OW-92-19 and MW05-1A to MW05-1D. The unusually elevated ground water level recorded in November 2017 at monitoring location OW-92-15, returned to levels similar historical levels during the 2018 monitoring program. There are only small fluctuations in water levels indicated for recent years.

Hydraulic head profiles for monitoring wells OW-92-12 to OW-92-19 for June and November 2019 are shown on Figure 3 illustrating a downward hydraulic gradient. The only variation in the direction of the hydraulic gradient is indicated in the upper 5.6 m to 10.4 m below ground surface in the spring and fall, from a downward gradient to an upward gradient in the weathered clay. This result may be attributed to a perched water table at the interface of the weathered clay and the intact clay. The relatively weak downward gradient from the sand to the weathered clay suggests a hydraulic interconnection between these units. The downward gradient is quite pronounced from the weathered clay down to the lower reaches of the intact clay deposit. It is interpreted that the intact clay deposit at depth beneath the landfill site acts as a barrier to groundwater flow.

3.1.2 Immediate Down-Gradient Wells and Wells in Line with Immediate Down-Gradient Wells

The results of the water levels measured at the large down-gradient nest of observation wells (OW-92-1 to OW-92-8 and MW05-8) are shown graphically on Figure C5 provided in Appendix C. These results indicate the shallow groundwater table lies within the sand deposit close to the original ground surface ranging in elevation from about 68.58 m to 71.46 m. Similar results are indicated at observation wells OW-92-9 to OW-92-11 and MW05-11 as well as OW-94-1 to OW-94-3 and MW05-R3 as shown graphically on Figures C6 and C7, respectively. Seasonal variations of nearly 1 m have previously been indicated. The high water levels generally occur during the wet spring whereas the lower water levels are recorded during the dry summer months and fall. Similar trends were observed in 2019 at most wells, with the higher spring elevations being more pronounced in the spring of 2019 (although not as much as in 2018).

Hydraulic head profiles for the nest of observation wells OW-92-1 to OW-92-8 are presented on Figure 3. Unlike the up-gradient groundwater level profiles, the down-gradient profiles historically have indicated a slight upward vertical gradient and a localized weak downward gradient observed at times between the upper 6.3 m to 7.6 m within the weathered clay. Similarly to 2018, a slight downward gradient is observed from the sand to the weathered clay in 2019. The upper four wells historically have appeared to be hydraulically connected with near vertical or hydrostatic water level profiles. A slight upward gradient from the bedrock to the weathered clay at the down-gradient boundary of the landfill would suggest there is upward vertical flow at this location, which would retard the potential for leachate migration into the deeper groundwater system. In the spring of 2019, there was near vertical or a hydrostatic water level profile between the bedrock and weathered clay.

3.1.3 Mer Bleue/Down-Gradient Control Wells

Water levels obtained at the down-gradient control wells are shown graphically on Figures C8, C9 and C10 in Appendix C. These results indicate artesian conditions at OW-94-4 to OW-94-6, OW-95-5 to OW-95-7 and OW-95-9, while at OW-95-1 to OW-95-3, the shallow groundwater table is close to the ground surface within the upper sand, weathered and intact clay. The water level measured at monitoring well OW-94-4 in November 2019 was lower than recent historical data (by 0.42 m), but similar to water levels typically measured in this monitor prior to 2012.

Hydraulic head profiles for the nest of observation wells OW-95-5 to 95-7 and OW-95-9, as shown on Figure 3, illustrate an upward gradient through most of the profile with a weak downward gradient from the sand to the weathered clay. It is noted that no water level could be recorded at OW-95-9 in November 2019 due to frozen conditions. Historically, there has been an upward gradient through the entire profile. The presence of an upward gradient suggests upward groundwater flow is occurring south of the landfill. These results may also suggest upward leaching of porewater from the Champlain Sea clay, a brackish water deposit, may be occurring at the southern boundary of the landfill. North of the landfill, downward leaching of the clay porewater is indicated.

3.1.4 Horizontal Hydraulic Gradients

The horizontal hydraulic gradient in the shallow sand deposit and weathered clay at this site is consistent with the relief of the property which changes in elevation by approximately 15 m to 18 m between the up-gradient and down-gradient boundaries of the landfill. Since the shallow water table appears to be a reflection of the original surface topography, horizontal hydraulic gradients are expected to vary between 0.007 in the plateau above the escarpment and 0.014 in the valley below. Water levels measured south of the landfill indicate shallow groundwater is flowing in a south to southwest direction with a small hydraulic gradient ranging between 0.005 and 0.025. The horizontal gradients in the bog area are influenced by seasonal fluctuations in the surface water levels. Hydraulic gradients could also be influenced by the leachate collection system (LCS) located along the south toe of the landfill. Keeping the LCS drained could result in a lowering of the water table at the southeast corner of the landfill by more than 3 m below the original grade at the southeast corner of the landfill and by 2 m at the southwest corner. This water table lowering could significantly influence the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient side of the LCS was constructed to alleviate any potential problems related to lowering of the groundwater table south of the landfill.

Water levels measured in the up-gradient and down-gradient deep wells (OW-92-12 and OW-95-9) indicate a typical difference in water levels of about 6 m, which represents a hydraulic gradient of approximately 0.01 (0.007 in spring 2019) across the site within the glacial till/upper bedrock.

Many factors, such as mounding within the waste pile, the installation of the leachate collection system and the construction of waste cells with under drainage will influence the rate of groundwater flow across the site.

3.2 Surface Water Flow Measurements

Estimates of surface water flow measurements for 2019 are summarised below along with the historical minimum and maximum flow rates estimated at each monitoring station.

Monitoring Station	Minimum Flow L/s	Maximum Flow L/s	Expected Dry Weather Flow L/s	Estimated Flow June 20, 2019 L/s	Estimated Flow Aug. 28, 2019 L/s	Estimated Flow Nov. 21, 2019 L/s
S-1	No flow	73	0.5 – 2	0.5	0.9	0.9
S-3	No flow	140	<0.5	0.3	No flow	No flow
S-5	No flow	No flow	No flow	Dry	Dry	Dry
S-8	No flow	5 – 10	0.5 – 2	No flow	Dry	No flow
S-9	No flow	94	2 – 5	3.3	Dry	Flow[b]
S-10 (SW-W)[a]	No flow	No flow	No flow	No flow	Dry	No flow
S-11 (SW-C)[a]	No flow	No flow	No flow	No flow	Dry	No flow
S-12 (SW-E)[a]	No flow	No flow	No flow	No flow	No flow	No flow
S-15	No flow	120	0.3 – 2	2.5	1.4	1.0
S-16	No flow	56	No flow	8.3	No flow	No flow
S-17	No flow	44	0.5 – 2	2.3	0.6	2.0

Notes:
[a] Monitoring stations S-10 (SW-W), S-11 (SW-C) and S-12 (SW-E) are located at the northern edge of the Mer Bleue Bog and consist of stagnant bog water.
[b] Flow was observed to be present at surface water monitoring station S-9 during the fall monitoring session but could not be measured due to the presence of ice.

Input: ETB
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4.0 GROUNDWATER QUALITY ASSESSMENT

Groundwater has been monitored at observation wells since 1981. However, since 1985, landfilling operations expanded over the original down-gradient observation wells which have since been replaced with the existing wells. Existing observation wells were installed in 1992, 1994, 1995, 1998, 2005, 2007, 2009, 2010 and 2011.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as follows:

- a shallow surface sand layer at depths ranging from 1.5 to 2.5 m below original grade
- the weathered clay zone of a thick clay deposit at depths ranging from 3.5 to 4.5 m below original grade
- the intact clay deposit at depths ranging from 7 to 8 m below original grade
- glacial till/bedrock contact zone at depths ranging from 22.3 to 37.1 m below original grade

The two upper stratigraphic units, the sand and weathered clay units, were sampled for both the June and November monitoring events. The two lower stratigraphic units, the intact clay and near bedrock units, are sampled every 18 months. Groundwater samples from these units were collected in November 2018 and the next sampling session for the monitoring wells screened in these units will be in the spring of 2020. The observation wells monitored in 2019 are listed in Tables 1a, 1b and 1c and illustrated on Figure 2.

As previously discussed, Condition 109 of the ECA requires groundwater monitoring locations MW09-1A, MW09-1B, MW09-1C and MW09-1D to be sampled once per year. Due to expected frozen conditions in the winter, MW09-1A, MW09-1B, MW09-1C and MW09-D have been monitored during the summer sessions starting in 2014. Due to dry conditions in the summer of 2019, these monitoring wells were monitored during the fall session instead. As indicated earlier, due to frozen conditions, no sample could be collected from monitoring well MW09-1A in November 2019. Data from these wells is being collected to assess the groundwater quality in the area of the Mer Bleue as part of the expansion of the landfill.

Current and historical analytical results for groundwater in all units are presented in Appendix D.

4.1 Quality Assurance/Quality Control

The 2019 QA/QC protocol included the following: (i) preparation of one laboratory trip blank and one field blank for the November 2019 monitoring session to be analyzed for VOCs; (ii) the collection and analysis of two blind groundwater sample duplicates for the June 2019 sampling session and (iii) one blind groundwater sample duplicate for the November 2019 sampling session. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the relative percent difference (RPD) between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All QA/QC results for groundwater were within acceptable tolerance limits during the June 2019 monitoring session, except for the potassium concentration in the sample collected from MW-05-1D (identified as 05-1D in the laboratory report) and its duplicate (identified as Dupe-2 in the laboratory report). The sample collected at MW-05-1D in June 2019 and its duplicate had potassium concentrations consistent with historical results.

One blind groundwater sample duplicate was analyzed during the November 2019 session. All QA/QC results for groundwater were within acceptable tolerance limits during the November 2019 monitoring session except for the copper concentration in the sample collected from MW-95-8 (identified as 95-8 in the laboratory report) and its duplicated (identified as Dupe-3 in the laboratory report). The sample collected at MW-95-8 and its duplicate were re-analyzed by the laboratory and deemed the QC to be acceptable for both samples. Copper concentrations are consistent with historical results for both MW-95-8 and its duplicate.

It is believed that the discrepancies noted should not affect the interpretation of the groundwater results.

The results of the VOCs analyses of the field blank and trip blank (identified respectively as Field Blank and Trip Blank in the laboratory report from the November 2019 monitoring session) were within acceptable tolerance limits with all parameters concentrations below their respective RDL.

4.2 Up-Gradient Control Wells

Monitoring of groundwater quality up-gradient from the site was made possible with the use of observation wells installed in 1992 behind the WCC administration office at 3354 Navan Road (OW-92-12 to OW-92-19). In 1995, two additional wells were installed within the shallow sand deposit to the northeast (OW-95-4) and northwest (OW-95-8). Four additional wells were installed in the fall of 1998 at the up-gradient corners of the waste footprint (OW-98-1 to 98-4). In August 2011, a borehole was drilled and a new observation well was installed to replace OW-98-2 in the intact clay deposit, as it was filled with sand. Monitoring wells OW-95-4, OW-98-4 and OW-98-3 were decommissioned in 2012 and replaced by existing monitoring wells MW05-1A to D as per Item 42 listed in Schedule A of ECA No. A460702. All these wells are referred to as the up-gradient control wells. The up-gradient groundwater quality in each stratigraphic unit was compared to the ODWQS for which aesthetic objectives or maximum or interim maximum acceptable concentrations exist.

4.2.1 Sand Layer

The background groundwater quality within the sand layer was monitored during the 2019 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-19, MW05-1D (replacing OW-95-4) and OW-95-8.

The groundwater quality during 2019 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During June 2019 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2019 Monitoring Session
92-19	[None]	Manganese and TDS
05-1D	Chloride, TDS, sodium	Chloride, TDS
95-8	Manganese and TDS	Iron, Manganese and TDS

Input: ETB
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As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, manganese, iron, sodium and TDS, which exceed the ODWQS.

4.2.2 Weathered Clay Deposit

The background groundwater quality within the weathered clay deposit was monitored during the 2019 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-18, OW-98-1 and MW05-1C (replacing OW-98-4).

The groundwater quality during 2019 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During June 2019 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2019 Monitoring Session
92-18	Chloride and TDS	Chloride, manganese and TDS
98-1	Chloride, iron, manganese, sodium and TDS	Chloride, iron, manganese, sodium and TDS
05-1C	[None]	Iron and manganese

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS, which exceed the ODWQS.

4.3 Mer Bleue/Down-Gradient Control Wells

Groundwater further down-gradient from the landfill is monitored with the use of nested observation wells installed in 1994 and 1995 south of the landfill at the northern edge of the Mer Bleue Bog. These observation wells were installed to obtain a better understanding of the hydrogeology of the area and geochemistry of the groundwater south of the landfill. The nested wells are located in line with the eastern limits of the landfill (OW-94-4, OW-94-5 and OW-94-6), east of the landfill centre line (OW-95-5, OW-95-6, OW-95-7 and OW-95-9) and in line with the western limits of the existing landfill (OW-95-1, OW-95-2 and OW-95-3). All these wells are referred to as the down-gradient control wells. The groundwater quality of the down-gradient control wells in each stratigraphic unit was compared to the ODWQS for aesthetic objectives or maximum or interim maximum acceptable concentrations.

4.3.1 Sand Layer

The down-gradient groundwater quality within the sand layer was monitored during the 2019 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-6, OW-95-3, OW-95-7.

The groundwater quality during 2019 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During June 2019 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2019 Monitoring Session
94-6	Chloride, manganese, sodium, temperature and TDS	Chloride, iron, manganese, sodium and TDS
95-3	Manganese, sodium and TDS	Manganese, sodium and TDS
95-7	Chloride, iron, manganese, sodium and TDS	Chloride, iron, manganese, sodium and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, iron, manganese, sodium and TDS which exceed the ODWQS. Similar ODWQS exceedances for these parameters were also observed in the up-gradient groundwater at similar concentrations.

4.3.2 Weathered Clay Deposit

The down-gradient groundwater quality within the weathered clay deposit was monitored during the 2019 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-5, OW-95-2 and OW-95-6.

The groundwater quality during 2019 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During June 2019 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2019 Monitoring Session
94-5	[Not available][1]	Chloride, manganese, sodium and TDS
95-2	Chloride, sodium and TDS	Chloride, manganese, sodium and TDS
95-6	Chloride, manganese, sodium and TDS	Chloride, manganese, sodium and TDS

Note: [1] Sampling was inadvertently excluded during the spring monitoring session at monitoring well 94-5.

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As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, manganese, sodium and TDS which exceed the ODWQS, similarly to groundwater quality within the same deposit upgradient of the landfill. The groundwater quality within the weathered clay deposit also has occasional ODWQS exceedances of iron.

4.4 Results

Piper trilinear diagrams for groundwater in the sand layer during June and November 2019 are shown on Figures 4 and 5, respectively. The diagrams indicate that shallow groundwater at the immediately down-gradient locations is somewhat variable and has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the sand within the Mer Bleue Bog. Similar to past observations, the distribution of up-gradient groundwater quality on the Piper diagrams is reflecting elevated but stable chloride and hardness (calcium and magnesium) concentrations at MW05-1D since 2012.

Figures 6 and 7 indicate that groundwater in the weathered clay at the immediately down-gradient site OW-92-10 has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the weathered clay within the Mer Bleue Bog. Groundwater at other compliance sites is more like groundwater in the weathered clay within the Mer Bleue Bog. These diagrams also indicate that groundwater in the weathered clay deposit up-gradient of the landfill is different from groundwater in the bog. There are no significant changes from the previous year.

A Phase II Environmental Site Assessment was conducted at the landfill by Intera (Intera, 2003). This assessment concluded that groundwater within the sand layer, the upper weathered clay and perhaps the deeper intact clay deposit on down-gradient lands has slightly elevated concentrations of parameters previously thought to be indicative of landfill leachate (e.g., boron, ammonia, TKN). However, there is no obvious spatial correlation of these parameters with proximity to the landfill or groundwater migration pathway. The lack of spatial correlation suggests that groundwater on down-gradient lands is representative of naturally elevated background groundwater quality associated with the Mer Bleue environment.

In addition, the groundwater and surface water trigger mechanism report prepared by Golder (Golder, 2007b) demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are not potential impacts from landfill activities. Naturally elevated parameters measured included boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

5.0 LEACHATE CHARACTERISTICS

Prior to the construction of the leachate collection system (LCS) in 1991-1992, leachate was sampled and analysed in areas where surface breakout was observed. Breakout of leachate, when encountered, usually occurred at the down-gradient toe of the landfill.

The monitoring program for leachate quality has focused on the LCS. For the purpose of the annual monitoring report, leachate generated by the landfill is monitored at the down-gradient end of the south toe collector at L5 at the same time surface water is monitored. A more extensive leachate monitoring program is carried out throughout the year in accordance with a City of Ottawa Leachate Discharge Agreement for the discharge of treated leachate at the Robert O. Pickard Environmental Centre (ROPEC), the municipal wastewater treatment plant.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation. The landfill is underlain by a thick natural clay deposit which has a hydraulic conductivity, K, of less than 10^{-9} metres per second and as such performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater, but rather it is predominantly precipitation that has infiltrated through the waste pile. It should be noted that leachate at the site could also consist of porewater from the underlying clay as a result of upward gradients and/or consolidation, noting that porewater release to the leachate collection system is slowed by the low hydraulic conductivity of the clay.

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. The intrinsic biodegradability of municipal landfill leachate can be measured by a BOD:COD ratio. During the first several years of production, the BOD:COD ratio generally is in the 0.5 range. As the landfill ages, the ratio decreases to levels less than 0.1 suggesting a more or less biologically recalcitrant organic composition (Andreottola et al., 1989). Also, the concentration of ammonia tends to increase with landfill age since ammonia is a by-product of the stabilisation of organic matter (Elefiniotis et al., 1989), although at a dry waste facility such as the WCC Navan Facility, ammonia concentrations can be expected to remain relatively low.

Typical parameter concentrations in leachate are provided in the tables below. Average concentrations indicate that the WCC Navan Facility leachate is distinctly different from most other landfill sites in Ontario, including the City of Ottawa Trail Waste Facility, with most analytes measured in the WCC Navan Facility leachate having much lower concentrations. The concentration of various parameters listed below suggests a comparatively low strength leachate is generated at the WCC Navan Facility. The concentration of the traditional indicators of environmental quality (conventional pollutants) such as BOD_5, suspended solids, ammonia and metals such as iron and zinc are relatively low. The WCC Navan Facility leachate has much lower concentrations because it is not generated from municipal waste.

Parameter	WCC Navan Waste Recycling and Disposal Facility L5 *			Trail Road & Nepean Landfills [1]			Ontario Landfills [2]		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
Boron	0.37	29.3	15.4	3.92	6.22	5.348	0.8	52	10.4
Ammonia	0.01	112	44.2	----	----	----	7.6	1,820	175
BOD_5	1.6	662	105.6	111	1,790	652	1	66,000	4,975
Conductivity	669	5,640	3,857	----	----	----	475	26,100	6,088
TDS	1,690	10,300	2,874	----	----	----	196	9,030	4,327
Sodium	53.9	850	539	----	----	----	13.8	16,000	936
Manganese	0.066	13.2	1.29	0.0879	1.62	0.627	0.03	793	3.54
COD	69.2	1,240	449	380	4,700	1,493	1	47,300	7,855
Iron	0.003	32.7	7.79	0.798	58.3	13.26	0.01	1,300	58
Copper	<0.0005	0.254	0.012	0.0165	0.374	0.1567	0.007	7	0.045
TSS	<2	1,190	108	2	12,400	92.1	3	8,130	445
Chloride	76.5	1,000	475	1,000	1,640	1,308	0.4	12,000	270
Lead	<0.00002	0.1	0.008	<0.05	0.276	----	0.001	2.1	0.070
Zinc	<0.005	0.48	0.05	0.0366	2.21	0.62	----	16	1.42

Notes:
All concentrations are in mg/L except conductivity (µS/cm)

Updated by: RPM
Checked by: ETB

* Calculated using all historical data since 1992 for L5.

< Denotes concentration is lower than the Reportable Detection Limit (RDL).

[1] City of Ottawa Trail Road Annual Operating and Monitoring Report – 2000.

[2] Howard and Livingston, "Contaminant Source Audits and Groundwater Quality", Environmental Geology of Urban Areas, 104-116, Ed. by N. Eyles, Geological Association of Canada, 1997.

Water impacted by leachate will typically have high concentrations of dissolved constituents with chemical concentrations ten to several hundred times higher than those measured at reference monitoring locations. Chemical concentrations have a high temporal variability due to variations in the composition, age and moisture of the waste and meteorological conditions.

Leachate monitored in 2019 to assist with assessment of surface water and groundwater quality was sampled on June 20, August 28 and November 21, 2019. Results of the chemical analysis undertaken by Paracel and the field measured parameters are provided along with historical data in Appendix E. The results indicate that leachate generated at the WCC Navan Facility continues to be a relatively weak wastewater when compared to municipal landfill leachate.

One field blank and one laboratory trip blank were analyzed during the August 2019 monitoring session. The results of the VOCs analyses for these two samples were within acceptable tolerance limits with all parameters concentrations below the RDL.

Leachate quality monitoring results for 2019 indicate that the leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Concentrations of ammonia, boron, chloride, potassium, and TKN show a generally increasing trend over time. The concentrations of DIC, manganese, show a general decreasing trend over time. Previously reported decreasing trend in hardness appears to be stabilizing. The concentrations of certain parameters remain above the surface water and groundwater quality near the site.

Monitoring of treated leachate is also carried out on a frequent basis in compliance with the City of Ottawa discharge requirements at the water pollution control plant (ROPEC).

6.0 GROUNDWATER COMPLIANCE ASSESSMENT

6.1 Compliance Mechanism

The objectives of groundwater trigger mechanisms at the WCC Navan Facility are to utilize the results of the ongoing groundwater monitoring program to assess site compliance and to trigger implementation of the contingency plans, when and if necessary. The purpose of the trigger mechanisms is to prevent leachate-impacted groundwater exceeding a certain negative threshold level from occurring. The trigger mechanism was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the Navan Facility.

Traditional methods of site compliance provide very limited useful and/or reliable parameters for assessment of the WCC Navan Facility; therefore, an alternate method must be used. The difference in hydrogeology across the site coupled with the very saline environment of the clay deposit that underlies the Mer Bleue clay have resulted in the MECP accepting that Guideline B-7 (RUPO) is not applicable at this site. The MECP's position in this regard was documented in a November 2000 memorandum issued by the MECP (MOE, 2000). Therefore, the Leachate Indicator Parameter list and the method to determine if leachate from the site is impacting local groundwater was developed in the Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The Leachate Indicator Parameter list includes alkalinity, ammonia, boron, chloride, hardness, magnesium, manganese and potassium.

After the completion of a monitoring session, the concentration of each Leachate Indicator Parameter for all groundwater locations used to assess compliance should be visually checked. If a parameter concentration appears to be elevated, a comparison to the background concentration range should be completed. The potential for an increase in concentration of a Leachate Indicator Parameter will be investigated by comparing the concentrations for each parameter to the background range for its corresponding stratigraphic unit. The background range will be derived from the maximum and minimum data obtained at the locations used to assess compliance from 1998 to present in each stratigraphic unit. In addition, data from monitoring well MW05-3 located to the east of the site and not impacted by landfill leachate will be used to define the background range. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each location used to assess compliance are presented in time-concentration graphs in Appendix F. The background ranges will be updated annually using the most recent data if it is not deemed impacted by landfill leachate. An exceedance of the background range is considered an exceedance of the trigger mechanism and the implementation of the trigger format outlined in the trigger mechanism report should proceed.

No comments from the MECP have been received on the groundwater aspects of the 2018 annual monitoring report at the time this report was completed.

6.2 Immediately Down-Gradient Wells Used to Assess Compliance

At the down-gradient limit of the landfill, groundwater quality was monitored at three nests of observation wells installed in 1992 and 1994. These wells are located at the southeast corner of the landfill (OW-92-9, OW-92-10 and OW-92-11), east of the landfill centre line at grid line 9 (OW-92-1 to OW-92-8) and at the southwest corner of the landfill (OW-94-1, OW-94-2 and OW-94-3). Two additional wells, MW-C and MW-E, were installed within the upper sand unit and shallow clay in 2000 at the northern boundary of the NCC property (now WCC property) located south of the VIA ROW. These observation wells are referred to as wells used to assess compliance.

MW07-1 is located in line with the wells used to assess compliance, to the southeast of the landfill in an area that has historically not been impacted by landfill leachate. These wells were installed in 2007 and their purpose is to monitor the future performance of the landfill expansion. With the commencement of landfilling operations in the expansion area east of the historical landfill footprint in 2016, these wells will be used along with the wells used in past reports to assess compliance along the southern property line. New trigger concentrations were proposed in the 2017 monitoring report (Golder, 2018). These trigger concentrations are implemented herein.

In 2005, three new sand layer wells used to assess compliance were installed to evaluate some unusual results at OW-94-3, OW-92-8 and OW-92-11. The new monitoring wells are called MW05-R3, MW05-8 and MW05-11 and have replaced OW-94-3, OW-92-8 and OW-92-11 for groundwater quality results, respectively, as of November 2006.

6.2.1 Sand Layer

The down-gradient compliance site groundwater quality within the sand layer was monitored during the 2019 groundwater monitoring program through the inclusion of monitors OW-94-3 and MW05-R3, OW-92-8 and MW058, OW-92-11 and MW05-11, MW-C, MW-E and MW07-1D. Monitor MW07-1D is included now that landfilling has begun in the lateral expansion area. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the sand layer are presented in time-concentration graphs in Appendix F-A.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	June 2019 Monitoring Session	November 2019 Monitoring Session
MW-C	None	Chloride
MW-E	None	None
05-R3	None	None
05-8	Alkalinity, Boron, Manganese	Alkalinity, Boron, Hardness, Manganese, Magnesium
05-11	Alkalinity, Ammonia, Boron, Hardness	Boron
07-1D	None	None

Input: ETB
Checked: RPM

6.2.2 Weathered Clay Deposit

The down-gradient compliance site groundwater quality within the weathered clay deposit was monitored during the 2019 groundwater monitoring program through the inclusion of monitors OW-92-7, OW-92-10, OW-94-2 and MW07-1C. Monitor MW07-1C is included now that landfilling has begun in the lateral expansion area. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the weathered clay deposit are presented in time-concentration graphs in Appendix F-B.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	June 2019Monitoring Session	November 2019 Monitoring Session
92-7	Potassium	None
92-10	Hardness, Magnesium	Hardness, Magnesium
94-2	None	None
07-1C	None	None

Input: ETB
Checked: RPM

6.3 Results

The Leachate Indicator Parameters at all groundwater monitoring locations used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2018 background range.

After the reported 2018 increases in concentrations above the background ranges observed in the sand stratigraphic unit, increasing trends continued in 2019 for concentrations of two parameters: manganese at MW05-8 (with a slight decrease in concentration reported in the fall) and ammonia at MW05-11 (with a significant decrease in concentration reported in the fall). Previously reported increasing concentrations at MW05-8 and/or MW05-11 for alkalinity, ammonia, hardness (magnesium), boron and potassium had a marked decrease in 2019 (some of those concentrations decreased below their corresponding trigger concentrations either in the spring or the fall). An increasing trend in potassium concentration at monitoring well 05-3D since June 2015 continued throughout 2019, with an exceedance of the corresponding trigger concentration reported in November 2019 at this location.

Therefore, there were no continued increases throughout 2019 above the background ranges observed in the sand stratigraphic unit in 2019 at trigger locations.

It is noted that MW05-11 is located immediately down-gradient of the leachate collection system (less than 10 m south of the leachate collection system). Monitoring well MW-E, located farther down-gradient directly south of the VIA ROW, on WCC owned land, did not show any exceedances in 2019.

The maximum historical manganese concentration was reported at MW05-8 in June 2019. Manganese concentrations reported at MW05-8 in June and November 2019 (13.7 and 13.2 mg/L, respectively) are exceeding the maximum background concentration of 8.21 mg/L and are following four exceedances reported at this location since spring 2017. However, it is noted that the increasing trend in manganese concentration reported at this location since the fall of 2017 was followed in the fall of 2019 by a slight decrease, as indicated above. Manganese concentrations at this location have been variable in the past but overall there is a general increasing trend. The manganese concentrations observed in the groundwater at MW05-8 are higher than the

maximum concentration of manganese reported for leachate from L5 (8.56 mg/L). As such, it is not expected that the increasing trend of manganese concentrations is a caused entirely by landfill leachate.

The slight increases beyond their corresponding trigger concentration in the fall of 2019 for alkalinity, boron and hardness (magnesium) at MW05-8, as well as boron at MW05-11, potassium MW05-3D and chloride at MW-C will need to be assessed during the 2020 monitoring sessions to determine if their increasing trends continues.

It is proposed to increase the maximum background concentration for ammonia and chloride in the sand stratigraphic unit to 2.22 mg/L and 322 mg/L, respectively. In both cases, the elevated concentrations were reported, whereas no sign of leachate impact was observed for other parameters during the same sessions.

There were no increases above the background ranges observed in the weathered clay stratigraphic unit in 2019 at trigger locations, with the exception of concentrations for hardness and magnesium at OW-92-10 which exceeded their corresponding background concentrations in June and November 2019 (589 mg/L and 588 mg/L for hardness and 80.7 mg/L and 81.5 mg/L for magnesium, respectively). Although in both cases they stabilized in the fall 2019, the slight increase in magnesium concentration reported at 92-10 in November confirms a trigger exceedance whereas the slight decrease for hardness did not confirm the trigger exceedance. While other leachate indicator parameters at this location were reported to be well within the background range, an increasing trend since 2012 in concentrations of alkalinity and ammonia has been observed. The concentrations of alkalinity, ammonia and chloride in the groundwater from the weathered clay are lower than the concentrations observed in the groundwater from the underlying intact clay. The historic upward gradients between the intact clay and weathered clay and potential release of porewater within the intact clay may, at least in part, be the source of the increased concentrations overtime observed in the weathered clay.

The maximum chloride concentration reported at OW-94-2 in November 2017 does not appear to be related to leachate impacts but rather natural (or influence from a secondary source) variations. Therefore, as proposed in the 2018 Annual Monitoring Report (Golder, 2019), the background maximum chloride concentration in weathered clay was increased from 605 to 629 mg/L.

Groundwater quality in the intact clay and glacial till/upper bedrock unit was not monitored during the 2019 monitoring session. Monitoring of these stratigraphic units occurs every 18 months with the next scheduled session in spring 2020. Concentrations of Leachate Indicator Parameters in groundwater samples collected in 2018 from compliance monitors screened in the intact clay unit were all below the respective trigger concentrations, except for concentrations of potassium, magnesium and hardness at MW07-1B, reported in November 2018, which exceeded their corresponding maximum background concentration. These exceedances will need to be verified during in the spring 2020 monitoring session. If future results do not reflect an upward trend and the data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in this monitoring well is still considered unimpacted by landfill leachate.

Concentrations of Leachate Indicator Parameters in groundwater samples collected from compliance monitors screened in the glacial till/upper bedrock unit in 2018 were all below the respective trigger concentrations, except for the concentration of magnesium from glacial till monitoring well MW07-1A reported in November 2018 (12.9 mg/L) which was above the trigger concentration. This exceedance would have to be confirmed during the spring of 2020. It follows another exceedance reported in the spring of 2017 with a possible short duration increasing trend associated with magnesium concentrations at this location. If future results do not reflect an upward trend and the

data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in this monitoring well is still considered unimpacted by landfill leachate.

Exceedances were also reported in November 2018 for alkalinity at MW05-3A and MW07-1A and hardness at MW07-1A. These exceedances will need to be confirmed during the spring 2020 monitoring session.

6.3.1 Confirmed Exceedances and Proposed Course of Action

As mentioned above, one confirmed exceedance of the trigger concentration was reported in the sand stratigraphic unit in June 2019 for manganese concentrations at MW05-8. However, the concentration reported in November 2019 at this location was lower and therefore did not confirm the continued increase in concentration. In the weathered clay stratigraphic unit, only one confirmed exceedance was reported in 2019 for magnesium at MW92-10.

Following the confirmed exceedances reported in the 2018 annual monitoring report (Golder, 2019), in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. Trigger results of the spring and fall monitoring sessions were reported by Golder, on behalf of WCC, to the MECP Ottawa District Office via email on August 8, 2019 and December 24, 2019, respectively. In accordance with the proposed course of action presented to the MECP in the 2018 annual monitoring report and communications in 2019, WCC acquired a spare leachate pump to reduce down time when a pump requires servicing and WCC intends to proactively maintain the forcemain in good working condition in a continuing effort to achieve a drained state in the leachate collection system.

Leachate pumping and disposal operating issues reported in the fall 2018 had an impact to groundwater quality in the sand and weathered clay units in monitoring wells located immediately downgradient of the leachate collection system (less than 10 m south of the leachate collection system and close to the south toe collector). Concentrations of some Leachate Indicator Parameters in the sand unit spiked in November 2018, but the efforts from WCC in 2019 were successful in limiting the continued increases in concentrations. Concentrations are expected to stabilize or decrease in future monitoring sessions as long as these corrective actions continue to be implemented. Since the hydraulic conductivity of the sand is greater than the weathered clay, it is expected that elevated concentrations will take longer to dissipate in the weathered clay unit. Increasing trends in the weathered clay will be monitored closely in 2020.

Results from the upcoming spring 2020 monitoring session will be analyzed to determine if the effect of these actions are detected in groundwater quality with a decrease in concentrations of Leachate Indicator Parameters at trigger locations. At that point, the need for a formal contingency plan will be assessed in collaboration with the MECP. It is WCC's intention to continue implementing in 2020 the proposed voluntary action plan to address increases in concentrations.

7.0 SURFACE WATER QUALITY ASSESSMENT

7.1 Quality Control/Quality Assurance

One blind sample duplicate was analyzed per surface water monitoring session in 2019 as part of the QA/QC protocol. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the RPD between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All duplicate results for surface water were within acceptable tolerance limits in 2019, with the exception of concentrations reported for manganese at one surface water monitoring station in August 2019 (135 mg/L for the primary sample and 355 mg/L for the duplicate sample, respectively). The concentration in the duplicate sample is uncharacteristic of manganese concentrations at this location. Since the concentration reported in the primary sample is within the range of historical concentrations reported at this location, the 2019 surface water data reported by the laboratory for manganese is considered anomalous but overall the surface water is considered acceptable.

7.2 Surface Water Quality Monitoring

A total of eleven surface water stations continue to be monitored on an on-going basis at this site. The monitoring stations have been located to obtain representative information on water quality up-gradient from the landfill at stations S1, S3, S15, S16 and S17 (background), on water quality at compliance sites down-gradient from the landfill at stations S5, S8 and S9 and on water quality in the Mer Bleue Bog at S10 (SW-W), S11 (SW-C) and S12 (SW-E). Monitoring locations SW-W, SW-C and SW-E are location references used by the NCC.

Stations S1 and S17 are located northeast and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Stations S3, S15 and S16 are located to the west/northwest and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Station S1 is located at the northeast corner of the landfill below a culvert that discharges into a south flowing east perimeter ditch. Station S3 is located at the northwest corner within the site buffer, down-gradient from where a north diversion ditch flows into a west drainage channel. Station S15 is located to the west of the landfill where the north ditch flows into a southward flowing west perimeter ditch. Station S16 is located northwest of the site in a ditch along the south side of Navan Road and up-gradient from station S15. Station S17 is located in an east ditch along the south side of Navan Road and up-gradient from station S1. These stations are considered to be representative of up-gradient background surface water quality.

Stations S5, S8 and S9 are located down-gradient from the landfill. Station S5 is located at a culvert beneath the VIA Rail right-of-way (ROW) just east of the landfill centre line near grid line 10 and is dry throughout most of the year. Station S8 is located in a wide and shallow westward flowing channel having a swamp environment and is down-gradient from the southwest corner of the landfill and north of the VIA ROW, immediately west from where the west drainage channel discharges into the ditch. Station S9 is located near a large concrete box culvert beneath the VIA ROW and down-gradient from the southeast corner of the landfill. Since the fall of 2013, water has been backing up upstream of surface water station S9 as a result of blockage in the box culvert by aggressive beaver activity. Steps were taken by WCC in spring 2017 to reduce the beaver activity in the area and no blockage was observed during the fall monitoring session. No specific beaver activity was noted in 2019.

Surface water sampling stations S10, S11 and S12, also referred to by the NCC in other reports as SW-W, SW-C and SW-E, respectively, are located south of the landfill at the northern edge of the Mer Bleue Bog and consist of stagnant bog water. Stations S10, S11 and S12 were added in 1995 to obtain data considered to be representative of water quality in the receiving water at the perimeter of the bog.

For the purpose of surface water quality assessment, the background surface water quality is assumed to be represented by the data available from stations located in close proximity to the landfill and up-gradient of surface water flow. For the 2019 monitoring program, the PWQO is being applied for the purpose of water quality assessment at the surface water sampling stations.

Surface water monitoring for 2019 was carried out on June 20, August 28, and November 21 at up-gradient control sites S1, S3, S15, S16 and S17, sites S5, S8 and S9 and the down-gradient control sites S10, S11 and S12. Analytical test reports submitted by Paracel for water samples obtained in 2019 are provided in Appendix B. Historical data are also provided in Appendix G.

Station S5, S8, S9, S10, and S11 were found to be dry during the summer monitoring session in 2019. Therefore, samples could not be collected at these stations at the time.

Water quality data was compared to historical data obtained at each station and trends in the concentration of key indicator parameters were examined.

The PWQO criteria for chromium changed in 1999 from chromium to chromium III and chromium VI. The laboratory reports total chromium and the exceedances noted in the tables in the following sections are values of total chromium that are greater than the PWQO for chromium III, i.e. 8.9 µg/L (there is no PWQO for total chromium). Should current data show an increasing trend, attempts will be made to separate the analysis into chromium III and chromium VI.

7.2.1 Up-Gradient Control Stations

The up-gradient surface water quality was monitored during the 2019 monitoring program through the inclusion of up-gradient stations S1, S3, S15, S16 and S17.

The surface water quality during 2019 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Station	Parameter(s) Exceeding or Outside PWQO		
	June 2019 Monitoring Session	August 2019 Monitoring Session	November 2019 Monitoring Session
S1	[None]	Cobalt, copper, iron, phenols, and total phosphorous	[None]
S3	Dissolved oxygen and iron	Dissolved oxygen, iron, phenols, and total phosphorous	Dissolved oxygen and iron
S15	Iron and total phosphorus	Iron, phenols, and total phosphorous	Cobalt, iron and phenols
S16	Cobalt, copper, dissolved oxygen, iron and total phosphorous	Cobalt, dissolved oxygen, iron, phenols, and total phosphorous	Chromium, cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorous, and zinc
S17	Iron and total phosphorous	Cobalt, copper, dissolved oxygen, iron, phenols and total phosphorous	Iron, phenols and total phosphorous

Input: ETB
Checked: RPM

As apparent from the above table, the up-gradient surface water quality is characterized by concentrations of the following parameters which exceed or are outside the PWQO: chromium, cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorus and zinc. Occasional PWQO exceedances of cadmium and boron have been observed in the past as well.

Surface water quality is generally consistent over time (with seasonal variability). An increasing trend in concentrations of alkalinity can be observed at surface water station S1 over time. Previously observed overall increasing trends for concentrations of chloride, DIC, sodium, TDS, hardness and conductivity at surface water station S1, concentrations of alkalinity, ammonia, DIC and iron at surface water station S3 (previously reported elevated concentrations were reported at this station in August 2018, have returned to typical historical concentrations), and concentrations of manganese, sodium and TDS at surface water station S15 appear to have stabilized, with seasonal variability remaining. Similarly, the previously observed decreasing trend in dissolved oxygen concentrations at surface water stations S3 appears to have stabilized with seasonal variability remaining. A slight increasing trend in iron concentrations is observed at surface water station S15.

The current or historical increases in concentrations of parameters at these locations is not related to leachate impact as these stations are up-gradient of the site.

7.2.2 Down-Gradient Control Stations

The down-gradient surface water quality was monitored during the 2019 monitoring program through the inclusion of down-gradient stations S10, S11 and S12.

The surface water quality during 2019 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Monitor	Parameter(s) Exceeding or Outside PWQO		
	June 2019 Monitoring Session	August 2019 Monitoring Session	November 2019 Monitoring Session
S10	Cobalt, dissolved oxygen, iron and total phosphorous	[No sample collected due to dry conditions]	Boron, cobalt, dissolved oxygen, iron, phenols, and total phosphorus
S11	Dissolved oxygen, iron and total phosphorus	[No sample collected due to dry conditions]	Boron, chromium cobalt, copper, dissolved oxygen, iron, phenols, total phosphorus, and zinc
S12	Cobalt, copper, dissolved oxygen, iron, lead, total phosphorus, and zinc	Chromium, cobalt, iron, lead, phenols, and total phosphorous	Iron, phenols and total phosphorus

Input: ETB
Checked: RPM

As apparent from the above table, the down-gradient surface water quality is characterized by dissolved oxygen, iron, and total phosphorus concentrations which exceed or are outside the PWQO. Occasional PWQO exceedances of boron, cadmium, cobalt, copper, chromium, phenols and zinc have been observed.

The concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the June, August and November 2019 monitoring sessions were generally similar to or lower than the surface water quality at the up-gradient station S16 during the same session.

Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed.

7.3 Surface Water Compliance Assessment

As previously mentioned, surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. It becomes increasingly difficult to assess surface water site compliance with scattered data. The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility. Surface water quality monitoring will continue at the site, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the WCC Navan Facility.

8.0 SEDIMENTS

Sediment samples SED-W, SED-C and SED-E were obtained at the surface water sampling stations SW-10, SW-11 and SW-12, respectively, on June 20, August 28 and November 21, 2019. Laboratory reports are presented in Appendix B and the results are summarized in Table 4 and Table 5. Included for comparison in Table 4 and Table 5 are the MECP Table 1 sediment criteria and Table 2 and Table 4 Recreation/Parkland soil criteria (MOE, 2011) and the CCME freshwater sediment and Recreation/Parkland soil criteria (CCME, 1999). The table below summarizes the parameters which exceeded sediment criteria.

Sediment Monitor	Parameter(s) Exceeding MECP Table 1 Sediment		Parameter(s) Exceeding CCME Freshwater Sediment	
	June 2019 Monitoring Session	November 2019 Monitoring Session	June 2019 Monitoring Session	November 2019 Monitoring Session
SED-E	Copper, nickel	[None]	[None]	[None]
SED-C	[None]	[None]	[None]	[None]
SED-W	[None]	Copper	[None]	[None]

Input: ETB
Checked: RPM

Analytical results on the sediment samples indicate that no parameters exceed the CCME Guidelines for freshwater sediment. Copper and nickel concentrations exceed the MECP Table 1 sediment criteria. The analytical results observed at the sampling locations are consistent with historical results observed at the respective locations.

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The following table summarizes the parameters which exceeded the soil criteria in 2019.

Sediment Monitor	Parameter(s) Exceeding MECP Table 2/Table 4 Soil		Parameter(s) Exceeding CCME Soil	
	June 2019 Monitoring Session	November 2019 Monitoring Session	June 2019 Monitoring Session	November 2019 Monitoring Session
SED-E	Boron	Boron	[None]	[None]
SED-C	Boron	Boron	[None]	Selenium
SED-W	Boron	Boron	[None]	Selenium

Input: ETB
Checked: RPM

Analytical results on the sediment samples indicate that boron exceeds MECP Table 2 and Table 4 soil criteria during the spring and fall monitoring sessions at each sampling location. Selenium exceeded the CCME soil criteria during the fall monitoring session at SED-C and SED-W. In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Natural wetland systems have been used to treat a variety of wastewater including agricultural and surface mine runoff, irrigation return flows, leachate, urban storm water discharge and other sources of water pollution (U.S. Environmental Protection Agency, 1987). Today, increasing attention is being given to artificial wetlands for the treatment of wastewater. Approximately 90% of Canada's 127 million hectares of wetlands are classified as peatlands where peaty soils are predominant (NAWCC, 1994). The value of peat as an agent for pollution prevention and control has been recognized during the last three decades. Peat's value is directly related to its unique physical and chemical properties. Compared to other mineral soils, peat has a very high organic content (60% carbon), with lignin and cellulose as its main constituents. Peat has a large specific area and is highly porous, properties similar to natural zeolites and activated carbon, which makes it a good adsorbent material (McLellan and Rock, 1988). These contain some functional organic groups such as carboxyl and amino groups that form complexes with metal ions (Dissanayake and Weerasooriya, 1981). Peat is also reported to exhibit ion exchange capacities (Sharma and Froster, 1993). The combination of the above mentioned properties, i.e., being a good adsorbent, forming complexes with metals and having ion exchange capacity makes peat an excellent metal trapping media. Peat is proven to be effective in removal of lead, cadmium, zinc and chromium from raw wastewater (Zhipie et al., 1984), removal of hexavalent chromium from wastewater, removal of copper, iron, manganese, zinc, lead and potassium from industrial wastewater (Cameron, 1978). Sphagnum peat, such as the peat found in eastern Ontario, is reported to be the most suitable peat to use for wastewater treatment systems, in terms of decay resistance (Warith, 1996).

The peat deposit in the Mer Bleue Bog predates any human activity in this area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink. Water levels in the Mer Bleue Bog fluctuate naturally from time to time and have been aggressively drained (in the early 1930's) to promote agricultural exploitation of the bog. Drainage of the Mer Bleue Bog is now under the management of the NCC. In more recent years, water levels have been allowed to rise and agricultural use of the bog has been significantly reduced. From time to time, given the right water levels and environment, the release of constituents absorbed by the peat can be expected. Therefore, it would appear that metals in excess of sediment criteria are the result of natural peat processes and not impacts from the landfill.

In 2002/2003, an assessment of the WCC site operations was undertaken in support of a WCC-NCC exchange of land parcels located south of the Navan landfill along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

9.0 PROPOSED 2020 MONITORING PROGRAM

The proposed 2020 Environmental Monitoring Program is the same as was conducted in 2019, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program and sediment monitoring which is proposed to be discontinued.

In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in downgradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations or one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in downgradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As explained in Section 7.3, the MECP agreed that an excursion of landfill leachate would be apparent in the underlying stratigraphic units prior to a surface water impact and a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. Therefore, it is proposed to discontinue sediment monitoring and rely on the groundwater and surface water monitoring programs to assess off-site leachate impacts. With MECP concurrence, sediment monitoring could resume temporarily if leachate impacts and trigger exceedances are reported at the site.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during November 2018 monitoring session and will be monitored again in the spring of 2020.

The objectives of the 2020 environmental monitoring program are:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

10.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Waste Connections of Canada. The report, which specifically includes all tables and figures, is based on data and information collected by Golder and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder as described in this report.

Golder has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Groundwater, leachate and/or surface water quality conditions may vary from these sampled locations.

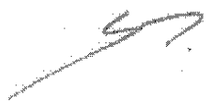
The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

11.0 CLOSURE

We trust this report meets your current needs. If you have any questions regarding this report, please contact the undersigned.

Golder Associates Ltd.



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ETB/YJM/PLE/sg

https://golderassociates.sharepoint.com/sites/115884/project files/6 deliverables/rpt 01 - gw, sw, sed monitoring/19130610-001-r-rev 0 - gw & sw 2019 monitoring_wcc haven_mar2020.docx

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Table 1a: Summary of Water Sampling Stations for June 2019

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5* S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-4/05-1D 95-8	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2** 05-3C 07-1C	94-5** 95-2 95-6
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Notes:
* Dry conditions or insufficient volume of water did not permit sampling at this station.
** Inadvertently, no sample was collected at this location.

Table 1b: Summary of Water Sampling Stations for August 2019

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5* S8* S9*	S10 (SW-W)* S11 (SW-C)* S12 (SW-E)
Sand Layer			09-1D*
Weathered Clay Deposit			09-1C*
Intact Clay Deposit			09-1B*
Glacial Till/Upper Bedrock			09-1A*
Leachate	L-5		

Notes: * Dry conditions did not permit sampling at this station.

Prepared by: ETB
Checked by: RPM

Table 1c: Summary of Water Sampling Stations for November 2019

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5* S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-8 95-4/05-1D	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7 09-1D
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2 05-3C 07-1C	94-5 95-2 95-6 09-1C
Intact Clay Deposit			09-1B
Glacial Till/Upper Bedrock			09-1A**
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Notes:

* Insufficient volume of water did not permit analyzing for all parameters, including field parameters.

** Monitoring location was frozen during this sampling event. No sample was collected.

Prepared by: ETB
Checked by: RPM

Table 2: List of Parameters Analyzed or Calculated in 2019

Parameter	Surface Water	Leachate	Groundwater	Sediments
Hardness ($CaCO_3$)	X	X	X	
Alkalinity ($CaCO_3$)	X	X	X	
Total Suspended Solids	X	X		
Bicarbonate (HCO_3)			X	
Carbonate (CO_3)			X	
Calcium	X	X	X	
Chloride	X	X	X	
Magnesium	X	X	X	
Total Phosphorous	X	X	X	
Potassium	X	X	X	
Sodium	X	X	X	
Sulphate	X	X	X	
Nitrate nitrogen	X	X	X	
Nitrite nitrogen	X	X	X	
Ammonia nitrogen[1]	X	X	X	
Total Kjeldahl nitrogen	X	X	X	
TDS	X	X	X	
Metals				
Arsenic	X	X	X	X
Boron	X	X	X	X
Cadmium	X	X	X	X
Chromium	X	X	X	X
Cobalt	X	X	X	X
Copper	X	X	X	X
Iron	X	X	X	X
Lead	X	X	X	X
Manganese	X	X	X	X
Mercury				X
Molybdenum				X
Nickel				X
Selenium				X
Zinc	X	X	X	X
Bulk Organics				
Phenols	X	X	X	
BOD_5	X	X		
COD (Chemical Oxygen Demand)	X	X	X	
DIC (Dissolved Inorganic Carbon)	X	X		

Parameter	Surface Water	Leachate	Groundwater	Sediments
DOC (Dissolved Organic Carbon)	X	X		
1,1-Dichloroethane		X	X	
Benzene		X	X	
Ethylbenzene		X	X	
Methylene Chloride		X	X	
Toluene		X	X	
Vinyl Chloride		X	X	
Xylene – m/p		X	X	
Xylene – o		X	X	
Field Measured Parameters				
pH	X	X	X	
Conductivity	X	X	X	
Temperature	X	X	X	
Dissolved Oxygen	X	X		
Flow	X			

Notes: [1] Unionized ammonia calculated for surface water.

Prepared by: ETB
Checked by: RPM

000079

Table 3: 2019 Monitoring Well Network Condition Survey

Well Number	Properly Cased?	Cap?	Lock?	Comments
OW-92-1	√	√	√	
OW-92-2	√	√	√	
OW-92-3	√	√	√	
OW-92-4	√	√	√	
OW-92-5	√	√	√	
OW-92-6	√	√	√	
OW-92-7	√	√	√	
OW-92-8	√	√	√	
OW-92-9	√	√	√	
OW-92-10	√	√	√	
OW-92-11	√	√	√	
OW-92-12	√	√	√	
OW-92-13	√	√	√	
OW-92-14	√	√	√	
OW-92-15	√	√	√	
OW-92-16	√	√	√	
OW-92-17	√	√	√	
OW-92-18	√	√	√	
OW-92-19	√	√	√	
OW-94-1	√	√	√	
OW-94-2	√	√	√	
OW-94-3	√	√	√	
OW-94-4	√	√	√	
OW-94-5	√	√	√	
OW-94-6	√	√	√	
OW-95-1	√	√	√	
OW-95-2	√	√	√	
OW-95-3	√	√	√	
OW-95-4				Abandoned, well removed.
OW-95-5	√	√	√	
OW-95-6	√	√	√	
OW-95-7	√	√	√	
OW-95-8	√	√	√	
OW-95-9	√	√	√	
OW-98-1	√	√	√	
OW-98-3				Abandoned, well removed.
OW-98-4				Abandoned, well removed.
MW05-R3	√	√	√	
MW05-8	√	√	√	
MW05-11	√	√	√	
MW-C	√	√	√	
MW-E	√	√	√	

Well Number	Properly Cased?	Cap?	Lock?	Comments
MW05-1A	√	√	√	
MW05-1B	√	√	√	
MW05-1C	√	√	√	
MW05-1D	√	√	√	Needs new tubing
MW05-2A	√	√	√	
MW05-2B	√	√	√	
MW05-2C	√	√	√	
MW05-2D	√	√	√	
MW05-3A	√	√	√	
MW05-3B	√	√	√	
MW05-3C	√	√	√	
MW05-3D	√	√	√	
MW07-1A	√	√	√	
MW07-1B	√	√	√	
MW07-1C	√	√	√	
MW07-1D	√	√	√	
MW09-1A	√	√	√	
MW09-1B	√	√	√	
MW09-1C	√	√	√	
MW09-1D	√	√	√	
MW11-1	√	√	√	

Entered by: ETB
Checked by: RPM

000083

Table 4: Summary of Analytical Results – Sediments (June 2019)

Parameter	June 20, 2019			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	3.3	1.3	2.4	18	18	12	6	5.9
Boron*	**11.1**	**3.0**	**17.5**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	23.9	16.7	12.6	160	160	64	26	37.3
Cobalt	4.5	2.5	2.7	22	22	50	50	nac
Copper	**16.2**	5	14.2	180	180	63	16	35.7
Iron	13,400	7,320	128,000	nac	nac	nac	nac	nac
Lead	8.3	5.1	6.5	120	120	140	31	35.0
Manganese	230	101	504	nac	nac	nac	nac	nac
Mercury	<0.1	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	1.8	<1	2.6	6.9	6.9	10	nac	nac
Nickel	**17.8**	7.8	10	130	130	45	16	nac
Selenium	<1	<1	<1	2.4	2.4	1	nac	nac
Zinc	65.3	26.7	63.7	340	340	200	120	123

Notes:
All concentrations are reported in µg/g dry.
nac - no applicable criteria for this parameter.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2007 (CCME, 1999).
* Criteria based on a hot water extract for available boron.

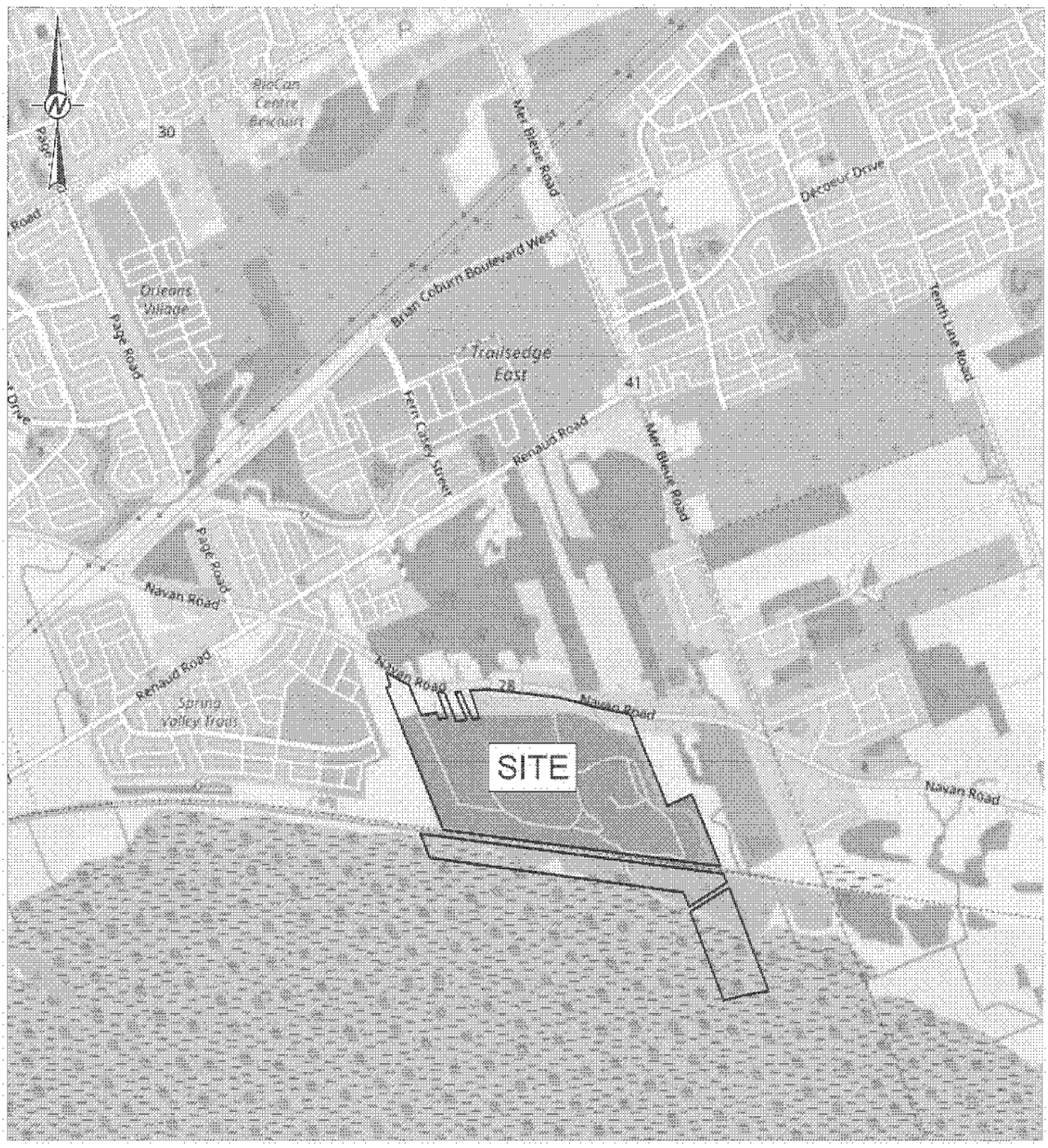
Prepared by: ETB
Checked by: RPM

Table 5: Summary of Analytical Results – Sediments (November 2019)

Parameter	November 21, 2019			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	2.4	1.3	2.4	18	18	12	6	5.9
Boron*	**8.4**	**7.7**	**18.6**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	14.8	17.5	23.9	160	160	64	26	37.3
Cobalt	2.8	3	4.6	22	22	50	50	nac
Copper	9.7	6.8	**18.5**	180	180	63	16	35.7
Iron	13,200	6,910	12,400	nac	nac	nac	nac	nac
Lead	5.4	5.5	7.8	120	120	140	31	35.0
Manganese	311	121	279	nac	nac	nac	nac	nac
Mercury	<0.2	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	<1	<1	3.4	6.9	6.9	10	nac	nac
Nickel	9.3	8.1	14.8	130	130	45	16	nac
Selenium	<1	**1.4**	**1.1**	2.4	2.4	1	nac	nac
Zinc	31.8	27	72.6	340	340	200	120	123

Notes:
All concentrations are reported in µg/g dry.
nac - no applicable criteria for this parameter.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2007 (CCME, 1999).
* Criteria based on a hot water extract for available boron.

Prepared by: ETB
Checked by: RPM



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NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

CLIENT
WASTE CONNECTIONS OF CANADA

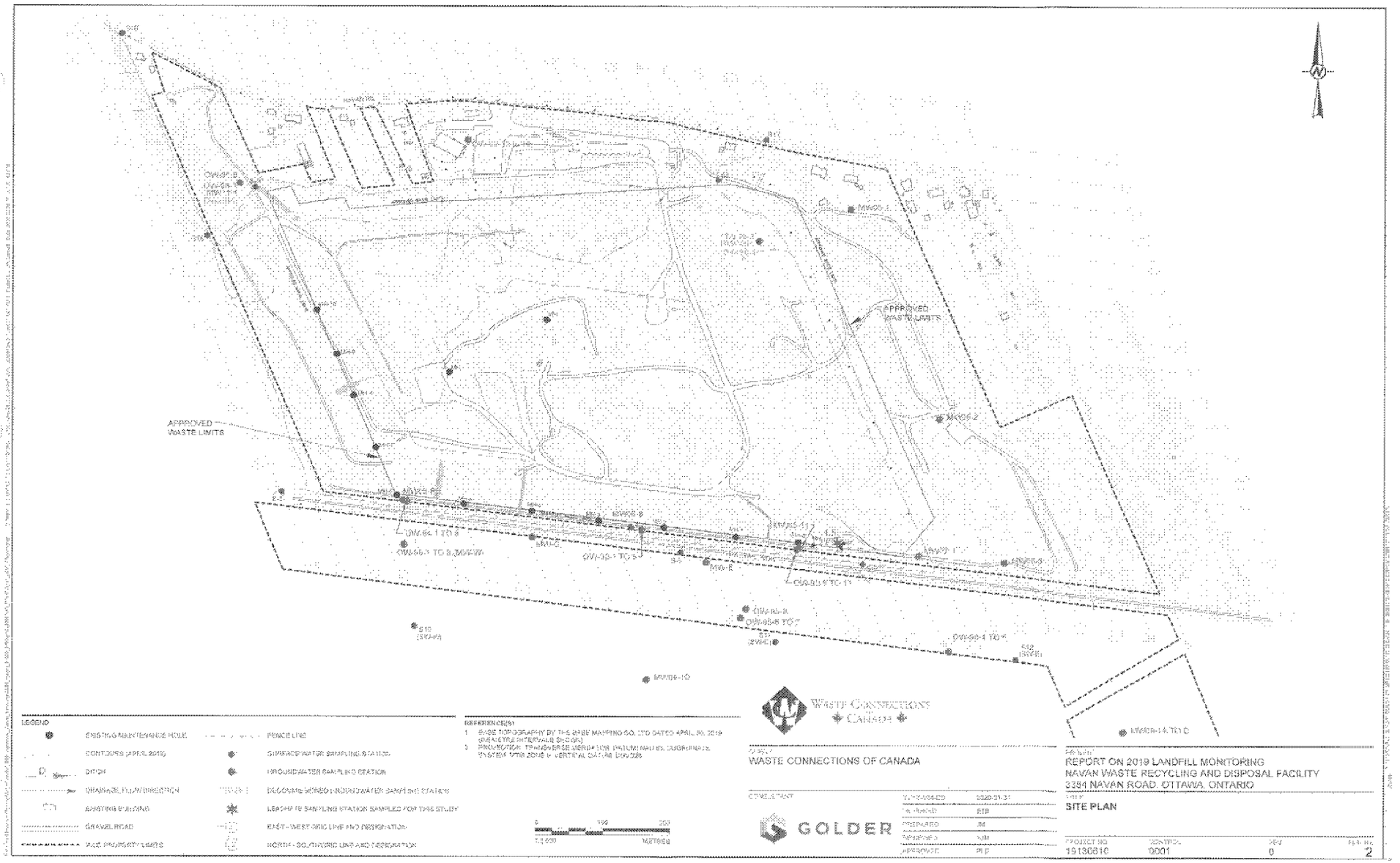
CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-31
DESIGNED	ETB
PREPARED	JM
REVIEWED	YJM
APPROVED	PLE

PROJECT
REPORT ON 2019 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
19130610	0001	0	1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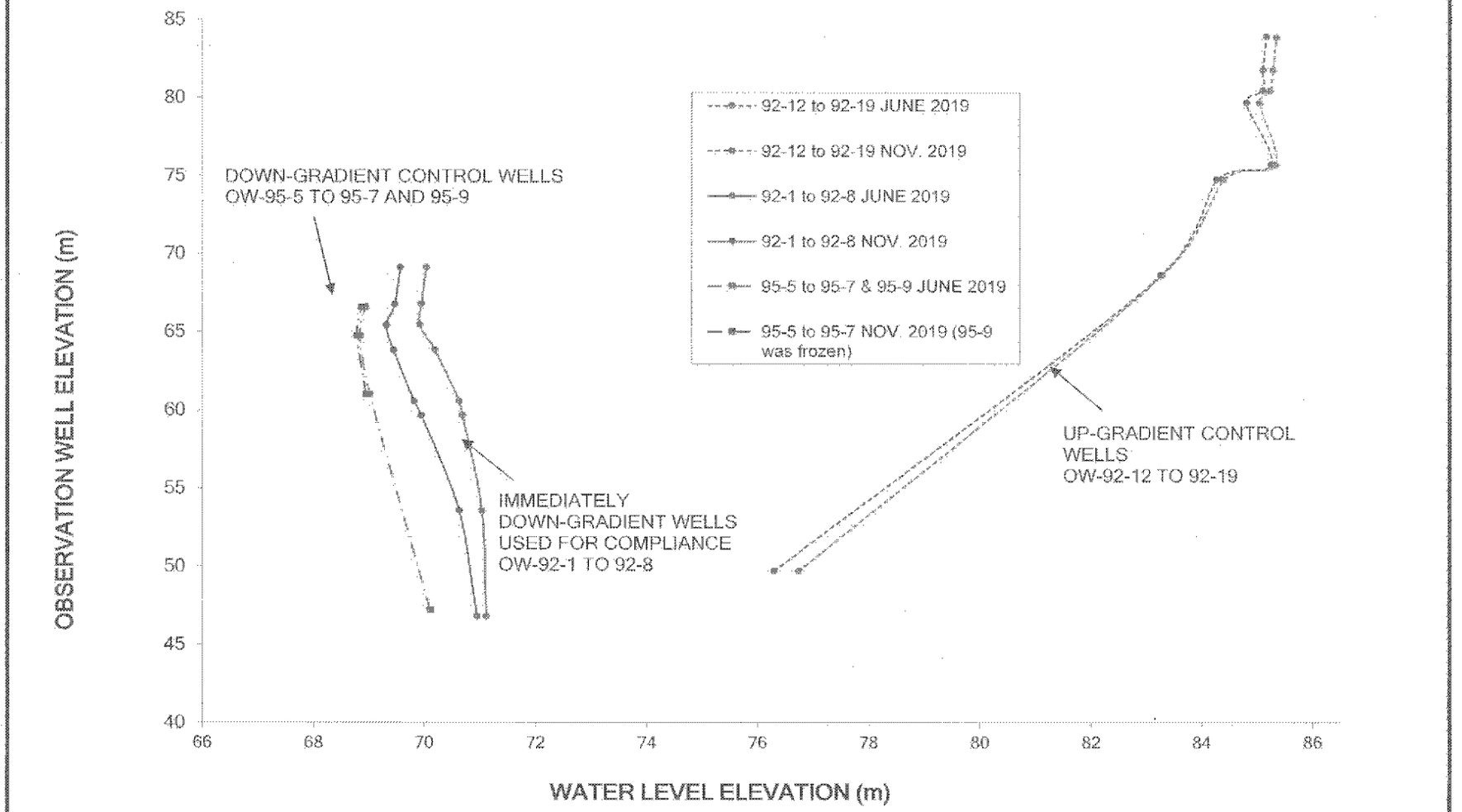


FIGURE 3

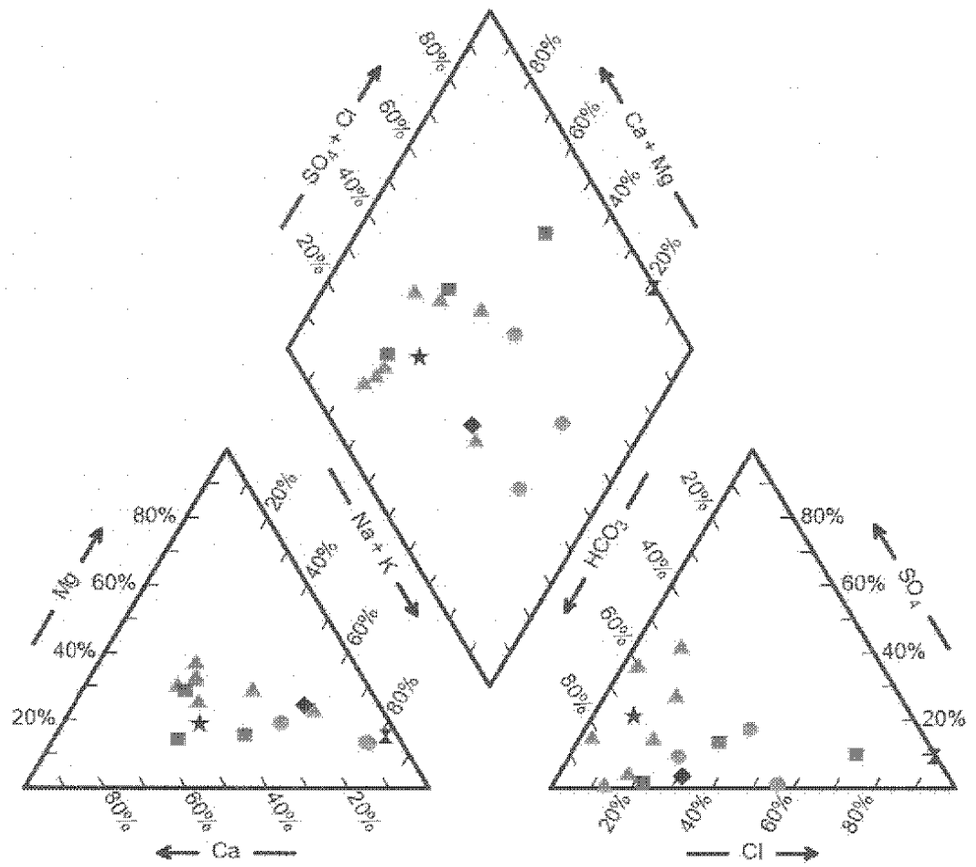
Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

HYDRAULIC HEAD PROFILES

GOLDER

000095



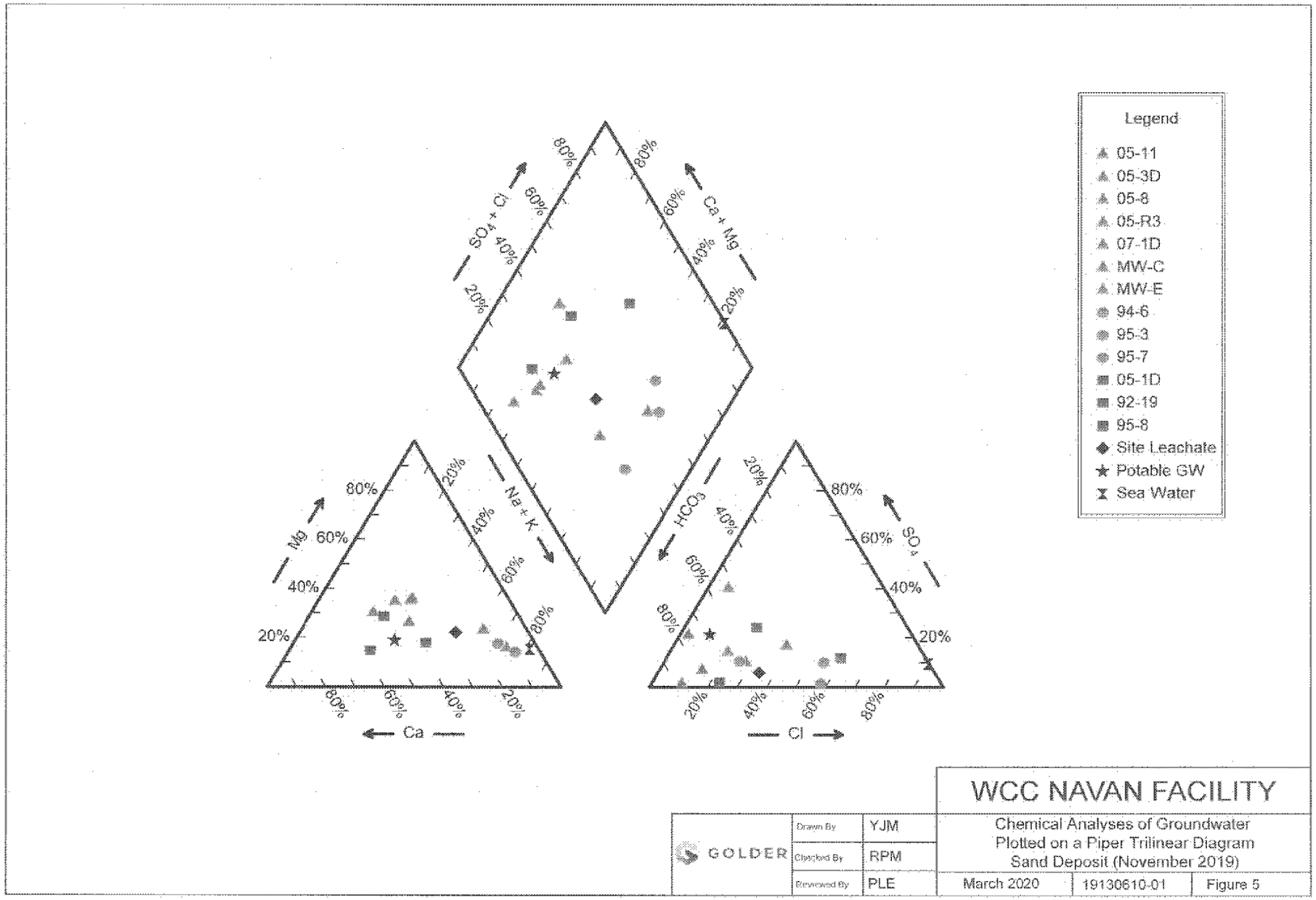
WCC NAVAN FACILITY

GOLDER

Drawn By	YJM
Checked By	RPM
Reviewed By	PLE

Chemical Analyses of Groundwater
Plotted on a Piper Trilinear Diagram
Sand Deposit (June 2019)

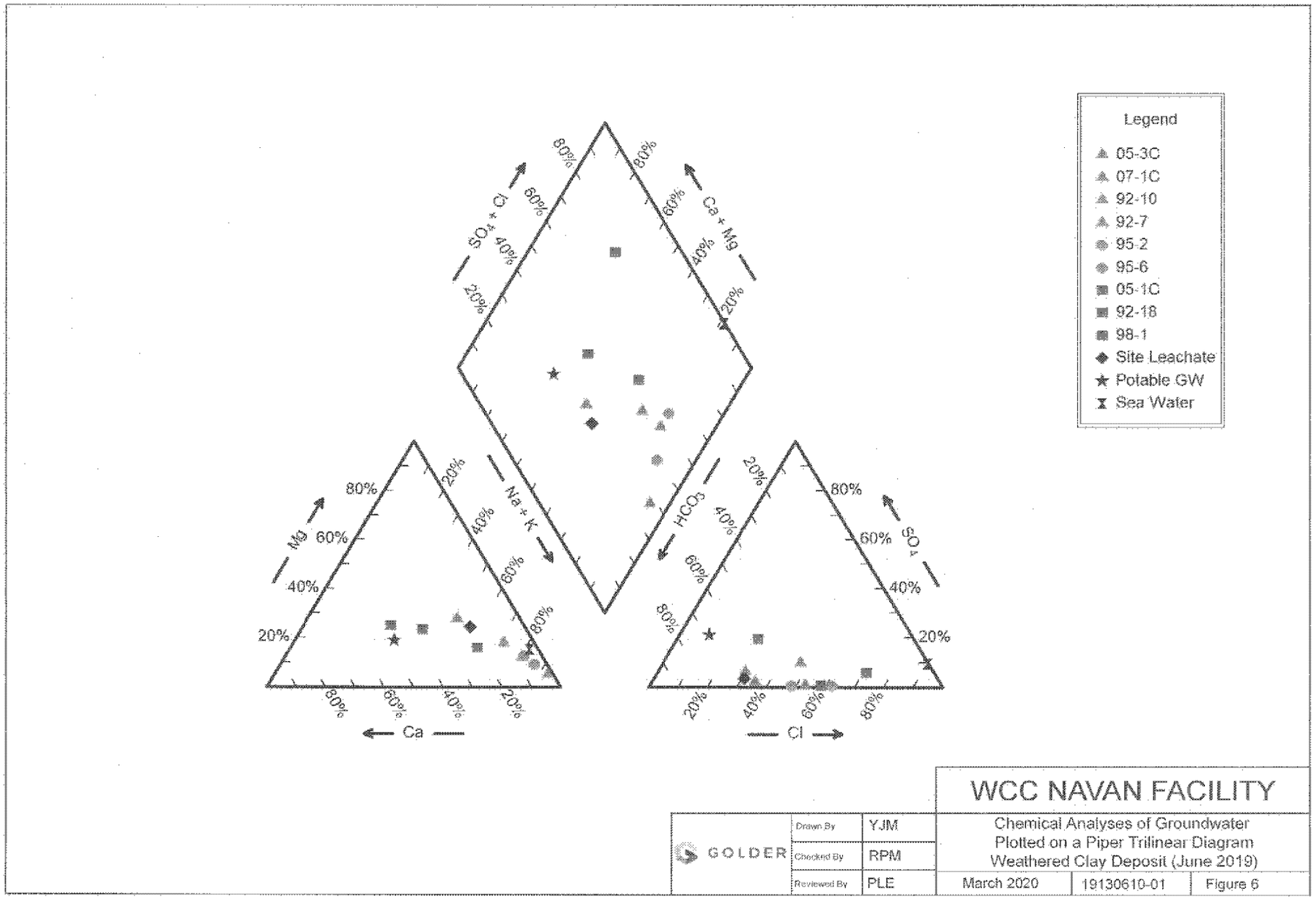
March 2020	19130610-01	Figure 4



WCC NAVAN FACILITY

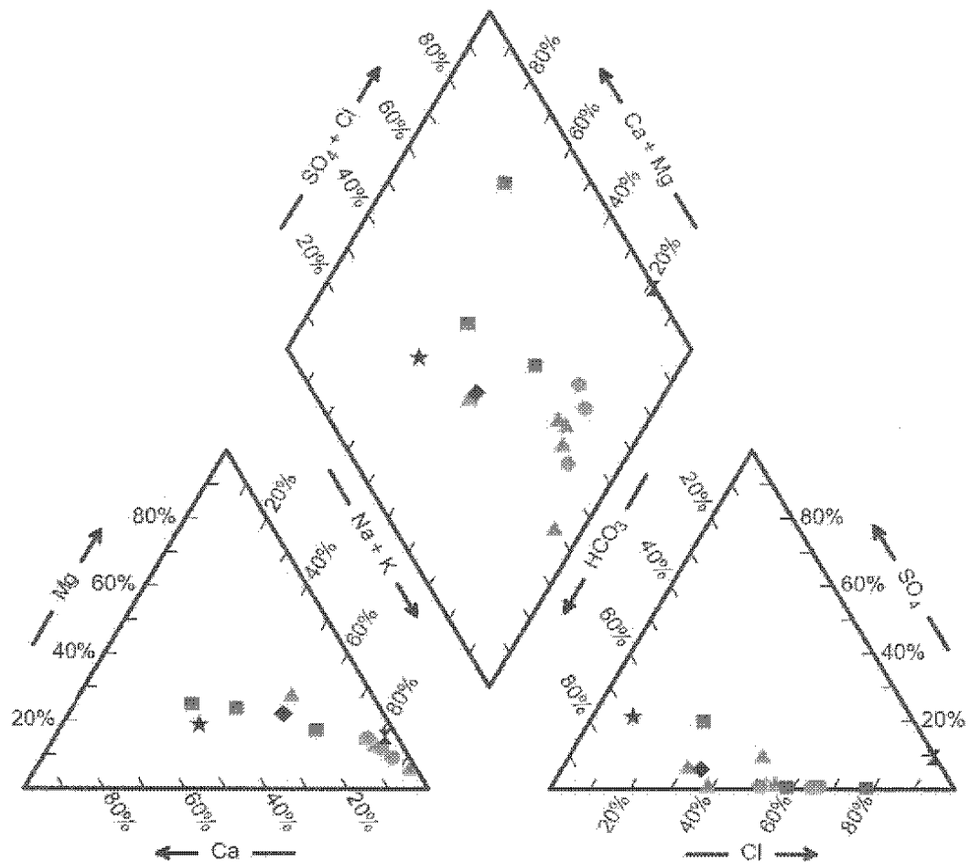
GOLDER

Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Sand Deposit (November 2019)	
Checked By	RPM		
Reviewed By	PLE	March 2020	19130610-01	Figure 5



WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Weathered Clay Deposit (June 2019)		
	Checked By	RPM			
	Reviewed By	PLE	March 2020	19130610-01	Figure 6



WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Weathered Clay Deposit (November 2019)		
	Checked By	RPM			
	Reviewed By	PLE	March 2020	19130610-01	Figure 7

APPENDIX A

Record of Borehole Sheets

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX B

Laboratory Certificates of Analysis

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX C

Groundwater Level Records

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	24-Mar-92 Elevation	25-Mar-92 Elevation	26-Mar-92 Elevation	30-Mar-92 Elevation	31-Mar-92 Elevation	01-Apr-92 Elevation	02-Apr-92 Elevation	03-Apr-92 Elevation	06-Apr-92 Elevation	10-Apr-92 Elevation	22-Apr-92 Elevation	07-May-92 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25	71.10	70.00	70.00	69.96		69.95		69.80		69.76	69.58	69.58
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03	53.25	58.86	60.78	67.15		68.15		69.28		69.75	69.66	69.77
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.83	58.13		63.48	64.58	67.26		67.78		68.36		69.01	69.31	69.46
OW-92-4	73.00	73.32	73.67		71.10	g	60.54	59.04		62.54	63.05	65.12		65.73		66.69		68.02	68.90	69.25
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29		65.04	65.54	67.22		67.67		68.29		68.87	69.11	69.19
OW-92-6	73.00	73.40	73.74		71.10	5.47	65.38	63.88		66.05	66.30	66.76		69.73		69.83		69.55	69.55	69.55
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22		69.32	69.41	69.84		69.87		69.77		69.60	69.51	69.54
OW-92-8	73.00	73.17	73.52		71.10	2.8	68.05	67.55		69.49	69.58	69.35		69.84		69.69		69.45	69.60	69.58
OW-92-9	72.30	73.03	73.39		70.67	7.6	65.82	62.32			64.27	66.87		67.44		68.12		69.00	69.20	69.42
OW-92-10	72.30	72.91	73.27		70.70	4.5	66.85	65.35			69.25	69.76		69.75		69.75		69.66	69.82	69.37
OW-92-11	72.30	72.99	73.33		70.75	2.6	68.9	67.4			69.40	69.78		69.79		69.78		69.69	69.83	69.83
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.66	48.16					74.31	74.25	74.25	74.25	74.25	74.25	74.55	74.64
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.56	67.06							80.61	81.01	81.65	83.05	83.00	82.89
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17								79.12	82.95	83.67	83.67	83.72
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17								76.62	78.92	82.51	83.80	83.84
OW-92-16	86.03	86.94	87.19		86.03	7.19	79.59	78.09								81.36	82.72	83.90	84.58	84.56
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9								83.75	84.29	84.79	85.01	84.87
OW-92-18	86.03	87.02	87.28		86.03	5.05	81.73	80.23								84.12	84.92	84.81	85.09	84.96
OW-92-19	86.03	86.96	87.22		86.03	2.93	83.85	82.36								84.35	85.39	85.46	85.55	84.98
OW-81					86.96															
OW-4-5					71.99													70.79		
OW-4-8					72.00													71.03		
OW-94-1	72.00	72.495	72.83		71.33	8.58	63.52	62.02												
OW-94-2	72.00	72.601	72.84		71.33	4.57	67.51	65.01												
OW-94-3	72.00	72.541	72.74		71.33	2.68	68.5	68												
OW-94-4	68.70	69.23	69.61		68.7	8.36	61.07	59.57												
OW-94-5	68.70	69.64	70.2		68.7	3.55	65.9	64.4												
OW-94-6	68.70	69.66	70.13		68.7	1.91	67.54	66.04												
MW-C			70.23																	
MW-E			70.87																	
MW05-1A*	86.48	86.23	86.27																	
MW05-1B*	86.56	86.31	86.33																	
MW05-1C*	86.48	86.32	86.34																	
MW05-1D*	86.62	86.35	86.39																	
MW05-2A*	72.26	69.70	81.38																	
MW05-2B*	72.15	69.74	81.31																	
MW05-2C*	72.06	69.75	81.20																	
MW05-2D*	72.06	70.80	81.25																	
MW06-3A*	69.47	69.70	70.93	74.53																
MW06-3B*	69.52	69.74	70.85	74.47																
MW06-3C*	69.47	69.75	70.80	74.52																
MW06-3D*	69.50	70.80	70.91	74.46																

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D

Prepared by: ETB
Checked by: YJM

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-May-92 Elevation	01-Jun-92 Elevation	17-Jun-92 Elevation	30-Jun-92 Elevation	21-Jul-92 Elevation	05-Aug-92 Elevation	19-Jul-93 Elevation	02-Nov-93 Elevation	04-Apr-94 Elevation	23-Apr-94 Elevation	08-Jun-94 Elevation	19-Oct-94 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25	69.49	69.30	69.35	69.35	69.63	69.66	69.61	69.62	69.85	69.88	69.84	69.82
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.63	52.03	67.93	69.51	69.58	69.60	69.60	69.58	69.55	69.58	69.50	69.46	69.60	69.57
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.33	58.13	67.66	69.16	69.40	69.43	69.42	69.44	69.63	69.42	69.27	69.29	69.41	69.40
OW-92-4	73.00	73.32	73.67		71.10	g	60.64	59.04	68.59	69.60	69.29	69.37	69.36	69.48	69.62	69.40	69.24	69.24	69.40	69.37
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29	68.54	69.17	68.28	69.25	69.31	69.36	69.38	69.43	69.09	69.45	69.43	69.20
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88	69.44	69.45	68.13	68.14	69.59	69.87	69.10	69.43	69.74	69.71	69.62	69.08
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22	69.29	69.50	69.12	69.17	69.55	69.67	69.11	69.41	69.85	69.75	69.70	69.09
OW-92-8	73.00	73.17	73.52		71.10	2.8	69.05	67.55	69.40	69.49	69.12	69.16	69.54	69.68	69.07	69.37	69.75	69.71	69.65	69.03
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.82	62.32	67.29	69.09	69.14	69.12	69.23	69.23	69.14	69.22	69.95	69.22	69.22	69.10
OW-92-10	72.30	72.91	73.27		70.70	4.8	66.85	65.35	69.29	69.34	69.12	69.16	69.38	69.44	68.94	69.24	69.36	69.55	69.42	68.98
OW-92-11	72.30	72.99	73.33		70.75	2.6	68.9	67.4	69.33	69.38	69.15	69.17	69.40	69.46	68.98	69.27	69.40	69.55	69.44	69.00
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.55	48.18	74.64	74.66	74.57	74.53	74.64	74.65	74.72	74.43			74.96	74.62
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.56	67.06	81.01	82.31	82.44	82.46	82.51	82.50	82.42	82.46	82.47	82.42	82.40	82.47
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17	83.34	83.50	83.56	83.56	83.62	83.63	83.57	83.55	83.41	83.46	83.50	83.48
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17	82.12	83.70	83.73	83.78	83.83	83.82	83.77	83.76	83.57	83.66	83.66	83.66
OW-92-16	86.03	86.94	87.19		86.03	7.19	79.59	78.09	83.32	84.18	84.32	84.29	84.41	84.43	84.32	84.41	84.12	84.40	84.26	84.19
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9	84.19	84.50	84.55	84.49	84.75	84.72	84.51	84.89	84.44	84.73	84.53	84.43
OW-92-18	86.03	87.02	87.28		86.03	5.05	81.73	80.23	84.19	84.58	84.62	84.56	84.66	84.62	84.57	84.75	84.92	84.39	84.61	84.50
OW-92-19	86.03	86.96	87.22		86.03	2.93	83.85	82.35	84.74	84.88	84.86	84.57	85.14	85.29	84.48	84.82	85.24	84.91	84.91	84.48
OW-81					68.96					84.61	84.49	86.13	84.99	84.86						
OW-4-5					71.99				68.67	70.37	70.32	70.28	70.56	70.46						
OW-4-8					72.00				68.99	70.41	70.64	70.59	70.62	70.52						
OW-94-1	72.00	72.495	72.83		71.33	8.68	63.52	62.02											68.98	
OW-94-2	72.00	72.601	72.84		71.33	4.67	67.51	66.01											69.04	
OW-94-3	72.00	72.541	72.74		71.33	2.58	69.5	68												
OW-94-4	68.70	69.23	69.61		68.7	8.38	61.07	59.57											67.77	
OW-94-5	68.70	69.64	70.2		68.7	3.55	65.9	64.4											67.82	
OW-94-6	68.70	69.66	70.13		68.7	1.51	67.54	66.04											67.78	
MW-C			70.23																	
MW-E			70.87																	
MW05-1A*	85.48	86.23	86.27																	
MW05-1B*	85.56	86.31	86.33																	
MW05-1C*	85.48	86.32	86.34																	
MW05-1D*	85.62	86.35	86.39																	
MW05-2A*	72.28	69.70	81.38																	
MW05-2B*	72.13	69.74	81.31																	
MW05-2C*	72.08	69.75	81.20																	
MW05-2D*	72.08	70.80	81.25																	
MW05-3A*	89.47	89.70	70.93	74.69																
MW05-3B*	89.52	89.74	70.85	74.47																
MW05-3C*	89.47	89.75	70.80	74.82																
MW05-3D*	89.50	70.80	70.81	74.46																

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	25-Oct-94 Elevation	06-Dec-94 Elevation	28-Mar-95 Elevation	20-Apr-95 Elevation	16-May-95 Elevation	23-Jun-95 Elevation	12 Jul 95 Elevation	26 Jul 95 Elevation	09 Aug 95 Elevation	13 Aug 95 Elevation	15 Aug 95 Elevation	18 Aug 95 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25	69.88	69.83	69.90	69.88	69.92	69.92						69.65
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03	69.56	69.50	69.81	69.77	69.72	69.70						69.59
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.63	58.13	69.39	69.29	69.61	69.55	69.57	69.58						69.44
OW-92-4	73.00	73.32	73.67		71.10	g	60.54	59.04	69.35	69.21	69.54	69.57	69.53	69.56						69.46
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29	69.15	69.27	69.45	69.43	69.40	69.50						69.37
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88	69.01	69.51	69.49	69.48	69.72	69.21						69.2
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22	69.00	69.50	69.48	69.49	69.32	69.23						69.17
OW-92-8	73.00	73.17	73.52		71.10	2.8	69.05	67.55	68.94	69.43	69.05	68.43	69.76	69.20						69.11
OW-92-9	72.30	73.03	73.39		70.67	7.8	63.82	62.32	69.06	69.15	69.17	69.21	69.18	69.16						69.07
OW-92-10	72.30	72.91	73.27		70.70	4.6	66.85	65.35	68.90	69.32	69.25	69.32	69.44	69.06						68.99
OW-92-11	72.30	72.99	73.33		70.75	2.6	68.9	67.4	68.92	69.36	69.29	69.35	69.50	69.11						69.03
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.63	48.18	74.57	74.33	74.59	74.69	74.97	74.88						74.81
OW-92-13	86.03	87.07	87.28		86.03	18.22	68.56	67.06	82.47	82.50	82.52	82.49	82.47	82.44						82.46
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17	83.48	83.49	83.49	83.48	83.50	83.50						83.41
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17	83.65	83.65	83.65	83.65	83.66	83.71						83.61
OW-92-16	86.03	86.94	87.16		86.03	7.16	79.59	78.09	84.15	84.26	84.15	84.24	84.20	84.26						84.11
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9	84.40	84.54	84.46	84.52	84.45	84.47						84.4
OW-92-18	86.03	87.02	87.28		86.03	5.05	81.73	80.23	84.52	84.63	84.55	84.62	84.65	84.54						84.49
OW-92-19	86.05	86.95	87.22		86.03	2.93	83.85	82.35	84.48	84.85	84.85	84.73	84.46	84.45						84.46
OW-81					88.96															
OW-4-5					71.99															
OW-4-8					72.00															
OW-94-1	72.00	72.496	72.83		71.33	8.86	63.52	62.02					71.09	71.09						70.79
OW-94-2	72.00	72.601	72.84		71.33	4.57	67.51	66.01					70.52	70.47						70.22
OW-94-3	72.00	72.541	72.74		71.33	2.58	69.5	68					70.36	70.33						70.18
OW-94-4	88.70	89.23	89.61		88.7	8.35	81.07	80.57					88.54	88.54						88.46
OW-94-5	88.70	89.04	89.2		88.7	3.55	86.9	84.4					88.51	88.35						88.42
OW-94-6	88.70	89.06	89.13		88.7	1.91	87.54	86.04					88.42	88.32						88.38
MW-C			70.23																	
MW-E			70.87																	
MW05-1A*	85.48	86.23	86.27																	
MW05-1B*	85.55	86.31	86.33																	
MW05-1C*	85.48	86.32	86.34																	
MW05-1D*	85.62	86.35	86.39																	
MW05-2A*	72.28	69.70	81.36																	
MW05-2B*	72.13	69.74	81.31																	
MW05-2C*	72.08	69.75	81.20																	
MW05-2D*	72.06	70.60	81.25																	
MW05-3A*	69.47	69.70	70.93	74.59																
MW05-3B*	69.52	69.74	70.85	74.47																
MW05-3C*	69.47	69.75	70.80	74.52																
MW05-3D*	69.50	70.60	70.91	74.46																

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	21-Aug-95 Elevation	28-Aug-95 Elevation	13-Sep-95 Elevation	18-Sep-95 Elevation	29-Sep-95 Elevation	11-Nov-95 Elevation	06-Jun-96 Elevation	08-Aug-96 Elevation	04-Sep-96 Elevation	09-Jun-97 Elevation	12-Oct-97 Elevation	03-Jun-98 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25					69.5	69.97	69.89	69.9	69.89	69.99	69.89	70.05
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03					69.95	69.92	69.7	69.83	69.6	70.06	69.86	70.09
OW-92-3	73.00	73.29	73.64		71.10	13.22	58.63	58.13					69.89	69.9	69.82	69.39	69.45	70.03	69.57	69.69
OW-92-4	73.00	73.32	73.67		71.10	g	60.54	59.04					69.89	69.87	69.82	69.36	69.44	70.04		69.55
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29					69.45	69.77	69.54	69.24	69.34	69.65	70.1	69.34
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88					69.13	69.55	69.35	69.2	69.17	69.21	68.83	69.02
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22					69.13	69.5	69.4	69.17	69.17	69.18	68.78	68.04
OW-92-8	73.00	73.13	73.52		71.10	2.8	69.05	67.55					69.1	69.46	69.35	69.11	69.17	69.2	68.82	69.07
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.82	62.32					68.99	69.36	69.21	69.06	69.15	69.28	68.83	68.98
OW-92-10	72.30	72.91	73.27		70.70	4.6	66.85	65.35					68.92	69.24	69.23	68.97	69	69.06	68.8	68.96
OW-92-11	72.30	72.99	73.33		70.75	2.8	68.9	67.4					68.91	69.36	69.23	68.99	69.03	69.1	68.83	68.98
OW-92-12	86.03	87.14	87.41		86.03	37.1	48.66	48.18					74.87	74.69	74.82	74.62	74.49	74.98	74.5	74.70
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.56	67.06					82.4	82.45	82.62	82.58	82.77	82.61	82.56	82.55
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17					83.41	83.55	83.72	83.56	83.51	83.66	83.48	83.58
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17					83.6	83.74	83.9	83.7	83.67	83.99	83.84	83.79
OW-92-16	86.03	86.94	87.19		86.03	7.19	79.59	78.09					84.04	84.37	84.42	84.26	84.24	84.53	84.06	84.20
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9					84.22	84.63	84.58	84.47	84.42	84.5	84.27	84.34
OW-92-18	86.03	87.02	87.25		86.03	5.05	81.73	80.23					84.24	84.66	84.54	84.62	84.47	84.58	84.31	84.43
OW-92-19	86.03	86.96	87.22		86.03	2.93	83.85	82.35					84.24	84.79	84.57	84.47	84.41	84.49	84.34	84.33
OW-81					86.96															
OW-4-8					71.98															
OW-4-8					72.00															
OW-94-1	72.00	72.496	72.83		71.33	8.56	63.62	62.02					69.13	69.29	69.828	69.316	68.81	69.72	68.38	69.32
OW-94-2	72.00	72.601	72.84		71.33	4.57	67.51	66.01					69.65	69.31	69.911	69.951	69.91	69.04	68.44	68.79
OW-94-3	72.00	72.541	72.74		71.33	2.68	69.5	68					69.62	69.82	69.941	69.391	69.85	69.93	69.01	68.74
OW-94-4	68.70	69.23	69.61		68.7	8.38	61.07	59.57					67.7	68.08	68.51	68.25	68.28	68.52	67.94	68.40
OW-94-5	68.70	69.64	70.2		68.7	3.55	65.9	64.4					68.13	68.6	68.38	67.95	67.54	68.05	67.66	68.00
OW-94-6	68.70	69.66	70.13		68.7	1.91	67.54	66.04					66.83	69.02	68.36	68.01	67.51	68.04	68.02	67.96
MW-C			70.23																	
MW-E			70.67																	
MW05-1A*	85.48	86.23	86.27																	
MW05-1B*	85.55	86.31	86.33																	
MW05-1C*	85.48	86.32	86.34																	
MW05-1D*	85.62	86.35	86.39																	
MW05-2A*	72.28	69.70	81.38																	
MW05-2B*	72.13	69.74	81.31																	
MW05-2C*	72.08	69.75	81.20																	
MW05-2D*	72.08	70.80	81.25																	
MW05-3A*	59.47	69.70	70.93	74.53																
MW05-3B*	59.52	69.74	70.85	74.47																
MW05-3C*	59.47	69.75	70.80	74.52																
MW05-3D*	59.50	70.80	70.91	74.46																

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

Prepared by: ETS
Checked by: YJM

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-Aug-98 Elevation	26-Oct-98 Elevation	03-May-99 Elevation	11-Oct-99 Elevation	02-May-00 Elevation	20-Oct-00 Elevation	06-Jun-01 Elevation	03-Oct-01 Elevation	17-May-02 Elevation	30-Oct-02 Elevation	22-May-03 Elevation	01-Oct-03 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25	70.01	70.01	70.2	70.12	70.2	70.28	70.32	70.31	70.37	70.42	70.36	70.41
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03	70.08	70.15	69.81	70.16	69.87	70.15	70.24	70.23	70.4	70.26	70.21	
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.63	58.13	69.92	69.86	69.31	69.67	69.97	69.78	69.91	69.74	70.2	69.70	69.94	
OW-92-4	73.00	73.32	73.67		71.10	g	60.54	59.04				69.57	69.97	69.7	69.84	69.6	70.27	69.54	69.89	
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29	69.35	69.54	68.95	69.17	69.97	69.2	69.51	68.98	69.91	69.13	69.77	69.26
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88	69.08	69.36	68.4	69.02	69.84	68.95	69.4	69.07	69.89	68.99	69.70	
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22	69.03	69.33	68.4	68.86	69.69	68.86	69.37	68.79	69.95	69.03	69.59	68.90
OW-92-8	73.00	73.17	73.52		71.10	2.6	69.05	67.55	69.07	69.34	69.39	68.96	69.74	68.86	69.41	68.8	69.97	69.02	69.59	68.91
OW-92-9	72.30	73.03	73.39		70.67	7.8	63.82	62.32	69.06	69.2	69.29	68.98	69.33	68.96	69.63	69.02	69.69	69.33	69.66	69.32
OW-92-10	72.30	72.91	73.27		70.70	4.6	66.85	65.35	69.99	69.21	69.21		69.28	68.82	69.3	68.85	69.69	69.17	69.46	68.80
OW-92-11	72.30	72.99	73.33		70.75	2.6	68.9	67.4	69.12	69.23	69.18	68.96	69.25	68.76	69.27	68.96	69.67	69.17	69.46	68.92
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.68	48.18	74.61	74.6	75.13	74.58	74.99	74.89	75.04	74.86	75.16	74.65	74.71	74.71
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.56	67.06	82.53	82.57	82.61	82.61	82.9	82.6	82.62	82.55	82.58	82.55	82.51	82.49
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17	83.52	83.58	83.69	83.61	83.85	83.67	83.59	83.46	83.52	83.45	83.56	83.48
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17	83.7	83.75	84.01	83.76	83.85	83.82	84.23	83.65	84.42	84.01	85.13	84.95
OW-92-16	86.03	86.94	87.19		86.03	7.19	79.59	78.09	84.18	84.32	84.46	84.35	84.53	84.17	84.31	84.04	84.52	84.00	84.42	84.09
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9	84.36	84.32	84.67	84.6	84.78	84.33	84.49	84.21	84.72	84.15	84.63	84.19
OW-92-18	86.03	87.02	87.28		86.03	5.05	81.73	80.23	84.43	84.54	84.77	84.76	84.89	84.46	84.74	84.5	84.72	84.14	84.74	84.23
OW-92-19	86.03	86.96	87.22		86.03	2.93	83.85	82.55	84.34	84.54	84.67	84.59	84.81	84.3	84.46	84.2	85.2	84.35	84.76	84.26
OW-81					86.86															
OW-4-5					71.59															
OW-4-6					72.00															
OW-94-1	72.00	72.496	72.83		71.33	8.55	63.62	62.02	69.2	69.29	69.52	69.9	69.6	69.2	69.41	69.4	69.77	69.35	69.70	69.45
OW-94-2	72.00	72.601	72.84		71.33	4.57	67.51	66.01	68.68	69.01	69.25	68.52	69.51	68.72	69.17	69.28	69.65	68.99	69.45	68.70
OW-94-3	72.00	72.541	72.74		71.33	2.58	68.5	68	68.64	68.98	69.01	68.53	69.46	68.59	69.06	69.22	69.69	69.07	69.44	68.72
OW-94-4	68.70	69.23	69.61		65.7	8.36	61.07	59.67	68.25	68.48	68.66	68.13	68.58	68.52	68.6	68.08	68.65	67.91	68.51	68.21
OW-94-5	68.70	69.64	70.2		65.7	3.55	63.9	64.4	67.66	68.38	68.34	68.27	68.45	68.31	68.4	67.92	68.48	67.92	68.43	67.88
OW-94-6	68.70	68.66	70.13		68.7	1.91	67.54	66.04	67.74	68.44	68.36	68.32	68.48	68.32	68.43	67.93	68.48	67.94	68.45	67.85
MW-C			70.23																	
MW-E			70.87																	
MW05-1A*	85.46	86.23	86.27																	
MW05-1B*	85.55	86.31	86.33																	
MW05-1C*	85.46	86.32	86.34																	
MW05-1D*	85.52	86.35	86.39																	
MW05-2A*	72.26	69.70	81.38																	
MW05-2B*	72.13	69.74	81.31																	
MW05-2C*	72.08	69.75	81.20																	
MW05-2D*	72.08	70.80	81.26																	
MW05-3A*	69.47	69.70	70.93	74.53																
MW05-3B*	69.52	69.74	70.85	74.47																
MW05-3C*	69.47	69.75	70.80	74.52																
MW05-3D*	69.50	70.80	70.91	74.46																

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

Prepared by: ETB
Checked by: YJM

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	05-Nov-03 Elevation	08-May-04 Elevation	05-Nov-04 Elevation	25-May-05 Elevation	16-Nov-05 Elevation	19-May-06 Elevation	14-Nov-06 Elevation	07-May-07 Elevation	19-Nov-07 Elevation	13-May-08 Elevation	03-Nov-08 Elevation	11-May-09 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	48.75	45.25	70.49	70.51	70.53	70.47	70.4	70.46	70.57	70.52	70.47	70.55	70.49	70.54
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03	70.35	70.40	70.20	70.52	70.14	70.27	70.35	70.36	70.44	70.55	70.52	70.50
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.63	58.13	69.87	70.09	69.84	70.07	69.83	70.03	70.07	70.02	69.84	70.39	70.19	70.23
OW-92-4	73.00	73.32	73.67		71.10	g	60.64	59.04	69.77	70.05	69.76	70.02	69.55	69.99	70.015	70.03	69.84	70.39	70.13	70.19
OW-92-5	73.00	73.31	73.64		71.10	8.06	63.79	62.29	69.48	69.88	69.33	69.65	69.11	69.73	69.899	69.88	69.41	70.37	69.71	69.83
OW-92-6	73.00	73.40	73.74		71.10	6.47	64.38	63.88	69.52	68.80	69.2	69.61	68.98	70.13	69.818	69.73	69.33	70.32	69.60	69.91
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22	69.57	69.70	69.25	69.44	68.94	70.22	70.18	69.80	69.34	70.18	69.59	69.85
OW-92-8	73.00	73.17	73.52		71.10	2.8	69.05	67.55	69.57	69.70	69.25	69.44	68.83	70.21	70.24	69.80	69.37	70.2	69.51	69.78
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.82	62.32	69.55	69.87	69.32	69.68	69.23	69.61	69.679	69.53	69.33	69.85	69.51	69.56
OW-92-10	72.30	72.91	73.27		70.70	4.8	66.85	65.35	69.63	69.61	69.19	69.34	69.16	70.1	70.185	69.46	69.32	69.77	69.53	69.64
OW-92-11	72.30	72.99	73.33		70.75	2.5	68.9	67.4	69.84	69.59	69.27	69.42	69.15	70.09	70.102	69.46	69.44	69.8	69.52	69.63
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.68	48.18	74.80	75.16	74.66	75.23	74.54	75.35	75.33	75.46	75.36	76.92	75.07	75.65
OW-92-13	86.03	87.07	87.36		86.03	18.22	68.56	67.06	82.57	82.59	82.54	82.58	82.55	82.63	82.675	82.70	82.59	82.86	82.69	82.70
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17	83.55	83.54	83.46	83.60	83.52	83.72	83.756	83.71	83.51	83.72	83.64	83.67
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17	85.00	85.02	84.89	85	84.87	85.15	85.057	85.19	84.57	85.14	84.94	85.23
OW-92-16	86.03	86.94	87.19		86.03	7.19	78.59	78.09	84.32	84.43	84.20	84.44	84.22	84.6	84.606	84.55	84.17	84.63	84.78	84.68
OW-92-17	86.03	87.09	87.37		86.03	6.36	80.4	78.9	84.59	84.66	84.36	84.63	84.44	84.88	84.841	84.76	84.37	84.84	84.50	84.62
OW-92-18	86.03	87.02	87.28		86.03	5.05	81.73	80.23	84.66	84.76	84.42	83.7	84.5	84.81	84.9	84.85	82.87	84.93	84.54	84.96
OW-92-19	86.03	86.96	87.22		86.03	2.93	83.85	82.35	85.00	84.92	84.63	84.69	84.67	85.42	85.486	84.61	84.52	84.82	84.82	85.19
OW-91					86.96															
OW-4-5					71.99															
OW-4-8					72.00															
OW-94-1	72.00	72.496	72.89		71.33	8.56	63.52	62.02	69.60	69.76	69.53	69.758	69.506	69.756	70.03	69.91	70.06	70.04	69.64	69.29
OW-94-2	72.00	72.601	72.84		71.33	4.57	67.51	66.01	69.52	69.53	68.99	69.331	69.361	69.671	69.576	69.45	69.22	69.44	69.19	68.97
OW-94-3	72.00	72.541	72.74		71.33	2.58	69.5	68	69.56	69.56	69.08	69.301	69.361	69.841	70.111	69.42	69.21	69.40	69.12	68.44
OW-94-4	68.70	69.23	69.61		68.7	8.38	61.07	59.57	68.48	68.55	68.63	68.67	68.49	68.89	68.755	68.67	68.45	68.61	68.73	68.73
OW-94-5	68.70	69.64	70.2		68.7	3.55	65.9	64.4	68.66	68.51	68.80	68.47	68.44	68.46	68.485	68.37	68.30	68.36	68.44	68.45
OW-94-6	68.70	69.66	70.13		68.7	1.91	67.54	66.04	68.54	68.51	68.51	68.48	68.45	68.56	68.507	68.41	68.35	68.41	68.47	68.50
MW-C			70.23																	
MW-E			70.87																	
MW05-1A*	85.48	86.23	86.27													78.66	78.88	79.05	78.76	75.95
MW05-1B*	85.55	86.31	86.33													84.276	83.975	84.31	84.035	83.95
MW05-1C*	85.48	86.32	86.34													84.915	84.625	84.91	85.075	84.46
MW05-1D*	85.62	86.35	86.39													84.83	84.56	84.85	85.12	84.55
MW05-2A*	72.23	69.70	81.38													66.21	66.11	66.62	65.91	66.38
MW05-2B*	72.13	69.74	81.31													68.195	67.535	67.77	67.745	67.13
MW05-2C*	72.08	69.76	81.20													70.36	67.99	70.17	68.72	69.26
MW05-2D*	72.08	70.80	81.25													71.2	68.02	70.14	69.44	71.11
MW05-3A*	69.47	69.70	70.93	74.55												70.02	70.02	70.03	70	70.04
MW05-3B*	69.53	69.74	70.85	74.47												69.9	69.91	70.08	70.07	70.17
MW05-3C*	69.47	69.75	70.90	74.52												69.46	69.43	69.54	69.69	69.80
MW05-3D*	69.50	70.80	70.91	74.46												69.355	69.405	69.73	69.555	69.74

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

Prepared by: ETB
Checked by: YJM

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	16-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	15-May-11 Elevation	22-Nov-11 Elevation	23-May-12 Elevation	20-Nov-12 Elevation	21-May-13 Elevation	20-Nov-13 Elevation	23-May-14 Elevation	12-Nov-14 Elevation	26-May-15 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25	70.49	70.52	70.01	70.36	70.49	70.59	70.53	70.62	70.66	70.73	70.78	70.76
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03	70.35	70.37	70.03	70.20	70.33	70.43	70.24	70.37	70.26	70.39	70.38	70.37
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.53	58.13	69.96	70.21	69.69	70.05	69.86	70.21	69.87	70.17	69.85	70.19	69.90	70.12
OW-92-4	73.00	73.32	73.67		71.10	g	60.54	59.04	69.60	70.28	69.63	70.07	69.78	70.20	69.80	70.15	69.78	70.17	69.82	70.09
OW-92-5	73.00	73.31	73.64		71.10	8.66	63.79	62.29	69.47	69.88	69.60	70.00	69.23	70.03	69.45	69.92	69.46	70.19	69.47	69.84
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88	70.27	69.55	69.72	69.95	69.02	69.94	69.32	69.82	69.46	70.26	69.39	69.73
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22	69.17	69.40	69.86	70.05	68.93	69.77	69.23	69.69	69.83	70.09	69.36	69.62
OW-92-8	73.00	73.17	73.52		71.10	2.8	69.05	67.55	69.10	69.41	69.65	69.44	68.93	69.77	69.26	69.73	69.59	70.13	69.30	69.63
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.82	62.32	69.39	69.76	69.64	69.81	69.73	69.80	69.62	69.85	69.85	69.81	69.69	69.56
OW-92-10	72.30	72.91	73.27		70.70	4.6	66.85	65.35	69.19	69.41	69.66	69.80	69.85	69.73	69.83	69.62	69.88	69.83	69.93	69.74
OW-92-11	72.30	72.99	73.33		70.75	2.8	68.9	67.4	69.18	69.42	69.16	69.80	69.81	69.68	69.59	69.58	69.86	69.79	69.90	69.69
OW-92-12	86.03	87.14	87.41		86.03	37.1	48.68	48.18	75.46	75.36	74.71	75.43	75.00	75.01	75.35	75.81	75.64	76.88	76.86	75.70
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.56	67.06	82.90	82.84	82.94	83.03	83.13	83.21	83.16	83.23	83.24	83.22	83.27	83.24
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17	83.94	83.83	85.91	84.05	84.13	84.32	84.30	84.33	84.31	84.33	84.38	84.25
OW-92-15	86.03	87.10	87.36		86.03	11.11	75.67	74.17	84.57	84.58	85.15	85.32	84.70	85.46	85.11	85.32	84.73	85.49	84.94	85.27
OW-92-16	86.03	86.94	87.19		86.03	7.19	78.59	78.09	84.90	84.57	84.70	84.77	84.90	85.01	84.86	84.99	84.76	85.08	84.90	84.89
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9	84.82	84.74	84.94	84.98	84.81	85.24	85.05	85.20	85.00	85.34	85.16	85.09
OW-92-18	86.03	87.02	87.28		86.03	5.05	81.75	80.23	84.80	84.81	85.03	85.04	84.75	85.26	85.01	85.22	85.01	85.40	85.13	85.12
OW-92-19	86.03	86.96	87.22		86.03	2.93	83.85	82.35	84.61	84.80	85.01	85.27	84.74	85.35	85.00	85.20	85.15	85.47	85.23	85.36
OW-81					55.99															
OW-4-5					73.99															
OW-4-8					72.00															
OW-94-1	72.00	72.496	72.83		71.33	8.56	63.52	62.02	69.57	69.79	69.53	69.88	69.56	69.96	69.81	70.00	69.65	70.07	69.79	69.94
OW-94-2	72.00	72.501	72.84		71.33	4.57	67.61	66.01	69.05	69.11	69.51	69.53	68.97	69.60	69.31	69.44	69.17	69.70	69.23	69.32
OW-94-3	72.00	72.541	72.74		71.33	2.58	69.5	68	69.04	69.13	69.50	69.67	68.92	69.45	69.28	69.39	69.20	69.66	69.28	69.36
OW-94-4	68.70	69.23	69.61		68.7	8.38	61.07	59.57	67.69	68.72	68.71	68.73	68.07	69.10	69.17	69.08	69.14	69.15	69.23	69.10
OW-94-5	68.70	69.64	70.2		68.7	3.55	65.9	64.4	68.38	68.39	68.41	68.46	68.69	68.98	68.96	68.99	68.96	69.04	69.01	68.67
OW-94-6	68.70	69.66	70.13		68.7	1.91	67.54	66.04	68.40	68.46	68.48	68.55	68.89	68.98	68.67	68.99	68.95	69.05	69.05	68.94
MW-C			70.23										68.31	69.16	69.00	69.16	68.83	69.22	69.11	69.18
MW-E			70.87										68.79	68.74	69.40	69.68	69.05	69.78	69.76	69.73
MW05-1A*	85.48	86.23	86.27						78.43	78.66	78.16	78.70	78.43	78.50	78.17	78.37	78.38	78.67	78.26	78.31
MW05-1B*	85.66	86.31	86.33						83.82	83.71	83.65	83.67	83.60	83.61	83.60	83.71	83.55	83.76	83.68	83.78
MW05-1C*	85.48	86.32	86.34						84.26	84.22	84.45	84.73	84.13	84.34	84.23	84.30	84.34	84.55	84.35	84.24
MW05-1D*	85.62	86.36	86.39						84.27	84.21	85.01	84.81	84.18	84.36	84.28	84.31	84.42	84.48	84.39	84.40
MW05-2A*	72.28	69.70	81.38						66.23	66.27	65.72	66.26	75.94	74.05	74.39	74.66	74.54	74.61	74.73	74.62
MW05-2B*	72.13	69.74	81.31						67.97	68.14	67.75	68.11	76.00	76.29	75.90	76.33	76.42	76.55	76.73	76.66
MW05-2C*	72.08	69.75	81.20						69.50	69.70	69.62	69.93	77.37	78.00	77.92	78.10	78.07	78.49	78.22	78.31
MW05-2D*	72.08	70.80	81.25						70.34	70.04	71.01	71.17	77.80	78.65	78.55	78.55	78.69	79.29	78.83	78.79
MW05-3A*	69.47	66.70	70.99	74.53					69.99	70.05	69.65	69.87	70.18	70.19	70.13	70.23	70.15	70.33	70.31	70.33
MW05-3B*	69.52	69.74	70.65	74.47					70.14	70.17	70.17	70.22	70.44	70.51	70.52	70.72	70.83	70.84	70.83	70.55
MW05-3C*	69.47	68.75	70.60	74.52					69.77	69.66	69.82	69.90	70.07	70.14	70.29	70.47	70.62	70.69	70.78	70.56
MW05-3D*	69.50	70.80	70.91	74.46					69.80	69.90	69.87	69.71	70.04	70.12	70.28	70.43	70.64	70.65	70.60	70.53

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1;2S/A/B/C/D

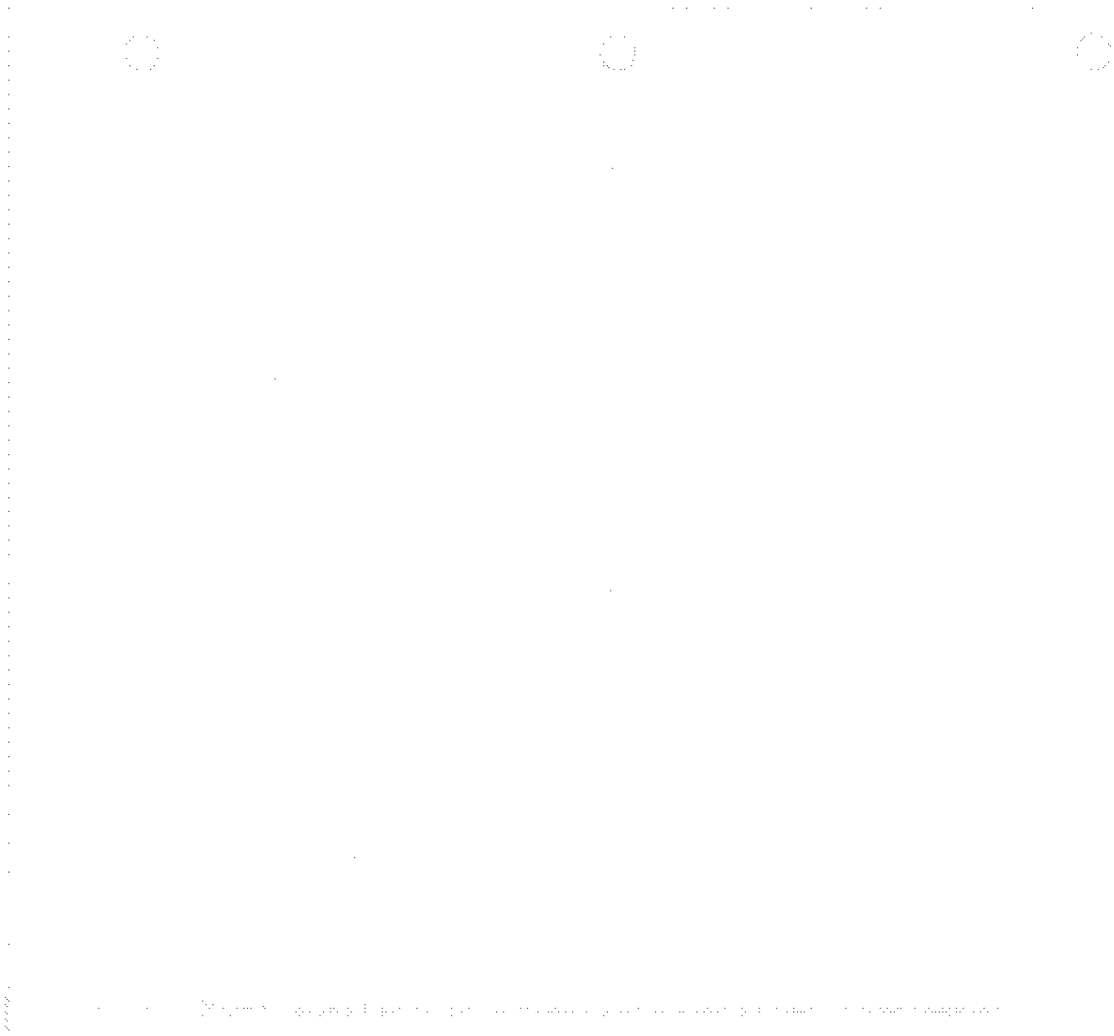
GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	Nov 2014 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	25-Aug-15 Elevation	19-Nov-15 Elevation	19-May-16 Elevation	16-Aug-16 Elevation	10-Nov-16 Elevation	17-May-17 Elevation	26-Aug-17 Elevation	22-Nov-17 Elevation	15-May-18 Elevation	03-Aug-18 Elevation	22-Nov-18 Elevation
	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	45.25		70.77	70.68		70.81	71.00		70.98	71.06		70.97
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03		70.25	70.53		70.22	70.60		70.78	71.10		70.88
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.63	58.13		69.77	70.37		69.70	70.34		70.31	71.00		70.37
OW-92-4	73.00	73.32	73.67		71.10	g	60.54	59.04		69.87	70.35		69.80	70.33		70.22	70.99		70.27
OW-92-5	73.00	73.31	73.64		71.10	8.05	63.79	62.29		69.18	70.05		69.16	70.78		70.41	71.18		70.11
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88		69.07	69.92		69.09	71.07		70.61	71.18		70.04
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22		68.97	69.78		69.16	71.03		70.64	71.34		70.26
OW-92-8	73.00	73.17	73.52		71.10	2.8	69.05	67.55		68.06	69.78		69.04	71.07		70.74	71.48		70.38
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.82	62.32		69.57	69.78		69.56	70.11		70.06	70.45		70.18
OW-92-10	72.30	72.91	73.27		70.70	4.8	66.85	65.35		69.75	69.83		69.78	70.22		70.12	70.32		70.11
OW-92-11	72.30	72.99	73.33		70.75	2.6	68.9	67.4		69.72	69.59		69.75	70.23		70.11	70.34		70.11
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.68	48.18		75.80	76.23		75.99	75.73		76.46	76.69		76.27
OW-92-13	86.03	87.07	87.36		86.03	18.22	68.56	67.06		83.23	83.25		83.20	83.30		83.39	83.38		83.28
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17		84.22	84.40		84.21	84.44		84.41	84.41		84.34
OW-92-15	86.03	87.10	87.36		86.03	11.11	75.67	74.17		84.74	85.32		84.62	85.54		86.17	85.34		84.81
OW-92-16	86.03	86.94	87.19		86.03	7.19	78.59	78.09		84.76	85.02		84.79	85.27		85.06	85.08		84.76
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9		84.97	85.21		85.05	85.56		85.39	85.30		85.00
OW-92-18	86.03	87.02	87.28		86.03	5.05	81.75	80.23		84.99	85.23		85.06	85.65		85.37	85.34		84.97
OW-92-19	86.03	86.96	87.22		86.03	2.93	83.85	82.35		86.08	85.23		85.13	85.53		85.47	85.34		85.02
OW-81					85.99														
OW-4-5					71.99														
OW-4-8					72.00														
OW-94-1	72.00	72.496	72.83		71.33	3.66	63.52	62.02		69.59	70.09		69.50	70.26		70.09	70.55		70.00
OW-94-2	72.00	72.651	72.84		71.33	4.97	67.91	66.01		69.02	69.37		68.94	69.80		69.62	69.84		69.47
OW-94-3	72.00	72.541	72.74		71.33	2.58	69.5	68		69.03	69.38		68.94	69.75		69.66	69.80		69.41
OW-94-4	68.70	69.23	69.61		68.7	8.36	61.07	59.57		69.16	69.12		69.02	69.13		69.16	69.15		69.14
OW-94-5	68.70	69.84	70.2		68.7	3.55	66.9	64.4		68.88	68.86		68.85	68.86		68.89	68.85		68.75
OW-94-6	68.70	69.66	70.13		68.7	1.91	67.54	66.04		68.96	68.95		68.95	68.97		68.99	68.94		68.90
MW-C			70.23							68.63	69.15		68.05	69.24		69.24	69.24		68.93
MW-E			70.87							69.24	69.69		69.28	69.80		69.83	69.74		69.27
MW05-1A*	85.48	86.03	86.27							78.44	78.32		78.25	78.63		78.46	79.75		76.57
MW05-1B*	85.55	86.31	86.33							83.56	83.76		83.44	83.78		83.71	83.80		83.63
MW05-1C*	85.48	86.32	86.34							84.33	84.33		84.18	84.68		84.51	84.46		84.26
MW05-1D*	86.02	86.39	86.39							84.37	84.32		84.23	84.59		84.55	84.41		84.32
MW05-2A*	72.28	69.70	81.38							74.74	75.08		74.62	75.25		75.31	75.52		75.14
MW05-2B*	72.13	69.74	81.31							76.55	76.82		76.51	76.86		76.96	77.10		77.40
MW05-2C*	72.08	69.75	81.20							78.07	78.49		77.90	78.71		78.42	78.78		78.41
MW05-2D*	72.08	70.80	81.25							78.81	78.94			79.36		79.21	79.19		78.74
MW05-3A*	69.47	69.70	70.93	74.55						70.33	70.49		70.92	70.59		70.64	70.73		70.65
MW05-3B*	69.52	69.74	70.85	74.47						70.86	70.86		72.18	71.32		71.49	71.46		71.40
MW05-3C*	69.47	69.75	70.80	74.52						70.57	70.65		71.46	70.81		70.80	70.99		70.97
MW05-3D*	69.50	70.80	70.91	74.45						70.54	70.67			70.82		70.67	70.75		70.69

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1;2;3/A;B;C;D.

Prepared by: ETB
Checked by: YJM



WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-1
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation (m)	2003 Top of Riser (m)	Nov 2011 Top of Riser (m)	May 2017 Top of Riser (m)	Original Surface Elevation (m)	Depth below Original Grade (m)	Elevation Centre of Well Screen (m)	Elevation Bottom of Well (m)	13-Jun-19 Elevation (m)	14-Nov-19 Elevation (m)
OW-92-1	73.00	73.31	73.67		71.10	25.1	46.75	46.25	71.12	70.95
OW-92-2	73.00	73.16	73.50		71.10	18.32	53.53	52.03	71.04	70.63
OW-92-3	73.00	73.29	73.64		71.10	12.22	59.62	58.13	70.69	69.95
OW-92-4	73.00	73.32	73.67		71.10	g	60.54	59.04	70.63	69.82
OW-92-5	73.00	73.31	73.64		71.10	8.08	63.79	62.29	70.19	69.45
OW-92-6	73.00	73.40	73.74		71.10	6.47	65.38	63.88	69.92	69.32
OW-92-7	73.00	73.25	73.59		71.10	5.13	66.72	65.22	69.95	69.47
OW-92-8	73.00	73.17	73.52		71.10	2.8	69.05	67.55	70.04	69.67
OW-92-9	72.30	73.03	73.39		70.67	7.6	63.52	62.32	70.09	69.72
OW-92-10	72.30	72.91	73.27		70.70	4.6	66.65	65.35	69.88	69.67
OW-92-11	72.30	72.99	73.33		70.75	2.6	68.9	67.4	69.84	69.84
OW-92-12	86.03	87.14	87.41		86.03	37.1	49.68	48.18	76.74	76.30
OW-92-13	86.03	87.07	87.26		86.03	18.22	68.56	67.06	83.29	83.26
OW-92-14	86.03	86.96	87.24		86.03	12.11	74.67	73.17	84.39	84.27
OW-92-15	86.03	87.10	87.35		86.03	11.11	75.67	74.17	85.33	85.25
OW-92-16	86.03	86.94	87.19		86.03	7.19	79.59	78.09	85.04	84.80
OW-92-17	86.03	87.09	87.37		86.03	6.38	80.4	78.9	85.23	85.10
OW-92-18	86.03	87.02	87.28		86.03	6.05	81.73	80.23	85.25	85.10
OW-92-19	86.03	86.96	87.22		86.03	2.93	83.85	82.35	85.34	85.16
OW-81					86.96					
OW-4-5					71.99					
OW-4-8					72.09					
OW-94-1	72.00	72.486	72.83		71.33	8.55	63.52	62.02	70.21	69.61
OW-94-2	72.00	72.601	72.84		71.33	4.57	67.51	66.01	69.41	69.27
OW-94-3	72.00	72.541	72.74		71.33	2.58	69.5	68	69.37	69.30
OW-94-4	88.70	89.23	89.61		88.7	8.38	81.07	79.57	89.16	88.74
OW-94-5	88.70	89.64	90.2		88.7	2.55	85.9	84.4	88.85	88.74
OW-94-6	88.70	89.66	90.13		88.7	1.91	87.54	86.04	89.97	88.83
MW-C			70.23						69.10	68.66
MW-E			70.87						69.69	69.07
MW05-1A*	85.48	86.23	86.27						78.56	78.30
MW05-1B*	85.55	86.31	86.33						83.79	83.44
MW05-1C*	85.48	86.32	86.34						84.31	84.18
MW05-1D*	85.62	86.35	86.39						84.28	84.26
MW05-2A*	72.28	69.70	81.38						75.54	75.14
MW05-2B*	72.13	69.74	81.31						77.28	77.07
MW05-2C*	72.08	69.75	81.20						78.72	78.55
MW05-2D*	72.08	70.80	81.26						79.04	79.01
MW05-3A*	69.47	69.70	70.93	74.63					70.81	70.64
MW05-3B*	69.52	69.74	70.65	74.47					71.32	71.29
MW05-3C*	69.47	69.75	70.80	74.52					70.90	70.87
MW05-3D*	69.50	70.50	70.91	74.46					70.77	70.77

Notes: * top of riser and surface elevations obtained in November 2005 for MW05-1/2/3/A/B/C/D.

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2005 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	23-Jun-95 Elevation	12-Jul-95 Elevation	26-Jul-95 Elevation	9-Aug-95 Elevation	13-Sep-95 Elevation	15-Aug-95 Elevation	18-Aug-95 Elevation	21-Aug-95 Elevation	25-Aug-95 Elevation	28-Aug-95 Elevation	13-Sep-95 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	69.232	69.556			69.232	8.12	61.2	60.45	68.8	68.576	68.688				69.736				
OW-95-2	69.232	69.306		68.68	69.232	4.57	64.7	63.95	68.6	69.205	68.386				68.595				
OW-95-3	69.232	69.266		68.81	69.232	2.33	66.7	66.325	68.52	68.278	68.486				68.536				
OW-95-4	85.312	85.31		85.67	85.312	2.72	83.34	82.59	83.01	32.57	83.46				83.22				
OW-95-5	68.477	69.347		69.79	68.477	8.25	60.98	60.23	68.56	68.357	68.437				68.507				
OW-95-6	68.477	68.272		68.7	68.477	4.52	64.71	63.96	68.46	68.27	68.352				68.432				
OW-95-7	68.477	68.177		69.83	68.477	2.31	66.55	66.18	68.45	68.41	68.377				68.427				
OW-95-8	79.32	80.28	84.46	84.62	79.32	2.72	77.35	76.6	78.33	79.1	78.99				78.65				
OW-95-9	68.73	69.482		70.93	68.73	22.30	47.18	46.45	68.96	69.222	69.282				69.332				
OW-98-1	79.32	80.14	84.3		79.32	4.57	76.6	74.76											
OW-98-2	79.32	80.14	84.79	84.4	79.32	6.19	71.83	71.13											
OW-98-3	85.312	85.44		85.84	85.312	7.09	79.97	78.22											
OW-98-4	85.312	85.48		85.87	85.312	4.51	81.55	80.8											
MW11-1				85.08				73.88											
W1a	abandoned	72.226				3.96				69.888		70.988	70.688	70.918	70.988	70.706	70.926	71.318	71.218
W1b	abandoned	72.336				2.54				70.246		70.946	70.886	70.986	71.016	70.876	71.086	71.326	71.206
W1c	abandoned	72.466				2.05				70.896		70.856	70.936	71.086	71.116	71.096	71.346	71.366	71.216
W1d	abandoned	72.558				1.52				DRY		70.788	71.038	71.106	71.118	71.196	71.486	71.356	71.196
W2a	abandoned	72.245				3.07				69.745		70.925	70.845	70.905	70.985	70.705	70.925	71.045	71.195
W2b	abandoned	72.348				2.5				70.573		70.628	70.868	71.018	71.068	70.918	71.168	71.348	71.198
W2c	abandoned	72.463				2.94				70.783		70.753	70.883	71.033	71.073	71.033	71.283	71.383	71.223
W2d	abandoned	72.559				1.53				DRY		70.599	71.079	71.079	71.109	71.189	71.469	71.349	71.159
W3a	abandoned	72.31				3.04				69.89		70.84	70.81	70.83	70.92	70.62	70.75	71.3	71.26
W3b	abandoned	72.428				2.52				70.328		70.826	70.786	70.846	70.936	70.756	70.876	71.316	71.276
W3c	abandoned	72.511				2.01				70.651		70.351	70.881	71.061	71.081	71.021	71.201	71.361	71.231
W3d	abandoned	72.654				1.52				DRY		69.974	71.414	71.134	71.124	71.204	71.474	71.384	71.222
W4a	abandoned	72.272				3.65				69.752		70.822	70.692	70.792	70.852	70.502	70.562	71.322	71.212
W4b	abandoned	72.362				2.49				70.192		70.562	70.812	70.962	71.012	70.822	70.972	71.312	71.212
W4c	abandoned	72.485				2.01				70.505		70.305	70.905	71.085	71.105	71.025	71.205	71.335	71.215
W4d	abandoned	72.508				1.53				DRY		70.068	71.308	71.108	71.198	71.416	71.348	71.188
W5a	abandoned	72.342				3.05				69.782		71.042	70.902	70.892	70.812	70.602	71.592	71.392	71.212
W5b	abandoned	72.463				2.56				70.353		70.863	70.943	71.083	71.143	70.963	71.15	71.413	71.243
W5c	abandoned	72.544				2.02				70.694		70.724	71.184	71.144	71.164	71.114	71.414	71.384	71.224
W5d	abandoned	72.64				1.53				DRY		70.56	71.28	71.11	71.12	71.21	71.53	71.39	71.2
OW1		72.231													70.821	70.791	70.681	70.651	70.611
OW2		72.277													70.857	70.837	70.737	70.697	70.727
MW05-R3*	72.35	72.93		73.85			57.86	55.38											
MW05-8*	72.48	73.16		74.11			58.48	55.96											
MW05-11*	72.155	72.905		73.858			68.686	68.166											
MW07-1a	70.83	71.43		71.845		25.9	47.49	46.78											
MW07-1b	70.65	71.25		71.605		8.53	62.86	62.1											
MW07-1c	70.6	71.19		71.635		4.72	65.54	65.86											
MW07-1d	70.6	71.23		71.815		2.44	68.826	68.16											
MW09-1A**	69.76	69.76		69.87															
MW09-1B	69.75	69.74		69.79															
MW09-1C	69.73	69.73		69.78															
MW09-1D	69.58	70.59																	

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser.

The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2009.

Prepared by: ETB
Checked by: YJM

COLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	18-Sep-95	29-Sep-95	16-Oct-95	29-Oct-95	11-Nov-96	5-Jun-96	5-Aug-96	4-Sep-96	5-Jun-97	12-Oct-97	3-Jun-98
	Elevation				Elevation				Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	69.232	69.566			69.232	8.12	61.2	60.46		68.706			68.756	68.756	68.586	68.836		68.976	
OW-95-2	69.232	69.566		69.65	69.232	4.57	64.7	63.95		68.486			68.576	68.506	68.356	68.316	68.426	68.106	68.396
OW-95-3	69.232	69.286		69.81	69.232	2.83	66.7	66.325		68.096			68.536	68.436	68.286	68.096	68.286	67.966	68.256
OW-95-4	85.312	85.31		85.67	85.312	2.72	83.34	82.59		82.76			84.24	82.79	82.66	82.56	82.76	82.59	82.67
OW-95-5	68.477	69.347		69.73	68.477	8.25	60.98	60.23		68.407			68.507	68.447	68.327	68.287		67.957	
OW-95-6	68.477	69.272		69.7	68.477	4.52	64.71	63.96		68.062			68.382	68.312	68.062	67.752	68.232	68.072	68.052
OW-95-7	69.477	69.177		69.63	68.477	2.31	66.55	66.18		68.087			68.427	68.387	68.027	67.727	68.217	67.627	68.047
OW-95-8	79.32	80.25	84.46	84.62	79.32	2.72	77.35	76.6		78.48			77.81	78.79	78.48	78.26	78.4	78.23	79.48
OW-95-9	68.75	69.482		70.93	68.75	22.30	47.18	46.43		69.182			69.292	69.182	69.282	69.282			69.232
OW-98-1	79.32	80.14	84.3		79.32	4.57	75.5	74.75											
OW-98-2	79.32	80.14	84.79	84.4	79.32	8.19	71.88	71.13											
OW-98-3	85.312	86.44		86.84	85.312	7.09	78.97	78.22											
OW-98-4	85.312	85.48		85.87	85.312	4.51	81.55	80.8											
MW11-1				85.08				73.58											
W1a	abandoned	72.236				3.06			71.388	71.488	71.448	71.428							
W1b	abandoned	72.336				2.54			71.376	71.446	71.456	71.356							
W1c	abandoned	72.466				2.05			71.366	71.476	71.426	70.998							
W1d	abandoned	72.558				1.52			71.356	71.468	71.458	70.258							
W2a	abandoned	72.245				3.07			71.425	71.465	71.445	71.345							
W2b	abandoned	72.348				2.5			71.398	71.458	71.426	71.158							
W2c	abandoned	72.453				2.04			71.373	71.463	71.433	70.993							
W2d	abandoned	72.559				1.53			71.318	71.439	71.419	70.089							
W3a	abandoned	72.31				3.04			71.51	71.49	71.46	71.43							
W3b	abandoned	72.426				2.52			71.476	71.496	71.466	71.426							
W3c	abandoned	72.511				2.01			71.391	71.461	71.441	71.021							
W3d	abandoned	72.634				1.52			71.254	71.444	70.434	70.214							
W4a	abandoned	72.272				3.05			71.452	71.482	71.462	71.422							
W4b	abandoned	72.362				2.49			71.342	71.402	71.342	71.212							
W4c	abandoned	72.465				2.01			71.335	71.405	71.405	70.925							
W4d	abandoned	72.608				1.53			71.348	71.449	71.428	70.188							
W5a	abandoned	72.342				3.05			71.502	71.522	71.472	71.462							
W5b	abandoned	72.463				2.56			71.403	71.403	71.463	71.153							
W5c	abandoned	72.544				2.02			71.394	71.404	71.474	70.244							
W5d	abandoned	72.64				1.53			71.37	71.38	71.47	2.54							
OW1		72.231							70.631	70.911	71.021	71.061				69.911			
OW2		72.237							70.687	70.967	71.127	71.107				70.147			
MW05-R3*	72.36	72.93		73.85			57.86	56.36											
MW05-5*	72.48	73.16		74.11			59.48	55.98											
MW05-11*	72.155	72.905		73.658			58.655	56.155											
MW07-1a	70.63	71.43		71.645		28.9	47.49	46.73											
MW07-1b	70.63	71.25		71.605		8.53	62.86	62.1											
MW07-1c	70.5	71.19		71.635		4.72	66.64	65.88											
MW07-1d	70.6	71.25		71.815		2.44	68.926	68.16											
MW09-1A**	68.78	69.70		69.87															
MW09-1B	68.73	69.74		69.79															
MW09-1C	68.73	69.75		69.79															
MW09-1D	69.58	70.60																	

Notes:
* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser
The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

Prepared by: ETB
Checked by: YJM

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2009 Top of Riser	Nov.2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	14-Aug-98 Elevation	3-May-99 Elevation	11-Oct-99 Elevation	2-May-00 Elevation	18-Oct-00 Elevation	8-Jun-01 Elevation	3-Oct-01 Elevation	17-May-02 Elevation	30-Oct-02 Elevation	22-May-03 Elevation	1-Oct-03 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	89.232	89.555			89.232	8.12	81.2	80.45				88.794	88.806	88.75	88.51	88.75	88.386	88.67	88.64
OW-95-2	89.232	89.306		89.65	89.232	4.57	84.7	83.95	88.326	88.585	88.528	88.549	88.566	88.55	88.29	88.55	88.186	88.55	88.29
OW-95-3	89.232	89.286		89.81	89.232	2.33	86.7	86.325		88.516	88.456	88.456	88.476	88.48	88.28	88.51	88.140	88.5	88.24
OW-95-4	85.312	85.31		85.67	85.312	2.72	83.34	82.83	82.6	82.7	82.58	82.83	82.68	82.65	82.43	82.10	81.98	82.53	82.59
OW-95-5	88.477	89.347		89.75	88.477	8.25	80.98	80.23				88.527	88.607	88.49	88.07	88.54	88.047	88.34	87.95
OW-95-6	88.477	89.272		89.7	88.477	4.52	84.71	83.96	87.982	88.402	88.402	88.422	88.402	88.43	87.99	88.51	87.972	88.41	88.05
OW-95-7	88.477	89.177		89.83	88.477	2.31	86.66	86.18	87.917	88.417	88.377	88.337	88.287	88.32	87.92	88.37	87.897	88.18	87.90
OW-95-8	79.32	80.26	84.46	84.62	79.32	2.72	77.35	76.6	78.2	78.77	78.85	79.09	78.71	78.92	78.45	78.13	78.42	79.08	78.61
OW-95-9	88.73	89.482		70.93	88.73	22.30	47.18	46.43	89.282	89.182		89.362	89.432	89.48	89.36	89.48	89.482	89.4	89.80
OW-98-1	79.32	80.14	84.5		79.32	4.57	75.5	74.75		78.09	78.73	79.02	79.01	78.07	78.42	78.09	78.39	79.03	78.59
OW-98-2	79.32	80.14	84.79	84.4	79.32	8.19	71.88	71.13		80.33	78.34	79.41	79.02	77.87	78.02	78.9	77.91	78.82	78.34
OW-98-3	86.312	85.44		85.84	85.312	7.09	78.97	78.22		81.75	81.58	81.44	81.43	81.39	81.24	81.51	81.31	81.44	81.34
OW-98-4	85.312	85.48		85.87	85.312	4.51	81.55	80.8		82.49	82.22	82.1	82.01	82.03	81.94	82.16	81.95	82.09	81.93
MW11-1				85.06				73.56											
W1a	abandoned	72.238				3.06			69.838										
W1b	abandoned	72.336				2.54			70.006										
W1c	abandoned	72.466				2.05			70.518										
W1d	abandoned	72.558				1.62			71.186										
W2a	abandoned	72.245				3.07			69.965										
W2b	abandoned	72.348				2.5			70.438										
W2c	abandoned	72.483				2.04			71.413										
W2d	abandoned	72.559				1.53			71.139										
W3a	abandoned	72.31				3.04			69.72										
W3b	abandoned	72.426				2.52			70.426										
W3c	abandoned	72.511				2.01			71.011										
W3d	abandoned	72.634				1.52			71.224										
W4a	abandoned	72.277				3.05			69.932										
W4b	abandoned	72.362				2.49			70.242										
W4c	abandoned	72.465				2.01			70.745										
W4d	abandoned	72.608				1.53			71.228										
W5a	abandoned	72.342				2.05			69.452										
W5b	abandoned	72.465				2.56			70.173										
W5c	abandoned	72.544				2.02			70.654										
W5d	abandoned	72.64				1.53			71.38										
OW1		72.231							70.841										
OW2		72.277							70.877										
MW05-R3*	72.36	72.93		73.85			57.86	55.36											
MW05-8*	72.48	73.16		74.11			58.48	56.68											
MW05-11*	72.155	72.905		73.858			58.656	56.155											
MW07-1a	70.63	71.43		71.645		23.9	47.49	46.73											
MW07-1b	70.63	71.25		71.605		8.53	62.86	62.1											
MW07-1c	70.6	71.19		71.635		4.72	66.64	66.88											
MW07-1d	70.6	71.23		71.615		2.44	68.926	68.18											
MW09-1A**	68.76	69.70		69.67															
MW09-1B	68.73	69.74		69.79															
MW09-1C	68.73	69.75		69.76															
MW09-1D	68.68	70.80																	

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser.
The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	5-Nov-03 Elevation	8-May-04 Elevation	5-Nov-04 Elevation	29-May-05 Elevation	16-Nov-05 Elevation	25-May-06 Elevation	14-Nov-06 Elevation	7-May-07 Elevation	19-Nov-07 Elevation	13-May-08 Elevation	3-Nov-08 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	69.232	69.556			69.232	8.12	61.2	60.45	68.71	68.84	68.76	68.776	68.455	68.526	68.596	68.62	68.526	68.78	68.83
OW-95-3	69.232	69.306		69.65	69.232	4.57	64.7	63.95	68.49	68.59	68.52	68.596	68.436	68.556	68.576	68.61	67.416	68.55	68.67
OW-95-3	69.232	69.286		69.81	69.232	2.33	66.7	66.325	68.47	68.46	68.44	68.41	68.32	69.126	68.361	68.31	68.226	68.30	68.39
OW-95-4	85.312	85.31		85.67	85.312	2.72	83.34	82.59	82.60	82.59	82.34	82.51	82.47	83.41	82.665	82.55	82.44	82.63	81.58
OW-95-5	68.477	69.347		69.73	68.477	8.25	60.98	60.23	68.37	68.53	68.48	68.567	68.277	68.557	65.832	68.60	68.337	68.51	68.57
OW-95-6	68.477	69.272		69.7	68.477	4.52	64.71	63.96	68.41	68.44	68.40	68.432	68.412	68.482	68.507	68.44	68.282	68.42	68.49
OW-95-7	68.477	69.177		69.63	68.477	2.31	66.55	66.18	68.41	68.43	68.40	68.43	68.3	68.297	68.36	68.37	68.127	68.34	68.33
OW-95-8	79.32	80.28	84.46	84.62	79.32	2.72	77.35	76.6	79.15	79.12	79.15	79.06	79.04	79.17	79.175	79.12	78.8	79.05	79.16
OW-95-9	68.73	69.482		70.93	68.73	22.30	47.18	46.43	69.96	69.98	70.00	70.527	69.887	68.732	68.769	68.68	68.762	68.72	68.82
OW-98-1	79.32	80.14	84.3		79.32	4.57	75.5	74.75	79.14	79.08	79.12	79.01	79.01	79.09	79.18	79.08	78.78	79.03	79.14
OW-98-2	79.32	80.14	84.79	84.4	79.32	8.19	71.88	71.13	78.93	78.88	78.96	78.84	78.78	78.98	79.005	78.90	78.99	78.96	78.88
OW-98-3	85.312	85.44		85.84	85.312	7.09	78.97	78.22	81.48	81.44	81.46	81.47	81.49	81.68	81.784	81.73	81.67	81.75	81.85
OW-98-4	85.312	85.48		85.87	85.312	4.51	81.55	80.8	81.99	82.07	82.05	82.11	82.09	82.27	82.255	82.19	81.99	82.28	82.12
MW11-1				86.06				73.68											
W1a	abandonad	72.238				3.06													
W1b	abandoned	72.336				2.54													
W1c	abandoned	72.486				2.05													
W1d	abandoned	72.556				1.52													
W2a	abandoned	72.245				3.07													
W2b	abandoned	72.348				2.5													
W2c	abandoned	72.453				2.04													
W2d	abandoned	72.559				1.53													
W3a	abandoned	72.31				3.04													
W3b	abandoned	72.426				2.52													
W3c	abandoned	72.511				2.01													
W3d	abandoned	72.634				1.52													
W4a	abandoned	72.272				3.05													
W4b	abandoned	72.362				2.49													
W4c	abandoned	72.465				2.01													
W4d	abandoned	72.608				1.53													
W5a	abandoned	72.342				3.05													
W5b	abandoned	72.463				2.56													
W5c	abandoned	72.544				2.02													
W5d	abandoned	72.64				1.53													
OW1		72.231																	
OW2		72.277																	
MW05-R3*	72.36	72.93		73.85			57.66	55.36						69.27	69.43	68.82	68.80	68.87	69.00
MW05-6*	72.48	73.16		74.11			68.43	66.98						69.68	69.52	68.99	68.80	69.03	69.08
MW05-11*	72.155	72.905		73.856			68.655	66.155						69.46	69.56	68.87	68.78	68.22	68.94
MW07-1a	70.63	71.43		71.645		23.9	47.49	46.73									68.87	69.94	69.90
MW07-1b	70.63	71.26		71.605		8.53	62.56	62.1									69.33	69.46	69.46
MW07-1c	70.6	71.19		71.635		4.72	66.64	66.86									69.22	69.21	69.55
MW07-1d	70.6	71.23		71.615		2.44	68.925	68.16									69.23	69.21	69.60
MW09-1A**	68.76	69.70		69.87															
MW09-1B	68.73	69.74		69.79															
MW09-1C	68.73	69.75		69.79															
MW09-1D	68.58	70.80																	

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser.

The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2009 Top of Riser	Nov-2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	11-May-09 Elevation	18-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	16-May-11 Elevation	22-Nov-11 Elevation	23-May-12 Elevation	20-Nov-12 Elevation	21-May-13 Elevation	20-Nov-13 Elevation	23-May-14 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	69.232	69.556		69.65	69.232	8.12	61.2	60.45	68.83	frozen	68.86	68.85	68.85	68.83	68.81	68.82	68.79	68.85	68.82
OW-95-2	69.232	69.308		69.81	69.232	4.57	64.7	63.95	68.67	68.57	68.57	68.56	68.54	68.51	68.87	68.62	68.83	68.80	68.81
OW-95-3	69.232	69.286		69.81	69.232	2.33	66.7	66.325	68.36	68.32	68.31	68.35	68.43	68.79	68.84	68.81	68.79	68.80	68.80
OW-95-4	85.312	85.31		85.87	85.312	2.72	83.34	82.59	81.53	82.43	82.44	81.53	82.72	82.61					
OW-95-5	69.477	69.347		69.73	68.477	8.25	60.98	60.23	68.57	68.40	68.61	68.62	68.69	68.97	68.99	69.01	68.84	69.05	68.98
OW-95-6	68.477	68.272		69.7	68.477	4.52	64.71	63.96	68.49	68.28	68.43	68.47	68.66	68.64	68.92	68.96	68.85	68.90	68.92
OW-95-7	68.477	69.177		69.83	68.477	2.31	66.55	66.18	68.33	68.31	68.28	68.29	68.44	68.89	68.96	68.93	68.92	68.93	68.95
OW-95-8	79.32	80.26	84.46	84.62	79.32	2.72	77.35	76.6	79.16	79.80	79.74	79.66	79.85	79.72	80.07	79.88	80.32	79.79	80.41
OW-95-9	68.73	69.482		70.03	68.73	22.30	47.18	46.43	68.82	68.67		68.30	68.39		68.81	68.84	68.79		69.93
OW-98-1	79.32	80.14	84.3		79.32	4.57	76.5	74.75	79.14	79.92	79.53	79.54	79.63	79.98	79.79	80.20	79.71	80.30	
OW-98-2	79.32	80.14	84.79	84.4	79.32	8.19	71.68	71.13	78.88	80.02	80.24	80.24	80.44						
OW-98-3	85.312	85.44		85.84	85.312	7.09	78.97	78.22	81.65	81.87	81.66	81.71	81.68	81.90					
OW-98-4	85.312	85.49		85.87	85.312	4.51	81.55	80.8	82.12	81.98	82.08	82.21	82.10	82.26					
MW11-1				85.06				73.58						79.99	80.32	80.10	80.52	79.98	80.58
W1a	abandoned	72.236				3.06													
W1b	abandoned	72.336				2.54													
W1c	abandoned	72.466				2.05													
W1d	abandoned	72.558				1.52													
W2a	abandoned	72.245				3.07													
W2b	abandoned	72.348				2.5													
W2c	abandoned	72.453				2.04													
W2d	abandoned	72.559				1.53													
W3a	abandoned	72.31				3.04													
W3b	abandoned	72.426				2.52													
W3c	abandoned	72.511				2.01													
W3d	abandoned	72.634				1.52													
W4a	abandoned	72.272				3.05													
W4b	abandoned	72.362				2.49													
W4c	abandoned	72.465				2.01													
W4d	abandoned	72.606				1.53													
W5a	abandoned	72.342				3.05													
W5b	abandoned	72.463				2.56													
W5c	abandoned	72.544				2.02													
W5d	abandoned	72.64				1.53													
OW1		72.231																	
OW2		72.277																	
MW05-R3*	72.36	73.83		73.86			57.86	55.36	65.63	68.39	68.51	68.60	69.09	68.99	69.64	69.35	69.45	69.30	69.78
MW05-8*	72.43	73.16		74.11			58.45	55.96	69.17	68.58	68.79	69.08	68.43	68.94	69.77	69.27	69.67	69.61	70.13
MW05-11*	72.155	72.905		73.658			58.655	56.155	69.06	68.50	68.91	69.08	69.19	68.83	69.72	69.63	69.51	69.89	69.81
MW07-1a	70.63	71.43		71.645		23.9	47.49	46.73	59.92	69.35	69.93	69.56	69.80	69.81	69.92	69.85	69.95	69.88	70.02
MW07-1b	70.63	71.25		71.605		8.53	62.86	62.1	69.54	69.50	69.61	69.57	69.48	69.98	69.85	69.89	69.82	69.95	69.94
MW07-1c	70.6	71.19		71.635		4.72	66.64	65.86	69.47	69.41	69.25	69.66	69.83	70.04	69.90	69.85	69.73	69.86	69.80
MW07-1d	70.6	71.23		71.615		2.44	68.925	68.16	69.45	69.35	69.34	69.70	69.52	70.18	69.93	69.98	69.87	69.98	69.93
MW09-1A**	68.78	69.76		69.87							69.51	69.41	69.41		69.43	69.32	69.47	69.32	69.40
MW09-1B	68.73	69.74		69.79							68.66	68.77	68.77		68.65	68.74	68.60	68.75	68.75
MW09-1C	68.73	68.75		69.79							68.56	68.58	68.58		68.61	68.59	68.73	69.43	68.62
MW09-1D	69.58	70.80									69.20	69.25	69.25						

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser.
The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

GOLDER

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	27-Aug-14	12-Nov-14	26-May-15	26-Aug-15	19-Nov-15	19-May-16	18-Aug-16	10-Nov-16	17-May-17	28-Aug-17	22-Nov-17
	m	m	m	m	m	m	m	m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m
OW-95-1	69.232	69.556			69.232	6.12	61.2	60.45		68.84	68.81		68.74	68.76		68.41	68.82		68.87
OW-95-2	69.232	69.308		69.65	69.232	4.57	64.7	63.66		68.83	68.73		68.74	68.78		68.71	68.69		68.82
OW-95-3	69.232	69.286		69.31	69.232	2.33	66.7	66.325		68.82	68.80		68.78	68.74		68.73	68.77		68.80
OW-95-4	85.312	85.31		85.67	85.312	2.72	83.94	82.59											
OW-95-5	68.477	69.347		69.73	68.477	8.25	60.98	60.23		69.04	68.99		69.01	69.00		68.95	69.00		68.89
OW-95-6	68.477	69.272		69.7	68.477	4.52	64.71	63.96		68.92	68.89		68.90	68.86		68.86	68.90		68.90
OW-95-7	68.477	69.177		69.63	68.477	2.31	66.66	66.18		69.00	68.94		68.97	68.91		68.90	68.95		68.96
OW-95-8	79.32	80.26	84.46	84.62	79.32	2.72	77.35	76.6		80.04	80.18		79.97	80.48		79.95	80.02		80.29
OW-95-9	68.73	69.482		70.93	68.73	22.30	47.16	46.43		69.89	69.91		69.88	69.96		69.89	69.88		70.03
OW-98-1	79.32	80.14	84.3		79.32	4.67	75.5	74.75		79.82	80.06		79.85	80.34		79.88	80.76		80.14
OW-98-2	79.32	80.14	84.79	84.4	79.32	8.19	71.88	71.13											
OW-98-3	85.312	85.44		85.84	85.312	7.09	78.97	78.22											
OW-98-4	85.312	85.48		85.87	86.312	4.51	81.55	80.8											
MW11-1				85.09				73.59		80.24	80.33		80.09	80.61		80.10	81.00		80.43
W1a	abandoned	72.228				3.05													
W1b	abandoned	72.336				2.64													
W1c	abandoned	72.466				2.05													
W1d	abandoned	72.558				1.52													
W2a	abandoned	72.245				3.07													
W2b	abandoned	72.348				2.5													
W2c	abandoned	72.453				2.04													
W2d	abandoned	72.559				1.53													
W3a	abandoned	72.31				3.04													
W3b	abandoned	72.428				2.52													
W3c	abandoned	72.511				2.01													
W3d	abandoned	72.634				1.52													
W4a	abandoned	72.272				3.05													
W4b	abandoned	72.362				2.49													
W4c	abandoned	72.465				2.01													
W4d	abandoned	72.605				1.53													
W5a	abandoned	72.342				3.05													
W5b	abandoned	72.483				2.56													
W5c	abandoned	72.544				2.02													
W5d	abandoned	72.64				1.53													
OW1		72.231																	
OW2		72.277																	
MW05-R3*	72.36	72.83		73.85			67.86	66.36		69.33	69.38		69.11	69.46		69.03	70.05		69.83
MW05-8*	72.48	73.16		74.11			58.48	56.98		69.36	69.53		69.05	69.78		69.07	71.08		70.58
MW05-11*	72.155	72.805		73.858			58.855	56.155		69.92	69.73		69.74	69.62		69.78	70.24		70.13
MW07-1a	70.83	71.45		71.645		23.9	47.49	46.73		70.02	70.03		70.01	70.19		70.11	70.27		70.33
MW07-1b	70.83	71.26		71.605		8.53	62.86	62.1		70.16	69.86		69.87	69.64		70.44	70.30		70.28
MW07-1c	70.6	71.19		71.635		4.72	66.64	65.88		70.09	69.81		69.85	69.73		69.85	69.83		70.05
MW07-1d	70.6	71.23		71.615		2.44	68.925	68.16		70.22	69.94		69.98	69.87		69.98	69.97		70.20
MW09-1A**	68.76	69.70		69.67					69.45	69.47	69.45	69.43	69.73	69.50	69.63	69.62	69.70	Not found	Frozen
MW09-1B	68.79	69.74		69.79					68.76	68.80	68.81	68.71	68.81	68.64	68.52	68.80	68.85	Not found	70.20
MW09-1C	68.73	69.78		69.79					68.50	68.83	68.82	68.56	68.61	68.61	68.59	68.82	68.82	Not found	70.20
MW09-1D	69.58	70.60							69.25	70.80		69.17			69.13			69.85	70.20

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser
The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

GOLDER

Prepared by: ETB
Checked by: YJM

WCC NAVAN FACILITY - HISTORICAL DATA
TABLE C-2
WELL WATER ELEVATIONS

Well Number	2003 Surface Elevation	2003 Top of Riser	2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	15-May-18 Elevation	3-Aug-18 Elevation	22-Nov-18 Elevation	13-Jun-19 Elevation	14-Nov-19 Elevation
	m	m	m	m	m	m	m	m	m	m	m	m	m
OW-95-1	69.232	69.556			69.232	6.12	61.2	60.45	60.87		68.88	68.83	68.73
OW-95-2	69.232	69.306		69.65	69.232	4.57	64.7	63.96	68.79		68.74	68.76	68.76
OW-95-3	69.232	69.288		69.81	69.232	2.33	66.7	66.329	69.77		68.73	68.76	68.72
OW-95-4	85.312	85.31		85.67	85.312	2.72	83.34	82.59					
OW-95-6	68.477	69.347		69.73	68.477	8.25	60.88	60.23	69.65		69.09	69.02	68.96
OW-95-8	68.477	69.272		69.7	68.477	4.52	64.71	63.96	68.86		68.88	68.84	68.78
OW-95-7	68.477	69.177		69.63	68.477	2.31	66.55	66.18	68.94		68.90	68.84	68.87
OW-95-5	79.32	80.28	84.48	84.62	79.32	2.72	77.35	76.6	80.76		79.97	80.76	80.05
OW-95-9	86.73	89.492		70.93	68.73	22.30	47.18	46.43	79.11		frozen	79.11	Frozen
OW-98-1	79.32	80.14	84.3		79.32	4.57	75.5	74.75	80.62		79.63	80.69	79.94
OW-98-2	79.32	80.14	84.79	84.4	79.32	8.18	71.88	71.13					
OW-98-3	85.312	85.44		85.84	85.312	7.09	78.97	78.22					
OW-98-4	85.312	85.46		85.67	85.312	4.51	81.55	80.8					
MW11-1				85.08				73.58	80.87		80.10	80.83	80.18
W1a	abandoned	72.238				3.05							
W1b	abandoned	72.336				2.54							
W1c	abandoned	72.465				2.05							
W1d	abandoned	72.558				1.52							
W2a	abandoned	72.245				3.07							
W2b	abandoned	72.345				2.5							
W2c	abandoned	72.453				2.04							
W2d	abandoned	72.559				1.53							
W3a	abandoned	72.31				3.04							
W3b	abandoned	72.425				2.52							
W3c	abandoned	72.511				2.01							
W3d	abandoned	72.634				1.52							
W4a	abandoned	72.272				3.05							
W4b	abandoned	72.362				2.49							
W4c	abandoned	72.465				2.01							
W4d	abandoned	72.609				1.53							
W5a	abandoned	72.342				3.05							
W5b	abandoned	72.483				2.56							
W5c	abandoned	72.544				2.02							
W5d	abandoned	72.64				1.53							
OW1		72.231											
OW2		72.277											
MW05-R5*	72.36	72.93		73.85			57.36	55.36	70.36		69.67	69.53	69.45
MW06-8*	72.48	73.16		74.11			58.48	56.98	71.32		70.21	69.88	69.43
MW05-11*	72.155	72.805		73.858			55.655	54.155	70.35		70.13	69.85	69.36
MW07-1a	70.63	71.43		71.945		23.9	47.49	46.73	70.39		70.30	70.46	70.29
MW07-1b	70.63	71.25		71.805		8.53	62.86	62.1	70.23		70.12	70.16	70.09
MW07-1c	70.6	71.19		71.835		4.72	65.64	65.88	69.83		69.81	69.91	69.90
MW07-1d	70.6	71.23		71.818		2.44	68.925	68.16	69.96		69.94	70.04	70.03
MW09-1A**	68.76	69.70		69.67					69.70	69.69	frozen	artesian	frozen
MW09-1B	68.73	69.74		69.79					68.90	68.76	70.20	68.88	68.74
MW09-1C	68.73	69.75		69.79					68.63	68.47	70.20	68.62	68.56
MW09-1D	69.62	70.60							69.23	69.18	70.20	Not monitored	69.22

Notes:

* top of riser and surface elevation obtained in Nov. 2005. New survey done in Nov. 2011 for top of riser.

The top of riser elevation at MW09-1A was adjusted for the November 2015 groundwater elevation calculations based on new measurement of stick-up obtained in November 2015 compared to the ground surface elevation surveyed in 2003.

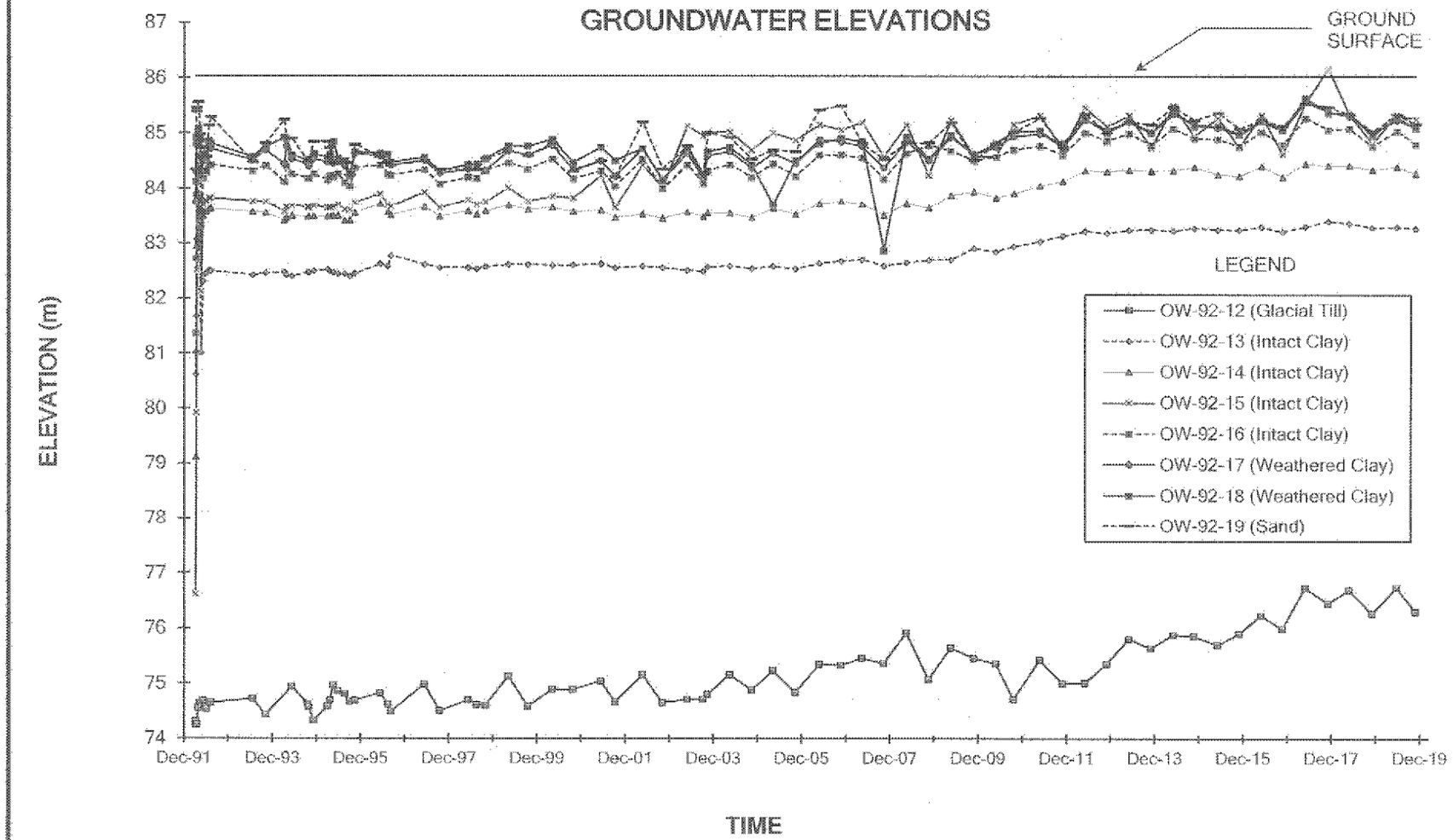


FIGURE C1

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-12 TO OW-92-19

GOLDER

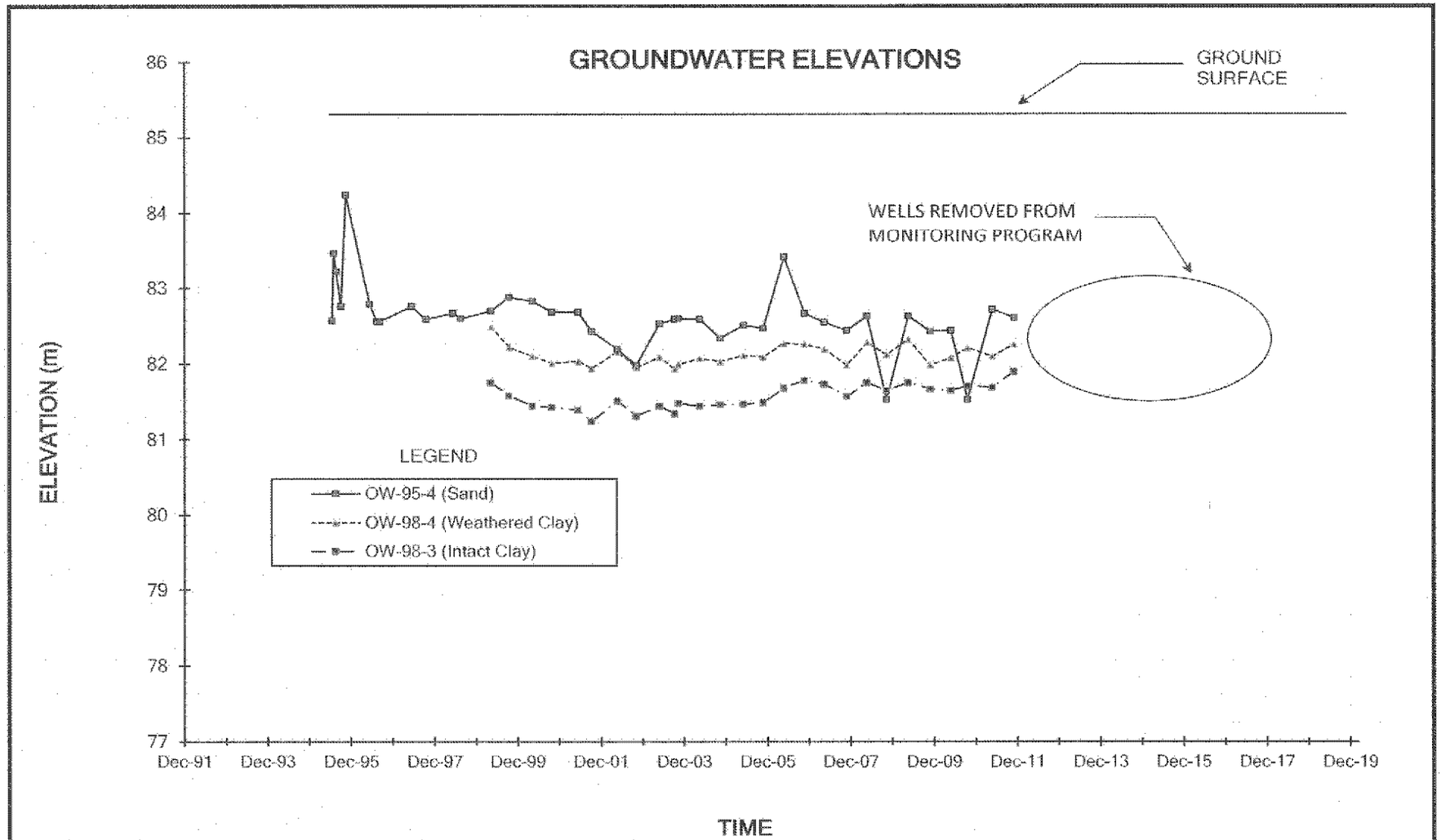


FIGURE C2

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-4 & OW-98-3 & 4

GOLDER

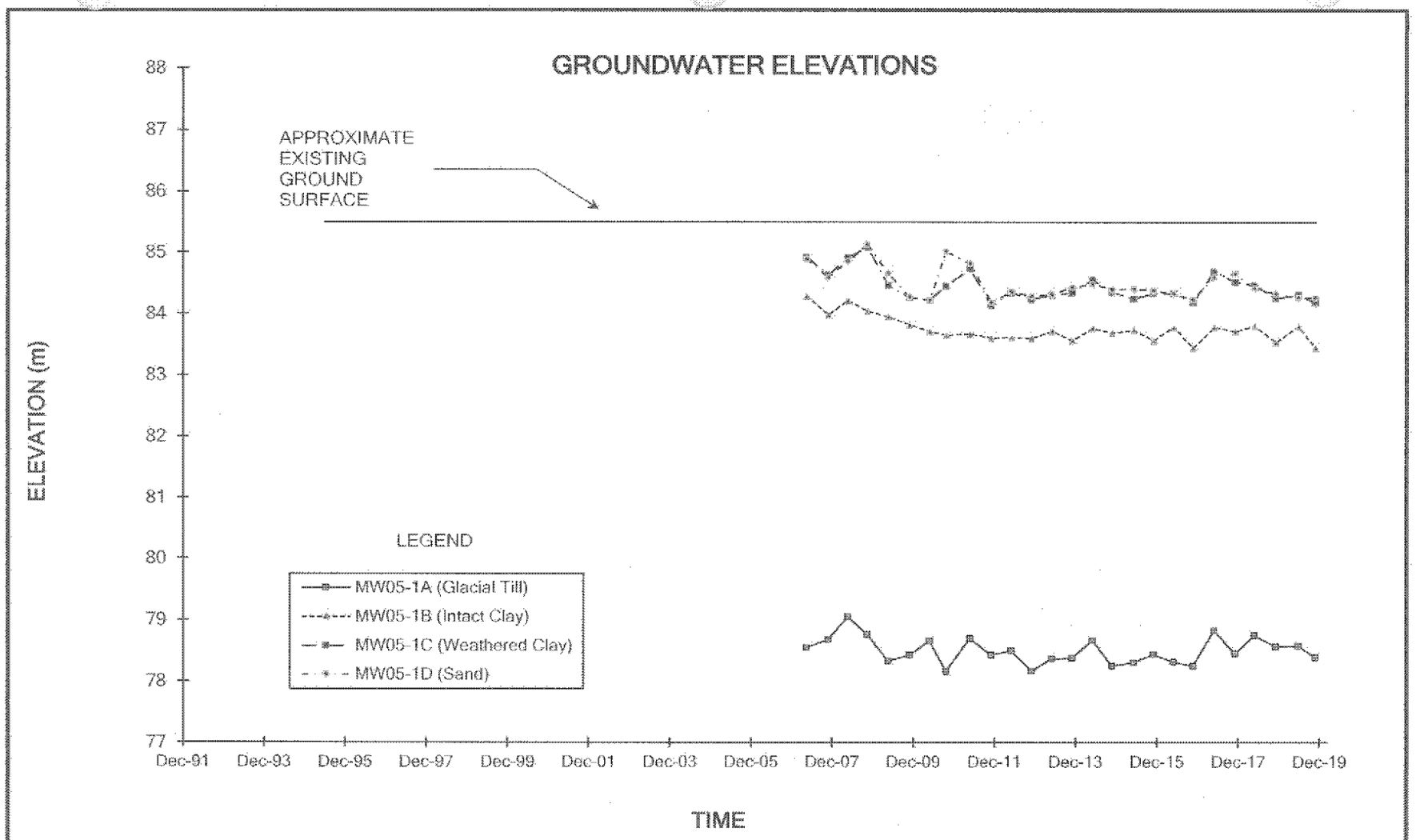


FIGURE C3

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS MW05-1A to MW05-1D

GOLDER

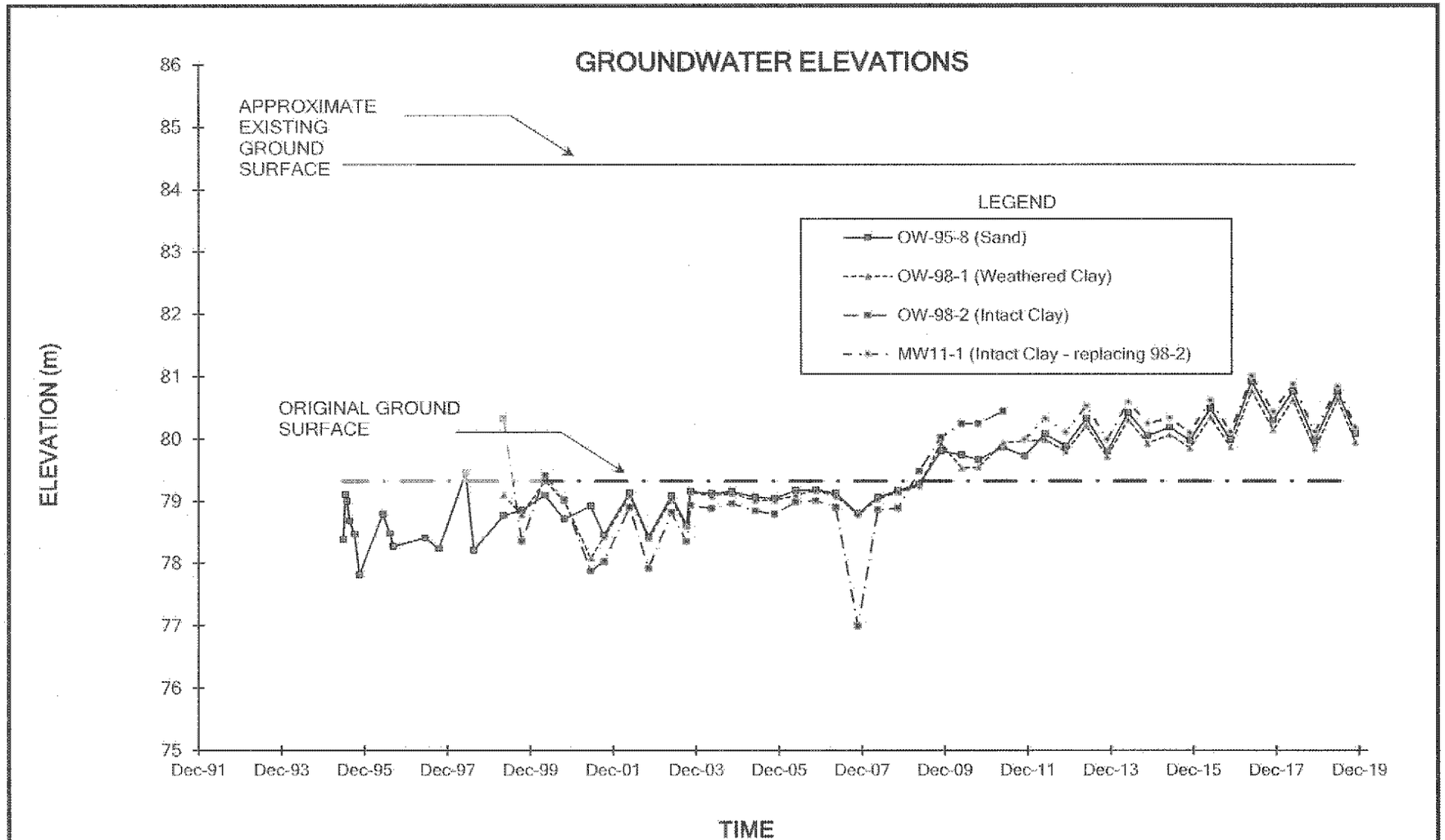


FIGURE C4

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-8, OW-98-1-2 & MW11-1

GOLDER

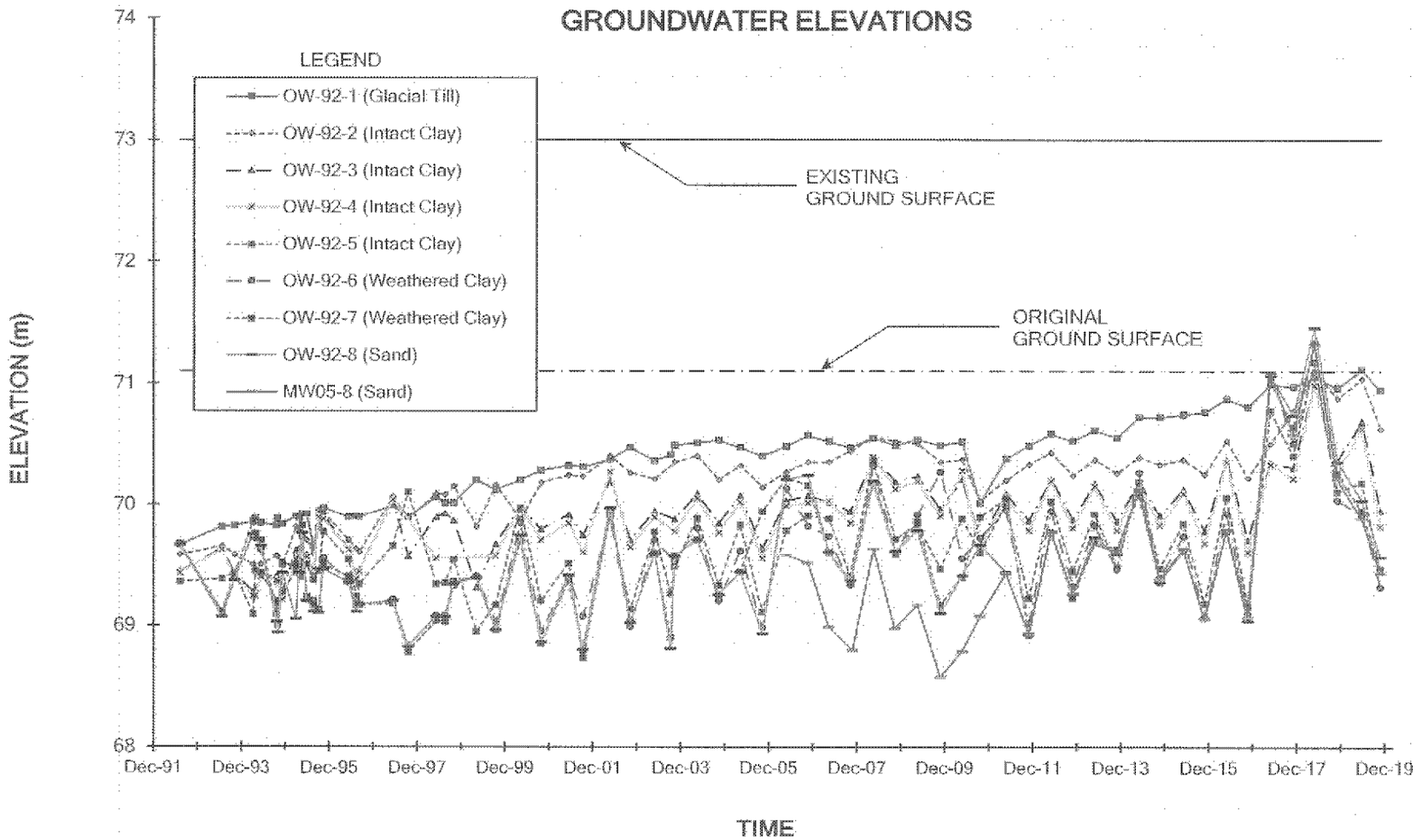


FIGURE C5

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-1 TO 92-8 & MW05-8

GOLDER

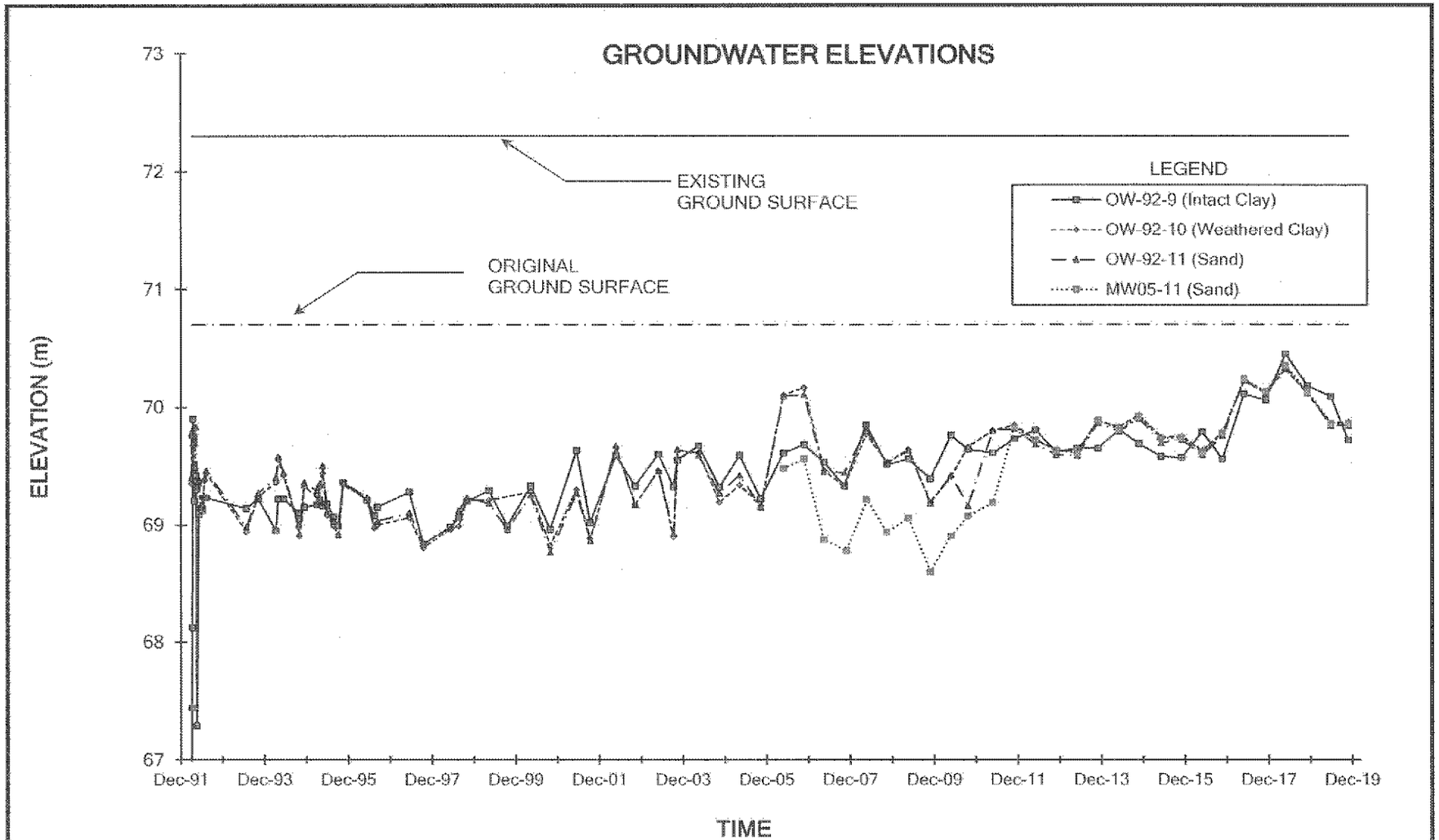


FIGURE C6

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-9 TO 92-11 & MW05-11

GOLDER

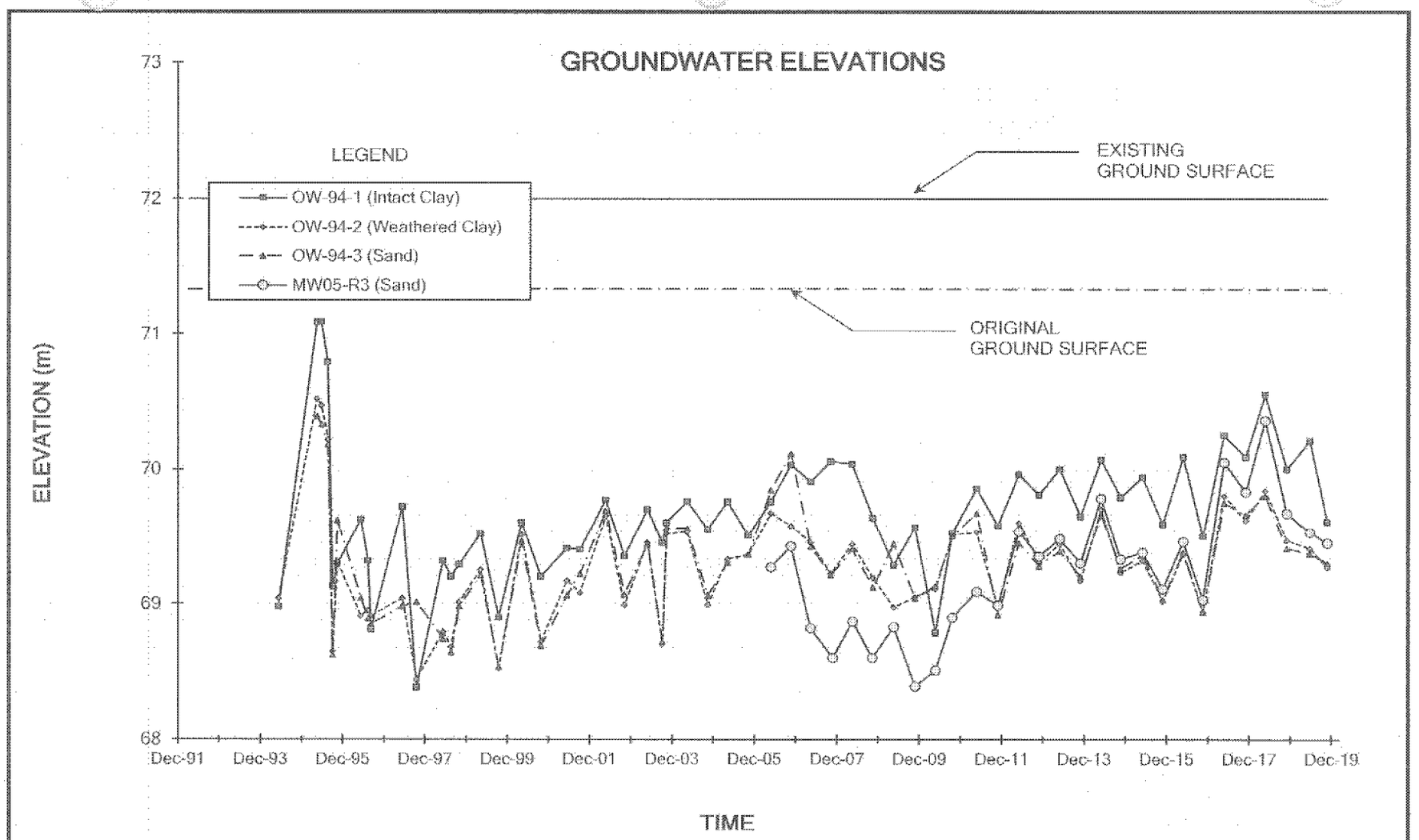


FIGURE C7

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-1 TO 94-3 & MW05-R3

GOLDER

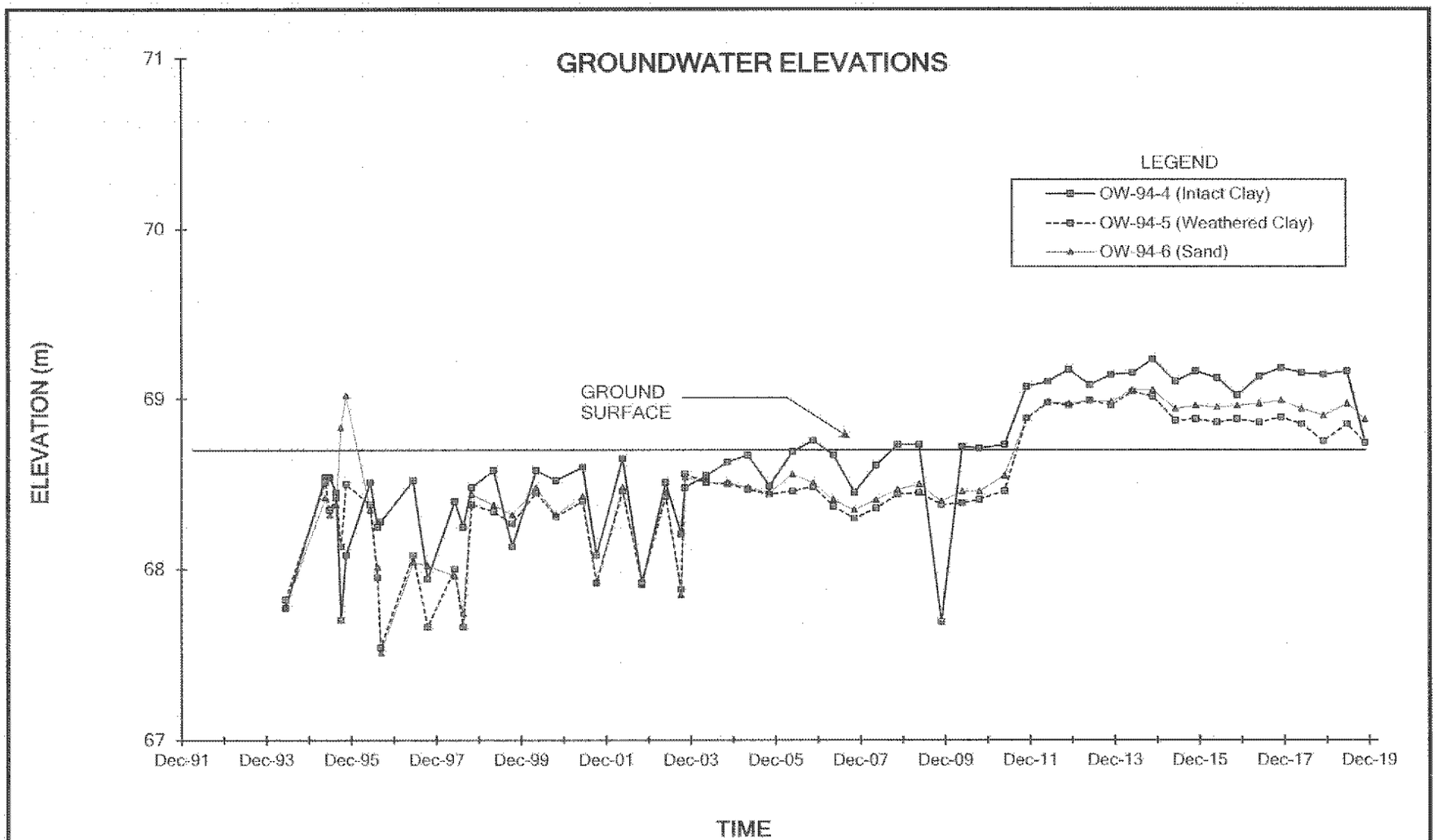


FIGURE C8

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-4 TO 94-6

GOLDER

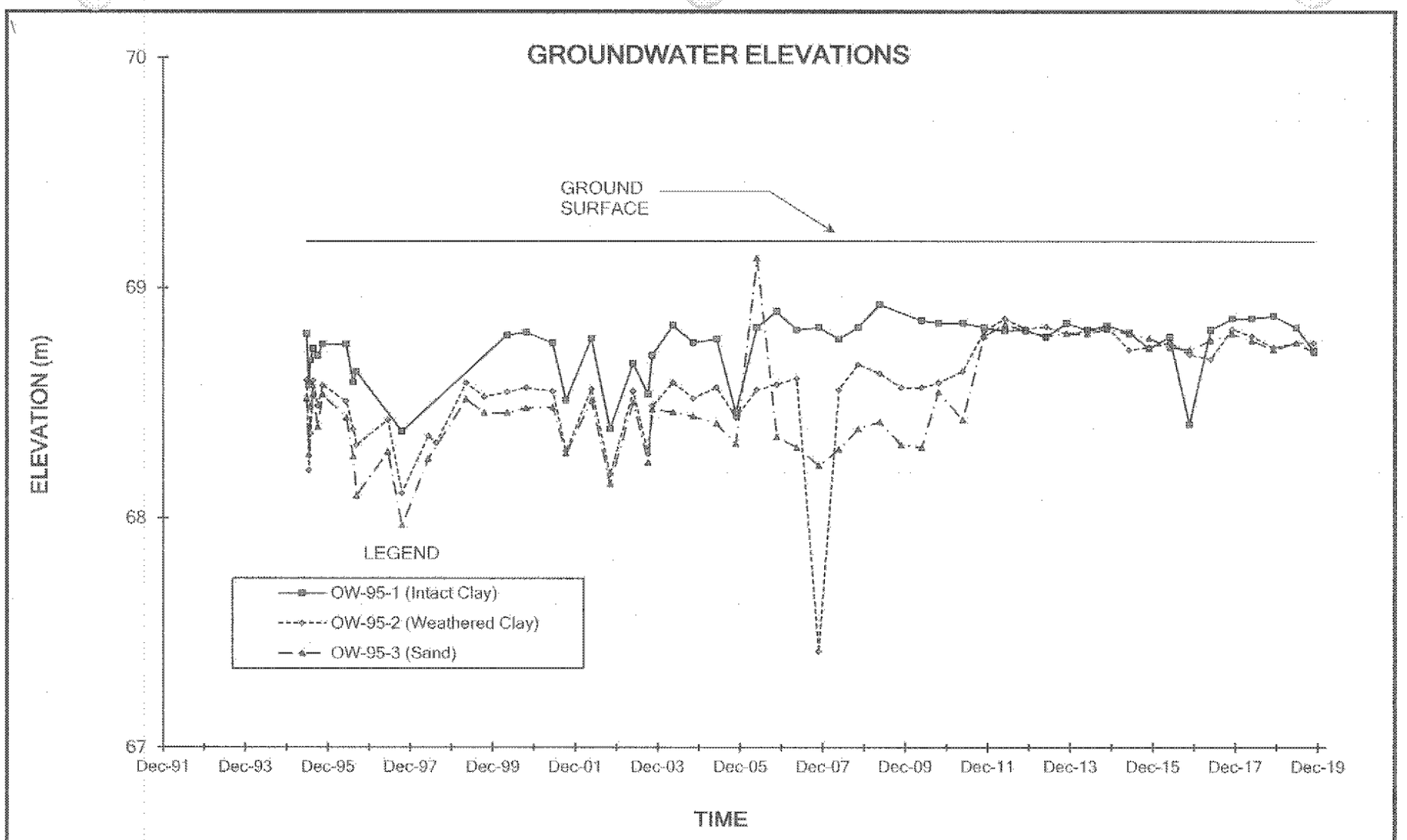


FIGURE C9

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-1 TO 95-3

GOLDER

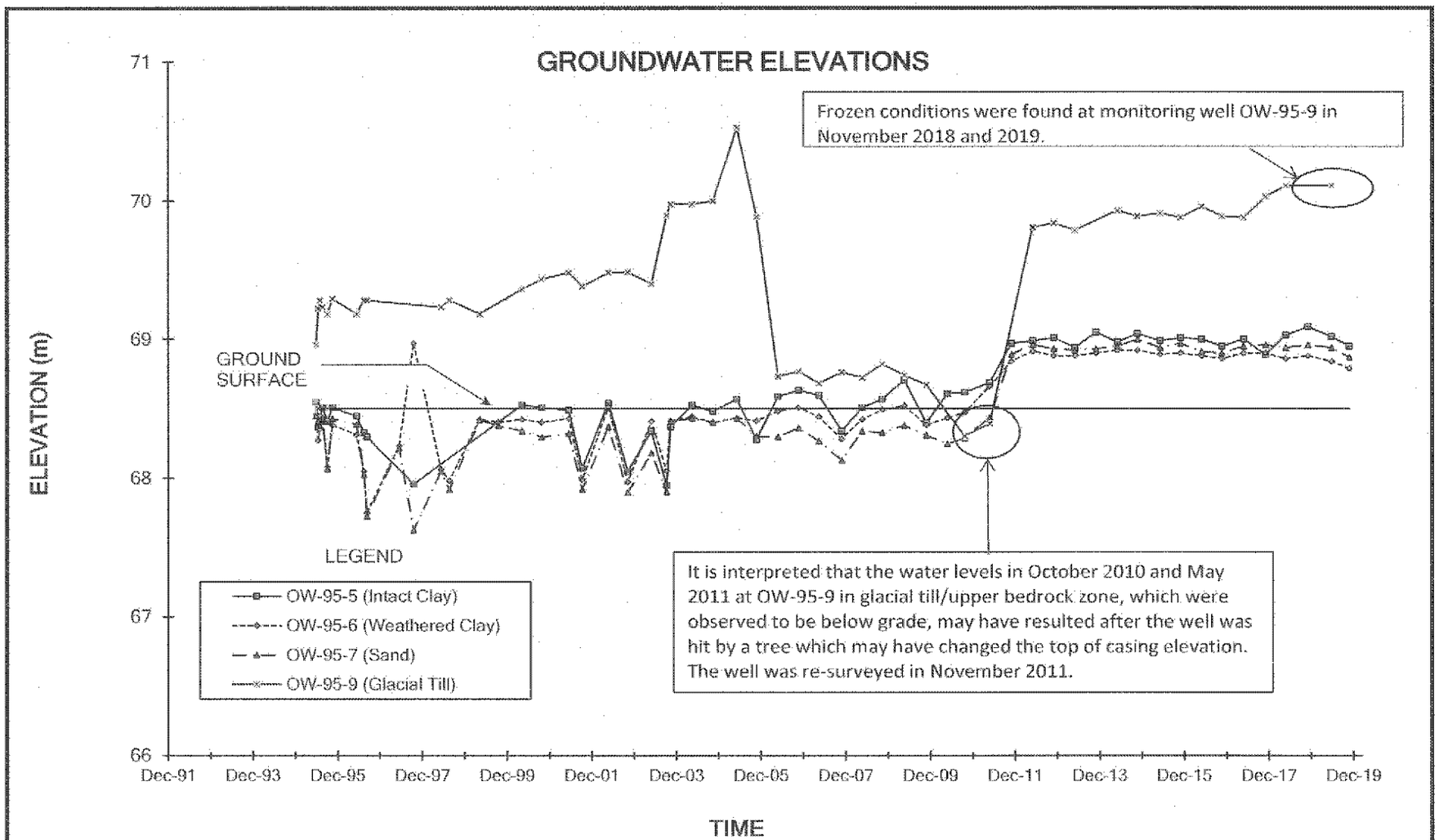


FIGURE C10

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-5 TO 95-7 & 95-9

GOLDER

APPENDIX D

Groundwater Results of Field and Laboratory Chemical and Physical Analyses

Appendix D-1 – Up-Gradient Wells

Appendix D-2 – Immediately Down-Gradient Wells

Appendix D-3 – Down-Gradient/Mer Bleue Wells

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX E

Leachate Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX F

Groundwater Leachate Indicator Parameter Concentrations

Appendix F-A – Sand Layer

Appendix F-B – Weathered Clay Deposit

APPENDIX F-A

Sand Layer

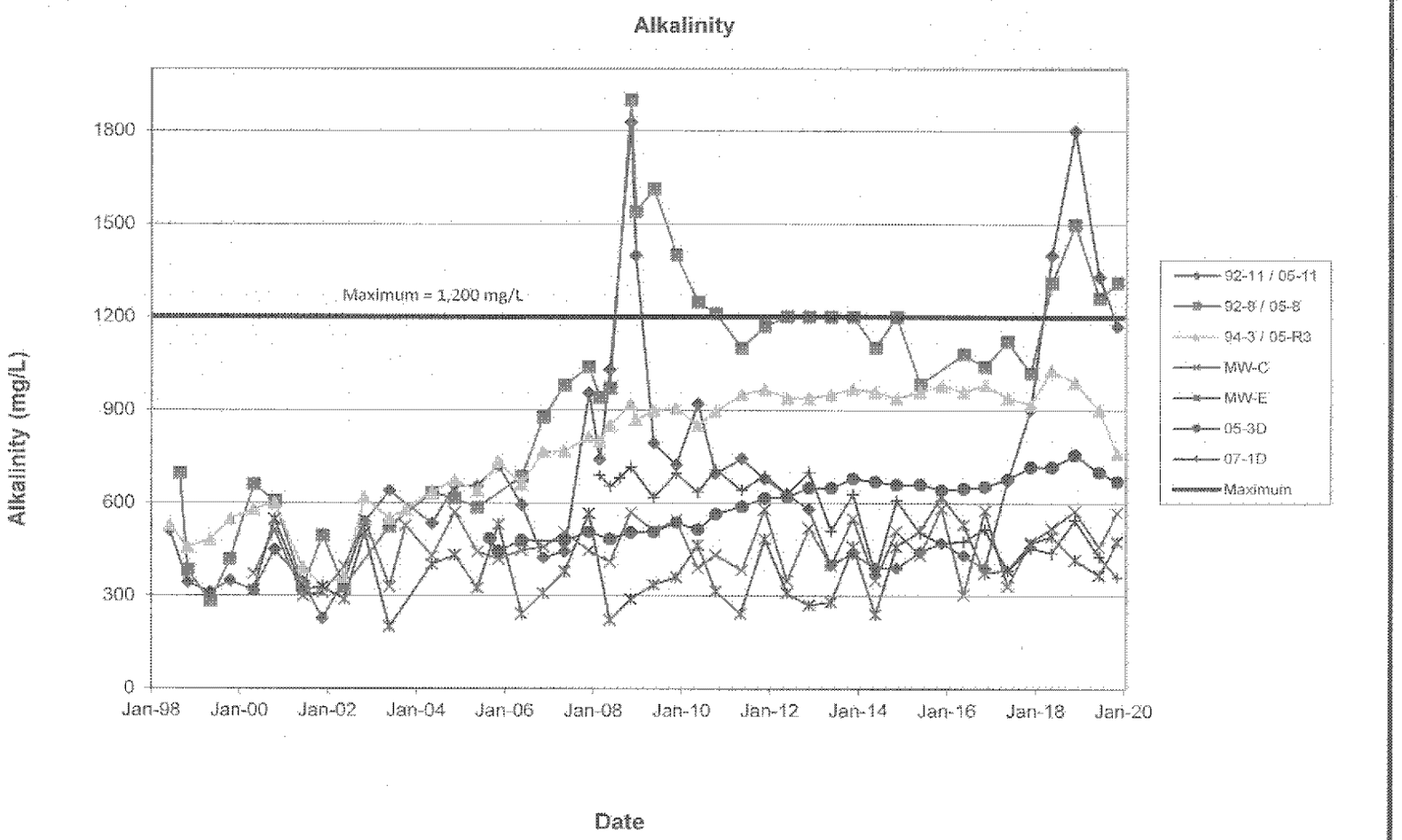


FIGURE FA1

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

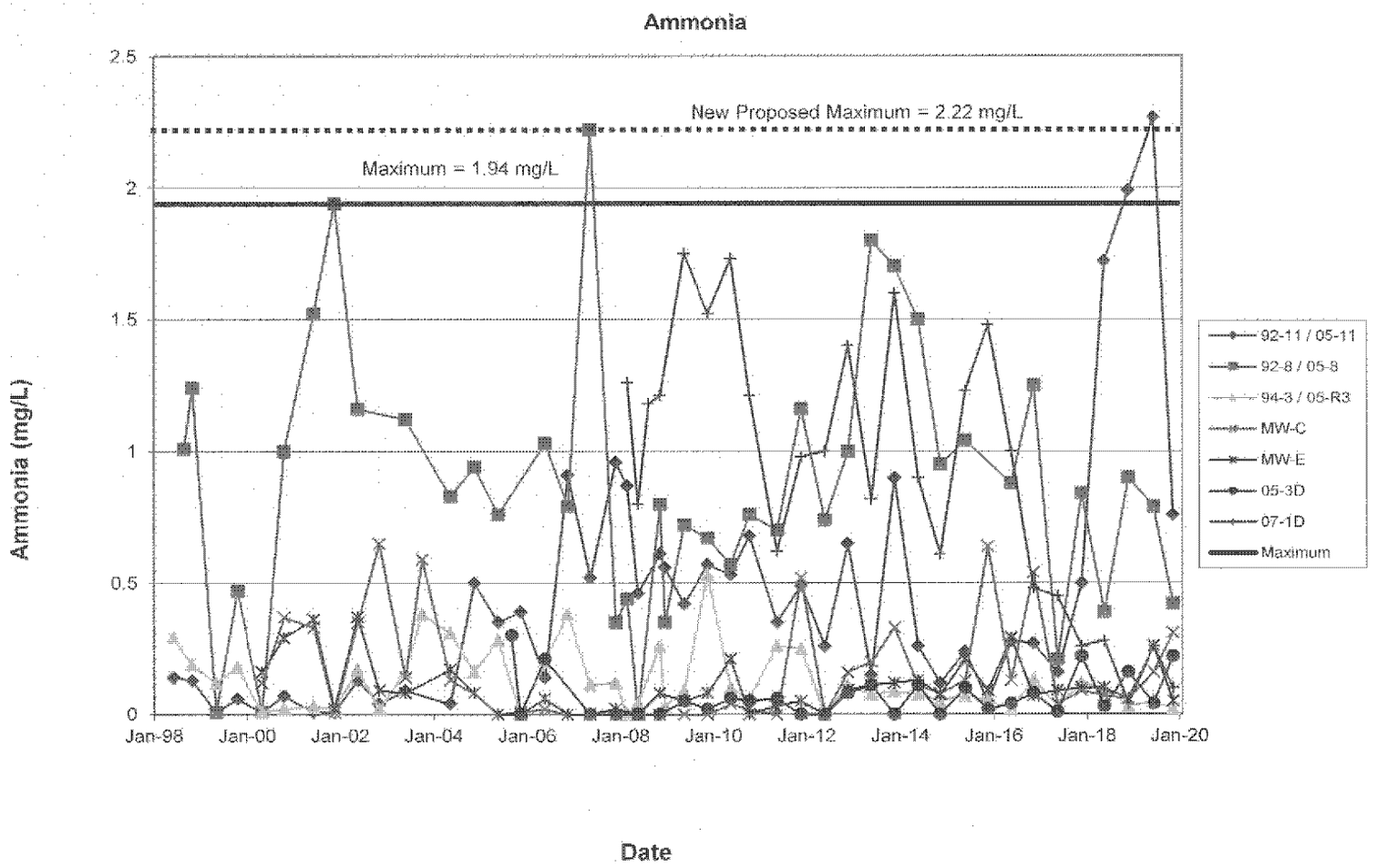


FIGURE FA2

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

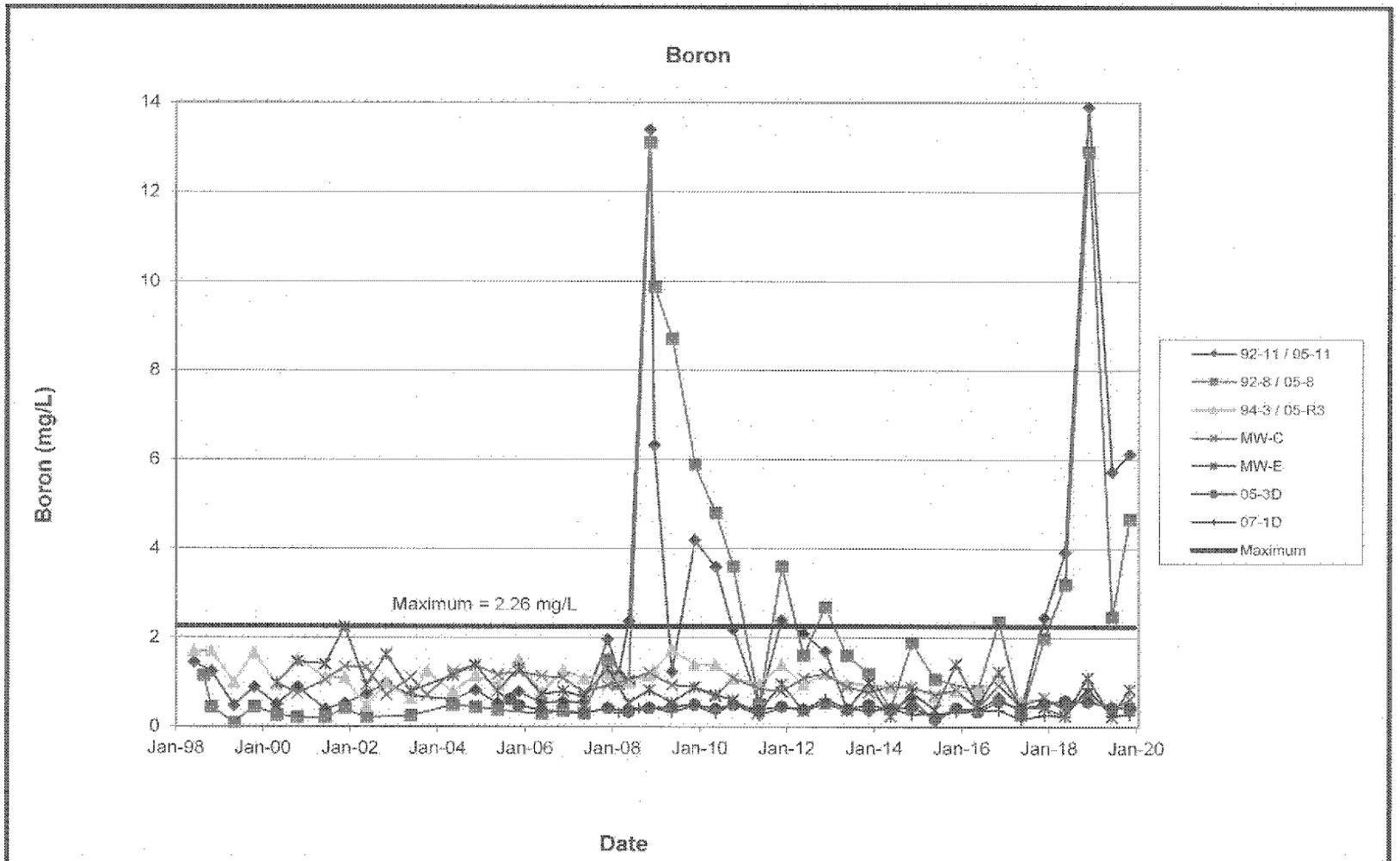


FIGURE FA3

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

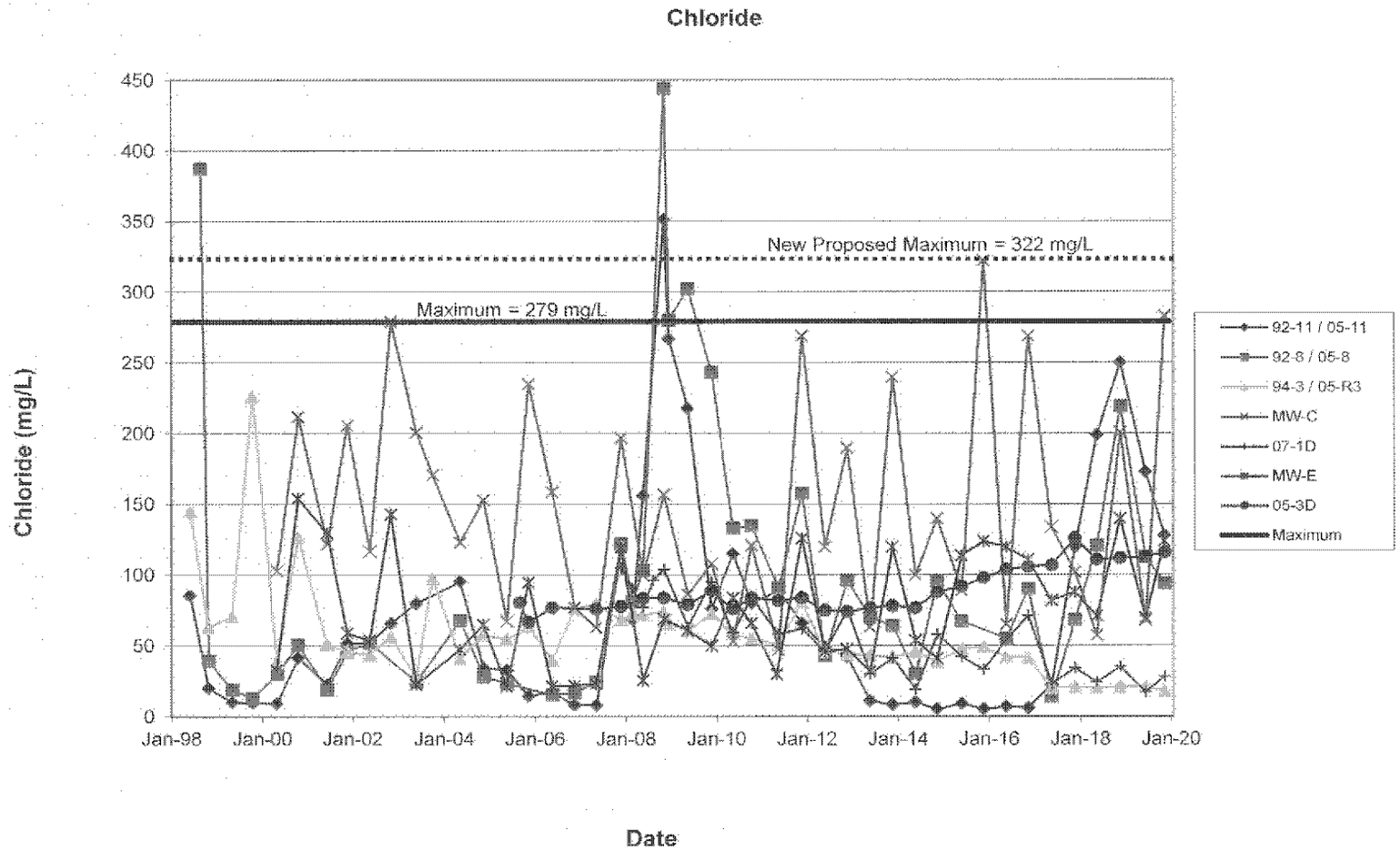


FIGURE FA4

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

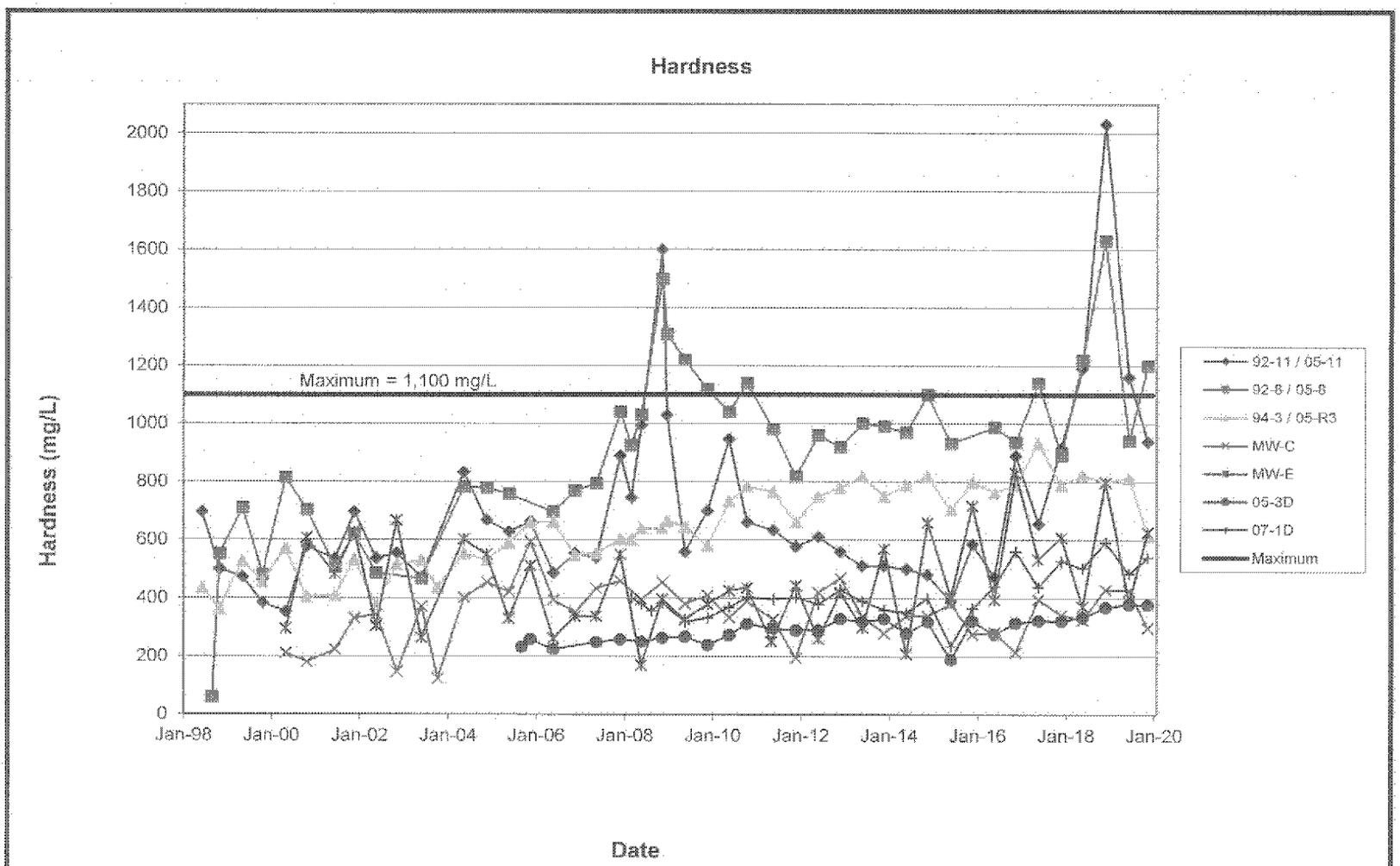


FIGURE FA5 Project No. 19130610-01 Prepared by: ETB Checked by: YJM March 2020	**WCC NAVAN FACILITY** GROUNDWATER SAND	GOLDER

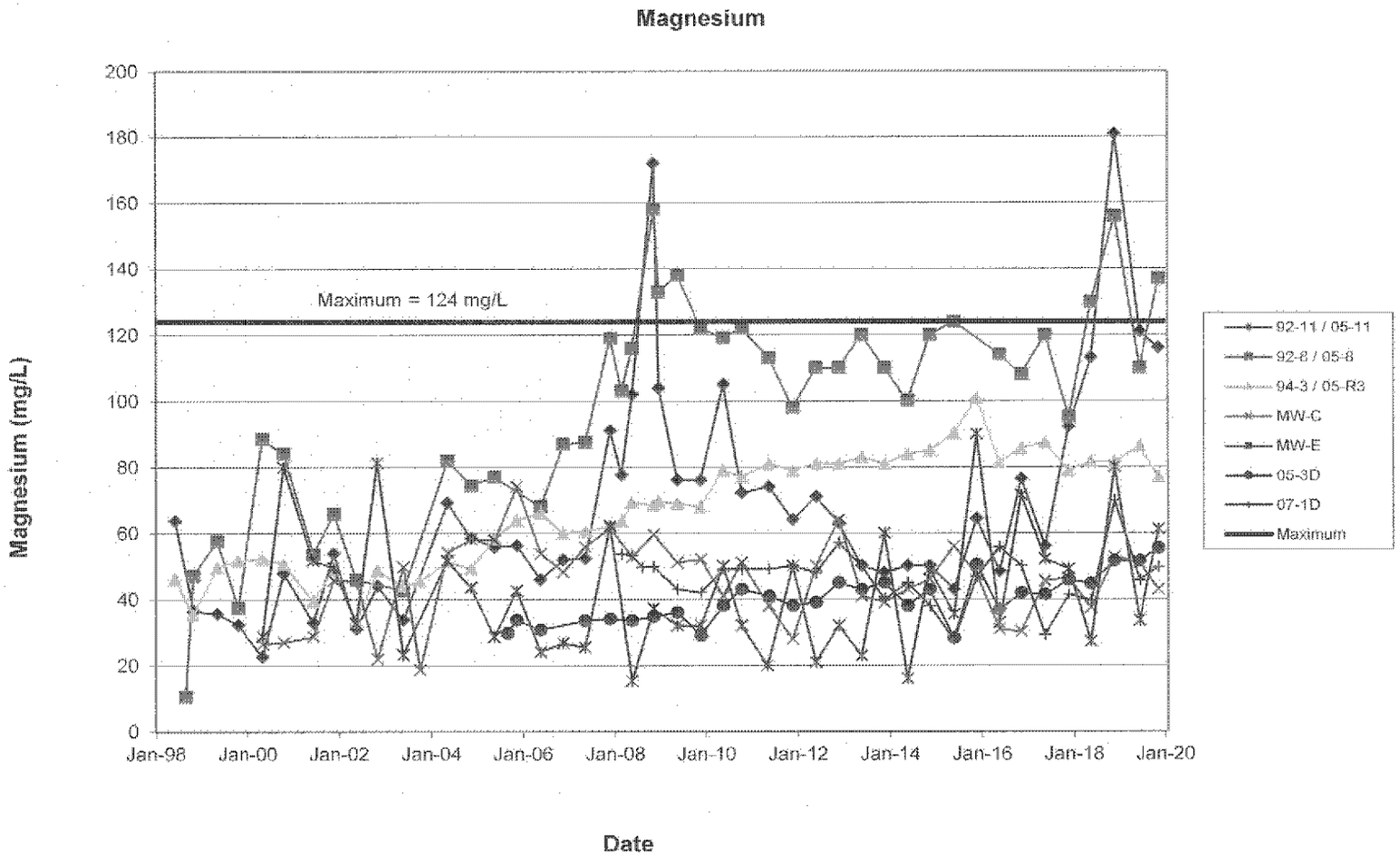


FIGURE FA6

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY
GROUNDWATER
SAND

GOLDER

000172

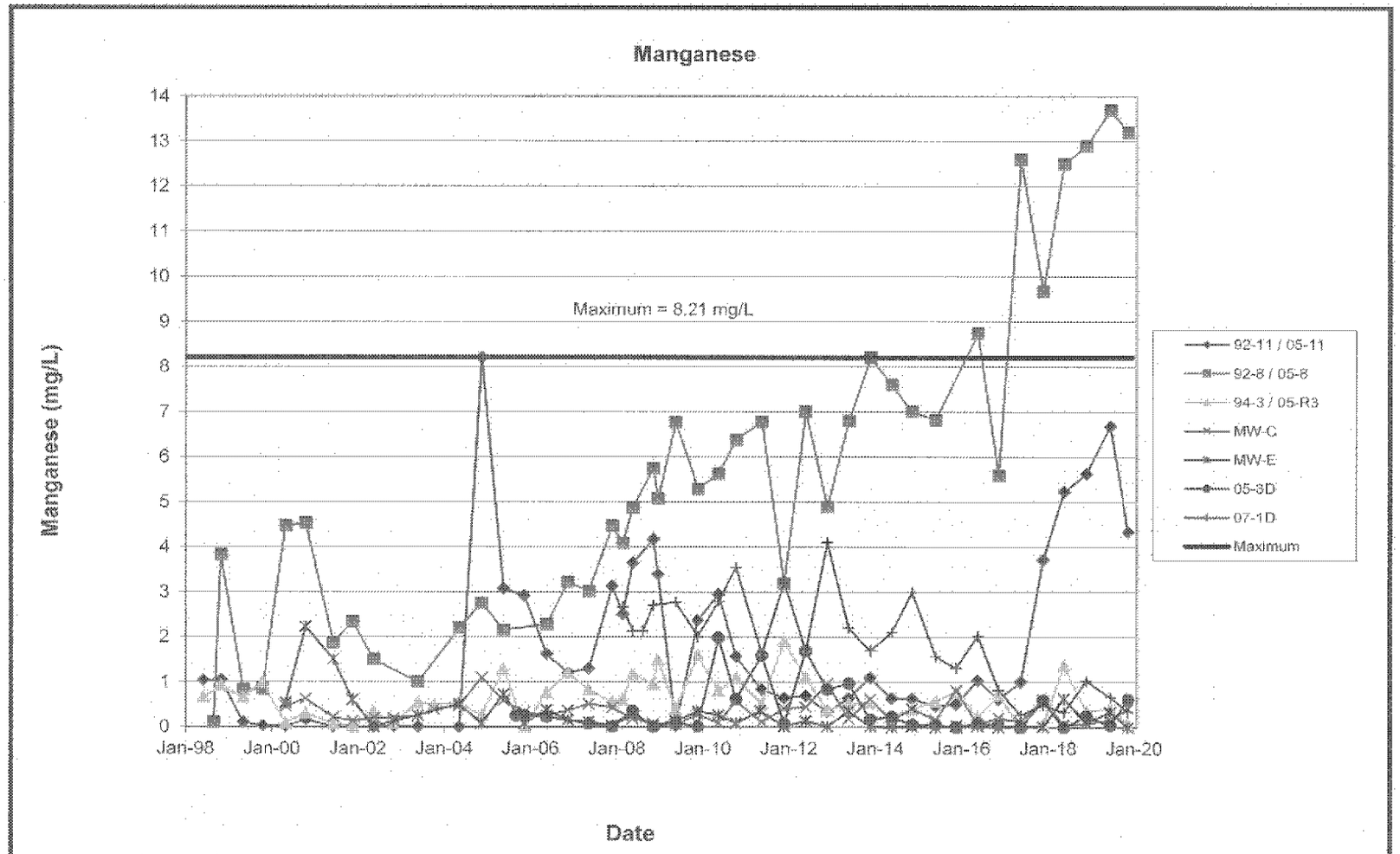


FIGURE FA7

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

000173

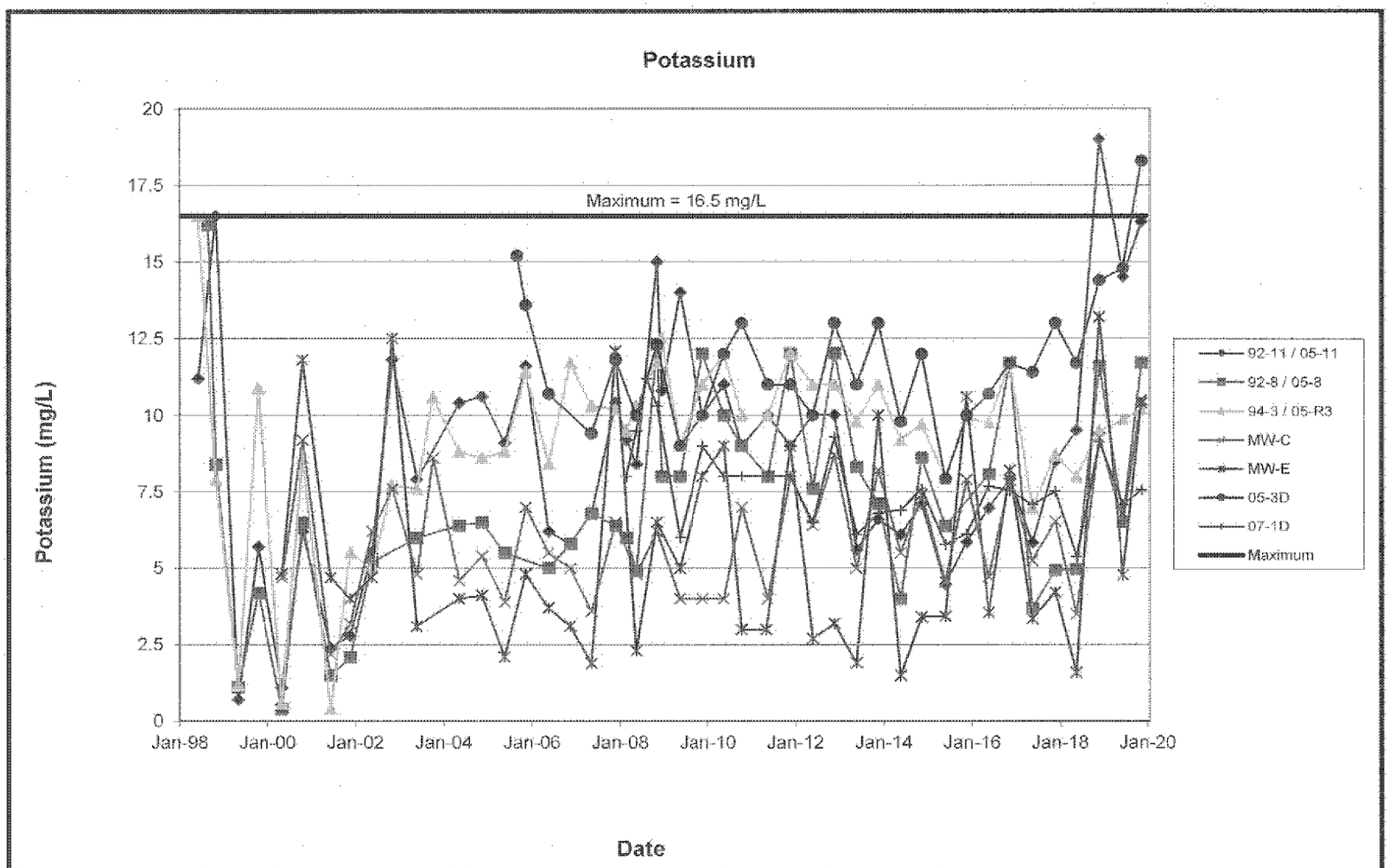


FIGURE FA8

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

APPENDIX F-B

Weathered Clay Deposit

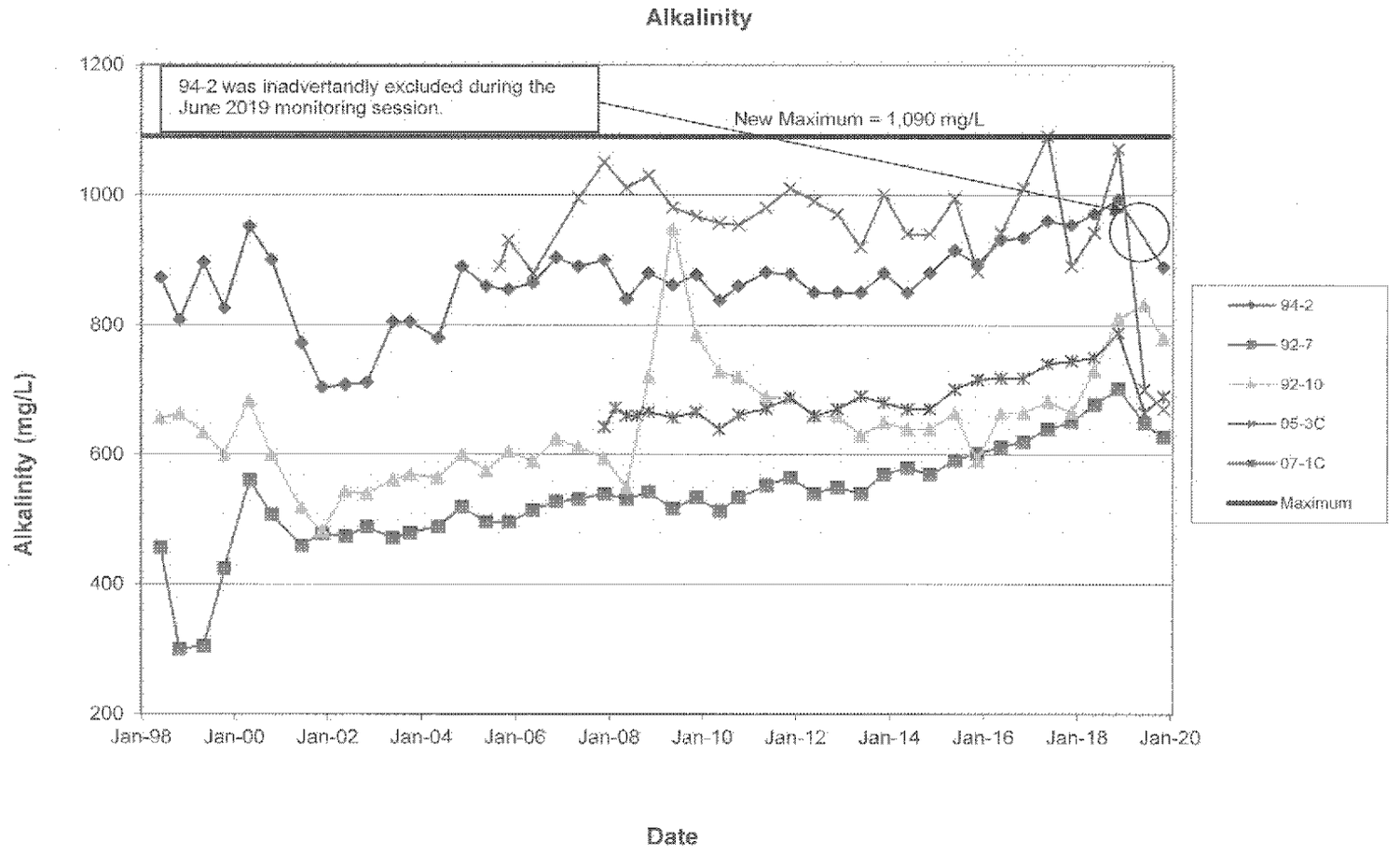


FIGURE FB1

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY
GROUNDWATER
WEATHERED CLAY

GOLDER

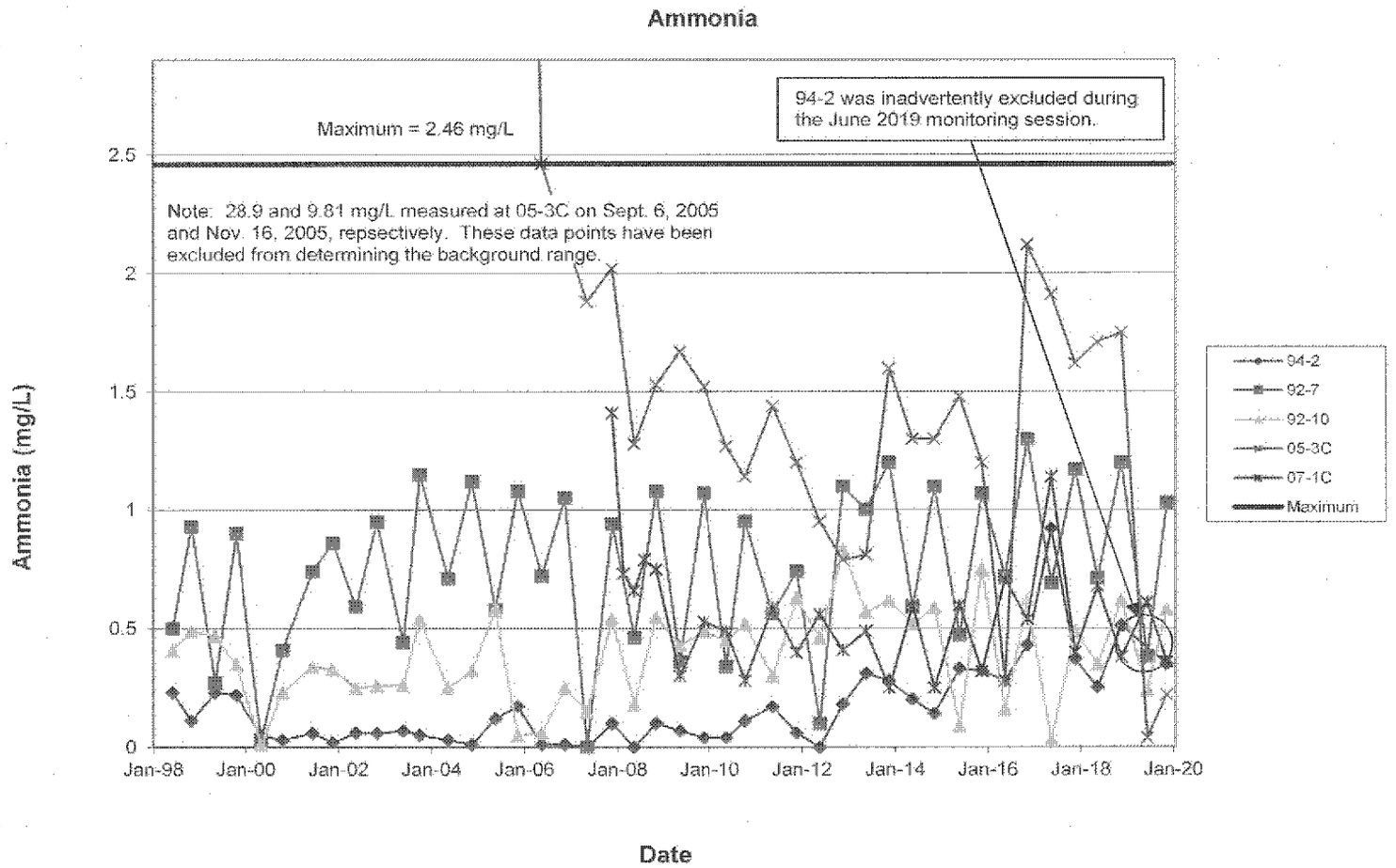


FIGURE FB2

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER

WEATHERED CLAY

GOLDER

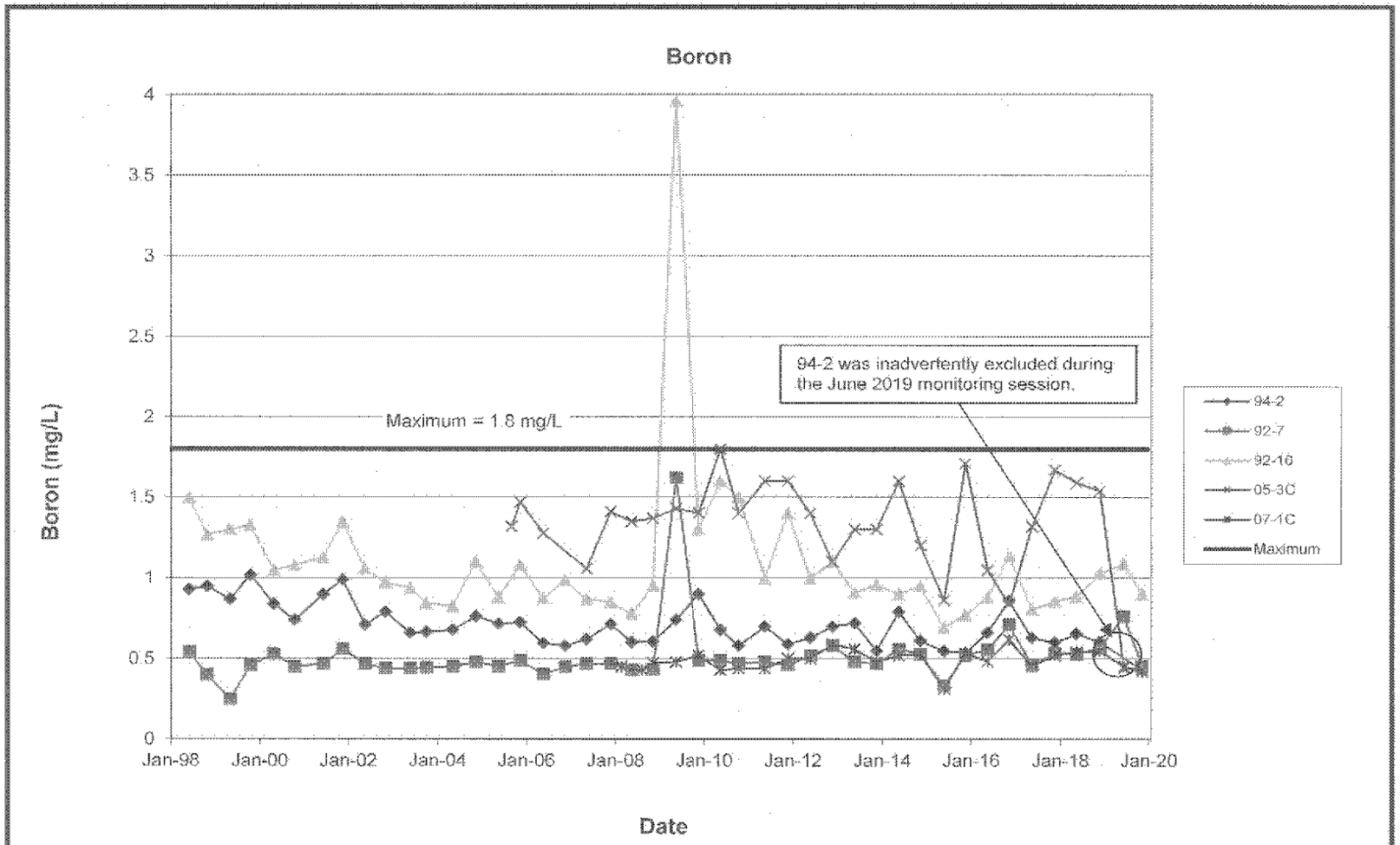


FIGURE FB3

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY
GROUNDWATER
WEATHERED CLAY

GOLDER

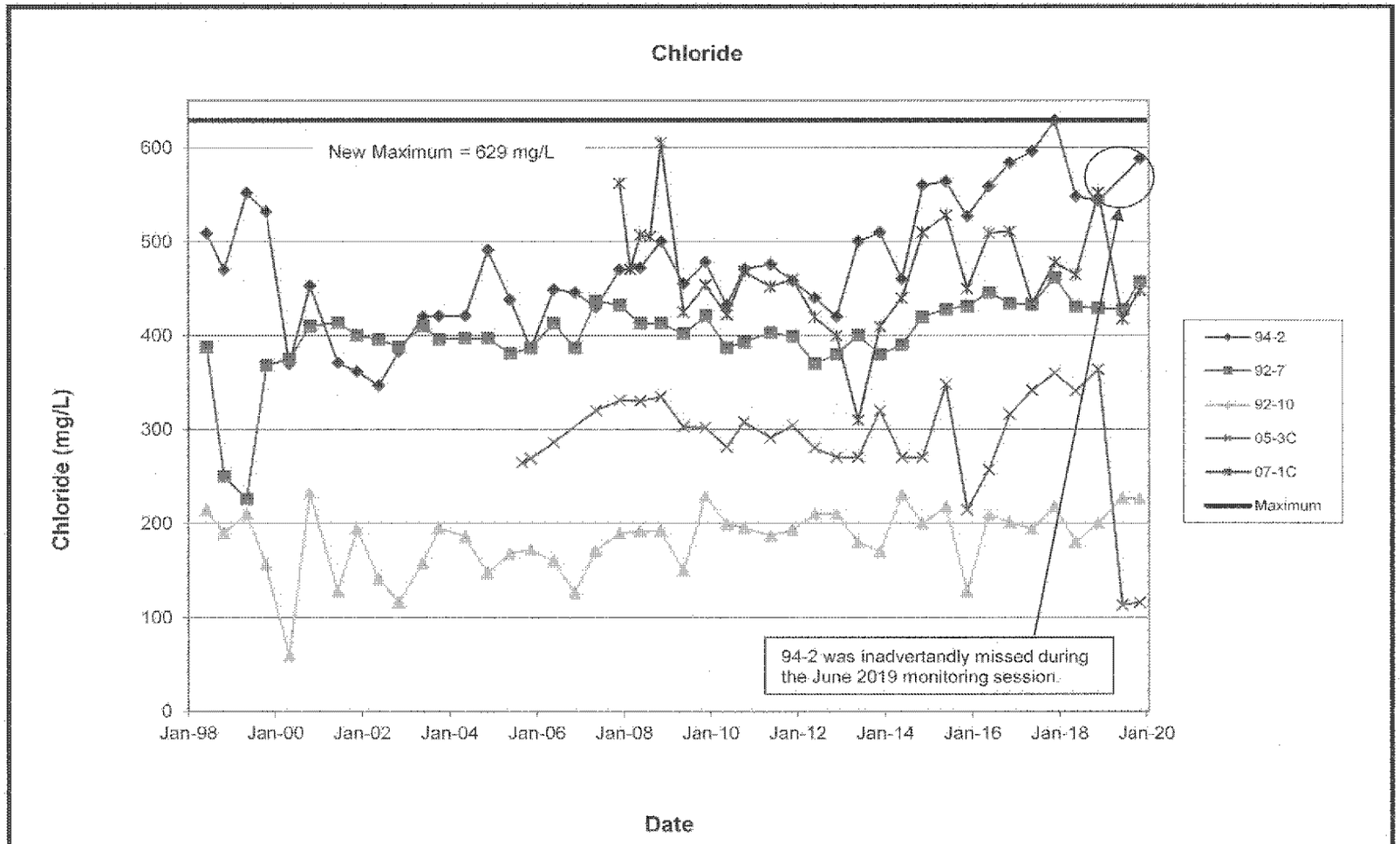


FIGURE FB4

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

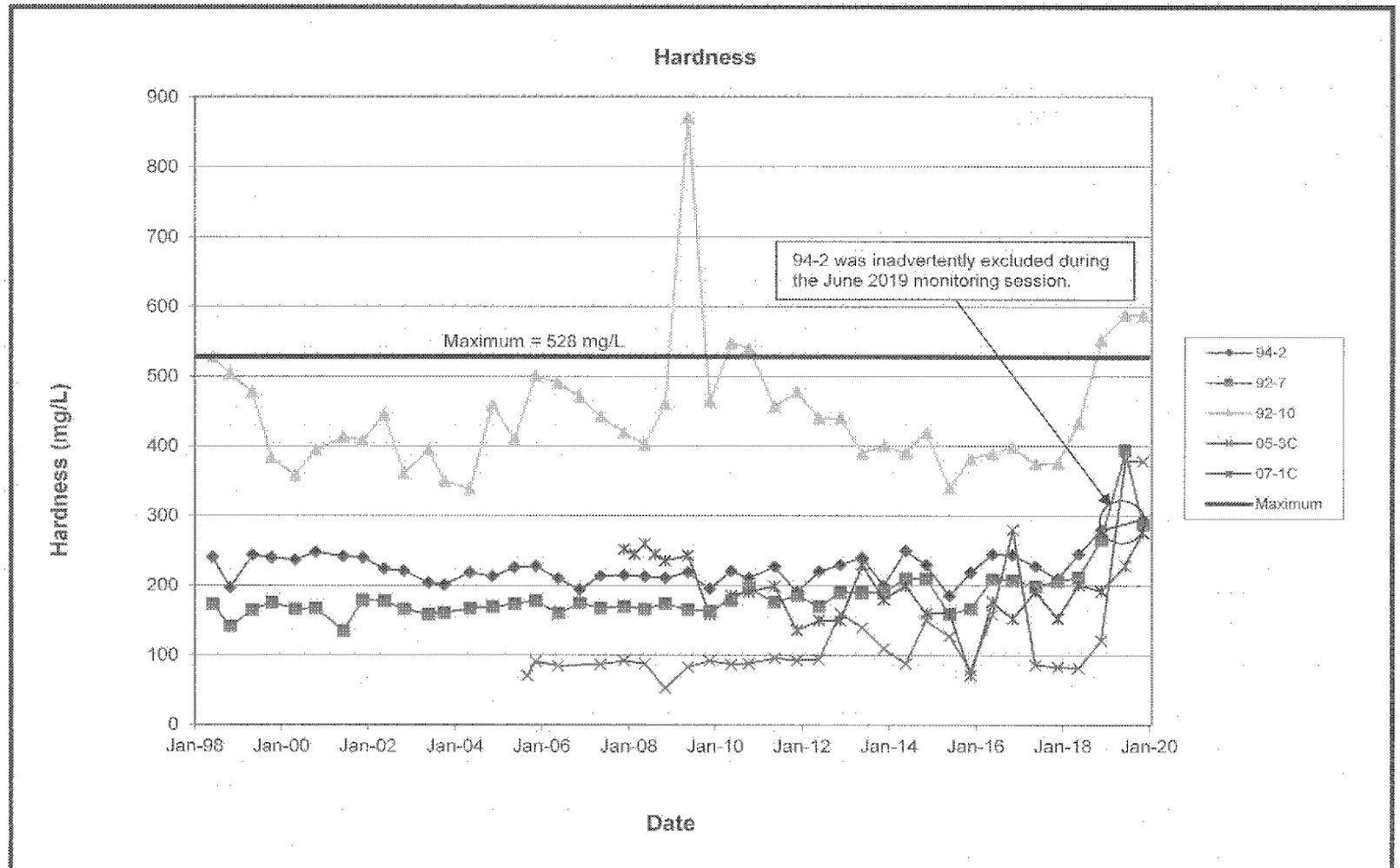


FIGURE FB5

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY
GROUNDWATER
WEATHERED CLAY

GOLDER

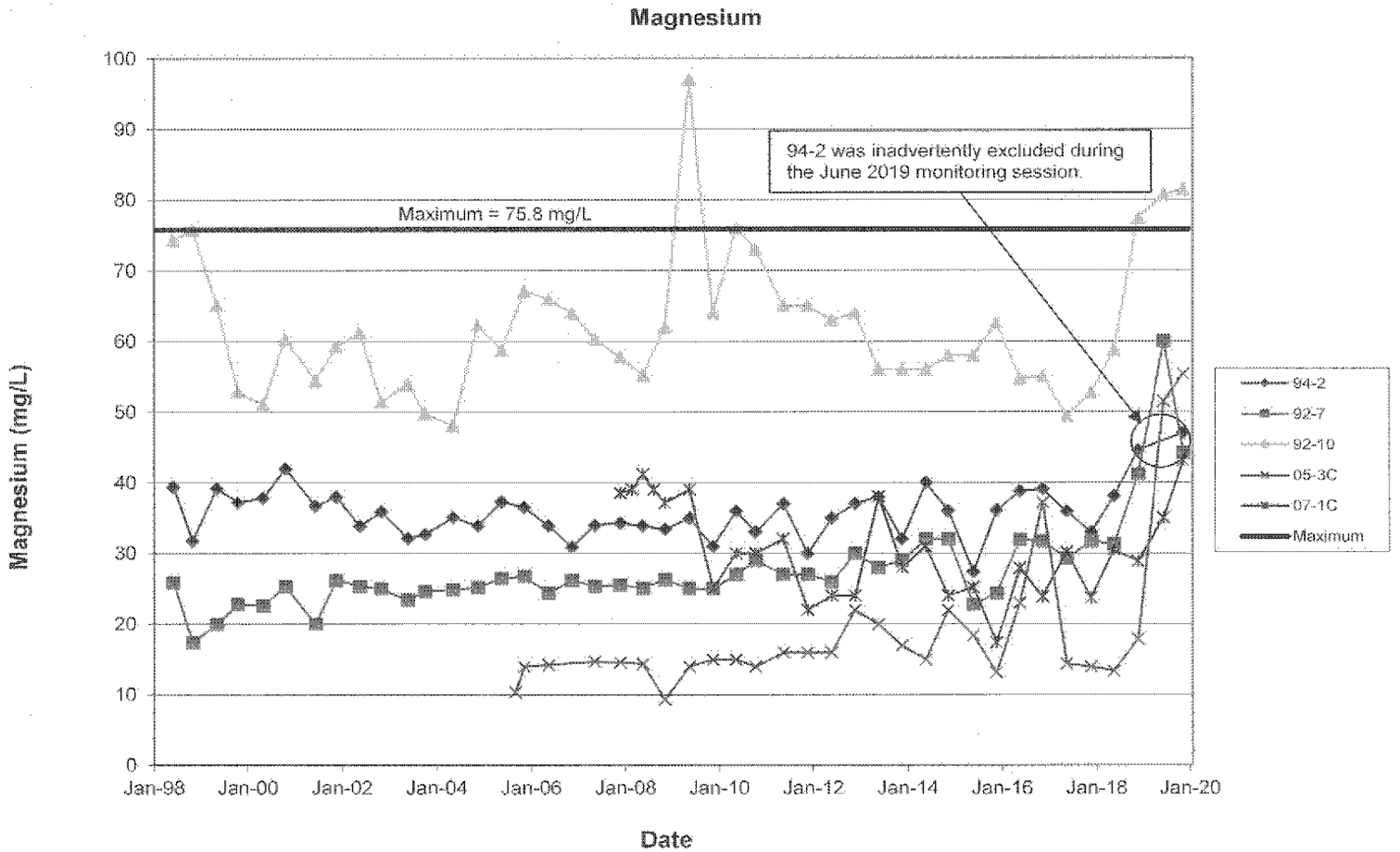


FIGURE FB6

Project No. 19130610-01

Prepared by: ETB

Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

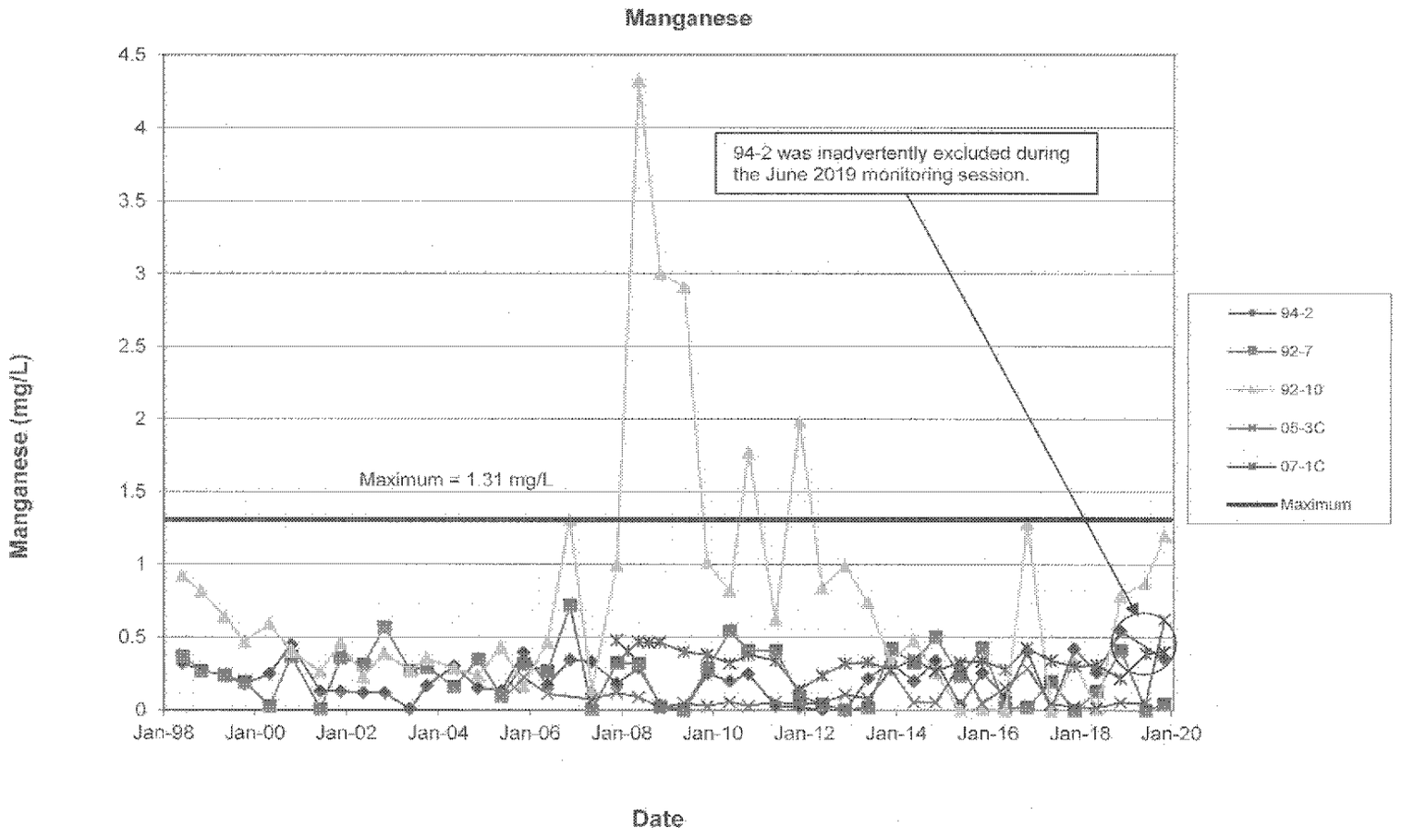


FIGURE FB7

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

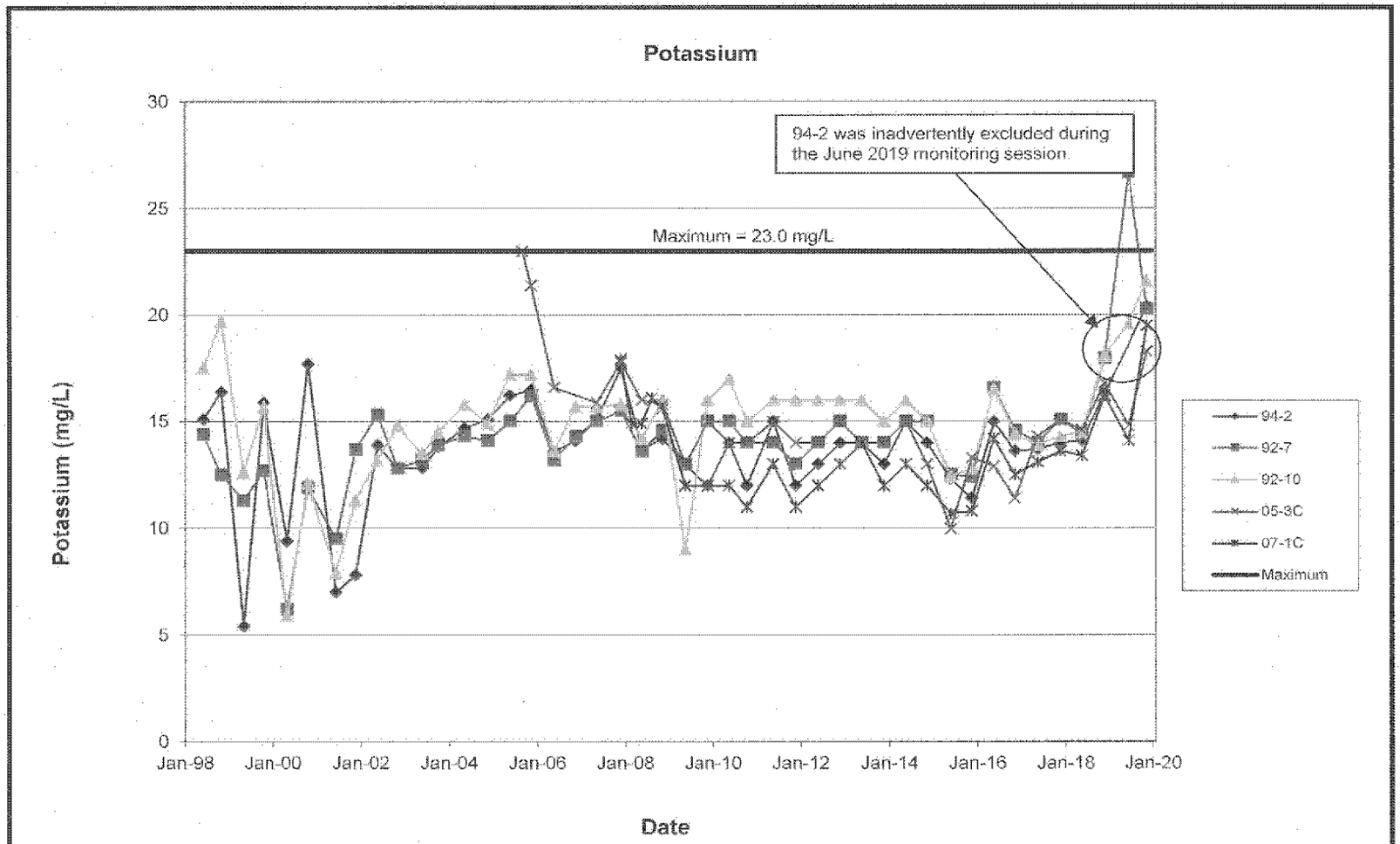


FIGURE FB8

Project No. 19130610-01
Prepared by: ETB
Checked by: YJM March 2020

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

000184

APPENDIX G

Surface Water Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report.

APPENDIX H

MECP Inspection Report and Correspondence

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	Waste Connections of Canada Inc. Mailing Address: Floor 2 - 610 Applewood Cres. Vaughan, Ontario, Canada, L4K 0E3 Physical Address: Floor 2 - 610 Applewood Cres. Vaughan City, Regional Municipality of York, Ontario, Canada, L4K 0E3 Telephone: (905)532-7510 Extension: 7415 email: chris.visser@wasteconnections.com Client #: 2344-AM3NKK, Client Type: Corporation, NAICS: 562110		
Inspection Site Address:	Navan Landfill Address: 3354 Navan Rd. Ottawa, City K4B 1H9 District Office: Ottawa GeoReference: Map Datum: NAD83, Zone: 18, Accuracy Estimate: 10-30 metres eg. Medium Quality GPS, UTM Easting: 460890, UTM Northing: 5030224, Site #: 9411-7BDU2B		
Contact Name:	Henri Huneault	**Title:**	Site Manager
Contact Telephone:	(613)824-7289 ext	**Contact Fax:**	
Last Inspection Date:	2018/10/18		
Inspection Start Date:	2019/09/12	**Inspection Finish Date:**	2019/09/12
Region:	Eastern		

1.0 INTRODUCTION

On September 12, 2019 Senior Environmental Officer A. Cappello of the Ministry of the Environment, Conservation and Parks (Ministry), Ottawa District Office conducted an inspection of Waste Connections Canada (WCC), formerly Progressive Waste Solutions Canada Inc. Navan Waste Recycling and Disposal Facility located at 3354 Navan Road in Ottawa, Ontario (the Site). The purpose of this inspection was to assess WCC's compliance with the requirements of the Environmental Protection Act, R.S.O. 1990, c. E. 19, as amended (EPA), Ontario Regulation 347 (O.Reg 347) and Provisional Certificate of Approval Waste Disposal Site Approval A460702.

Prior to conducting the inspection, available data and information, including the ECA and notices, previous inspection reports and the 2018 Operations and Monitoring Report report were reviewed. The 92.85 hectare waste management facility that includes a 40 hectare landfill and processing operations is located on the west side of Navan Road, south of Renaud Road. The adjacent properties include residential homes, the Mer Bleue Bog and commercial properties. The Site is secured with fencing, marsh areas, berms, ditches and a locked gate. WCC employs approximately 26 people and operates Monday to Saturday from 7:00 until 6:00 p.m. with Site preparations occasionally taking place on the weekend. The inspection included an interview and Site tour which were provided by Mr. Henri Huneault, Site Manager.

The Site is permitted to receive waste generated within the Province of Ontario while the processing site may accept waste generated within Outaouais and the Province of Ontario. No waste from the City of Toronto shall be accepted for disposal or for processing at the Site. The Site is permitted to accept only solid non-hazardous municipal waste, asbestos waste, commercial and institutional (IC&C) waste including construction and demolition waste, dry non-putrescible domestic waste and impacted soil. Similarly at the processing site only solid non-hazardous municipal waste excluding putrescible waste shall be accepted.

In June 2015 WCC received approval to operate a Soil Treatment Pad at the landfill and processing facility. Notice 8 under ECA A460702 provides the governing operational requirements for the soil remediation pad, including, training

of personnel, sampling and analysis, uses of soil post soil remediation.

Active landfilling was undertaken in the Phase 1 of the landfill between January and October of 2018 followed by Phase 4 area in October through to the end of December 2018. Other activities undertaken at the Site include the excavation of the east cell identified as Phase 6, continued recycling operations at the facility with treatment of hydrocarbon impacted oils, screening of oversized materials and the pre-treatment and disposal of collected leachate to ROPEC for off-site treatment.

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):
Provisional Certificate of Approval No. A460702, dated April 16, 2009, was issued to Waste Services (CA) Inc., now WCC. The approval officially revoked and replaced the previous approval that was dated May 12, 2006 due to the Site's expansion. The following summarizes the notices that have amended ECA No. 460702:

Notice No. 1 dated October 9, 2009: Permitted construction of base liner and leachate collection system for Phase 1
Notice No. 2 dated August 4, 2010: Widening of Navan Road
Notice No. 3 dated November 1, 2010: Landfill gas odour control system
Notice No. 4 dated April 29, 2011: Financial assurance update (processing Site)
Notice No. 5 June 13, 2012, Notice No. 5: Financial assurance update (processing Site)
Notice No. 6 dated: Financial assurance update (processing Site)
Notice No. 7 dated February 25, 2014: Financial assurance update (landfill)
Notice No 8 dated June 8, 2015: Soil Treatment Pad
Notice No. 9 dated February 1, 2016: Financial assurance update (landfill)
Notice No. 10 dated March 14, 2017: Financial assurance update (combine landfill and processing site FA)

Amended Environmental Compliance Approval (Air) No. 3536-8APNZD was issued to on November 24, 2010 for the approval of one flare, one candlestick flare, one lot of natural gas heating, ventilation and air conditioning equipment and one leachate pumping facility. The conditions of the Air ECA were not included in this inspection.

2.1 FINANCIAL ASSURANCE:

Specifics:
Condition 15 (a) through (e) updated in Notice No. 10 dated March 14, 2017 outlines the financial assurance (FA) requirement for the landfilling and processing operations. The most recent notice combined the FA requirements for the landfill and processing site.

WCC is required to provide FA in a form acceptable to the Director in the amount of $13,914,411 (cumulative payment) no later than January 31, 2018. Condition 15 (d) states that the financial assurance will be reviewed every three years starting on January 18, 2018. WCC is currently in compliance with their financial assurance requirements.

2.2 APPROVED AREA OF THE SITE:

Specifics:
The Site is approved for the use and operation of a 40 hectare footprint within a total waste disposal site of 92.85 hectares. Litter fences to control windblown litter were observed at the top of the landfill mound on the active face.

2.3 APPROVED CAPACITY:

Specifics:
The capacity of the Site is 7,600,000 cubic meters. The Site is permitted to receive up to a maximum daily rate averaged over a year, including daily and interim cover, of 1,500 tonnes per day. The maximum annual amount at which the Site can receive waste for disposal is 234,750 tonnes. The 2018 Operations and Monitoring Report (2018 AMR) stated a total of 408,041 tonnes of materials entered the Site. Of this total, 233,994 tonnes (57.35%) were received as landfill materials, 14,712 tonnes (3.61%) were recycled and removed from the Site and an estimated 50.7 tonnes (0.01%) were waste materials rejected and removed from the Site by WCC for alternative disposal at another licensed facility. Other materials received for re-use on Site included 11,935 tonnes (2.92%) of rock, brick, concrete and rubble re-used as aggregate for road construction, 5,623 tonnes (1.38%) of clean fill, topsoil, and asphalt re-used on Site for final grading, road/pad construction and engineered fill, 31,726 tonnes (7.78%) of treated soils re-used for final cover and structural fill in the east buffer area; and 110,000 tonnes (26.96%) of special materials such as storm sewer screenings and impacted non-hazardous soils that were received at the Site for re-use as cover material.

The life expectancy remaining for the Site as of January 1, 2019 is estimated to be approximately 7.71 years to 11.4 years although the actual life of the landfill will vary based on annual fill rates, in-place waste density, waste diversion and recycling initiatives.

2.4 ACCESS CONTROL:

Specifics:
The Site was inspected on September 12, 2019 at a time when facility was open to the public. During the Site inspection, the scale house with both an incoming and outgoing scale was observed. Mr. Huneault confirmed the scale house attendants are trained to assess incoming loads of waste to ensure only solid non-hazardous waste that is not putrescible is contained in the vehicles. The scale house attendant also confirms compliance with Condition 34 which states only waste from the Province of Ontario, is accepted at the Site. In addition, the scale house attendant confirms compliance with Condition 35 which states only waste generated within the Outaouais and Province of Ontario, may be received at the Processing Site. Waste from the City of Toronto shall not be accepted at the landfill or at the processing site. WCC also employs a screener who is positioned near the active face and uses a CB to communicate with other employees. It is the screener's responsible to identify truck containing unacceptable waste and to scare away the birds.

On occasion, unwanted or inappropriate wastes may be found at the landfill Site such as putrescible wastes or liquid industrial wastes. WCC has a standard operating procedure to identify and remove the waste appropriate for disposal at another licensed facility. WCC completes a Rejected Waste Form and submits the notification to the Ottawa District Office as required in Condition 133. In 2018 the ODO received fifteen Rejected Waste Form notifications via email.

2.5 COVER MATERIAL:

Specifics:
Cover material requirements are outlined in Conditions 55, 56 (a) though (c) and 57 through 60. Acceptable materials used for daily cover include clean aggregate, foundry sand, wood chips and contaminated soil. Condition 56(a) requires daily cover in the amount of 150 mm be applied at the end of each working day. Since the Site was operational during the Site inspection this daily cover had not yet been applied. The active face was confined to one area and the use of screen fencing was being utilized to control litter. Contaminated soil deposited at the Site is a big component of the daily cover used. Hydrocarbon impacted soils are brought to the pad for processing. One WCC employee is responsible for assessing compliance with Condition 139.1 and associated analytical results confirming the soil is solid non-hazardous waste.

A Special Waste Profile is completed for any foundry sands, contaminated soils and asbestos waste.

Condition 56(b) requires intermediate cover in the amount of 300 mm be applied in areas where landfilling has been temporarily discontinued for six months or more. Intermediate areas were well covered and no windblown litter present. Numerous trees have been planted to add to the existing screening at the Site to restrict the view of the recycling storage area.

Condition 56(c) requires final cover in the amount of 900 mm of clay and 150 mm of top soil shall be applied on waste areas that have reached final contours. Outer bermed areas of the Site have received grading and tree planting activities to promote a visually appealing look of the Site.

Condition 57 requires existing intermediate cover material that has eroded such that waste is exposed, the cover material shall be promptly replaced. It was reported that erosion issues are part of the weekly inspections at the Site that generally erosion has not been an issue.

2.6 WASTE BURNING:

Specifics:
Condition 54 prohibits the burning of waste, including wood waste and brush at the Site. No evidence of burning was observed during the Site inspection.

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Specifics:
The monitoring at the Site consists of water quality analysis of surface water, groundwater and leachate. The monitoring program is outlined in Conditions 109 and 112 of ECA A460702. Condition 109 requires WCC to carry out groundwater and surface water monitoring and Condition 112 requires a Professional Geoscientist or Engineer

possessing the appropriate hydrogeological training and experience to execute or directly supervise the execution of the groundwater monitoring and reporting program. Currently Golder Associates Ltd (GAL) completes the sampling programs which meets the requirements of Condition 112. Results of the monitoring program are detailed in the 2018 Operations and Monitoring Report (herein after referred to as the 2018 Annual Monitoring Report/AMR).

The 2018 AMR states the following: "Groundwater at the Navan Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weather clay zone, an intact (unweathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present up-gradient, at the down-gradient edge (used to asses compliance) and further down-gradient of the landfill in each of these units". Water quality monitoring programs are carried out twice annually for groundwater and three times annually for surface water and leachate. Surface water quality monitoring was completed on May 23rd, August 30th and November 28th of 2018. Leachate was sampled at the pump station on May 23rd, August 30th and December 19th. Groundwater quality monitoring was completed on May 15th, August 30th and November 22, 2018. Groundwater monitoring wells further in the Mer Bleue Bog were sampled on August 30th, 2018.

The Ministry has stated that the Reasonable Use Guideline is not applicable at this Site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanisms (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately downgradient from the landfill, which are used to assess compliance, were graphed and visually checked for exceedances of the 1998 to 2017 background range.

The following comments were made in the AMR:

In 2018, one confirmed exceedance of trigger concentration was reported in November for manganese concentrations reported at MW05-8 (with three successive exceedances with an increasing trend) and one confirmed exceedance of the trigger concentration was reported in November for boron at MW05-11 (three successive exceedances with a spike or short duration increase trend). WCC notified the ODO (the undersigned provincial officer) by telephone on March 6, 2019.

The AMR also states that although the manganese concentrations reported at MW05-8 are not believed to be caused by landfill leachate, the boron exceedances combined with increasing trends in concentrations for other Leachate Indicator Parameters indicated that the operating issues experienced in the fall with leachate pumping and disposal activities having to be stopped for long periods of time have had an impact to groundwater collection system (less than 10 metres south of the leachate collection system and close to the south toe collector). High groundwater table elevations reported at downgradient locations in the spring of 2017 and 2018 may have also contributed to the exceedances reported prior to November 2018. The results from the 2019 sampling program will be analysed to determine the need for a formal contingency plan.

In addition, the groundwater and surface water trigger mechanism report prepared by GAL demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are no potential impacts from landfill activities. Naturally elevated parameters measured include boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

The approved groundwater monitoring program was followed, except that as discussed in Section 1.0, groundwater monitoring locations BH09-1A, BH09-1B, BH09-1C and BH09-1D were not sampled during the winter of 2017 due to historical conditions of frozen water in the monitoring wells; these wells were sampled instead during the summer session on August 28, 2017 for BH09-1D and fall sessions on November 29, 2017 for BH09-1B and BH09-1C (frozen conditions were observed at BH09-1A during the fall session).

The 2019 AMR will be reviewed by the Ministry's hydrogeologist upon receipt in the new year.

Surface Water

Surface water and leachate sampling was completed on May 23, August 30, and November 28, 2018. The only deviations from the approved surface water monitoring program were that due to dry or stagnant conditions, surface water monitoring station S5, S8, S9, S12 and S20 were not sampled in August monitoring session.

A total of eleven surface water stations are monitored to obtain representative information on water quality up-gradient from the landfill and to assess compliance at down-gradient stations. Analytical results for up-gradient surface water stations show the surface water quality of characterized by concentrations of the following parametres which exceed or are outside the PWQO: cadmium, chromium, cobalt, dissolved oxygen, iron, lead, phenols, total phosphorus and zinc. Surface water quality is generally consistent over time with seasonal variability. GAL concluded that increases in concentrations of parameters at these locations is not related to leachate impact as these stations are up-gradient of

the site.

Analytical results for the down-gradient surface water stations are summarized in the table under section 7.2.2. Landfill Monitoring Report. Exceedances of the PWQO are various parameters, including the following; dissolved oxygen, iron, total phosphorus, boron, cobalt, phenols, cadmium and lead. These exceedances were observed in monitoring stations S10, S11 and S12. GAL's report states that the concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the August and November 2018 monitoring sessions were generally similar or lower than the surface water quality at the up-gradient station S16 during the same session. Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed.

Leachate

The leachate monitoring program following the program outlined in Conditions 109 and 112 of the ECA A460702. Leachate quality analysis was undertaken on samples obtained from the pump station (L5) during the May 23rd, August 30th and December 19th monitoring sessions. Due to the leachate pump being out-of-service during the November sessions, no sample could be collected at the time, therefore a sample was collected in December.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation because the landfill is underlain by a thick natural clay deposit that performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater but is predominantly precipitation that has infiltrated through the waste pile.

As reported in the 2018 AMR, average concentrations indicated that landfill leachate is distinctly different from most other landfill sites in Ontario as most analytes measured have a much lower concentrations. Leachate quality monitoring results for 2018 indicates that leachate generated at the Site is not significantly different from previous monitoring events. The results indicated that leachate generated at the Site continues to be a relatively weak wastewater when compared to municipal landfill leachate.

2.8 LEACHATE CONTROL SYSTEM:

Specifics:
Condition 86 of the ECA requires that the leachate management system be managed and operated as described in Item 41 in Schedule A attached to the ECA. Item 41 is the Design and Operations Manual approved for the landfill in January 2008. An elaborate perimeter leachate collection system (LCS) and surface water diversion works are installed, maintained and monitoring at the Site. Surface water is diverted around the landfill footprint by a series of perimeter ditches that divert water around and away from the landfilling area. WCC uses a clay cover system when waste has reached the approved fill heights in addition to the installation/planting of vegetation cover while berms and swales divert surface water to perimeter ditches. Surface water is also managed through re-vegetation, installation of silt fencing, applying topsoil over and seeding of the finished surfaces. Storm water retention ponds have been constructed on the east and west sides of the waste mound as part of the surface water management.

The existing leachate management system includes an underlain system in the northwest corner of the existing waste footprint. This area is connected via perforated HDPE pipe to a perimeter leachate collection trench. It consists of a granular-filled trench and perforated drainage pipe which runs along the west and south edges of the waste mound and also extends approximately 150 metres north from the location of the pump station. An underlain leachate collection system also exists in Phase 4, 5 and 1.

As reported in the 2018 AMR, leachate quality monitoring results for 2018 indicates leachate generated at the Site is not significantly different from previous monitoring events. All leachate was pre-treated and pumped via forcemain to the City of Ottawa's sewer system for final treatment at the City's wastewater treatment plan, Robert O Pickard Environmental Centre. The AMR indicated that one Notice of Violation was issued by the City of Ottawa for a leachate overflow that occurred at the sampling manhole located on Renaud Road on September 18, 2018.

Condition 93 requires the leachate collection system piping for each stage of the landfill be inspected annually for the first five years after waste placement and then as often as future inspections indicated to be necessary. The forcemain carrying the leachate to the sewer system was flushed and cleaned three times in 2018.

A leachate spill occurred on September 18, 2018 at WCC's sampling manhole located in the east shoulder of Renaud Road, at the intersection of Page Road. The spill of leachate was caused by blockage in the discharge pipe which connects to the City's system. The City of Ottawa's on contract spill response company NCM responded dislodging the blockage using a vacuum truck. WCC also shut down their system at approximately 9:20 p.m. WCC estimated that approximately 65 m3 of leachate spilled to the road surface and to a grassed area immediately adjacent to the manhole. Leachate also entered catchbasins along Renaud Road which discharge to a stormwater retention pond.

The cause of the blockage was likely related to the forcemain cleanout performed by RSR Environment Inc. that had taken place earlier in the day on September 18th. RSR Environment completed a pump sequence to verify the systen was operating and flowing without obstruction. During the 2018 inspection, it was reported that WCC updated their Forcemain Cleanout SOP to include monitoring at the manhole after the clean-out procedure to ensure this type of incident does not occur again. Mr. Huneault reported that WCC is now monitoring the manhole on a weekly basis. The biannual clean-up procedure has not been yet been updated to include the contingency plan of testing for two days to ensure the leachate forcemain is flowing as expected. Please refer to Section 6.0 Other Inspection Findings.

2.9 METHANE GAS CONTROL SYSTEM:

Specifics:
Condition 84 requires that any buildings or structures at the Site contain adequate ventilation systems to relieve any possible landfill gas accumulation. Routine monitoring for explosive methane gas levels shall be conducted in all buildings or structures at the Site, especially enclosed structures which at times are occupied by people. WCC shall ensure landfill gas alarms are installed and working properly in all existing and proposed Site buildings. It was reported that monitoring is completed monthly and all associated equipment is calibrated by the contractor Armstrong on an annual basis. The 2018 AMR (Report of Landfill Gas Monitoring, section 4.3) states that gas monitors are installed in three on-Site buildings, including the scale house and have not been triggered to date.

As part of the 2009 Landfill Site Expansion, a gas collection and flaring system was approved under ECA No. 6733-7BYS9A as an interim odour control system and is not intended for a landfill gas collection system. The construction of the system was initiated in November 2010 and the flare is now operational using three landfill gas wells to supply the gas to combust. Since the landfill gas has a methane content that will burn no supplemental natural gas supply is needed. The landfill gas odour control system was extended in the fall of 2016. An additional 7 landfill gas collection wells were installed on the east and west sides of the landfill in December 2017. WCC stated that the expansion of the landfill gas collection system was delayed as the elevation required for installation was not reached when anticipated due to wet conditions over 2017 and the reduced amount of waste received. Mr. Huneault reported that four additional landfill gas collection wells were recently installed.

Condition 110 requires annual sampling of the landfill gas according to Item 41 on Schedule A and include on sampling session during the winter when the ground is frozen. The 2017 AMR states that landfill gas monitoring was undertaken in May, August and December 2018 by GAL - methane gas was less than 5% of the Lower Explosive Limi (LEL) was found at most locations. Non-methane organic compounds do no present an emission problem at the Site.

Local residents can file complaints related to the Site through The Friends of Mer Bleue (FOMB) website. Each complaint is forwarded to executives of the FOMB, WCC, MECP and City Councillor's office. The Ministry received odour complaints through the FOMB website November 1, 2018, October 12, 2018, January 13, 2019, May 15, 2019, June 18, 2019 and July 19, 2019. WCCs documents all complaints in the AMR.

2.10 OTHER WASTES:

Specifics:
The Site utilizes last harvest at the active face for additional recyclable capabilities; an excavator with a grappler and magnet allows for easy removal of metals, wood and bulky items. The wood and metals are recovered and moved to a recycling area.

Condition 37 allows House Hazardous Waste (HHW) events. The residential sources (generators) must bring their own wastes to the Site. The wastes are to be received by a hazardous waste carrier permitted through a valid approval to receive, temporarily store and transport HHW to an approved waste disposal Site. All HHW collected by the hazardous waste carrier must be removed from the Site within 24 hours of the completion of the household hazardous waste collection event. WCC hosted a HHW event on Sunday June 3, 2018 when the landfill was not open. The HHW event is always held on a Sunday to ensure there is no confusion between the HHW event and the landfill operations.

Condition 39 requires WCC provide a segregated area for the storage of white goods at the processing site to ensure refrigerant appliances accepted at the Site which have not been tagged by a licensed technician shall be store in a segregated clearly marked area, in an upright position. In addition, Condition 39 requires the white goods to be stored in a manner which allows for the safe handling and to allow the removal of refrigerants. Mr. Huneault confirmed two WCC employees are licensed to remove refrigerant from appliances; Vince Giamberardino (OPD expiry date in January 2024) and Simon Ricard (ODP expiry date June 2023). The binder that contains all tags was reviewed at the time of the Site inspection which showed ODPs are removed approximately 1-2 times per month. At the time of the inspection, white goods were observed to be stored mostly in an upright position, segregated with those that had been tagged. Mr. Huneault also reported that gas recovery company that picks up the freon is Wieners Wholesale Group Inc.

Condition 52 requires that WCC ensure that no more than two hundred twenty-five (225) tonnes of unprocessed and residual waste materials from processing operations shall be stored on Site at any time. Due to space restriction, the amount of unprocessed material is minimal and has never reached close to 225 tonnes.

Condition 65 requires that no waste is received, landfilled or removed from the Site unless a Site supervisor or attendant is present and supervises the operation. At the time of the Site inspection a site attendant was observed present at the active face.

Condition 66 requires that the Site is operated and maintained in a secure manner. The entrance to the Site off Navan Road has a locked gate and portions of the property are fenced. The east side of the property has an extensive ditch system where it is difficult to walk or have vehicles gain access. The south side is fenced to prevent access with snow machines while the west side has marsh land and a ditch. Along the north side of the Site there is a ditch and berm. WCC also has a security camera system and a security guard present for off hours.

Condition 67 requires a sign be installed and maintained at the entrance including the name of Site, owner, ECA number, hours of operation, allowable wastes, telephone number for complaints, 24 hour emergency number, warning against dumping outside the Site and a warning against unauthorized access. A sign meeting all the requirements was observed during the Site inspection.

Condition 70 requires the Site be operated and maintained so that dust, litter, odour, noise, vermin, vectors and traffic do no create an off-Site adverse effect. Mr. Huneault reported that vermin and vectors are not a problem at the Site but these is a pest control program at the Site. Litter is controlled with fencing that is repositioned based on the wind direction. Off-site odours are addressed in Section 2.9 of this report.

Condition 72 addresses dust control at the Site. Dust is controlled on Site by subcontracting CTM Sweeping to clean the yard and Navan Road on an as needed basis, the use a wheel wash to minimize the amount of dirt tracked to the road as well as the use WCC's own sweeper.

Conditions 76 through 83 outline the requirements to accept, handle and dispose of asbestos-containing waste at the Site. Currently WCC accepts asbestos waste from 8:00 a.m until 10:00 a.m with 24 hour notice although WCC will accept asbestos waste without the notice if it conducive to what is happening at the landfill that day. WCC ceases normal landfilling activities when asbestos is to be disposed at the active face. Asbestos waste is deposited in a pit which is then covered by either cover or waste materials to shield the workers from exposure. WCC employees wear protective equipment including masks and tyvek suits and all are provided with training to safely handle asbestos waste.

Condition 88 requires all employees that operate any aspect of the Site shall have the appropriate training. Mr Huneault reported that training is completed on a monthly basis. A summary of the training history of each employee is documented in their employee file. Training includes, but is not limited the following topics; Fire Prevention Plan and Flammable and Combustible Liquids, Asbestos, Lockout/Tagout, Confined Space, Heat Street, Cold Stress, Electrical Safety, Trench Protection, Respirator, Hearing Conservation, Material Sorting and Bailing, Material Handling, Coolant Policy, Maintenance Policy: Coolant, Fuelling, Preventative Maintenance Schedule, Heavy Equipment, Support Equipment, Battery Switch Policy, Daily Inspection Policy, Fuelling Policy as well as monthly safety meetings. All employees are also trained in the new employee handbook.

Condition 89 requires a daily inspection that includes assessing the adequacy of the daily cover material, evidence of unacceptable waste or illegal dumping, the need for dust control on working areas or access roads, unacceptable levels of odours and evidence of leachate discharge to the surface in the immediate vicinity of the working face. WCC currently conducts daily inspections for these items which are addressed immediately. Daily inspection are not currently documented as it part of the on-going operation of the Site where as weekly inspections are written reports.

Conditions 90 and 91 require a variety of items to be inspected on a weekly basis and are documented by WCC staff. Currently Mr. Huneault reviews and signs off all weekly inspections and ensures issues are rectified by not seeing the same item on the following week's report. Condition 132 requires the weekly inspection be documented and include the date and time of inspection, name, title and signature of trained personnel conducting the inspection, a listing of all the areas inspected and any deficiencies observed and recommendation for remedial action and the completion date of such action. Mr. Huneault provided an updated weekly inspection form that includes a column for corrective actions required/comments.

Condition 125 requires WCC to respond and document all complaints received at the Site. As discussed in Section 2.9 of this report, the number of complaints reduced significantly once the landfill gas collection system was expanded and operational. Section 4 of the 2018 AMR documented all of the odour complaints received.

Condition 133 requires that a record be kept of all waste refusals including the reason for the refusal and origin of the waste, if known. WCC provided the undersigned officer of fifteen occurrences of waste refusals in 2018.

Conditions 135 and 136 outline the submission and information requirements for the annual report. The 2018 AMR was received at the ODO within the specified timeline and contains the required documentation.

Condition 139.1 (1) was added to ECA A460702 in Notice No. 8 issued June 8, 2015 which states no contaminated soil other than soil impacted with petroleum hydrocarbons (PHCs), volatile petroleum compounds (VOCs, including benzene, toluene, ethylbenzene, xylenes), low molecular weigh polyaromatic hydrocarbons (PAHs, including naphthalene) may be accepted for processing at the Soil Treatment Pad. Condition 139.2(1) requires documentation from the generator showing the origin of the contaminated soils, verifying that is a solid non-hazardous waste and characterizing its contaminating constituents. WCC current practise is to analyze the contaminated soil accepted at the Site on a job by job basis. A Special Waste Profile is completed for each job, which also includes the required analytical results and is assigned a job number. Each job is segregated on the Soil Treatment Pad and labelled with the job number. The windrows with the associated job numbers were observed during the Site inspection. WCC has not accepted any contaminated soils from emergency spills response. Sampling requirements outlined in 139.3 (1) are completed and submitted to AGAT Laboratories. All treated soil is used as daily over on the Site - therefore reporting outlined in 139.6(1) has not been required (no off-Site disposal).

Ontario Regulation 347 requires landfill sites larger than 1.5 million cubic meters to report annually on the greenhouse gas reductions being achieved at the Site. The Navan Landfill meets the regulation requirements and submitted the required Landfill Data Collection Form electronically to the Ministry.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

The 2017 inspection did not identify any non-compliance issues.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate?
No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?
No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ?
No

Specifics:

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?
No

Specifics:

Was there any indication of minor administrative non-compliance?
No

Specifics:

5.0 ACTION(S) REQUIRED

Pages 199 to / à 203

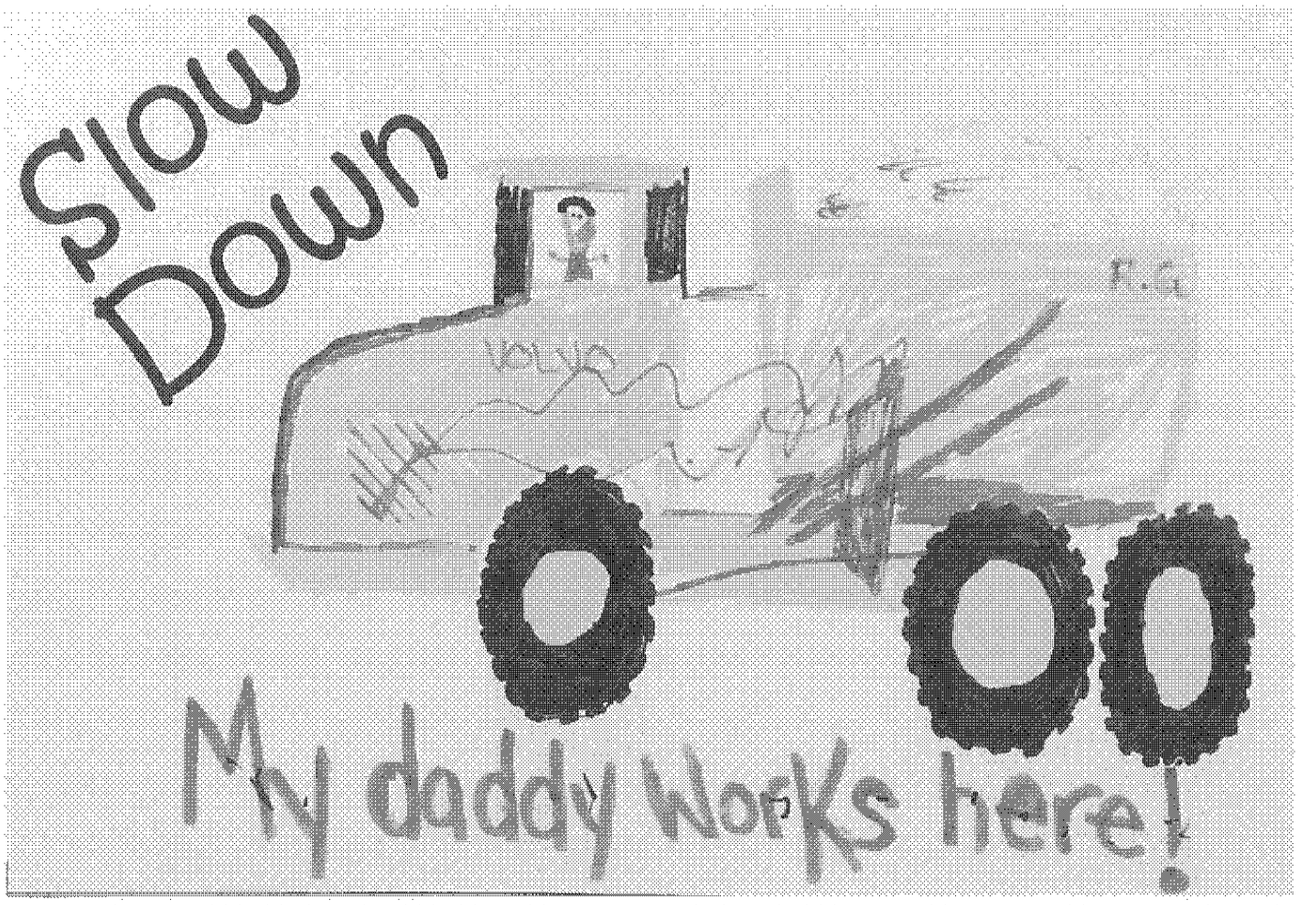
are not relevant

sont non pertinentes

WASTE CONNECTIONS OF CANADA

NAVAN WASTE RECYCLING AND DISPOSAL FACILITY

3354 NAVAN ROAD, OTAWA, ON K4B 1H9



OPERATIONS AND MONITORING REPORT 2021

WASTE CONNECTIONS OF CANADA

3354 NAVAN ROAD, OTAWA, ON K4B 1H9
Tel: 613-824-7289 Fax: 613-824-6730

2021
OPERATIONS AND MONITORING REPORT

Waste Connections of Canada Inc.
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 Navan Road, Ottawa, Ontario

March, 2022

EXECUTIVE SUMMARY

The Navan Waste Recycling and Disposal Facility is a 91.87 ha waste management facility that includes a 40 ha landfill as well as processing (recycling) operations. The Site is located in the east end of the City of Ottawa (formerly in the City of Gloucester) and is owned and operated by Waste Connections of Canada Inc. (WCC).

The site currently operates under amended Environmental Compliance Approval (ECA) for a waste disposal site (ECA # A460702) re-issued April 16th, 2009 with subsequent amendments (Notices 1 through 13) as well as an ECA for Industrial Sewage Works, ECA # 5616-86NKNW amendment dated June 29th, 2010 and ECA Air # 3536-8APNZD amendment dated November 24th, 2010 and ECA # 4024-9WFQE5 dated June 8th, 2015 and ECA # 2427-AETKQ5 dated November 14, 2016. The waste ECA also incorporates and makes reference to the Design and Operations (D&O) Report for the Site prepared by Golder Associates and dated January 2008.

An emergency amendment under Notice No. 13 dated September 29, 2021 was received which stipulated the following: Emergency Notice for Soils was issued permitting up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021 and contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1.

The Facility is approved to receive solid non-hazardous and asbestos waste, excluding putrescible waste. Landfilling is restricted to waste generated within the Province of Ontario, excluding the City of Toronto. The site includes a processing facility for the recycling of waste materials and treatment of hydrocarbon impacted soils. The processing site is approved to receive solid non-hazardous waste, excluding putrescible waste, generated within the Outaouais Region of the Province of Quebec and within the Province of Ontario, excluding the City of Toronto. The site is also approved to host household hazardous waste (HHW) day events, whereby, the waste is received by a carrier approved through valid certificates of approval to receive, temporarily store and transport HHW to an approved waste disposal site. Other than during HHW events, no hazardous or liquid industrial wastes, as defined in O. Reg. 347, R.R.O. 1990, are permitted at the site. Most of the waste handled at the Site is generated within the City of Ottawa and neighbouring municipalities.

In 2021, a total of 513,078 tonnes of materials entered the site. Of this total, 190,415 tonnes (37.11%) were received as landfill material; 5,074.24 tonnes (1.0%) were recycled and removed from the site; and an estimated 36 tonnes (0.01%) were waste materials rejected and removed from the site by WCC for alternative disposal at another licensed facility. Other materials received for re-use on site included 40,041 tonnes (7.8%) of rock, brick, shingles, concrete and rubble re-used as aggregate for road construction and staging area pads; 8,120 tonnes (1.58%) of clean fill, topsoil, and asphalt re-used on site for final grading, road/pad construction and engineered fill; 95,846 tonnes (18.68%) of treated soils or soils re-used on site; and 173,546 tonnes (33.82%) of special materials such as storm sewer screenings and impacted non-hazardous soils received at the site for re-use as daily cover material.

Golder Associates Ltd. estimated the air space used by measuring the volumetric changes between topographic mapping generated from aerial photography obtained on May 1st, 2021 and the previous year on April 28th 2020. The net estimated air space used (ASU) between the last two aerial survey dates was reported to be 319,316 m^3. Records indicate that the ASU during that period of time was consumed by approximately 380,715 tonnes of waste, daily cover material and other materials resulting in a density calculation of 1.19 tonnes/m^3 and a five year average density of 1.42 tonnes/m^3. Air space used was also calculated based on assigning assumed waste densities to the various waste streams received and landfilled, cover material and re-used materials placed within the air space from May 1st to December 31st, 2021. Using this approach, it is estimated that approximately 244,244 m^3 of remaining air space was used and excludes materials diverted off site for recycling and some materials re-used outside the air space. Based on this approach, the weighted average of the in-place density for all of the materials used in the air space calculation was estimated to be 1.34 tonnes/m^3. The variance in density calculations could be attributed to factors such as cell excavation and settlement which influence the year over year volume calculations. The air space remaining as of January 1st, 2022 was estimated to be 1,252,969 m^3.

Under the present Environmental Compliance Approval (ECA), the life expectancy remaining for the Navan Waste Recycling and Disposal Facility as of January 1st, 2022 is estimated to be 5.1 – 5.2 yrs (2027) based on future projected maximum annual waste receipts for landfilling including daily cover of 344,750 tonnes and a 5 year average waste density of 1.42 tonnes/m^3. The actual life of the landfill will vary based on annual fill rates, in-place waste densities, waste diversion and recycling initiatives at the Facility, and the rate of air space development.

Diversion through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the Navan Facility. For example, all daily and intermediate cover needs are met by substituting the use of virgin soils with the re-use of significant quantities of impacted soils. Brick, concrete, asphalt and rubble are also recovered for re-use each year in the construction of access roads. Roofing shingles free of paper and other debris are also re-used on site as a sub-base for roads and pads over which a base of aggregate or recycled asphalt is placed. In addition, steel, aluminum, wood, tires and white goods are recovered daily from the active face for recycling. Recycling of E-waste and drywall was continued in 2021 as a service to the local community. Hydrocarbon contaminated soils treated in 2021 were re-used at the site as final cover material and structural fill within the east buffer area.

Materials received by the Navan Waste Recycling and Disposal Facility are those which IC&I generators have generally deemed to be waste and of no further value (i.e., post diversion at the source). Many of the waste generators, serviced by waste collection contractors who bring waste to the Site, also divert materials from landfill at their place of business prior to collection. Recycling within the IC&I sector is regulated by the Ministry of the Environment, Conservation and Parks under Regulations 101, 103 and 104. While the Site receives post-diversion waste materials from the IC&I sector, WCC has procedures in place to screen the incoming waste for recyclable material in what is known as a "last chance harvest" which is a "positive" sort where the recyclable item must be removed from the mixed waste mass. In this case, the majority of the material is not recyclable (i.e. it is waste). This is very different than recycling from "source separated" material, which results in a "negative" sort, where the waste components are removed from what is predominantly recyclable material. WCC also encourages and receives "clean" recyclable materials such as drywall, metal, electronics and glass where such materials can be shipped to market in bulk in efforts to make the recycling of such materials more economically viable.

The Navan Waste Recycling and Disposal Facility diverted over 149,081 tonnes of material from disposal in 2021, and over 440,508 tonnes during the past 5 years. For 2021, this represents a "last chance harvest" diversion rate of 43.9% and excludes the re-use of impacted soils for daily cover material. This is in addition to the diversion rate for IC&I waste considered to occur at the source. WCC will continue to improve waste diversion and recycling initiatives at the Navan Facility and pursue economically viable waste diversion opportunities to help the local community and WCC clients achieve a better IC&I recycling rate.

Significant activities and capital works undertaken between January 1st and December 31st, 2021 included active landfilling in Phase 6 (refer to Figure 2.4); excavation of clay cover material in the N-E quadrant of Phase 8; continued recycling operations at the facility with treatment of hydrocarbon impacted soils; screening of coarse granular soils to separate rock from soil for re-use; pre-treatment and disposal of collected leachate to ROPEC for off-site treatment; retained Dillon Consulting Limited to undertake Airborne Contaminant Discharge Monitoring and Reporting requirements for the landfill site as well as the National Pollutants Release Inventory and Green House Gas reporting; retained Golder Associates to carry out surface water, groundwater, leachate, gas and noise monitoring and reporting programs; added clay cover to completed fill areas of the landfill; constructed a new perimeter access road on the east side of the waste footprint; retained Base Mapping to undertake aerial photos and prepare topographic mapping of the site; retained Les Entreprises Forlam Inc. to construct the perimeter 300 mm diameter landfill gas collection pipe line along the north, west and east limits of the waste footprint; retained Farrell & Sons to construct the concrete pads for the permanent enclosed gas flare and abstraction plant; and, retained Perennial Energy, LLC to manufacture, assemble, package, check, test, and deliver a Landfill Gas Extraction Plant and Enclosed Flaring System.

Leachate generated by the landfill is collected by a drainage system consisting of three separate components that gravity flow to a leachate treatment and pumping station located at the southeast corner of the waste pile and a fourth located in the east cell that is pumped to the on-site treatment station. Presently, the disposal method of choice for the pre-treated leachate is direct discharge to the City of Ottawa sewer system via approximately 2 km of forcemain. In 2021, a total of 88,591 m^3 of pre-treated leachate was discharged to the City of Ottawa wastewater system, a 33.3% reduction over 2020. The decrease is attributed to efforts to reduce the infiltration of surface water runoff into the waste. There were no issues reported with the operation of the leachate treatment and pumping system in 2021.

The WCC Facility is ideally situated on a thick deposit of Champlain Sea Clay (Leda Clay). The clay deposit at this site ranges from 22 metres to greater than 33 metres in depth. A clay ridge that cuts across the site rises approximately 18 m above the floor of an abandoned Ottawa River Channel. This results in surface water and shallow groundwater flowing in a southward direction. The Site is located on the northern fringe of the Mer Bleue Bog, a well-known salt water bog that is an Area of National Scientific Interest (ANSI). These natural features are ideal for the control and monitoring of leachate at the site.

Environmental control systems and operational activities that include the operation and maintenance of an elaborate perimeter leachate collection system (LCS) and surface water diversion works are monitored in accordance with the conditions of the ECA. Monitoring carried out to identify areas of environmental concern includes measuring water quality parameters in surface water and in groundwater at the site's boundary as well as in the leachate generated by the landfill. Monitoring for the presence of landfill gas was also carried out. In addition, sediment quality monitoring at three locations within the Mer Bleue Bog that was started in 2000 at the request of the National Capital Commission (NCC) was continued.

The monitoring program carried out in 2021 was a continuation of the monitoring program already in place for this site.

Based on the groundwater levels obtained during the 2021 monitoring program, no significant change in groundwater flow patterns has been observed.

Groundwater at the Navan Waste Recycling and Disposal Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (unweathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present in each of these units up-gradient, at the down-gradient edge of the waste pile (used to assess compliance) and further down-gradient of the landfill within the buffer zone.

The objectives of the 2021 Environmental Monitoring Program were to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702; to assess any potential impacts on water quality at the site resulting from landfill operations; to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the Facility; to document the chemical composition of groundwater and surface water in the vicinity of the Facility; to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate; and to document the chemical composition of sediment at three locations in the Mer Bleue Bog.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2020 background range.

Leachate quality monitoring results for 2021 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Trigger concentration exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

WCC's efforts were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented.

In 2021, there were two confirmed exceedances (continued increase in concentration beyond the background range), manganese concentration in the weathered clay at OW-92-10 in November 2021 and the ammonia concentration in the intact clay at MW-07-1B in November 2021. These two confirmed exceedances were reported by Golder to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in the 2021 Landfill Monitoring report and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions.

The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

In 2002/2003, an assessment of the WCC Navan Facility operations was undertaken in support of a WCC-NCC (WSI-NCC) exchange of land parcels located south of the Navan Facility along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

A Monitoring and Screening Checklist prepared and signed by a Competent Environmental Practitioner (CEP) is included with the Golder 2021 Landfill Monitoring report attached as Appendix '1'.

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program and sediment monitoring which is proposed to be discontinued. As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to

collect a sample during a dry period (i.e., in the summer or the fall depending on site conditions) as has been done between 2014 and 2021.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the November 2021 monitoring session and will be monitored again in the spring of 2023.

In 2021, Golder Associates Ltd. (GAL) was retained to carry out the landfill gas monitoring program. The monitoring program undertaken was a continuation of the monitoring program already in place for this site and the results of the monitoring events undertaken are presented in more detail in the GAL report provided in Appendix '2'.

LFG monitoring was undertaken in May, August and December 2021. At most locations monitored, methane gas was detected at concentrations lower than 1.25% by volume. Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 1.25% by volume at MH-2 (G18-a), MH-3 (G13-a), MH-4 (G-12a) and MH-5 (G11-a) in August 2021, MH-7 (G5-a), MH-9 (G3-a), and MH-10 (G2-a) in December 2021.

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the WCC Navan Facility based on the 2021 monitoring results. Although no monitoring locations are available below surface at the property boundary, it is anticipated that the WCC Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events, with the exception of MH-6 (G6-a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), in May 2021 which reported relatively low detection (1 part per million or 1 ppm).

It is noted that an interim LFG odour control system was installed in 2011 and commissioned in April 2012. Extensions to the LFG odour control system were installed in 2016, in 2017 and in 2019. The additional wells installed in 2017 and 2019 are intended to be part of the future permanent LFG collection system. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells. In 2021, construction of the permanent landfill gas collection system was started consisting of the construction of the 300 mm diameter HDPE landfill gas header pipe along the north, west and south perimeters of the waste footprint and construction of the concrete pads for the enclosed flare and abstraction plant.

out. In 2022, landfilling will continue in the last completed cell identified as Phase 6 and north part of Phase 1. Closure work will be carried out on the north side of Phase 6 and the east sides of Phase 6 and Phase 1 where final waste grades will have been reached.

The development of the remaining landfill capacity in the area of Phase 6 and Phase 1 (east cell expansion) requires the filling and compaction of material along the east waste limit. Soil management practices will include the following:

- Treated soils will be placed and compacted in the east buffer area;
- Excavation of clay from the Phase 8 area will occur in the first three quarters of 2022;
- Sediment control measures will be taken so that inactive areas such as soil stockpile side slopes are seeded; silt fences are installed as required around the perimeter of disturbed areas; and surface runoff from the stockpile areas will be channeled to the internal ditch system which will drain to the site's stormwater retention ponds.

Along with landfilling operations, other site operations expected to be carried out in 2022 will consist of the following:

- Provide additional landscaping to completed final cover areas on the north surfaces of Phase 4.
- Re-align surface runoff away from fill areas and cell construction areas.
- Raise grades at the east waste limit and grade to direct surface runoff away from waste.
- "Last Chance Harvest" of recyclable waste will continue in the active face using specialized heavy equipment as per present practice.
- Increase efforts to sort and divert waste from small vehicles at the small vehicle drop-off area and provide incentives to clients to sort materials at source, prior to arrival at the Site.
- Establish markets for new recyclable materials and increase the types of materials to be recycled at the site.
- Enhance treatment of hydrocarbon impacted soils.
- Construct a working pad in the area of Phase 1 for recycling activities.
- Expand the east end of the existing recycling pad north into Phase 8.
- Continue the screening of rock out of contaminated soils received at the site.
- Add additional wells (horizontal and/or vertical) to the landfill gas flaring system, if required, to enhance and control fugitive gas in fill areas and odours from the landfill.
- Construct the perimeter landfill gas forcemain along the east waste perimeter as designed by Golder Associates and connect to the existing landfill gas collection system.
- Install and commission the permanent enclosed flare and abstraction plant.
- Extend and complete the east access road onto the top of Phase 1.

The 30 m buffer at the northern, eastern and western perimeter of the landfill and the 10m buffer at the southern perimeter will continue to be maintained as required by the ECA. Aesthetic improvements at the site will continue to be an on-going objective.

In August 2007, WCC (WSI) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Approval under the Ontario Environmental Protection Act (EPA) as well as other legislation were also received which culminated in the issuance of the above noted Certificates of Approval for the Site. Condition 4 of the EAA approval required that WCC (WSI) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WCC's compliance monitoring program (EAAB File # is EA 02 08 02). In accordance with Condition 3 of the EA approval, WCC has previously submitted a separate document proposing an EA Compliance Monitoring Program. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of follow up EACMRs with submission of the Annual Operations and Monitoring Report. Accordingly, this EACMR is submitted as Appendix 5 to this Annual Report and covers the period January 1st to Dec. 31st, 2021. No non-compliance issues were identified during the reporting period.

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1. INTRODUCTION

The Waste Connections of Canada Inc. (WCC) Navan Waste Recycling and Disposal Facility operates under the Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) for a Waste Disposal Site number A460702 as amended. The site is approved to receive solid non-hazardous and asbestos waste, excluding putrescible waste. Landfilling is restricted to waste generated within the Province of Ontario, excluding the City of Toronto. The processing site is approved to receive solid non-hazardous waste, excluding putrescible waste, generated within the Outaouais Region of the Province of Quebec and within the Province of Ontario, excluding the City of Toronto. The site is also approved to host household hazardous waste (HHW) day events whereby the waste is received by a carrier approved through valid certificates of approval to receive, temporarily store and transport HHW to an approved waste disposal site. Other than during HHW events, no hazardous or liquid industrial wastes, as defined in O.Reg 347, R.R.O. 1990, are permitted at the site. Most of the waste handled at the site is generated within the City of Ottawa and neighbouring municipalities. The site is also approved to treat contaminated soils.

This report presents the annual operating and monitoring conditions for the site to the Ministry of the Environment , Conservation and Parks (MECP) pursuant to Conditions 135 and 136 of the ECA No. A460702. The site is located in the eastern portion of Ottawa, Ontario on Part of West Half of Lot 2, Part of Lots 3 and 4, Concession IV, Ottawa Front (Parts 1, 2 and 3 on Plan 4R-19707, Parts 1 and 2 on Plan 5R-13200, Parts 1, 2, 3, 5 and 6 on Plan 5R-11073, Parts 1 and 2 on Plan 5R-11716 also referred as Parts 1, 2 and 3 on Plan 4R-21920), 3354 Navan Road, Township of Gloucester, now in the City of Ottawa, UTM Easting: 460570, UTM Northing: 5030570 at the front entrance to the site (see Key Plan, Figure 1.1 and Survey Plan, Figures 1.2 and 1.3).

1.1 BACKGROUND

The site was formerly owned and operated by Huneault Waste Management Ltd., and has undergone a series of name changes beginning with Waste Services Inc. (WSI) in 2000. In 2002, Capital Environmental Services Inc. (CERI) acquired WSI and kept the operating name of WSI. Later, in July 2010, WSI merged with BFI Canada Inc. BFI Canada Inc. changed name to Progressive Waste Solutions Canada Inc. and later merged with Waste Connections Inc. now operating in Canada as Waste Connections of Canada Inc. (WCC). The Site started operations in the early 1960s, and has operated under the Environmental Compliance Approval (ECA) No. A460702 first issued in 1971 by the Ministry of the Environment, Conservation and Parks (MECP) and numerous amendments since. The current ECA approval officially revoked and replaced the previous approval dated May 12, 2006 due to the site's expansion in 2009. The following summarizes the notices that have amended the current ECA No. 460702:

- Notice No. 1 dated October 9, 2009: Permitted construction of base liner and leachate collection system for the east cell expansion.
- Notice No. 2 dated August 4, 2010: Widening of Navan Road.
- Notice No. 3 dated November 1, 2010: Landfill Gas Odour Control System.

- Notice No. 4 dated April 29, 2011: Financial assurance update (processing site)
- Notice No. 5 dated June 13, 2012: Financial assurance update (processing site)
- Notice No. 6 dated April 19, 2013: Financial Assurance update (processing site)
- Notice No. 7 dated February 25, 2014: Financial assurance update (landfill)
- Notice No. 8 dated June 8, 2015: Soil Treatment Pad
- Notice No. 9 dated February 1, 2016: Financial assurance update (landfill)
- Notice No. 10 dated March 14, 2017: Landfill and Processing Facility Financial Assurance
- Notice No. 11 dated June 19, 2018: Landfill and Processing Facility Financial Assurance
- Notice No. 12
- Notice No. 13 dated September 29, 2021: Temporary Tonnage Exemption for Contaminated Soil

The site also operates under an ECA for Industrial Sewage Works, ECA # 5616-86NKNW amendment dated June 29th, 2010 and ECA Air # 3536-8APNZD amendment dated November 24th, 2010, ECA # 4024-9WFQE5 dated June 8, 2015 and ECA # 2427-AETKQ5 dated November 14, 2016. The waste ECA also incorporates and makes reference to the Design and Operations (D&O) Report for the site prepared by Golder Associates and dated January 2008.

The site occupies a 91.87 hectare (ha) property (blue and green areas on Fig. 1.2) that includes a 40 ha area currently approved for recycling and disposal (red area on Fig. 1.2). Figure 1.2 depicts the existing approved waste boundaries at the site including the total land area currently owned by WCC. The site receives solid, non-hazardous industrial, commercial and institutional (IC&I) waste including construction and demolition (C&D) waste, asbestos waste, dry non-putrescible (i.e., non-organic) domestic waste and impacted soil. The approved service area for the receipt of waste for disposal is the Province of Ontario excluding the City of Toronto. The approved service area for processing/recycling and transfer includes the Province of Ontario (excluding the City of Toronto) and the Outaouais Region of the Province of Quebec (consisting of Quebec Region 7 including La Vallée-de-la-Gatineau, Pontiac, les Collines-de-l'Outaouais, Papineau and the City of Gatineau). Solid non-hazardous industrial and commercial waste including C&D waste and dry domestic recyclable waste may be received for processing. In 2015 the site was approved for the treatment of contaminated soils (ECA Amendment Notice 8) as part of its processing operations.

The remaining operating life for the landfill disposal site is influenced significantly by a number of factors such as the waste mix, the annual waste receipts, materials recycled and re-used, and the density of the in-place waste to name a few. Consequently, the remaining life can only be estimated to extend to the year 2027 based on current site approvals and projected annual waste receipts (refer to Section 5).

The last expansion of the Navan Waste Recycling and Disposal Facility received approval under the Ontario Environmental Assessment Act (EAA) in 2007 and approval under the Ontario Environmental Protection Act (EPA) as well as other legislation in 2009. Major amendments to the Environmental Compliance Approval for a waste disposal site (ECA # A460702) were issued as listed above. An Environmental Compliance Approval for Industrial Sewage Works, ECA # 4816-7C7M6C issued on April 16th, 2009 was amended by ECA # 5616-86NKNW on June 29th, 2010. An Environmental Compliance Approval Air, ECA # 6733-7BYS9A issued on April 16th, 2009 was amended by ECA # 3536-8APNZD on November 24th,

2010 and by ECA # 4024-9WFQE5 on June 8th, 2015 and by ECA # 2427-AETKQ5 dated November 14, 2016.

The site is situated on a thick deposit of Leda clay and is located immediately north of a large bog (Mer Bleue). The underlying clay deposit serves as a natural liner system. Leachate management activities include the operation of a leachate collection system that consists of a perimeter collector and underdrain systems. A leachate pre-treatment/pumping station and forcemain connection to the City of Ottawa sanitary sewer system was completed in 2007 and commissioned in early 2008. It continues to be used for the management of leachate generated by the facility. Surface water is diverted around the landfill footprint through a series of berms, swales and ditches. Landfill gas generated by the facility continues to be monitored and an interim landfill gas odour control system approved by the Technical Standards and Safety Authority (TSSA) was constructed and commissioned in early 2012. Design details for a permanent landfill gas collection and enclosed flaring system was completed by Golder Associates Ltd. and construction was started in 2021.

1.2 *PURPOSE AND ORGANIZATION OF REPORT*

This document is referred to as the Operation and Monitoring (O&M) Report. The O&M components specifically described in this document include the following:

- Zoning and surrounding land uses;
- Existing facilities and utilities;
- Geology;
- Hydrogeology;
- Surface water flow system;
- Mer Bleue Bog;
- Description of operations (2021);
- Waste quantities and characteristics;
- Site capacity and life expectancy;
- Surface water management;
- Leachate management;
- Landfill gas management;
- Groundwater quality assessment;
- Leachate water quality assessment;
- Surface water quality assessment;
- Sediment quality assessment;
- Landfill gas monitoring results;
- Diversion of waste and other materials from disposal; and
- Proposed 2022 operations.

All O&M components described in this report have been prepared to address the Conditions of the ECA for the Navan Waste Recycling and Disposal Facility, ECA No. A460702.

1.3 *WASTE QUANTITIES*

The maximum total amount of waste that can be received at the site for disposal is controlled by the site's approved final waste contour plan. Base on the final waste contour plan approved, the estimated total air space for the site was approximately 7.6 million cubic metres. Under the current ECA (#A460702), the maximum annual amount at which the site can receive waste for disposal (excluding daily and interim cover material) is 234,750 tonnes per year. The maximum daily rate, averaged over a year, at which the site can receive waste (including daily and interim cover material), is 1500 tonnes per day. The maximum amount of unprocessed material and residuals from the processing operation that may be stored on site at any one time is 225 tonnes. In 2021, an Emergency Notice for Soils was issued permitting up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021 and contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1.

Diversion, through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the Navan Waste Recycling and Disposal Facility. Management is constantly searching for on-site and off-site diversion or re-use opportunities to ensure that approved disposal capacity is preserved and used for the disposal of waste material of least commercial value. Given the provincial policy and regulations concerning waste diversion from landfill, the site will continue to provide critical support to the City and Province in their efforts to meet diversion targets while at the same time ensuring essential disposal capacity is available locally.

1.4 *ECA AMENDMENTS (2021)*

The site currently operates under amended Environmental Compliance Approval (ECA) for a waste disposal site (ECA # A460702) re-issued April 16th, 2009 with subsequent amendments (Notices 1 through 13). An emergency amendment under Notice No. 13 dated September 29, 2021 was received which stipulated the following: Emergency Notice for Soils was issued permitting up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021 and contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1. A copy of the MECP amendment Notice No. 13 is provide in Appendix 4, Schedule 'D'.

1.5 *ENVIRONMENTAL ASSESSMENT COMPLIANCE MONITORING REPORT (EACMR)*

In August 2007, WCC (formerly WSI) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Approval under the Ontario Environmental Protection Act (EPA) as well as other legislation were also received which culminated in the issuance of the above noted Environmental Compliance Approval for the site. Condition 4 of the EAA approval required that WCC (WSI) prepare an annual compliance report describing the

extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WCC's compliance monitoring program. In accordance with Condition 3 of the EA approval, WCC had previously submitted a separate document proposing an EA Compliance Monitoring Program. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of follow up EACMRs with the submission of the annual Operations and Monitoring Report. Accordingly, this EACMR is submitted as Appendix 5 to this annual report and covers the period January 1st to Dec. 31st, 2021.

No non-compliance issues were identified during the 2021 reporting period.

The Ministry's EAAB File # is EA 02 08 02.

1.6 *HISTORY OF THE FACILITY*

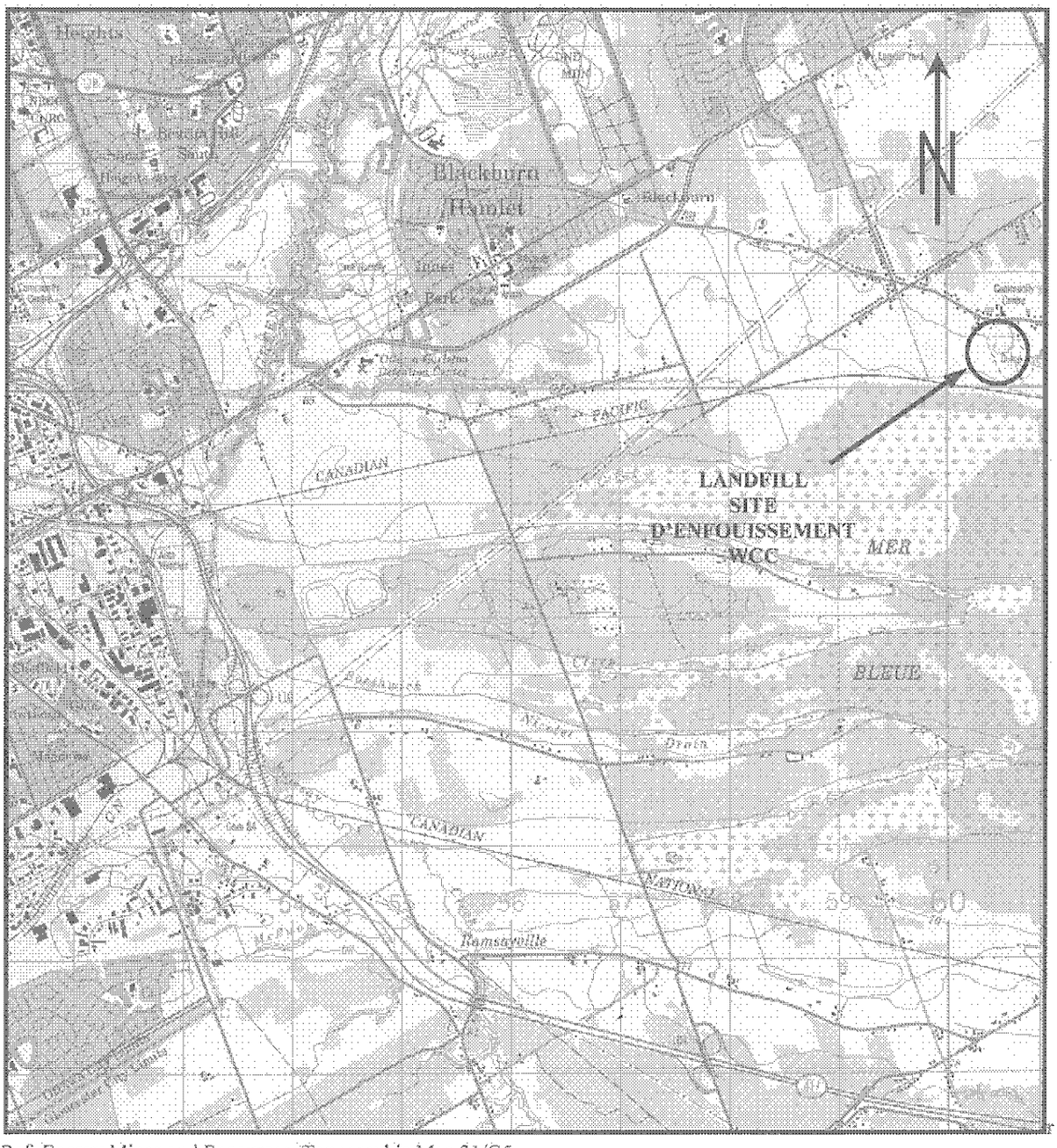
Landfilling at the site started in the early 1960s and served, at the time, as a rural dump operation for local residents. In 1971, the Ministry of the Environment (MOE) issued an Environmental Compliance Approval (CofA No. 460702) to Mr. D. J. Huneault for disposal of industrial waste including construction and demolition waste. Currently the site receives all types of solid, non-hazardous waste for disposal excluding putrescible waste. In 1995, the CofA was amended for the operation of waste processing and composting facilities at the site. Composting operations were later suspended with the issuance of the ECA amendments in April 2009 for the landfill expansion.

Annual monitoring of groundwater and surface water was initiated in 1987 and has evolved into a comprehensive monitoring program that is reported to the MECP on an annual basis. In 1992, a leachate collection system was constructed along the down-gradient toe of the landfill and surface water diversion ditches were constructed up-gradient within the north buffer zone. Leachate was initially collected in retention ponds and re-circulated onto and into the landfill following treatment through a peat filter and constructed wetland system. Transport of leachate by tanker truck to the municipal wastewater treatment plant was initiated in 1997 following odour issues related to leachate storage ponds. Presently, leachate is pre-treated on site and discharged to the City of Ottawa sewer system for treatment at the Robert O. Pickard Environmental Centre (ROPEC). Construction of the existing leachate pre-treatment/pumping station and forcemain connection to the sanitary sewer system was completed in 2007 and commissioned in early 2008.

In 2011, a landfill gas collection and flaring system was constructed as an interim odour control system. This system was commissioned and approved in April of 2012 by the Technical Standards and Safety Authority (TSSA) and has since remained operational. Permanent vertical gas wells were last added in the Phase 4 area of the landfill in 2019. In 2020, one horizontal gas well was added to the landfill gas collection system in the northwest corner of Phase 1. In 2021, construction of the permanent landfill gas forcemain and abstraction plant was started.

In June of 2015, the site was approved for the treatment of contaminated soils as part of the site's processing operations. Treatment of hydrocarbon impacted soils has since been on-going.

A more detailed record of milestones in the site's history is presented in Appendix 4 – Schedule 'C'.



Ref: Energy Mines and Resources, Topographic Map 31/G5

FIGURE 1.1	**KEY PLAN**	WASTE CONNECTIONS OF CANADA

APPROVED
LIMIT OF WASTE
PART 1, 5R-6669
PART 2, 5R-6669
PART 1, 5R-11073
PART 2, 5R-11073
PART 1, 5R-13200
PART 1, 5R-11716
PART 1, PLAN 04352 - 0312
PART 1, PLAN 04352 - 0314
PART 1, PLAN 04352 - 0316
PART 1, PLAN 04352 - 0331
PART 1, PLAN 04352 - 0333
PART 1, PLAN 04352 - 0334
PART 1, PLAN 5R - 9465
PART 1, PLAN 5R - 5696
PART 1, PLAN 4R - 19707
PART 2, PLAN 4R - 19707
PART 3, PLAN 4R - 19707
PART 5, PLAN 5R-11073
PART AREA 1 PLAN 4R - 19707
70.30 Ha
EAST 1/2 LOT 4
WEST 1/2 LOT 4
EAST 1/2 LOT 3
WEST 1/2 LOT 3
EAST 1/2 LOT 2
WEST 1/2 LOT 2
LOT 3
LOT 2
LOT 1
P.I.N. 04352 - 0441
P.I.N. 04352 - 0442
P.I.N. 04352 - 0443
P.I.N. 04352 - 0444
P.I.N. 04352 - 0445
P.I.N. 04352 - 0446
P.I.N. 04352 - 0447
P.I.N. 04352 - 0448
P.I.N. 04352 - 0449
P.I.N. 04352 - 0450
P.I.N. 04352 -

OF

IA FRONT)
GLOUCESTER

SURVEYING LTD.

SCALE = 1:500

0 5 10 20 30 40 50

BEARING NOTE

BEARINGS ARE GRID AND ARE DERIVED FROM THE EASTERLY LIMIT OF PART 2, PLAN 5R-6569, SHOWN ON PLAN 4R-21920 AS HAVING A BEARING OF N16°39'15"W.

LEGEND

⊕	SURVEY MONUMENT FOUND
⊡	SURVEY MONUMENT SET
SIB	STANDARD IRON BAR
SSIB	SHORT STANDARD IRON BAR
IB	IRON BAR
#	ROUND
CM	CANADA LANDMARK
Acc.	ACCEPTED
WIT	WITNESS
———	FENCE
SIB/JLP	J.L. PAYETTE O.L.S.
1287/(1287) /1822	FARLEY, SMITH & DENIS SURVEYING LTD.

NOTE: ALL BEARINGS, DISTANCES AND MONUMENTS ARE PER PLAN 4R-21920, UNLESS NOTED OTHERWISE.

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE AUGUST 18, 2009

RONALD A. DENIS
ONTARIO LAND SURVEYOR

SCHEDULE

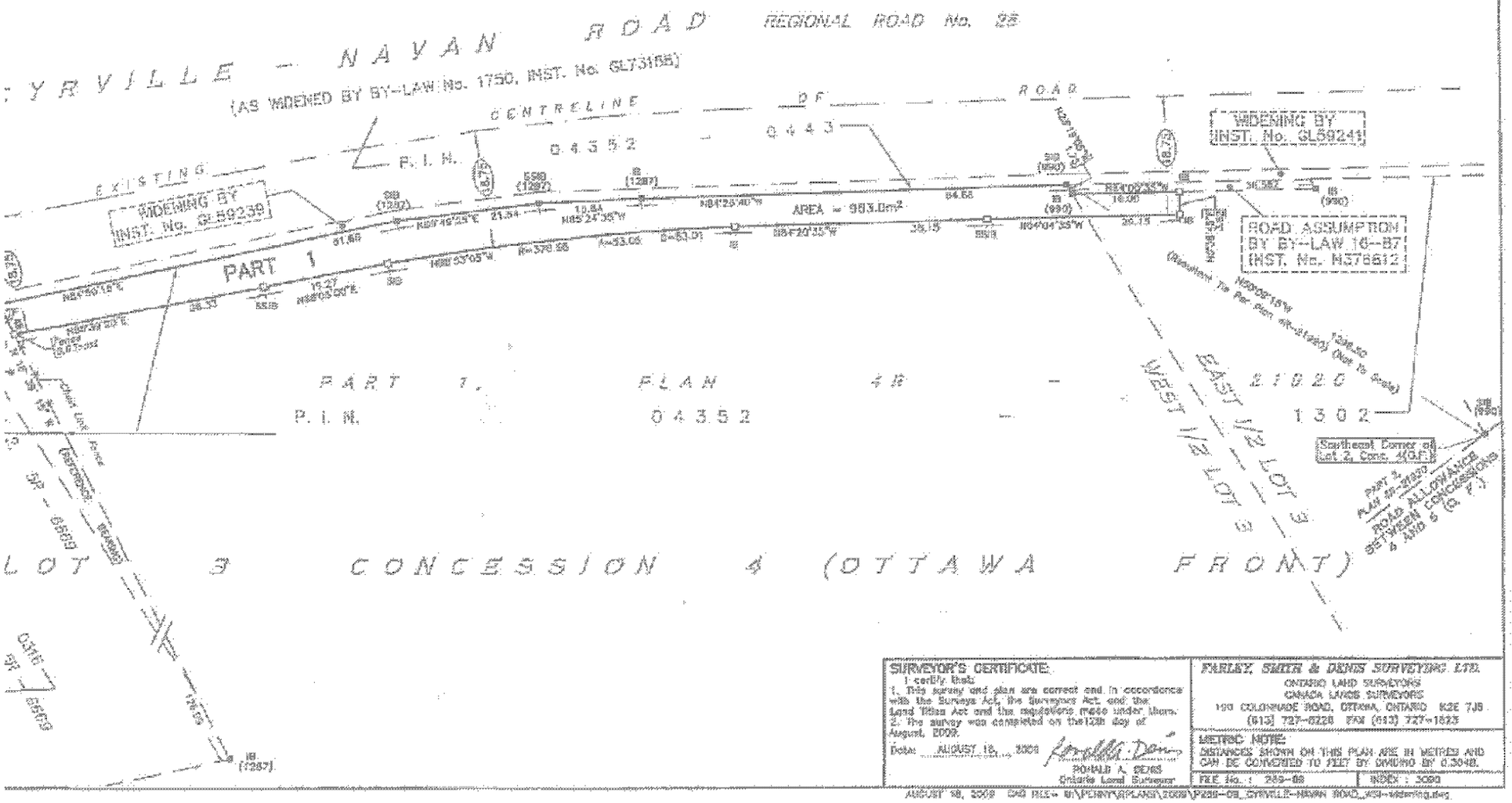
Part	Lot	Concession	P.I.N.
1	Part of Lot 3	S (O.F.)	PART of P.I.N. 04352-1302

PLAN 4R-23883

RECEIVED AND DEPOSITED

DATE August 18, 2009

per: Dep. C. Holloway
LAND REGISTRAR FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON No.4



SURVEYOR'S CERTIFICATE

I certify that:
1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act, and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 13th day of August, 2009.

Date: AUGUST 18, 2009

RONALD A. DENIS
Ontario Land Surveyor

FARLEY, SMITH & DENIS SURVEYING LTD.
ONTARIO LAND SURVEYORS
CANADA LANDS SURVEYORS
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METRIC NOTE:
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

FILE No.: 249-08 INDEX: 3080

AUGUST 18, 2009 DWG FILE: N:\PLANS\PLANS\2009\P249-08_ORLEANS-NAVAN ROAD_REG-WIDENING.dwg

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2. SITE SETTING

2.1 *Site Location and Legal Description*

The Navan Waste Recycling and Disposal Facility is located in the eastern portion of Ottawa, Ontario on Part of West Half of Lot 2, Part of Lots 3 and 4, Concession IV, Ottawa Front at 3354 Navan Road, City of Ottawa (formerly the Township of Gloucester), UTM Easting: 460570, UTM Northing: 5030570 at the front entrance to the site. The location is indicated on the Key Plan, Figure 1.1. The latest legal survey plan for the site was registered on April 13th, 2008 as Plan 4R-21920. Parts 1, 2 and 3 of this Plan are lands owned by WCC (refer to Fig. 1.2). A narrow section of land bordering Navan Road, west of the site entrance and having an area of 963 m^2 referred to as Part 1 on Plan 4R-23883 dated August 18th, 2009 was severed from WCC property as part of a Site Plan Agreement for the development of the new site facilities (refer to Fig. 1.2 and 1.3) and transferred to the City of Ottawa for the future widening of Navan Road.

2.2 *Location, Zoning, and Surrounding Land Uses*

According to the City of Ottawa's Official Plan (City of Ottawa, 2003) (Schedule B), the site is designated as Solid Waste Disposal site and is located within the Developing Community designation of the Urban Area. The East Urban Community is the southeast portion of the Orléans Community bounded by Mer Bleue Road to the east, a former Canadian Pacific Railway line (VIA Rail ROW) bordering the Mer Bleue Bog and WCC Site to the south, the National Capital Commission (NCC) Greenbelt to the west and a hydro corridor to the north. Generally, it is Urban Area (Developing Community) to the north, west and east, and Significant Wetland to the south (refer to Fig. 2.1, 2.2 and 2.3). Designations in the vicinity of the Site include: General Urban Area, including Mixed Use and Employment Areas to the north, Significant Wetland Area to the south, Residential to the immediate west and General Rural Area further to the east.

The Developing Communities designation is used by the City to identify those areas where the detail for the development of the lands requires additional study. The planning process for the Phase 1 lands was completed when City Council approved the Phase 1 Community Development Plan (CDP) document July 2005. The Landfill Site is located within the Phase 2 study area of the East Urban Community as shown on Figures 2.1 and 2.2. The landfill site was clearly identified during the work on each of these studies. The adopted CDP includes policies to protect the landfill site from sensitive land uses being established within 500 metres without a specific study to ensure compatibility. The CDP confirmed the Official Plan policies for road widening along Navan Road and also identified the need for future linkages that would be necessary to create the municipal infrastructure (water, sanitary and storm sewers) to complete the development of the community.

In 2006 a study of a 500 m buffer area around the WCC landfill site was initiated by the city. The purpose of the study was to fulfill the Official Plan requirements and to determine whether any land would be temporarily or permanently undevelopable due to its proximity to the WCC site. The peer reviewed buffer study was completed in the late spring of 2008. It determined that the landfill posed no constraints to

development of any Phase 2 lands. However, the peer review noted that where development occurs within the buffer zone, warning clauses should be placed in the purchase and sale agreements and on title. The clause should state that there is a possibility of occasional dust and odour episodes from the landfill operations.

The City of Ottawa has now adopted a Comprehensive Zoning By-law for the entire Amalgamated City (2001). By-law 250-2008 was adopted by Council in June of 2008 and was subject to numerous appeals, none related to the landfill. In November 2008 the Ontario Municipal Board provided an Order that brought the vast majority of the Zoning By-law into effect. All of the lands in the area of the site are now subject to the provisions of this By-law.

The existing adjacent lands are predominantly residential and rural residential with some scattered non-residential uses. The land is primarily open pasture, wooded areas and the Mer Bleue Bog. Existing land uses adjacent to the site boundaries are as follows:

- **To the North:** Navan Road, formerly known as Regional Road 28, residential and light commercial developments, and a former school now used as a senior's center, medical center and pharmacy.

  The north side of Navan Road is zoned Development Reserve in the Comprehensive Zoning By-law for the City of Ottawa. A Plan of Subdivision Proposal has been approved for approximately 23 hectares of largely undeveloped land, situated north of Navan Road and extending to Renaud Road (refer to Figure 2.2). These lands owned by Ashcroft Homes are presently under development. The eastern limit of the proposed development abuts the properties of the White Street residential enclave and other undeveloped lands. The lands to the west, known as Eastboro, continue to be under development for residential purposes and include two schools.

  The senior's center property directly across from the WCC Site is in a special Development Reserve Zone (DR) that identifies the community center as an additionally permitted use. A medical center and pharmacy also occupies this property presently.

- **To the East:** woodlots, a small scrap yard, and a small recycling business (abandoned and partially remediated). The lands to the east are also in the DR Zone.

  There was a rezoning for 3628 Navan Road to permit a recycling business to be recognized as a Temporary Use so that an Environmental Compliance Approval could be issued for the use of a portable wood chipper. This exception to the By-law is identified as DR [1616] and it is a Temporary Use permission which expired on December 7th, 2011. This property has been identified by the City of Ottawa as the preferred location for a large storm water management pond to service the Phase 2 CDP. The design for this pond has been approved by the City of Ottawa and is presently under construction by Ashcroft Homes.

  The balance of the lands to the east is in the same Development Reserve Zone (DR) which replaces the former Future Growth zone;

- **To the South:** VIA Rail right-of-way (ROW) is currently used as a recreational trail, however, railway traffic may resume in the future. This ROW is used as the zoning boundary in the comprehensive by-law. A 100 m strip of land south of the ROW is owned by WCC.

The lands south of the ROW that are within the Provincially Significant Wetland are identified as Environmental Protection (EP) in the zoning by-law. The remaining lands south of the ROW are zoned Rural in the By-law;

- **To the West:** Immediately west was a former composting and soil blending operation recently shut down which is zoned DR, while beyond that point are lands re-zoned and being developed by Claridge Homes for urban residential (R3VV[1286]), including Open Space (O1) and a portion that remains as a DR Exception [459]-h Zone.

Figure 2.3 summarizes the current zoning that is found in the area as shown in the Comprehensive Zoning By-law for the City of Ottawa.

The lands owned by WCC are within two defined zoning areas. The actual landfill being zoned as Heavy Industrial Exception [2] (IH[2]H(11)) and the buffer area being a separate Exception Zone to recognize its function as a buffer (IH[1483]H(11)). These are the zones found in the Comprehensive Zoning By-law. The WCC lands that lie south of the VIA Rail corridor are zoned as Environmental Protection and Rural as shown on Figure 2.3.

2.3 *Existing Site Design and Facilities*

The existing approved design and operation of the site is described in the Design and Operations report prepared by Golder Associates Ltd. for the site expansion (Golder, January 2008) and the approved Quality Assurance/Quality Control Plan and Specifications for the WSI Landfill Leachate Collection and Management System – Lateral Expansion Area (Golder, June 2009 and MOE reference Number 1851-7SUSJ9). The following sections summarize some of the current facilities and systems described therein.

2.3.1 Existing Facilities

A gated entrance from Navan Road at the north end of the site presently serves as the only access point into the landfill. The gate is locked after operating hours and monitored by security personnel. Access during operating hours is controlled by an attendant at the scales, operating from a scale house. The scale house is in close proximity to the equipment maintenance garage and administrative office building.

Internal roads are constructed and relocated as necessary to provide access to the active landfill areas and other site facilities. The internal roads are generally constructed using recycled asphalt, re-used screened rock, brick or crushed concrete over a sub-base of re-used shingles. The current approximate road network is illustrated in plan view on Figure 2.4.

A waste processing area has been built on interim-covered waste in the south-central part of the waste footprint to facilitate stockpiles of recycled and processed materials (refer to Figure 2.4). A small vehicle pad consisting of reinforced concrete retaining walls was constructed south of the scale house for the unloading and sorting of waste from small vehicles. Concrete block bunkers are available for the separation of larger volumes of recyclable materials such as shingles, aggregates, clean fill, windshield glass, etc.

A minimum buffer width of 30 metres is maintained around the west, north and east sides of the approved waste disposal area. A 10 metre buffer is maintained between the southern limit of the waste footprint and the VIA rail corridor. Additional buffer lands owned by WCC exist to the east and west with a minimum 100 metres wide strip of land extending the full width of the site south of the VIA right-of-way (see Figure 2.4).

2.3.2 Leachate Management and Groundwater Protection System

The existing leachate management system at the Navan Waste Recycling and Disposal Facility includes an underdrain system in the northwest corner of the existing waste footprint north of Grid Line I and between Grid Lines 3 and 6 (refer to drawing 6.2). This area is connected via perforated HDPE pipe to a perimeter leachate collection trench. It consists of a granular-filled trench and perforated drainage pipe which runs along the west edge of the waste mound (Grid Line 1) and the south toe of the waste mound (between Grid Lines Q & R).

An underdrain leachate collection system also exists in the southeast corner of Phase 8 consisting of a combination of perforated collection pipes, French drains and sand drainage blanket. This drainage layer extends from Grid Line N to the south toe of the waste mound and between Grid Lines 14 and 16.

An underdrain leachate collection system also exists in the north central area of the waste footprint in the Phase 4 and 5 area of the site (refer to Fig. 2.4) consisting of a combination of perforated collection pipes, French drains and sand drainage blanket. This large drainage system extends from the north toe of the waste mound to Grid Line L and between Grid Lines 6 and 16.

The leachate drainage system in the east expansion cell (Phase 1) was constructed in 2014/2015 and consists of a network of perforated HDPE pipe, separation and filter geotextiles, a clear drainage stone layer and a sand protective layer. A similar system was constructed in 2018/19 for the cell to the north in Phase 6. A pump station was constructed at the northwest corner of Phase 1 to assist with the drainage of the east cells.

The existing leachate collection systems are illustrated in Figure 6.2 and discussed in greater detail in Section 6.3.

All leachate collected in the existing leachate collection system is designed to gravity drain or be pumped to a wet well and a pre-treatment/pump station located in the south buffer near Grid Lines R-16. Pre-treatment of leachate consists of air stripping hydrogen sulphide (H_2S) and Volatile Organic Carbons (VOCs) with the use of activated carbon filters prior to discharge. During 2021, all leachate was pre-treated and pumped via forcemain to the City of Ottawa sewer system for final treatment at the City's municipal sewage treatment plant. The leachate forcemain was flushed and cleaned twice during 2021. No operational issues with the treatment and pumping station were reported in 2021.

A vertical manhole, connected to the leachate collection system in the centre of the existing waste footprint (referred to as "the central manhole"), provides an alternative point of access to evacuate leachate from this part of the leachate collection system in the event that positive drainage to the wet well and pump station cannot be maintained due to sub-grade settlement. This manhole has been raised to an elevation of 101 metres and will require that it be raised with additional MH sections in 2022.

Access to the leachate collection pipes in the Phase 4 and 5 area (refer to Fig. 2.4) is provided via a series of cleanouts along the north side of the existing waste footprint. Cleanouts are also provided along the east perimeter for leachate collection pipe access in the east cell expansion. Access to the west and south perimeter leachate collection system is provided via a series of manholes. The system was checked for drainage to ensure proper performance of the drainage/collection system. Low permeability cover soils are currently used to minimize infiltration of precipitation into the waste column. At present, clay soil cover is located on the north, west and south facing slopes as well as the surface of completed fill areas in Phase 3, the north part of Phase 4 and parts of Phase 1. Leachate containment is currently provided by a thick deposit of natural low-permeability clay soil which underlies the entire site and a constructed final clay cover.

2.3.3 Landfill Gas and Odour Management System

The Certificate of Approval (Air), ECA # 6733-7BYS9A issued on April 16th, 2009 was amended by ECA (Air) # 3536-8APNZD on November 24th, 2010 to add one (1) candlestick flare, used to combust a maximum of 0.24 actual cubic metres per second (500 scfm) of landfill gas (LFG) collected from three (3) vertical landfill gas wells and gas collected from the Leachate Collection System (refer to Fig. 8.1). Construction of the approved candlestick flare was completed at the end of 2011 and was commissioned and approved by the Technical Standards and Safety Authority (TSSA) in April of 2012. Horizontal and vertical wells were later added in the area of Phase 4, Phase 3 and Phase 1 to enhance the odour control system. Details are provided in Section 8.

A fixed line misting system powered by a portable generator was added at the end of 2017 to be on hand ready to be implemented as an emergency response system to assist in addressing odour issues.

2.3.4 Surface Water Management System

The regional surface water flow system in the area of the landfill is discussed in sub-section 2.7 and existing surface water control features are shown on Figures 2.4 and 6.1. Existing controls can be summarized as follows:

a) Upstream flows originate north and northwest of the site. This flow is diverted around the landfill by ditches that exist along the north perimeter of the site buffer zones.

b) A diversion ditch has been constructed along the northern limits of the landfill that discharges into the east perimeter ditch at the northeast corner of the landfill. The east perimeter ditch conveys flows southward to storm water management ponds located at the south-east corner of the site. These ponds discharge into a perimeter ditch that flows south under the VIA ROW onto and through WCC property and drains to the Mer Bleue drainage basin.

c) Another diversion ditch has been constructed northwest of the site in the north buffer area. This ditch discharges further west into a natural drainage channel termed the west perimeter ditch which is not well defined. Surface water from the completed west parts of the site is controlled and discharges into a storm water pond located at the northwest corner. This pond discharges into a ditch located on WCC property which drains into the west perimeter ditch. The west perimeter

ditch conveys flows southward and then westward north of the VIA ROW to the Mud Creek drainage basin.

d) An east diversion ditch was constructed in accordance with South Nation Conservation Authority requirements for a fish habitat and was commissioned following approval in the fall of 2009.

e) Interim clay cover has been placed over inactive portions of the existing waste mound. Finished slopes are covered with clay soil and topsoil, graded and seeded. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control. To protect the perimeter clay slopes against erosion, clay diversion dikes and drainage swales have been constructed to collect surface run-off above the slope. Storm water collected by the swales is directed down the landfill side slopes via rip-rap lined drainage chutes. Culverts exist at the top of each drainage chute to provide surface runoff across the perimeter access road, with the access road itself serving as a berm.

2.4 *Climatic Setting*

The landfill is located 17 km northeast of the meteorological station located at the Ottawa International Airport (OTAWA INTL. A, climate ID 6106001). Climatic conditions at the site are presented on Figures 2.5 and 2.6 and summarized as follows:

a) The average monthly temperatures in 2021, obtained from Environment Canada Atmospheric Environment Service, varied from an average low of about -8.3°C in February to an average high of 22.3°C in August with an annual average temperature of 7.6°C. The 60 year average ranges from a low of -10.4°C to a high of 20.9°C and an annual average of 6.2°C.

b) The average (1961 to 2021) annual precipitation at the Ottawa International Airport station is 920.1 millimetres. The driest month is generally February at an average of 55.4 mm and the wettest month being July at an average of 91.2 mm. Total precipitation for 2021 was 836.8 mm and ranged from a low of 30.2 mm in January to a high of 139.9 mm in October.

c) The average annual water surplus (i.e. precipitation minus evaporation) for the Ottawa vicinity is in the order of 320mm (12.5 in.). The water surplus provides an estimate of the amount of water available for infiltration into the site and for surface run-off during a 12-month period.

2.5 *Geology*

Regionally, the site is located within the Ottawa Valley clay plain at the western edge of the Prescott and Russell sand plains. The lowland region is composed of unconsolidated glacial deposits of till, varved clays and marine beds of clay and sand from the post-glacial Champlain Sea. The region is bound to the north by Precambrian formations of the Canadian Shield and underlain by interbedded Paleozoic bedrock that outcrops in ridges and scattered exposures due to faulting and downdrop fault blocks. The WCC Facility is situated on the banks of the Ottawa River Channel. The post-glacial Ottawa River Channels, east of Ottawa, are from 3 kilometres to 10 kilometres wide and up to 18 metres deep. They are floored with clay and silt and bordered by sand deltas. Figure 2.7 shows the surficial geology of the area.

Sand deposits cover the escarpment that runs through the site. Sands are found to be 0.6 metres to 2 metres deep in the area of the Facility above the escarpment. For the most part, the sand below the escarpment has been eroded, leaving behind only a thin sand blanket. A thick (20 to 35 m) marine clay deposit underlies the entire area and has been exposed by the deep erosion channels that have cut through the escarpment and wherever the thin sand deposit has been eroded. The bedrock beneath the site is shown to consist of shale of the Billings Formation (Figure 2.8). A review of MECP water well records within the site vicinity study area indicated that the Site is underlain by limestone or shale.

2.6 *Hydrogeology*

The regional groundwater flow direction in the deep bedrock is east (Charron, 1978). In the general area of the site, groundwater flows from a north to south direction, toward the Mer Bleue bog located south of the site. Figure 2.9 indicates the groundwater flow direction and the interpreted groundwater recharge, transitional and discharge areas as described in studies undertaken for this area (A.J. Robinson and Associates Inc., 1987, Gore & Storrie Limited, 1992).

The thick clay deposit which underlies the site and surrounding area acts as an acquitard, such that lateral flow is directed through the surface sand unit and the upper weathered clay (total thickness of a few metres). Shallow groundwater flow is strongly influenced by topography, the depth of the surficial sand layer, the underlying weathered clay, the natural drainage systems and recently constructed drainage systems. Shallow groundwater flow occurs at the site generally in a north to south direction, as shown schematically on Figure 2.10.

The results of water levels measured at the site at up-gradient wells indicate the shallow water table to be typically located approximately 1 to 2 metres below ground surface with only small fluctuations in water levels indicated for recent years. A downward hydraulic gradient has been profiled up-gradient to the site. The only variation in the direction of the hydraulic gradient is indicated in the upper 5.6 metres to 10.4 metres below ground surface, from a downward gradient to an upward gradient in the weathered clay. These results may be attributed to a perched water table at the interface of the weathered clay and the intact clay. The relatively weak downward gradient from the sand to the weathered clay suggests a hydraulic interconnection between these units. The downward gradient is quite pronounced from the weathered clay down to the lower reaches of the intact clay deposit. It is interpreted that the intact clay deposit at depth beneath the landfill site acts as a barrier to groundwater flow.

The results of the water levels measured at the down-gradient wells at the site indicate the shallow groundwater table lies within the sand deposit close to the original ground surface ranging in elevation from about 68.8 metres to 70.2 metres. Seasonal variations of nearly 1 metre have been observed. The high water levels generally occur during the wet spring whereas the lower water levels are recorded during the dry summer months and fall. Unlike the up-gradient groundwater level profiles, the down-gradient profiles generally indicate a slight upward vertical gradient, although a localized weak downward gradient is observed at times between the upper 6.3 metres to 7.6 metres within the weathered clay. The upper sand and fractured clay layers appear to be hydraulically connected with near vertical or hydrostatic water level profiles. A slight upward gradient at the down-gradient boundary of the landfill suggests there is upward vertical flow of shallow groundwater at this location which would retard the potential for leachate migration into the deeper groundwater system.

Water levels obtained further down-gradient of the landfill indicate the shallow groundwater table is close to the ground surface within the upper sand or organic deposit with artesian conditions within the clay. Hydraulic head profiles illustrate an upward gradient through most of the profile with a weak downward gradient from the sand to the weathered clay. Historically, there has been an upward gradient through the entire profile. The presence of an upward gradient suggests upward groundwater flow is occurring south of the landfill. These results may also suggest upward leaching of pore water from the Champlain Sea clay, a brackish water deposit, may be occurring at the southern boundary of the landfill. North of the landfill, downward leaching of the clay pore water is indicated.

The horizontal hydraulic gradient in the shallow sand deposit and weathered clay at this site is consistent with the relief of the property which changes in elevation by approximately 15 metres to 18 metres between the up-gradient and down-gradient boundaries of the landfill. Since the shallow water table appears to be a reflection of the original surface topography, horizontal hydraulic gradients are expected to vary between 0.7% in the plateau above the escarpment and 1.4% in the valley below. Water levels measured south of the landfill indicate shallow groundwater is flowing in a south to southwest direction with a small hydraulic gradient ranging between 0.5% and 2%. The horizontal gradients in the bog area are influenced by seasonal fluctuations in the surface water levels. Hydraulic gradients could also be influenced by the leachate collection system (LCS) located along the south toe of the landfill. Keeping the LCS drained could result in a lowering of the water table by more than 3 metres below the original grade at the southeast corner of the landfill and by 2 metres at the southwest corner. This water table lowering could significantly influence the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient side of the LCS was constructed to alleviate any potential problems related to lowering of the groundwater table south of the landfill.

Water levels measured within the glacial till/upper bedrock up-gradient and down-gradient of the site indicate a difference in water levels of about 6 metres, which represents a hydraulic gradient of approximately 1% across the site within the glacial till/upper bedrock.

Many factors, such as mounding within the waste pile, the installation of the leachate collection system and the construction of waste cells with under drainage will influence the rate of groundwater flow across the site.

Within the study area MECP water well records indicate that former groundwater users obtained their groundwater from the overburden and bedrock interface. This interface is considered the main aquifer in the study area. Down-gradient of the landfill, in the direction of groundwater flow, there are no potential groundwater users and the marine clays present in the Mer Bleue bog area produce saline water.

2.7 Surface Water Flow System

The Navan Landfill is located on a watershed divide between two major drainage watersheds - the Rideau River watershed to the west and the South Nation River watershed to the east (see Figure 2.11). Surface runoff drains to both the east and west of the site. The east side of the site drains to the Bear Brook drainage basin, which is part of the South Nation River watershed. The west side drains into the Mud Creek drainage basin which in turn drains into Green's Creek; part of the Rideau River watershed. The Mer Bleue bog, a

unique and internationally recognized ecological feature, is located to the south of the landfill as seen on Figure 1.1.

2.8 *Mer Bleue Bog*

The Mer Bleue bog, located south of the site, is an important ecological and hydrologic feature in the Ottawa area. This 4,106 ha area was formed approximately 9,500 years ago, following the last ice age, (Frasier et al., 2001) when the Champlain Sea occupied the Ottawa Valley and laid down deep marine clay deposits. As the glaciers began to melt, a spillway channel formed south of the present day Ottawa River. Melt water flowing through the southern channel eroded the floor of the Champlain Sea. As the melt waters receded and isostatic rebound forced sea water eastward to the Atlantic Ocean, the southern channel ceased flowing and a lake formed in the present location of the Mer Bleue bog. Plant growth progressively filled in the lake, forming a raised peat dome Sphagnum bog. The peat thickness is reported to be about 6 to 7 m.

The Mer Bleue is underlain by Ordovician limestone and shale, deposited as marine sediments 445 million years ago (Brunton, 1984). The bedrock layer is deeply buried by organic deposits over the central portion of the Mer Bleue with marginal deposits of marine clay, and sand deposits along two prominent ridges. The marine clay deposits are very thick, ranging from 12 to 45 m in depth (Hobson et al., 1969). There are also sandy shoreline deposits located on the northern and southern margins of the Mer Bleue bog (Brunton, 1984).

The hydrologic features of the bog are very unusual. Being a domed bog, surface water drainage in the bog flows radially outwards from the centre towards the edges of the bog and then flows in the "lagg" along the perimeter of the bog. The elevation at the centre of the bog is approximately 70 m above sea level, sloping gradually down to about 67 m at the perimeter of the bog. Groundwater flow into the bog is very small given the low permeability of the underlying clay soils. Surface water inflow to the bog is also very limited because the contributing drainage watersheds are quite small; consequently the bog receives most of its water and nutrients in the form of atmospheric precipitation (for this reason the Mer Bleue is referred to as an "ombrotrophic bog").

Surface water flowing radially outwards from the centre of the bog enters the lagg around the perimeter of the bog which is basically a channel of standing or very slowly flowing water flowing along the perimeter of the bog. The lagg receives water from the bog and distributes it through the surrounding lands. On the western portion of the bog, drainage channels drain bog waters westward to Greens Creek. On the eastern portion of the bog, drainage from the bog ultimately discharges to Bear Brook Drain to the southwest.

Attempts were made in the late 1800's to drain portions of the bog for agricultural purposes; however, these drainage ditches no longer function because of the many beaver ponds which started up in the late 1950's. Now the water level in the Mer Bleue is at or near the surface of the bog for most of the year. The Savage Drain is an example of an agricultural drain which is quite visible in aerial photographs of the bog as a prominent linear feature on the eastern side of the bog. Flow in the drain in the northern part of the bog (nearest the landfill) is northward and then eastward along the lagg on the perimeter of the bog. There are a number of agricultural drains along the northern and eastern parts of the bog which receive surface water from the bog.

Shoreline erosion is not a concern as the surface water flow rates are nil to minimal. Flooding in the bog is also not a concern as water levels are controlled naturally through beaver dams and the ability of sphagnum to absorb large amounts of water.

In addition to its hydrologic function, the lagg is also a transition zone for plant communities and water quality, where the water regime changes from acid dominated waters in the bog to increasing calcium and basic waters.

Fraser et al., (2001) studied flow patterns and geochemistry in the peat in the Mer Bleue bog. The researchers found that vertical groundwater flow patterns in the bog alternated annually between periods of recharge and discharge in accordance with changes in precipitation, evapotranspiration and the differential head response of the lower peat layer to changes in water table. A sustained moisture deficit during the summer maintained a flow reversal for about a month until a significant rainfall raised the water table. One of the reasons that the researchers selected the Mer Bleue for their study of flow reversals was that the large peatland was isolated from the regional groundwater flow (Fraser, et al., 2001).

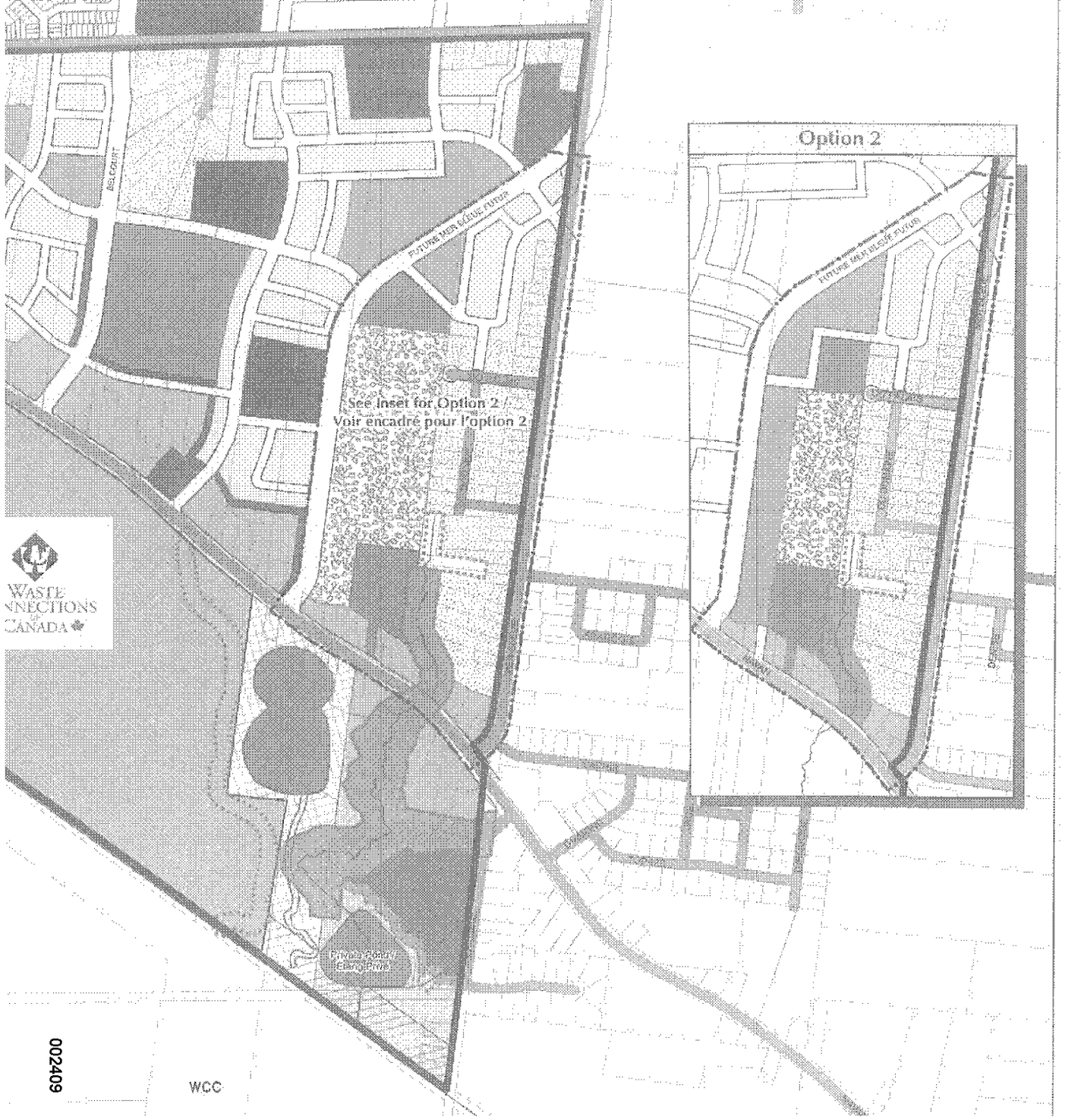
The surface vegetation in the Mer Bleue bog has, to some extent, become a shrub-rich bog as a result of the extensive drainage activities and peat mining of the 19th and early 20th centuries. These disturbances reduced the wetland size by 20%, accelerated the maturation of the peatland and accelerated the rate of tree establishment. The re-establishment of beaver populations along the margins of the peatland have helped restore pre-disturbance water levels, however many bog species have already been reduced (Brunton, 1992).

Ponding due to beaver activity has the potential to convert the bog vegetation to marsh communities. There is a concern about the spread of invasive and/or non-native plant species; in particular, purple loosestrife, grey birch, glossy buckthorn and European frog-bit (Wetlands International, 2001).

East Urban Community
COMMUNITY DESIGN PLAN

Communauté urbaine de l
PLAN DE CONCEPTION COMMUNAUTAIRE

- Proposed School / Ecole proposé
- Future Institutional Site / Futur emplacement
- 15m Overland Flow Corridor / Couloir d'écc
- Existing and Proposed Parks / Parc existant e
- Wooded Area / Zone boisée
- BFI Waste Disposal Site / Décharge de BFI
- Storm Water Management Pond / Bassin de
- Slope Stability Setback / Marge de reculeme
- Aquatic Habitat Setbacks from top of Bank / Marge de reculement des habitats aquatique à partir du haut de la rive
- Buffer to Mer Bleue Bog / Zone tampon de la tourbière de la Mer Bleu
- Proposed Street / Rue proposé
- Future Mixed Use Area /
- Phase 2 Area /



Communauté urbaine d
PLAN DE CONCEPTION COMMUNAUTAIRE

LAND USE / UTILISATION DU SC

- School / Ecole
- Institutional / Institutionnel
- 15m Overland Flow Corridor / Couloir d'
- Park / Parc
- Wooded Area / Zone boisée
- BFI Waste Disposal Site / Décharge BFI
- Storm Water Management Pond Area / Zone de retention des eaux pluviales
- Slope Stability Setback / Marge de reculer
- Aquatic Habitat Setbacks from top of Ban Marge de reculement des habitats aquatic de la rive
- Existing Residential – Potential for long ter redevelopment to low/medium density re Résidentiel existant – Potentiel, à long ter en résidentiel de densité faible à moyenne
- Future Residential – low/medium density Résidentiel futur – faible/moyenne densité
- Future Residential – medium/high density Résidentiel future – moyenne/haute densi
- Mixed Use – institutional, office, commer Secteur polyvalent – institutionnel, bureau
- Leisure/ recreational uses - Significant acc servicing constraints limit development po Utilisations de loisir et récréatives - Les co conduites pluviales et domestiques limiter
- Future development potential to low dens and sanitary servicing constraints can be o Potentiel d'aménagement futur en lotissen densité, uniquement si les contraintes de domestiques peuvent être résolues
- Buffer zone from the rail corridor / Zone t
- Proposed Street / Rue proposé

Ottawa

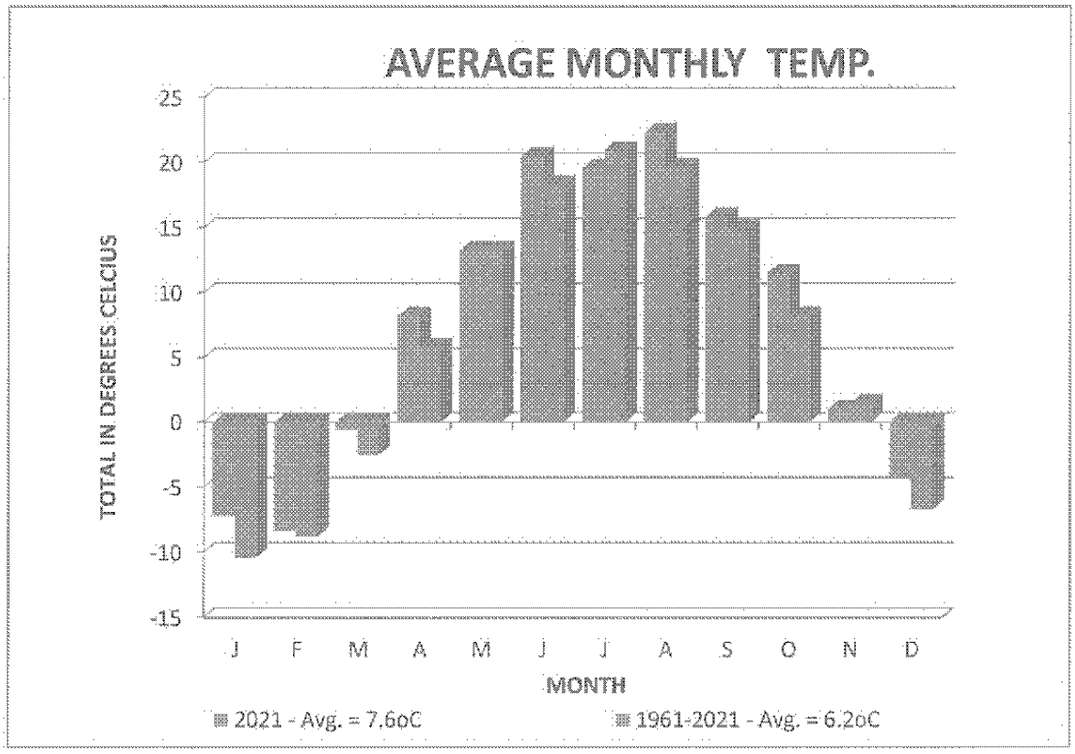
FIGURE 2.3

CURRENT ZONING OF SITE AND SUROUNDING AREA

WASTE CONNECTIONS OF CANADA

GATE
SCALE CLERK
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
PHASE 2 (COMPLETED)
PHASE 4
PHASE 6
PHASE 5
PHASE 3
PHASE 8
PHASE 7
PHASE 1
LIMIT OF WASTE
LIMIT OF WASTE
INTERIM LANDFILL GAS FLARE
MATERIAL PROCESSING AREA & SCREENINGS
MATERIAL PROCESSING AREA
RECYCLING AREA
CONTAMINATED SOIL TREATMENT AREA
EAST CELL PUMP STATION
DRAINAGE CHUTE
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT PUMPING STATION
MH-10
MH-9
MH-8
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
C.O.MH

002411



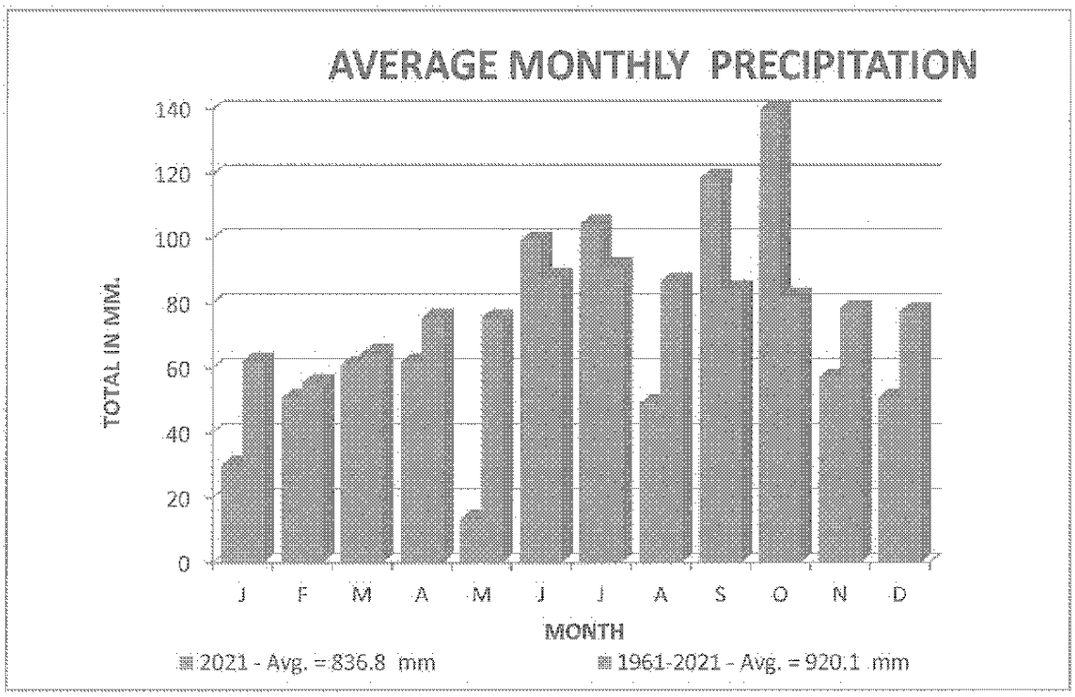
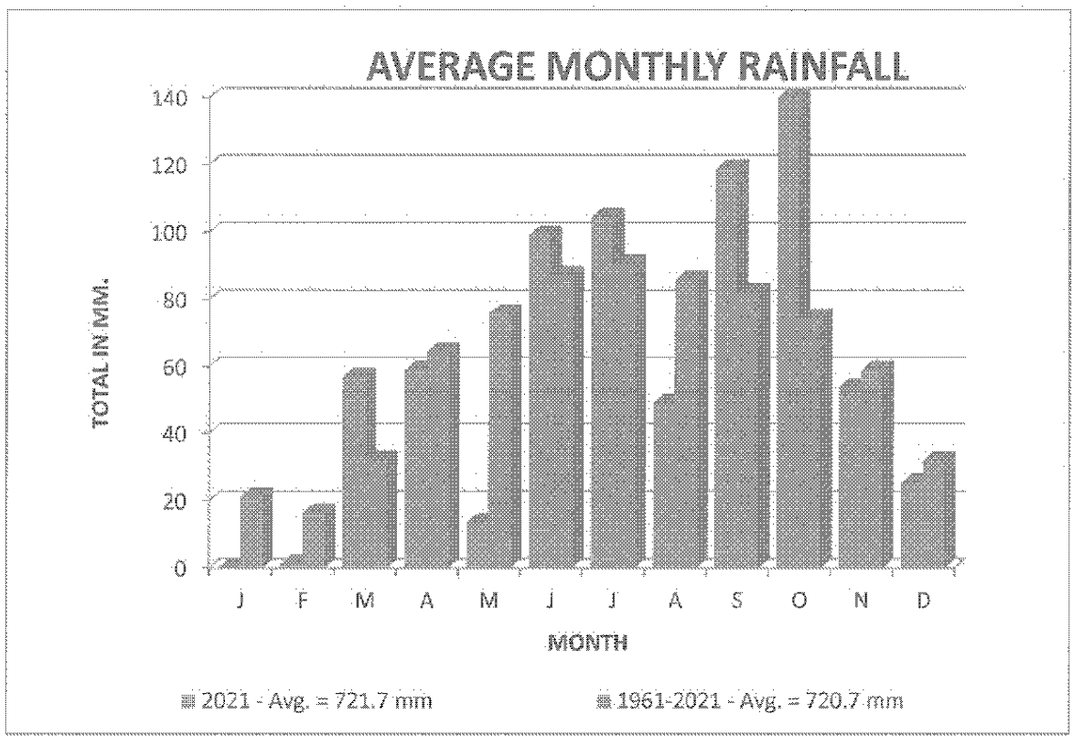


Figure 2.5: Average MonthlyTemperature and Precipitation for 2021



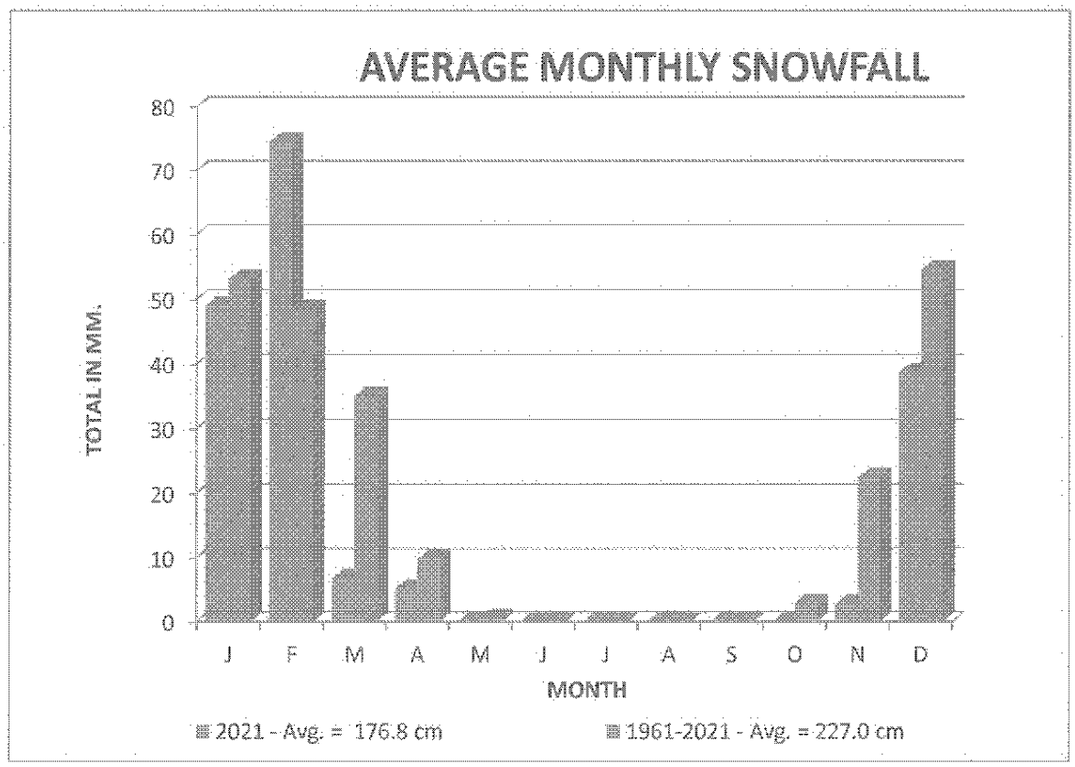
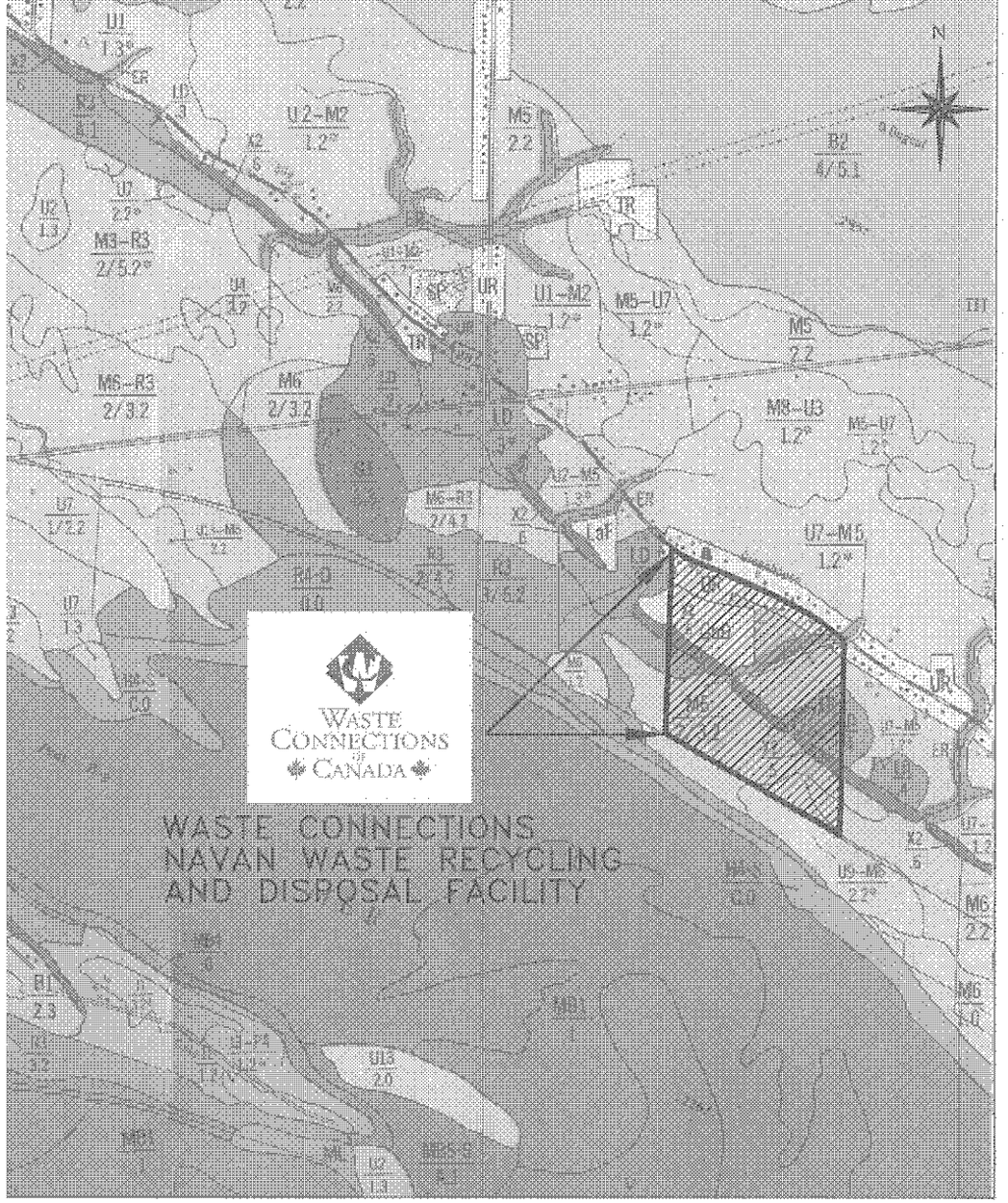


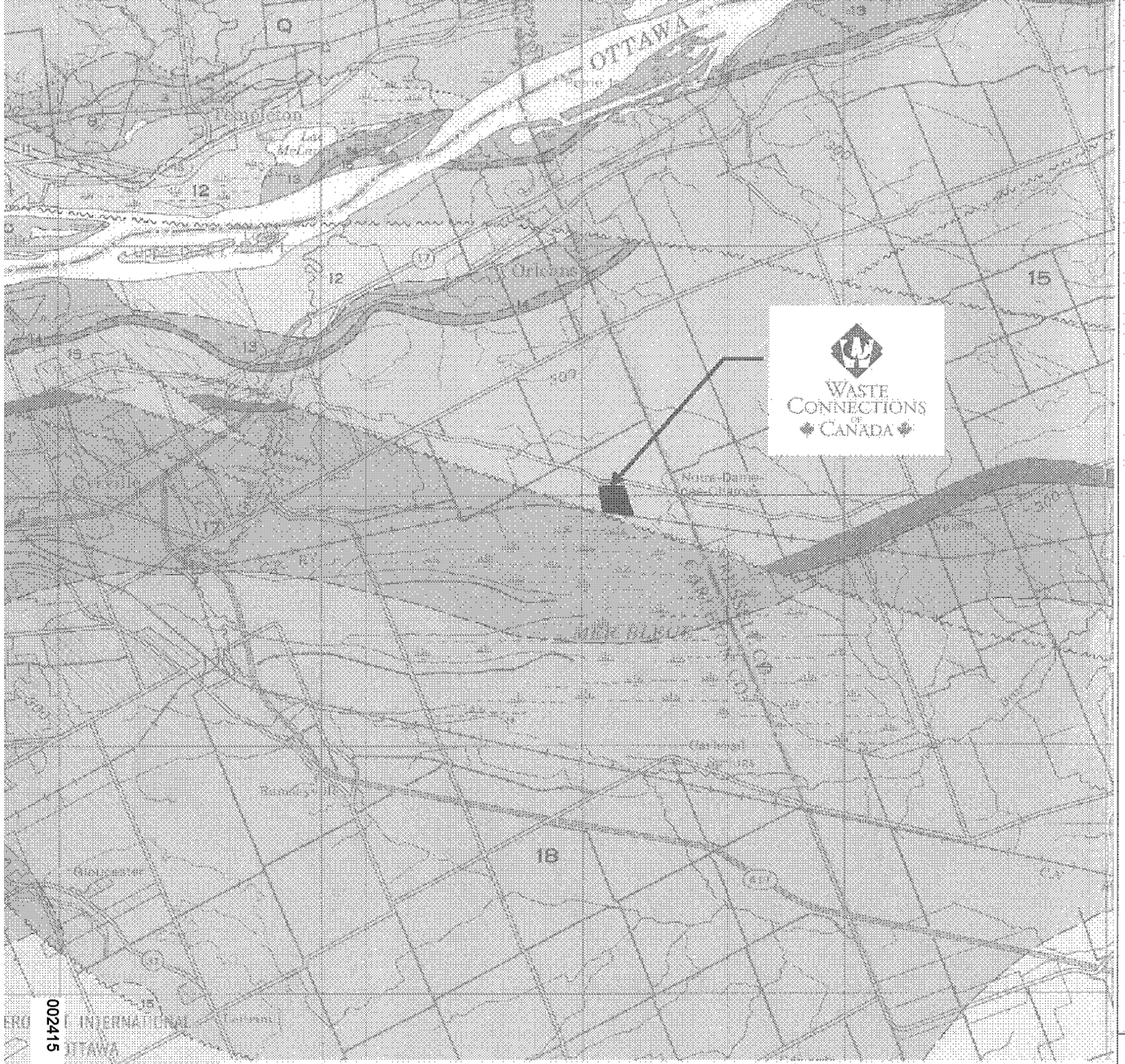
Figure 2.6: Average Monthly Rainfall and Snowfall for 2021



Scale 1:25,000

1 2 3 Kilometres

002414



LEGEND

Q — No information is available on these Quaternary deposits

ORDOVICIAN

14 — QUEENSTON FORMATION: r

13 — CARLSBAD FORMATION: gre lay

12 — BILLINGS FORMATION: blac

11 — FAIRVIEW FORMATION: dark

10 — OTTAWA FORMATION: limest sandstone in basal part

9 — ST. MARTIN FORMATION: gra dolomite

8 — ROCKCLIFFE FORMATION: sh

7 — OXFORD FORMATION: volcan

6 — MARCH FORMATION: interbed

ORDOVICIAN OR CAMBRIAN

5 — NEPEAN FORMATION: sandst

PALEOZOIC

PRECAMBRIAN

A — Granite, diorite, monzonite, gneiss and foliated, also unfoliated mig

B — Syenite, monzonite, massive and

P — Pegmatite, vuggy pegmatite asso

D — Diorite, gabbro, diabase, anorthosite, meta

M — Marble, (metasedimentary), graphi

X — Amphibolite, greenstone, quartz garnetiferous (includes probably

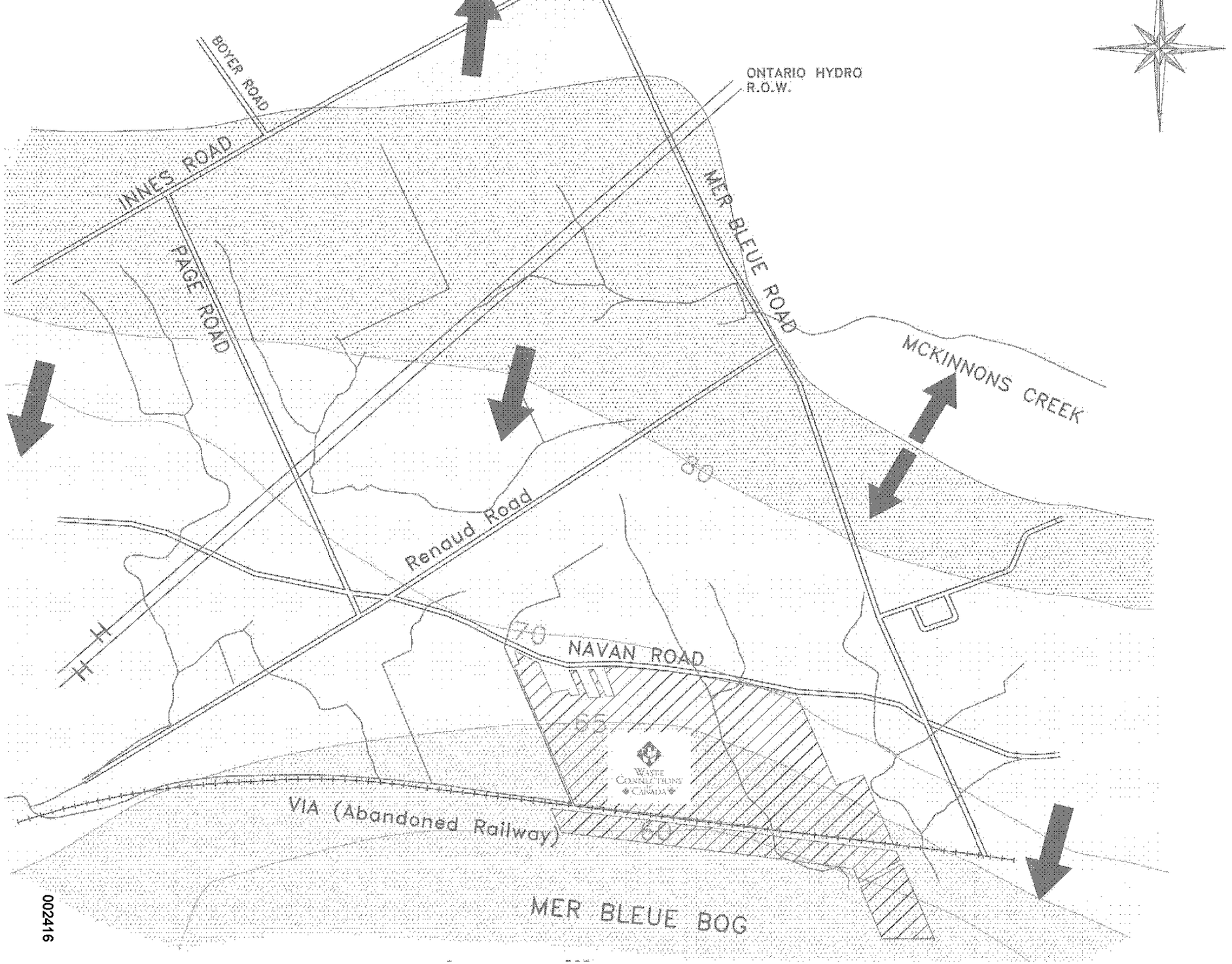
G — Paragneiss, pelitic and psammop (includes some layered amphibo

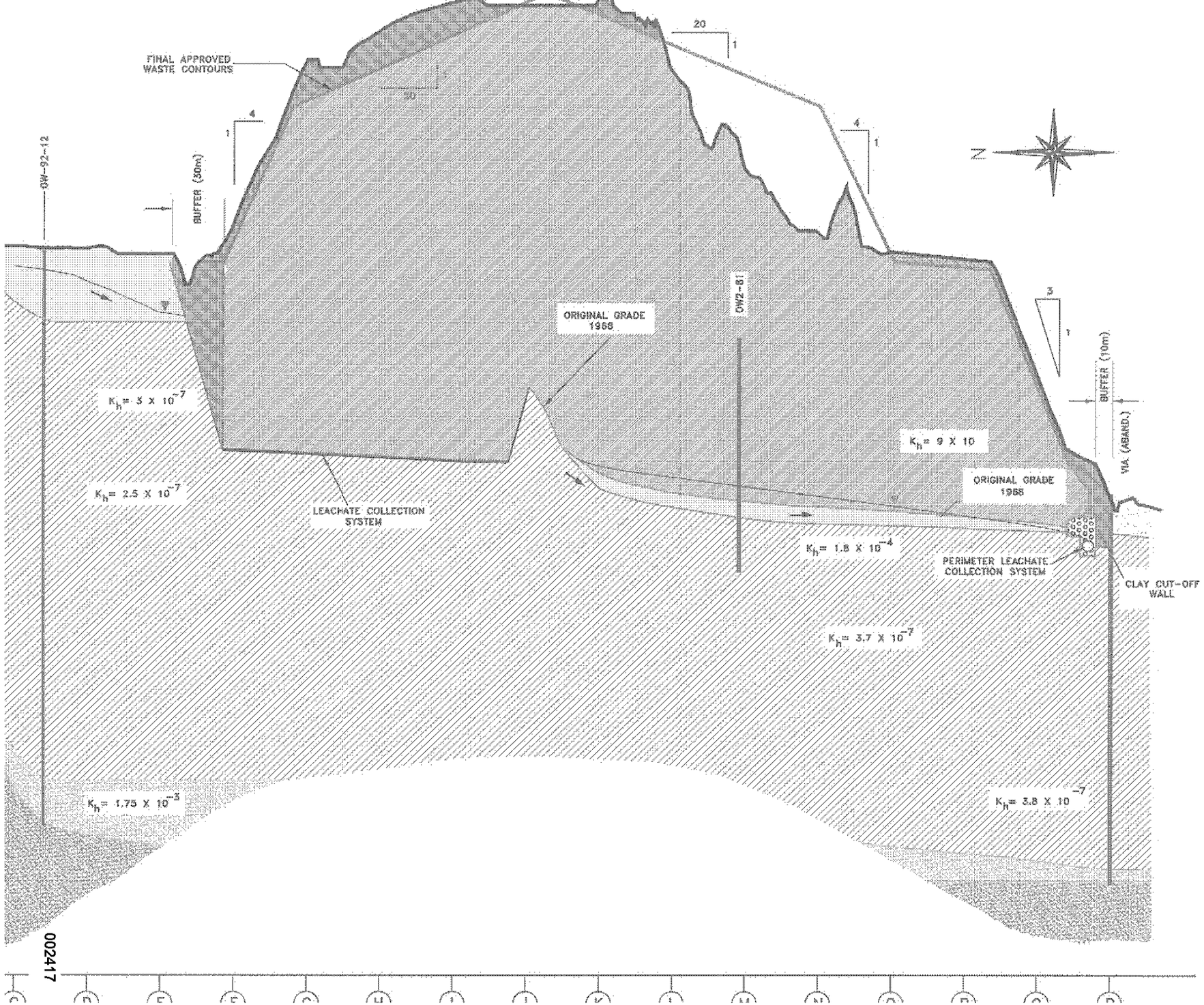
Q — Quartzite, interlayered paragneiss

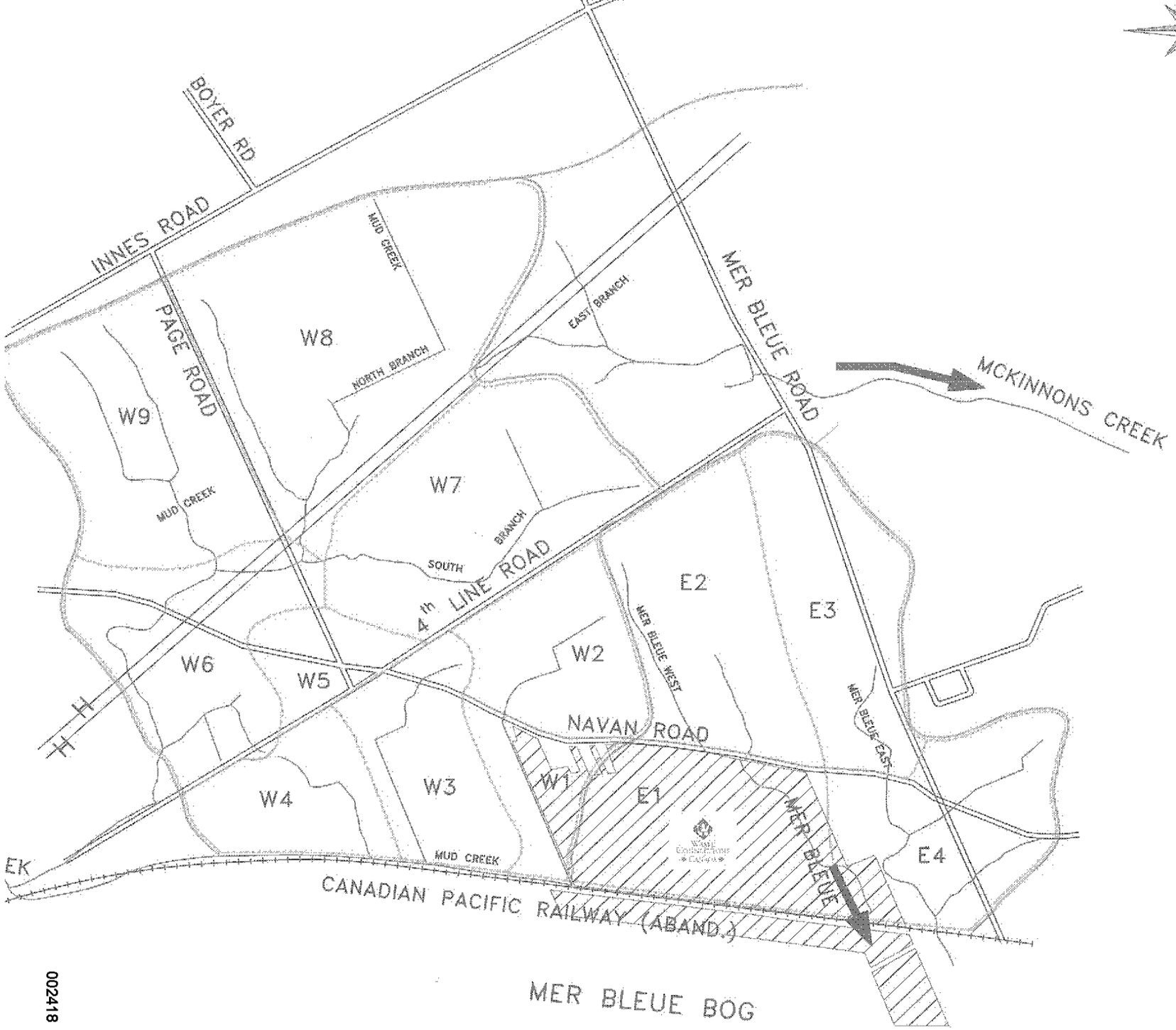
U — Undifferentiated Precambrian

Geological boundary (approximate, assumed) .....

Fault (confined, approximate) .....


BOYER ROAD
ONTARIO HYDRO
R.O.W.
INNES ROAD
PAGE ROAD
MER BLEUE ROAD
MCKINNONS CREEK
Renaud Road
NAVAN ROAD
WASTE
CONNECTIONS
CANADA
VIA (Abandoned Railway)
MER BLEUE BOG
002416


FINAL APPROVED WASTE CONTOURS
20
1
4
1
BUFFER (30m)
GW-92-12
ORIGINAL GRADE 1988
GW2-81
3
1
BUFFER (10m)
VIA (ABAND.)
K_h= 3 X 10^{-7}
K_h= 2.5 X 10^{-7}
LEACHATE COLLECTION SYSTEM
K_h= 9 X 10
ORIGINAL GRADE 1988
K_h= 1.8 X 10^{-4}
PERIMETER LEACHATE COLLECTION SYSTEM
CLAY CUT-OFF WALL
K_h= 3.7 X 10^{-7}
K_h= 1.75 X 10^{-3}
K_h= 3.8 X 10^{-7}
N
002417


BOYER RD
INNES ROAD
PAGE ROAD
MUD CREEK
NORTH BRANCH
W8
EAST BRANCH
MER BLEUE ROAD
MCKINNONS CREEK
W9
MUD CREEK
W7
SOUTH BRANCH
4th LINE ROAD
E2
E3
MER BLEUE WEST
W6
W5
W2
MER BLEUE EAST
NAVAN ROAD
W1
E1
W4
W3
MUD CREEK
MER BLEUE
E4
EK
CANADIAN PACIFIC RAILWAY (ABAND.)
MER BLEUE BOG

002418

3. OPERATIONS - 2021

3.1 *Description of Operations*

The Navan Waste Recycling and Disposal Facility has evolved over the years from being simply a disposal site into an integrated waste management facility with increased focus on re-use and recycling.

Prior to 1981, landfilling was carried out by end-dumping over an existing east-west oriented ridge with minimal base preparation. Following an ownership change in 1981, the site was operated using an area method with waste being placed in the southern half of the landfill (i.e., below the escarpment). As-built survey information collected during the construction of the perimeter leachate collection system indicated the base elevation of the waste varied between 68 and 70 m ASL below the escarpment along the perimeter of the waste footprint. The landfill expansion approvals received in 2009 added 3,600,000 m^3 of air space bringing the total estimated waste capacity for the site to 7.6 million m^3, which included the previously approved capacity of 4 million m^3.

Prior to expansion, cell development in the north central part of the landfill footprint (Phases 4&5 on Drawing 2.4) consisted of stripping topsoil and excavating native sand and clay soils to the required elevations for the construction of a leachate collection system. These base grades varied from 69.5 m ASL at the low point of the system along the east edge of Phase 8 at Grid Point M-16 to approximately 73.2 m ASL at the high point of the system in the N-W corner of Phase 4 at Grid Point F-7. The base grades were sloped downward at 0.5% draining in a south-easterly direction to the S-E corner of the cell (Grid Point M-16). The cell construction maintained gravity flow of leachate to the pump station located southeast of the waste footprint (Grid Q/R-16) entering the pump station at about elevation 67 m. Construction of the east cell expansion (Phase 1) was completed in 2015 with a leachate collection system overlying a clay floor ranging in elevation from 70.1 m to 72.1 m. Construction of the east cell expansion (Phase 6) was completed in 2019. Both cells in Phase 1 and Phase 6 drain to a pump station near Grid J/K-17. The design of the leachate collection system is summarized in Section 6.3.

The landfill will continue to be developed until the upper approved final waste contours are achieved. Figure 3.1 presents the current approved top of waste grades. The final cover, which at a minimum will have a 1.0 m thickness, will be superimposed on top of the final grades. Generally, an interim clay cover is constructed immediately upon reaching the approved fill heights in an effort to reduce water infiltration and the volume of leachate generated at the site. Clay cover has been placed in areas such as the north, west, south and southeast slopes and the top of waste where final waste grades have been reached in the area of Phase 3 and the north half of Phase 4.

Active landfilling continued from January through December of 2021 in the Phase 6 east cell area. Significant activities and capital works undertaken between January 1st and December 31st, 2021 included the following:

1. Active landfilling in the east cell (Phase 6);
2. Excavation of clay cover in the N-E quadrant of Phase 8;
3. On-going recycling operations at the facility;
4. Treatment of hydrocarbon contaminated soils in the material processing area of the site;
5. Screening of coarse granular soils to separate rock from soil for re-use;
6. Continued pre-treatment of collected leachate and disposal to ROPEC for off-site treatment;
7. Retained Dillon Consulting Limited to complete the reporting requirements under the National Pollutants Release Inventory (NPRI) for the 2020 calendar year; to assess the Greenhouse Gas Reduction Reporting as required under Ontario Regulation 347; to determine the reporting requirements under Ontario Regulation 390/18 – Greenhouse Gas Emissions Reporting and the Federal Government Greenhouse Gas Reporting Program;
8. Retained Golder Associates to carry out surface water, groundwater, leachate, gas and noise monitoring and reporting programs;
9. Added clay cover to completed fill areas of the landfill;
10. Constructed a new perimeter access road on the east side of the waste footprint;
11. Retained Base Mapping Ltd. to undertake aerial photography and produce an updated topographic map of the site;
12. Retained Les Entreprises Forlam Inc. to construct the perimeter 300mm diameter landfill gas collection pipe line along the north, west and south limits of the waste footprint;
13. Retained Farrell & Sons to construct the concrete pads for the enclosed landfill gas flare and abstraction plant; and
14. Retained Perennial Energy, LLC to manufacture, assemble, package, check, test, and deliver a Landfill Gas Extraction Plant and Enclosed Flaring System.

A brief description of the major activities and capital works follows.

3.1.1 Active Landfilling

From January through to the end of December of 2021, active landfilling was carried out in the east cell in Phase 6. Operations in this area focused on constructing an access road and a receiving pad for haul trucks and placing lifts over the drainage layer. Construction of the east buffer wall against which waste could be

placed was achieved with the use of treated soils placed along the east waste limit in Phase 6. Access to the active fill area was provided by a north-south access road along the west edge of the cell area running along the east side of grid line 14 then turning east at Grid Line J and into the cell then exiting at the N-W corner of Phase 6 near Grid Point E-15.

3.1.2 Cell Development

On-going cell wall construction of the east cell defined as Phase 6 was carried out concurrently as other landfilling operations progressed. Excavated clay from the N-E quadrant of Phase 8 was used to construct the cell walls along Grid Line D from Grid Lines 16-19 and along Grid Line 19 from Grid Lines D-G. Construction of the leachate collection system on the constructed sloped walls of the cell was completed by WCC personnel.

3.1.3 Processing (recycling)

Recycling operations continued throughout 2021 making use of an excavator equipped with a grappler and magnet for the removal of metals, wood and bulky items from the waste stream received at the active face. Wood and metals recovered were moved to a recycling area located on site within the waste footprint where metals and wood are stored for further processing and/or bulk removal. A resident mobile wood grinder is used on site to reduce the wood into chips suitable for use as bio-fuel at a local mill or re-used at a local organic waste composting facility. A Duratech EJ100 Wood Grinder was used for the grinding of recycled wood into wood chips. On occasion a wood grinding contractor was retained to assist with wood grinding operations. A refrigerant recovery program established at the site continued to assist clients wanting to properly dispose of their appliances containing refrigerants. Materials such as brick, concrete, rubble, clean roofing shingles and asphalt continued to be separated for beneficial re-use in the construction of access roads, turn areas at the active face and storage pads. Other materials recycled and/or re-used at the site consist of cardboard, drywall, glass, tires, electronic waste, batteries and propane cylinders found within the waste. Further details on recycling and material volumes are provided in Section 9.

3.1.4 Contaminated Soil Treatment

The treatment of hydrocarbon contaminated soils was on-going throughout 2021 in the soil processing area of the landfill along Grid Line O between Grid Lines 9 and 13 (refer to Dwg 2.4). A total of 38,593 tonnes of hydrocarbon impacted soils meeting the target parameters were received at the treatment area and re-used as a construction fill material in the east buffer along Grid Line 19 between Grid Lines D and P in accordance with ECA conditions for the site. A total of 30,769 tonnes of impacted soils were re-used as construction material within the waste footprint of the landfill.

3.1.5 Soil Screening Plant

A METSO rock screening plant was used for the screening of rock and rubble greater than 50 mm. This plant separates materials 150 – 600 mm and 50 – 150 mm. The rock was re-used as general fill and as construction materials such as rip-rap for drainage chutes and erosion control. Material finer than 50 mm was landfilled or re-used as cover material. A total of 26,484 tonnes of rock was re-directed from landfill airspace.

3.1.6 Leachate Management

Leachate generated by the landfill continued to be collected through a leachate collection system and directed to an on-site leachate pre-treatment/pumping station. In 2021, a total of 88,591 m^3 of leachate was pre-treated and pumped via force main to the City of Ottawa sewer system for final treatment at the Robert. O. Pickard Environmental Centre (ROPEC), the City of Ottawa wastewater treatment plant. The forcemain conducting leachate to the sewer system was flushed and cleaned twice in 2021. No operational problems with the leachate discharge operations at the landfill were reported for 2021.

3.1.7 Stormwater Management

Stormwater and snow melt water at the site is managed to direct surface runoff to the east and west watersheds using a series of natural and constructed ditches, swales, chutes, culverts and stormwater ponds. In 2019, a 237 m long culvert was constructed at the north and northeast corner of the cell in Phase 6. The culvert consists of a 900 mm diameter corrugated smooth interior HDPE pipe joined with bell and spigot c/w gasket and pre-fabricated concrete headwalls at both ends. A sediment trap was also constructed in front of the inlet structure. Construction of the north and north-east clay walls over the culvert in the Phase 6 cell was completed in 2020 and vertical extension of the clay wall continued in 2021.

3.1.8 Landfill Gas Monitoring

Monitoring of methane gas at the landfill site was performed by Golder Associates Ltd. on three separate occasions in 2021. Results of the monitoring programs and interpretation of the data are presented in Section 8 and Appendix '2' of this report. Construction of the candlestick flaring system for the Interim Odour Control System designed by Golder and approved by the MECP was completed in late 2011. In early 2012 the flaring system was commissioned and approved by the Technical Standards and Safety Authority (TSSA) and has since been in continuous operation.

In 2014, the landfill gas collection system was expanded to collect gas from the central manhole and from horizontal wells constructed at the top of the Phase 3 area in efforts to mitigate fugitive emissions from these areas. In 2016, additions to the gas collection system were required and five horizontal collectors were constructed. In 2017, seven vertical wells and one horizontal well were added. In 2019, four additional vertical wells were constructed in Phase 4. In 2020, one horizontal well was added at the north-west corner

of Phase 1. In 2021, the 300 mm diameter landfill gas collection pipe line for the permanent landfill gas collection and flaring system was constructed along the north, west and south limits of the waste footprint.

Dillon Consulting Limited was retained to complete the previous year (2020) reporting requirements under the National Pollutants Release Inventory (NPRI); to assess the Greenhouse Gas Reduction Reporting as required under Ontario Regulation 347; to determine the reporting requirements under Ontario Regulation 390/18 – Greenhouse Gas Emissions Reporting and the Federal Government Greenhouse Gas Reporting Program.

3.1.9 Noise Monitoring

Monitoring of noise levels at the WCC Navan Facility was performed by Golder Associates Ltd. at two points of reception (POR) for the period of November 1st to November 9th, 2021. Monitoring results are presented in a Technical Memorandum provided in Appendix 3. The noise levels at the two PORs are reported to be dominated by road traffic noise along Navan Road with audible noise from landfill operations of the WCC Navan Facility. The measured average hourly noise levels were equal to 48 dBA and 57 dBA at Monitoring Location 1 and Monitoring Location 2, respectively. The noise level at Monitoring Location 1 was below the applicable MECP Landfill Guidelines for landfilling operations noise limit, whereas at Monitoring Location 2 the average cumulative (i.e. ambient plus landfill) hourly noise level was 2 dB above the noise limit. Monitoring Location 2 is located on landfill property in close proximity to landfill activity. The nearest off site noise POR is some 100 m to the N-E of Monitoring Location 2 on the other side of the busy Navan Road. It is expected that the off-site noise POR would be lower due to increased distance and Navan Road traffic noise sources between the POR and landfill activities. Therefore, the Facility is expected to be able to operate within the compliance with the relevant noise limits based on the results of 2021 noise monitoring. It should be noted that the Facility is not a source of noise complaint from area residents.

3.1.10 Surface Water, Groundwater and Leachate Monitoring

Water quality monitoring programs are carried out twice annually for groundwater, and three times per year for surface water and leachate by Golder Associates Ltd. Surface water quality monitoring events were carried out on May 27th, August 24th, and November 24th of 2021. Leachate was also sampled by Golder at the pump station on May 27th, August 24th, and November 24th 2021. Groundwater quality monitoring was carried out in May and November 2021. Groundwater monitoring wells further in the Mer Bleue Bog were sampled in August of 2021 as frozen well conditions prevent winter sampling. Additional monitoring of surface water, groundwater and sediments requested by the National Capital Commission (NCC) in early 2000 was continued. Results of the monitoring programs and interpretation of the data reported by Golder Associates Ltd. are presented in Appendix '1' of this report and discussed in Section 7.

3.1.11 Closure

Closure consisting of placing clay fill material of at least 1.0m in thickness was continued where final waste grades were reached in the area of Phases 1 and 4. These areas are also used for staging excavated wet clay for drying and re-use purposes. Placing of topsoil and seeding will be carried out in these areas at a later date.

3.1.12 Aerial Photography

Base Mapping Co. Ltd. of Ottawa was again retained to undertake aerial photography of the Navan Waste Recycling and Disposal Facility. Digitized topographic maps of the site with 0.5 metre contour intervals were obtained for May 1st, 2021. The 2021 topography with 2 metre contour intervals is shown on most drawings. To date, a total of 221,100 m^2 of the waste footprint has received clay cover as shown of Figure 3.2.

3.2 *Daily Site Operations*

The site continues to be operated in accordance with the approved Design and Operations report (Golder, 2008) and the amended Certificate of Approval. Daily site operations are described in the following sub-sections.

3.2.1 Access

The site is well serviced by Regional Roads, being located on Regional Road 28, locally known as Navan Road (refer to Figure 1.1). Most of the traffic at the site is generated by commercial vehicles which access the site via Innes Road (Regional Road 30) and Navan Road. The Tenth Line Road (Regional Road 47) and Milton Road (Regional Road 31) also provide access from East Ottawa (Cumberland Township).

Access to the site is provided by one entrance located off Navan Road. The gate is kept locked after hours to restrict access. The access road is paved between Navan Road and a distance past the scale house and wheel wash station (Grid Lines C-15). A well-maintained all-weather road provides access to the designated unloading areas. Other access roads are provided throughout the site allowing access to water management systems, material stockpiles, site facilities and equipment storage areas (refer to the Site Features Plan - Figure 2.4).

3.2.2 Hours of Operation

Approved hours of operation for the receipt of waste are from 7:00 am to 6:00 pm Monday through Saturday, inclusive, however the site generally closes at 5:00 pm on week days and 1:00 pm on Saturdays and statutory holidays. The site does not receive waste prior to 7:00 am or after 6:00 pm on these days. Waste acceptance outside of these hours requires the approval of the MECP District Manager. Operating hours may vary within the approved hours. On occasion and as required, Landfill excavation and equipment/site maintenance may occur outside these hours.

The site is secured after operating hours and includes sporadic security patrols by a security services contractor. No scavenging is permitted at the site.

3.2.3 Site Staffing

WCC routinely reviews and monitors its staffing needs for the site and adjusts the staffing level accordingly. Currently 23 fulltime equivalent employees (FTE) are employed locally at the site including management, sales, administrative, clerical, and operations personnel. University and/or college students are also retained to assist with general landfill task and fulfil the work requirements of their co-op program.

The number of employees at the landfill site is variable from time to time and is based on the workload which can be seasonal and personnel turnover. Throughout the year, part time personnel or contractors are hired to perform general tasks such as grass cutting, general site clean-up, minor site maintenance work, surveying, traffic control, etc. Personnel from other WCC districts are also called upon from time to time to assist with landfill operations. When required, contractors are also hired for task specific work such as maintenance, security and landscaping.

3.2.4 Equipment

The following equipment was in use at the landfill site in 2021:

1) 1- 826G & 1- 826H CATERPILLAR WASTE COMPACTOR
   - levelling; compaction; grading of waste

2) D7R CATERPILLAR BULLDOZER (C/W LANDFILL PKG)
   - levelling; placing; grading of waste

3) D6N LGP CATERPILLAR BULLDOZER
   - Levelling; compaction; grading; earth works

4) D6T XW & D6T LGP CATERPILLAR BULLDOZER
   - Levelling; compaction; grading; earth works

5) Volvo EC340DL EXCAVATOR
   - excavating; levelling; ditching; grading; soil movement; berm construction

6) CAT 330 WH EXCAVATOR C/W GRAPPLER
   - recycling; excavating; levelling; ditching; grading; soil movement; berm construction; processing; box scrape outs

7) Volvo EC220 EL EXCAVATOR C/W GRAPPLER AND MAGNET
   - recycling; excavating; levelling; ditching; grading; soil movement; berm construction; processing; box scrape outs

8) JOHN DEERE 310J BACKHOE (C/W ATTACHMENTS)
   - excavating; recycling; levelling; ditching; grading; snow removal; box scrape outs

9) CAT 420F BACKHOE (C/W ATTACHMENTS)
   - excavating; levelling; ditching; grading; snow removal; box scrape outs; tree planting

10) 1 – 730 CAT ARTICULATED TRUCK
- 6-wheel drive truck / earthworks; daily cover

11) 2 - A25E VOLVO ARTICULATED TRUCK
- 6-wheel drive truck / earthworks; daily cover

12) 1 - CAT 950H LOADER
- material loading; snow removal; processing; road maintenance

13) 1 - CAT 950M LOADER
- material loading; snow removal; processing; road maintenance

14) DURATECH EJ100 WOOD GRINDER
- wood and drywall grinding

15) 2- MACK ROLL-OFF TRUCK
- on-site container management; dust control

16) PICK-UP TRUCKS AND ALL-TERRAIN VEHICLES
- site access; road sweeping; snow removal; magnetic sweeps; salting

17) 1 TON DUMP TRUCK (c/w SNOW PLOUGH)
- For general use and snow removal both on-site and off-site

18) 3-35 HP LEACHATE PUMPS
- available throughout the year for leachate management

19) 2- 100 MM GORMAN RUPP PUMPS AND ADDITIONAL GENERAL PURPOSE PUMPS
- available for the handling of leachate and surface water

20) TANKER 22.7 m^3 (5,000 GAL.)
- On-site water needs (dust control; clean roadways; flush leachate MHs etc.)

21) 100 KW GENERATOR, 40 KW GENERATOR AND 20KW GENERATOR
- Power supply for the candlestick flare
- Power supply for the odour misting system
- Pump Station backup power supply.

22) KUBOTA UTILITY VEHICLE
- Equipped with snow blowing and lawn mowing equipment.

23) ARGO UTILITY VEHICLE C/W TRACKS
- All terrain vehicle.

24) LIGHT TOWERS
- Landfill and recycling area lighting and power supply for equipment.

25) METSO SCREENING PLANT
- Screening of oversize materials from soil and rubble.

Vehicles are equipped with 2-way radio equipment along with hand held portable 2-way radios utilized for on-site communication between equipment operators, supervisors, spotter, weigh scale attendants, maintenance personnel and site office.

The size and type of equipment available on site handles the every day and long-term operation of this engineered facility. Additional equipment is brought on site as required to supplement or replace the WCC heavy equipment during repair programs or for special projects.

3.2.5 Equipment Maintenance

A maintenance building completed in 2009 is used for equipment repairs and storage of parts, tools and supplies. A comprehensive preventative maintenance program is in place and equipment maintenance is fully documented. A maintenance schedule is followed in a strict manner. WCC's own staff mechanics perform all lubrication and oil changes as well as most vehicle repairs. Qualified equipment dealers perform major repairs and warranty work when required. A daily pre-trip and post-trip inspection of all equipment in use is performed by equipment operators.

All machinery is equipped with fire suppressant and first aid equipment. First-aid stations are located at various locations on site.

On-site personnel are able to perform routine maintenance on all machinery and employees are trained to operate and maintain different pieces of equipment. A daily, weekly and monthly equipment inspection is carried out and documented for each piece of equipment. Daily records of fuel, lubrication consumption, and hours of operation are maintained.

3.2.6 Scale House and Small Vehicle Pad

Two full-time employees operate the scale house. Two 100 tonne Rice Lake scales installed in early 2009 are in operation to reduce traffic congestion on Navan Road. All vehicles are weighed upon entering and leaving the landfill. Drivers must exit their vehicle and sign the weigh bill at the scale house. The scale clerk records the name of the client, the origin of the waste (customer), the type of waste, driver identification, truck identification and notes using a grid system where the waste was placed within the landfill. All records from these transactions are maintained at the site office and recorded in WCC's computer records.

The scale clerk has contact with the site office, spotter and equipment operators at all times. The site cannot be opened unless the scale clerk and an operator/spotter are present. Rejected loads of waste are recorded and reported to the MECP and a record is kept on site.

A small vehicle unloading area was built southeast of the weigh scales to service small vehicles and promote recycling. The paved area is maintained and kept clean at all times. Concrete bunkers were added in 2012 west of the small vehicle pad to add capacity for small loads of aggregate, shingles, asphalt, metals, wood

and recyclable windshield glass. These bunkers are also used to accommodate small waste vehicles preventing them from entering the landfill where commercial and heavy equipment activity is occurring.

3.2.7 Site Office

Management and administrative staff work in an office/maintenance building constructed in 2009 located north of the landfill near the Navan Road site entrance. The site office is open Monday to Friday during working hours of the landfill. All records are maintained at the site office. The site office is equipped with several computers to maintain landfill records, employee information and site operation manuals. Areas of active landfilling are recorded daily and referenced to a grid system. The daily operation of the landfill is carried out from this office.

3.2.8 House Keeping and Controls

(a) Site safety

All employees have been instructed in safety procedures and a Joint Occupational Health and Safety Committee meets monthly to discuss health and safety issues at the site. Managers have been tasked as Site Safety Leaders dedicating time to safety related programs, training and safety awareness. On-site employees have completed waste handling safety courses, GHS training (Global Harmonized System of Classification and Labelling of Chemicals), confined space entry, and CPR & basic first aid training courses. On-site first-aid stations are available on the equipment, maintenance facility, scale house, pump station and site office. On-site communication allows for quick response. Emergency spill kits are available at the maintenance garage and site office. All workers have been provided with personal protective equipment (PPE) and must wear hard hats, safety boots, reflective clothing and safety glasses. All vehicles have back-up alarms. A spotter directs all traffic and machinery at the working face of the landfill.

Employees have been instructed in the handling of special materials, in particular impacted soils and asbestos, a designated waste. All employees and haulers follow a documented protocol for the handling of these materials. In brief, the procedure is as follows:

No hauler is allowed to enter the site with these materials without prior approval. All haulers of these materials must give advance warning of their coming to the site. A time slot is then assigned for receipt of the material. A designated spot for the placement of the materials is prepared. Asbestos waste is landfilled and covered without any equipment coming into contact with the waste. Disposable safety coveralls, head covers and respirators are also available on site for the handling of special wastes.

Employees have been instructed as to the types of waste allowed and materials not allowed to be received at the site. All containers must be open and void of any liquid material before they can enter the site. Closed containers are refused. Waste that is inadvertently dumped at the site is either placed back in the hauler vehicle or stored in one of WCC's boxes for later removal. Hauled materials are inspected for any banned waste and the above procedure followed. Materials rejected from the landfill are reported to the MECP district office. Records of rejected waste and materials removed from the site are kept at the landfill site office.

(b) Scavenging control

No scavenging is permitted at the site. The spotter and equipment operators working at the active face strictly enforce this. On-site personnel carry out recycling of wood, metals and white goods in a controlled and manageable manner at the active face using heavy equipment specially equipped with a grappler and magnet. A small vehicle receiving pad is provided where waste from small vehicles can be received safely and materials can be sorted for recycling by the vehicle operator. Concrete bunkers were added to this area to further assist with the recycling of materials such as asphalt, aggregates, shingles, wood, metals and windshield glass. A program for the recovery of refrigerants is available and this service continued throughout 2021.

(c) Litter control

Litter has not been a problem at the Navan Waste Recycling and Disposal Facility because of the use of daily cover. Periodic checks are made of the finished and active areas of the site for litter. Litter fencing is maintained at the active working face and temporary fencing is maintained in areas of the landfill perimeter as a supplementary litter control measure. Fencing is cleaned of litter as required. At least twice each year WCC personnel collect litter accumulated in the ditches along Navan Road for a distance of 1 km to the east and west of the site entrance. No complaints related to litter were received in 2021.

(d) Vector and vermin control

The presence of vermin and vectors is not a problem at the site primarily due to the dry, non-putrescible nature of the waste stream. Periodic checks have proven that no problems with vermin exist at the site due to proper landfilling procedures. If vermin are detected at the site, a registered pest control company is retained to control the problem. Although some seagulls and crows do frequent the site in summer months, this is not considered a health or environmental problem because of the small numbers present. A bird scare permit has been obtained from the Ministry of Natural Resources. When required, pellet whistlers are shot into the air to control birds during business hours. Abell Pest Control was hired in 2018 to set up bait control stations at various locations throughout the landfill to monitor activity on site and continued their work throughout 2021. No complaints were received in 2021.

(e) Dust management plan

The landfill has the potential to generate fugitive dust emissions. Fugitive dust sources have been assessed in accordance with MECP guidelines. In order to minimize the potential for off-property impacts due to fugitive dust, the following practices are implemented at the site:

- Aggregate (e.g., gravel, crushed limestone) is spread over unpaved roads to reduce silt loading. Repeat applications of aggregate are done on an as-needed basis, dependent on the condition of the roads.
- Watering of unpaved roads is carried out to increase the moisture content of the surface material and reduce the potential for fugitive dust generation. Dust suppressants (e.g., calcium chloride,

wood chips) are also used, depending on the ability of watering to appropriately control dust. The frequency of application of water or dust suppressants to roadways is adjusted based on road conditions, weather conditions and traffic loadings. In 2021, watering of access roads for dust suppressant with the use of an on-site water truck was carried out on 142 separate occasions throughout the dry weather months. The company also owns a backhoe equipped with a road brush for sweeping asphalted surfaces. In addition to the use of on-site equipment, mud and dirt was removed from Navan Road and on-site paved roads by a subcontractor retained to vacuum sweep/flush paved surfaces on 9 separate occasions.

- A speed limit of 15 km/h is enforced while vehicles are traveling on unpaved roads. This limit is posted on site and communicated to users of the unpaved roads.
- Where possible, travel distances to material transfers and drop points are kept as short as practical to reduce dust generation.
- A wheel wash station was constructed in 2009 east of the weigh scales and scale house to wash vehicles exiting the landfill and to reduce mud drag-out onto Navan Road. The wheel wash station is operational during the non-freezing months of the year.

The site maintains a log to record the date and time of any fugitive dust complaints and a summary is provided in Appendix '4' – Schedule 'A'. This log also describes activities related to the investigation of the complaint and also records the mitigative measures implemented to address concerns raised. In 2021, WCC received no complaints related to dust or dirty roads.

(f) Noise control

The active face of the landfill operation is sufficiently set back from Navan Road to minimize disturbance resulting from noise. Berms and soil stockpiles are located between active fill areas and nearby homes and offices to act as a sound barrier. Landscaped berms have been constructed along Navan Road east and west of the site access as well as east of the wheel wash station. No complaints related to noise were received in 2021. Noise monitoring was carried out by Golder Associates Ltd. and results are presented in Appendix 3. The results and site observations indicate that elevated background noise levels exist at surrounding receptors due to road traffic noise along Navan Road including landfill activities. Based on these results, the operations of the Navan Landfill are considered to be in compliance with the MECP's Landfill Guideline and NPC-205.

(g) Aesthetic controls

Landscaped berms have been constructed along Navan Road and a tree planting program is in place to improve site aesthetics. Each year efforts are made to further improve site aesthetics. A fish habitat ditch was completed along the east limit of the site complete with vegetation, landscaping and other ditch features. In addition to drainage, the ditch also provides an aesthetic barrier to the landfill.

(h) Fire control

Fire control is maintained by the supervision of all staff including the scale staff, the spotter and equipment operators. A number of non-smoking signs have been erected throughout the site that warns users of the

danger of fire in the landfill. Personnel have been instructed on the procedures of handling a landfill fire. The use of the landfill compactor and soil as cover material does not allow a fire to persist. The excavator, compactor, loader and the dozers are available to isolate a fire. Spare cover material, available at the working face, will be used in conjunction with the landfill compactor to smother a fire. The proximity of the Ottawa Fire Department at Blackburn Hamlet (less than 5 kilometres) will allow any superficial fire to be put out in a timely manner. On-site security and the presence of employees who live adjacent to the site will allow for quick action in the event of fire after hours. All machinery is equipped with proper fire extinguishers.

(i) Odour Control (Odour Management Plan)

To ensure the WCC Navan Facility is operated in a manner that minimizes the impact from odour on the public and the natural environment, the following program is in place at the WCC Navan Facility to deal with odour issues.

(1) Odour Monitoring

WCC has a comprehensive program for monitoring odours and for taking remedial action in the event that odours become at all problematic in the operation of the WCC Navan Facility. Any unusual odour events and any measures taken to deal with odour at the site are recorded and filed on-site.

There are no Ontario Government standards for odour. There are no agreed-upon, empirical measurement protocols or odour thresholds that may be used in the operation of a landfill or processing facility. Consequently, the ultimate test of an effective odour-control strategy for any facility can only be that it produces no odour complaints from the surrounding community over an extended period of operation. The operators of the facility need to take preventative and other control measures to ensure that odours never reach a threshold where they can generate complaints. The best odour monitoring program available is to give responsibility to all staff working at the site to use their own senses to constantly monitor for excessive levels of odour on-site. While some level of on site odour is normal and acceptable, it can become a problem when these same odours register off the property. As well, the character of the odour is significant. Many 'aerobic' odours may be very inoffensive, even at a significant concentration, while even very low levels of the types of odour associated with anaerobic activity may be deeply offensive.

It is normal practice at the site to monitor odours in the following way. Every morning, when staff first arrives on the site, a general inspection is undertaken of the facility. While the site manager is looking for anything untoward, the presence of any odours likely to extend beyond the perimeter of the site will be of special concern. In addition, whenever any material at the site is being disturbed by the equipment used at the facility, staff on site periodically stand downwind of the work that is being done, and assure themselves that any odours being created are mild, indicative of fully aerobic activity, and are not likely to be carried off the property.

In the event staff on-site believes any odours may have some potential for off-site impact, they will drive to a location off-site and downwind from the work at the facility to determine at that moment if any off-site impact can be detected. If there is a detectable off-site impact, work on the site will be stopped immediately and remedial measures will be taken (see below). If no off-site impacts are detectable, work

at the site will proceed with caution, with further periodic inspections off-site. Remedial measures will again be taken as appropriate.

The key to this approach is that all staff is constantly vigilant for even mild odours produced on-site and will take actions to deal with those odours well before they become evident off-site.

A windsock and flag is installed on the site. This provides a strong visual reminder to site staff of existing wind conditions, such that they can make judgments as to the potential for off-site odours, given that day's planned activities.

No odour monitoring program is of much value unless there is a companion program to control those same odours, once they are detected. What follows is a stepped program, capable of dealing effectively with everything from the mildest odours to the most offensive. It should be noted that all of the measures described below can and are just as likely to be applied to only sections of a site, rather than to the entire site. The source of odour problems can commonly be quite localized.

(2) Prevention

The best odour control strategy is odour prevention. If experienced staff early in the process makes the correct, preventative decisions, odour will not be an issue. Although mild odours are experienced on-site from time to time, they are mild in nature and should not be noticeable off-site.

A perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends below the water table. This drainage system has significantly reduced, if not eliminated, the potential for off-site migration of LFG.

Monitoring of methane gas at the landfill site is performed on three occasions per year generally during the spring, summer and late fall or winter. Results of the monitoring programs and interpretation of the data are presented in Section 8 of this report.

A leachate pumping station has been constructed in the southeast corner of the landfill site and a forcemain connection to the municipal sewage treatment plant commenced in 2007. Presently, the disposal method of choice for leachate generated by the WCC Navan Facility is treatment at the Robert O. Pickard Environmental Centre, a waste water treatment plant. The use of leachate retention ponds has been discontinued. This eliminates the possibility of odours emanating from on-site treatment and leachate retention ponds.

As discussed an interim LFG odour control system was installed in 2011 and commissioned in April 2012. The purpose of the interim LFG odour control system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells as well as a series of horizontal extraction wells.

(3) Masking the Odour

Principally, these additional measures will consist of using physical, biological and/or chemical methods to mask the odours on the surface of the odour source, so that none of the odours contained within are

released to the environment. A number of proven masking techniques are available and can be used at the discretion of the site manager:

- Physically covering the surface of the odour source with a 15 centimetre layer of bulking material is often enough to block the release of most odours for a period of a day or more while remedial work is done;

- A number of biological inoculants are available commercially. These substances, when applied to the surface in a water solution, are felt to effectively reinforce aggressive aerobic activity on the surface by out competing any anaerobic colonies that may be present in the near surface area. In effect, this creates a bio-filter, and biologically processes anaerobic gases as they are released; and/or

- A number of chemical/nutrient mixtures are also available commercially. These substances, when applied to the odour source in much the same manner used with the biological inoculants, can have a very similar or even stronger effect. Manufacturers of these products claim that their compounds rapidly stimulate the growth of one desirable family of microorganisms or another, again to create a bio-filter effect.

Whatever the actual mechanism, these products have been proven effective in the field. In all cases, odour control strategies used at this level can be applied within minutes of the decision to use them, and the effects will be largely felt within 10-15 minutes of that application, if not sooner.

(4) Isolating an Odour Source

The last strategy will consist of using additional measures to isolate and neutralize the offending odour source material. The offensive material may be removed from the problem area, landfilled and covered immediately. This isolation strategy will be used at the discretion of the site manager.

(j) Contingency for winter operations

The following contingency factors have been implemented in the event that very cold conditions cause operating problems:

- Snow removal equipment

A variety of equipment is available for snow removal. Two CAT 950 loaders are mainly used for this purpose. A John Deere and a CAT backhoe along with a one ton truck equipped with snow ploughing equipment are also used. A Kubota utility vehicle equipped with snow blowing equipment is available to assist with snow removal along walkways and vehicle restricted areas.

- Cover material stockpiles

Impacted soil reserved for re-use as daily cover material has been stockpiled in certain areas of the landfill. In case of frost, an excavator equipped with ripping tooth is available for ripping through the frost line. The excavator and 6-wheel drive articulated dump trucks are used to move and stockpile cover as a contingency.

(k) Complaints Procedure

In the event that an odour complaint is received, either by the City of Ottawa or the MECP, it is expected that those parties will immediately contact WCC site staff and notify them of the problem. WCC staff will take immediate steps to determine the extent of the problem and whether or not it is caused by the facility. If the source of the complaint is deemed to be originating from the WCC Navan Facility, appropriate measures as described above will be taken to mitigate the problem. Again, all such measures taken will be documented and a record kept on-site. If the identity of the complainant is made known to WCC staff, staff will contact the complainant that day, listen to their description of the problem, advise them in detail of the measures taken to rectify the problem, and invite them to visit the facility at some point to see for themselves how the site is operated. WCC will also call them back to determine whether or not they have been aware of any other site related issues.

WCC staff has found in the past that this kind of immediate and personal attention goes a long way to building community support for a facility and builds community confidence in the management of the site.

The site maintains a log to record the date and time of any complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. A summary of complaints received in 2021 is provided as Schedule 'A' in Appendix '4'. In 2021, WCC personnel received 1 odour related complaint. No other complaints were received by site personnel in 2021.

(l) Record Keeping

Record keeping is in accordance with the requirements of the ECA and as described in the D&O (Golder, 2008) as follows:

Site inspection records and daily waste records are retained at the site for a minimum period of two years. The records include the following information:

a. Type and estimated amount of waste received at the site for landfilling and processing;
b. Area of the site in which landfilling operations are taking place;
c. Type, source and amount of daily and intermediate cover used;
d. Waste types and quantities of recyclable wastes received at the site;
e. Source of their generation (e.g. customer);
f. Waste types and quantities of recyclable wastes transferred off the site;
g. Destination of recyclable wastes transferred off the site;
h. White goods tag numbers tagged at the site;
i. Types of wastes and quantity transferred from the processing area into the landfill area;
j. The calculated total quantity (including volume or weight) of waste remaining on-site at the end of each day;
k. Records of any dust suppression activities undertaken at the site;
l. Maintenance and repairs performed on the equipment used at the site;

m. Records of complaints received and actions taken to resolve them;
n. Summary of emergency situations and actions taken to address them; and
o. Any environmental and operational problems and any mitigative actions taken.

3.2.9 Waste Acceptance and Placement

The mechanics of waste placement at the active disposal face are described as follows:

1. Procedures are in place at the site to pre-screen all special waste materials prior to arrival at the site. Generators/haulers are required to provide information related to the type of waste to be delivered at the site and complete and submit a computer generated or hard copy Special Waste Approval Form which is screened prior to approval by WCC staff. Once approved, an Vehicle Code (VC) number is provided and must be presented at the scale prior to entry to the site.

2. The gate clerk registers all vehicles entering the site at the weigh scale. Vehicles are weighed and directed to the active disposal face. Light vehicles are diverted to an unloading area near the entrance to the site and do not enter the working area of the landfill. Appropriate signs are posted to indicate clearly where vehicles are to unload.

3. Vehicles reach the active face via a well-maintained gravel surfaced access road. On arrival, they wait until a ground worker screens the load and directs them to back into the active working face. The working face length is confined to as small an area as possible, but generally is wide enough so that 6 to 8 trucks can operate safely in the working face area at any one time. After dumping, the trucks move a distance of several metres from the active working face where they can be cleaned by the truck operator.

4. Waste is placed and compacted on the active working face using a "push down method" and/or a "push up method" to an average depth of approximately 60 cm.

5. A landfill D7 dozer is used to spread and level the waste as it is received. An 826 CAT compactor works on top of the refuse and compacts and shapes the waste into place. Between 3 and 5 passes with this equipment are made before the required density is obtained. Additional waste is spread evenly by repeated passes of the dozer and compactor to a total average lift depth of 2.5 to 3 metres.

6. Cover material is placed daily and as required. Generally, impacted soil hauled to the active face is used as cover material and spread into a minimum 15 cm thick layer. Areas not visited for an extended period of time are covered with a minimum of 25 cm of interim cover material.

7. All weigh tickets are kept on site along with daily and monthly summaries which are available for review. All rejected waste loads are reported to the Ministry of the Environment, Conservation and Parks (MECP) district office in Ottawa and a record of the report is kept on site.

8. Asbestos waste is landfilled in accordance with Section 17 of Ont. Reg. 347. These procedures consist of the following:

    a. Personnel involved in the disposal of asbestos are trained to recognize the related hazards.

b. Asbestos is accepted only in containers/bags and not in a loose form. Care is taken to ensure that staff and equipment do not come into contact with the asbestos.
c. Asbestos is accepted only with 24 hour pre-notification.
d. Personal protective equipment including disposable coveralls, head covers and respirators are available for the handling of special wastes.
e. Prior to the arrival of asbestos on-site, a trench is excavated to receive the material.
f. Other operations in the immediate vicinity of the trench are temporarily suspended while the containers are emptied in the trench.
g. The trench is immediately covered over with at least 1.25 metres of waste or cover soil.

9. Refrigerant containing appliances are received and handled in accordance with the following procedures:

a. When refrigerant containing appliances are identified in the waste load, the client will be notified and given the opportunity to reclaim the unit(s) and remove it from the site and a rejected waste form shall be completed by scale personnel if the unit is reclaimed for removal;

b. Should the client/driver not reclaim the refrigerant containing unit(s), scale personnel shall be notified immediately and the unit(s) shall be recorded on the weigh ticket and the unit(s) shall be removed by landfill or recycling personnel and taken to a designated area on the recycling pad taking all necessary precautions not to damage the refrigerant containing unit;

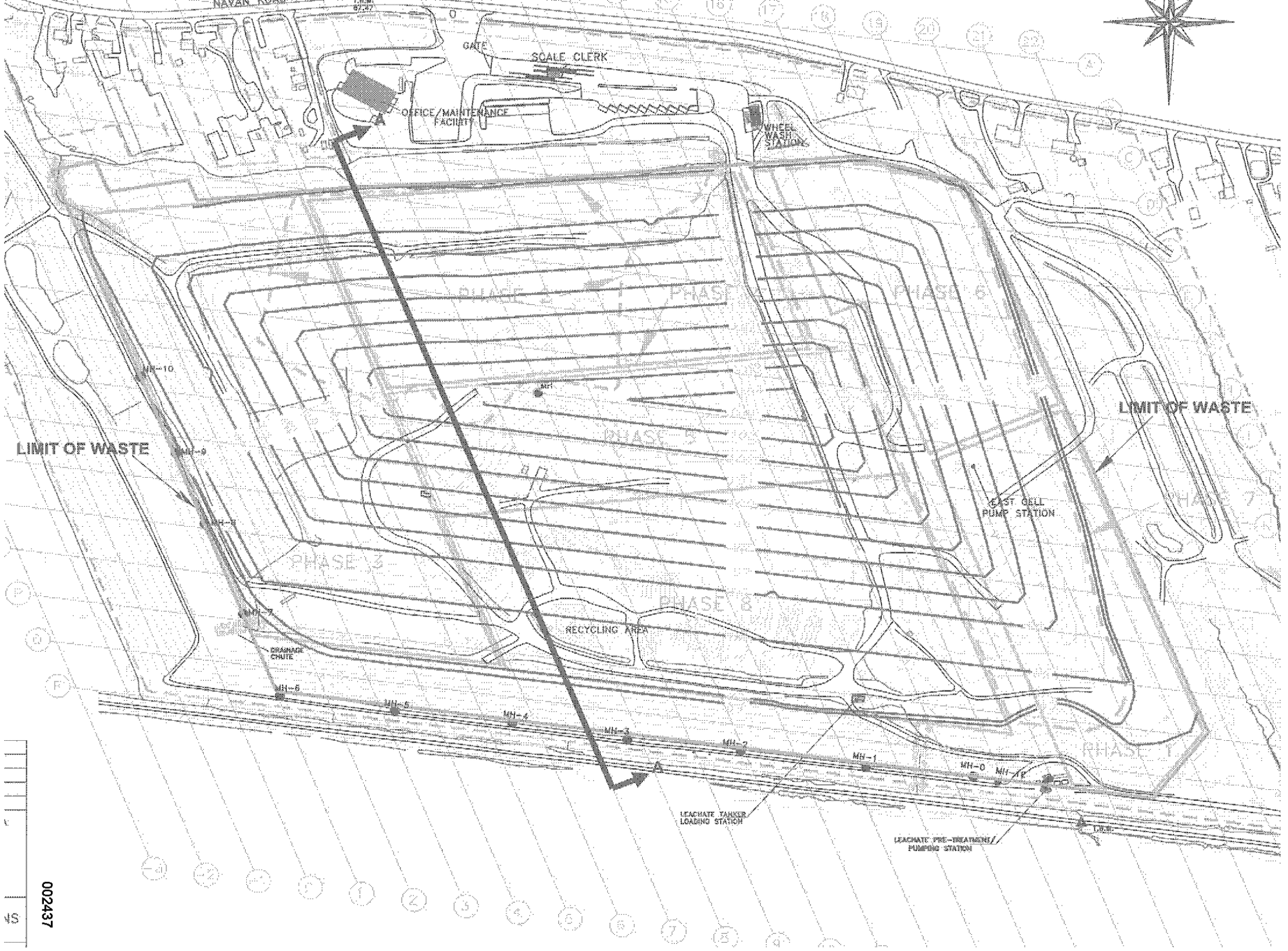
c. Every effort shall be taken by personnel to store the refrigerant containing unit in the designated area on the recycling pad in an orderly manner that is accessible to the refrigerant removal technician and in an up-right position or, if not possible due to damage, in a manner to prevent damage to the refrigerant containing unit.

d. Once a sufficient number of units have been stored for removal of refrigerants, or once quarterly, a certified technician shall be retained to safely remove all refrigerants and certify them as completed and a record of the certification shall be kept on file;

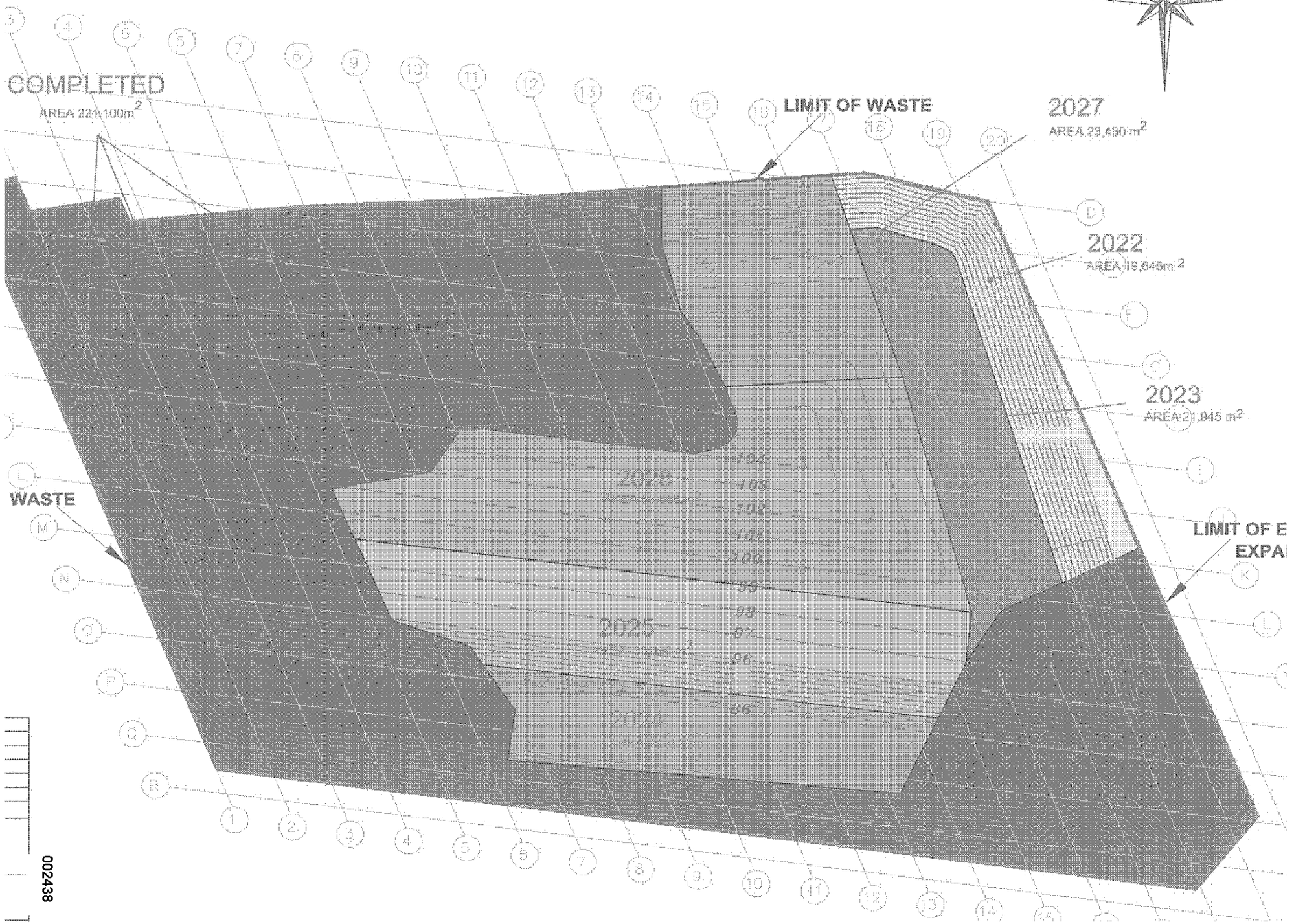
e. Once the unit has been certified it shall be available for removal as scrap metal;

f. The procedures noted above shall apply for all units received at the site that do not contain a refrigerant removal certificate, including those claimed to no longer contain refrigerant materials.

No waste is accepted, deposited or removed from the site unless the site supervisory personnel is present.


GATE
SCALE CLERK
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
PHASE 2
PHASE 6
PHASE 5
PHASE 3
PHASE 8
PHASE 7
MH-10
MH-9
MH-8
MH-7
LIMIT OF WASTE
LIMIT OF WASTE
EAST CELL PUMP STATION
RECYCLING AREA
DRAINAGE CHUTE
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-1A
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT/ PUMPING STATION
002437

NAVAN WASTE RECYCLING AND DISPOSAL FACILITY



4. WASTE QUANTITIES AND CHARACTERISTICS

Major private haulers as well as small haulers serving all segments of the Ottawa community, Eastern Ontario and the Outaouais are served by the Navan Waste Recycling and Disposal Facility. Materials processed at the site in 2021 consisted mainly of contaminated soils, construction and demolition waste, IC&I waste including asbestos waste as well as general dry waste and recyclable materials. Materials received at the site for re-use included brick, rubble and small concrete as aggregate, asphalt, granular materials and clean roofing shingles for road/pad construction material. Impacted non-hazardous soils were also received for re-use as cover material or treated for re-use outside the designated air space in accordance with approvals received for the site. Materials such as metals, wood, glass, drywall, cardboard, white goods, tires and electronics were also recycled and removed from the site.

All materials received at the site are weighed upon arrival on one of two scales located at the entrance to the facility. During 2021 a total of 513,078 tonnes of waste and other materials were received at the site of which 190,415 tonnes were landfilled. The total tonnage and number of loads are summarized in Table 4.1 below.

Table 4.1: WCC Material Tonnage, Jan.1 – Dec. 31, 2021

	Tonnage	No. of Loads
Total:	513,078	67,219
Total Landfilled:	190,415	N/A
Total Reused/recycled:	322,663	N/A
Monthly Average:	42,757	5,602
Daily Average:	1,650	216

The above material tonnage received in 2021 includes waste landfilled, recycled waste materials, treated contaminated soils, rejected waste removed from the site and other materials received for re-use at the site.

The material distribution is as follows:

- Tonnage landfilled totalled 190,415 tonnes (37.11%) and included IC&I waste, C&D waste and other materials that were received and directed to the active working face for landfilling;

- Recyclable materials such as cardboard, tires, glass, drywall, e-waste, wood, metals and white goods taken off-site to market totalled 5,074.24 tonnes (1.0 %);

- Waste materials rejected and removed from the site by WCC for alternative disposal at a licensed facility totalled an estimated 36 tonnes (0.01%).

- Special materials such as storm sewer screenings and impacted non-hazardous soil received at the site for re-use as cover material totalled 173,546 tonnes (33.82%).

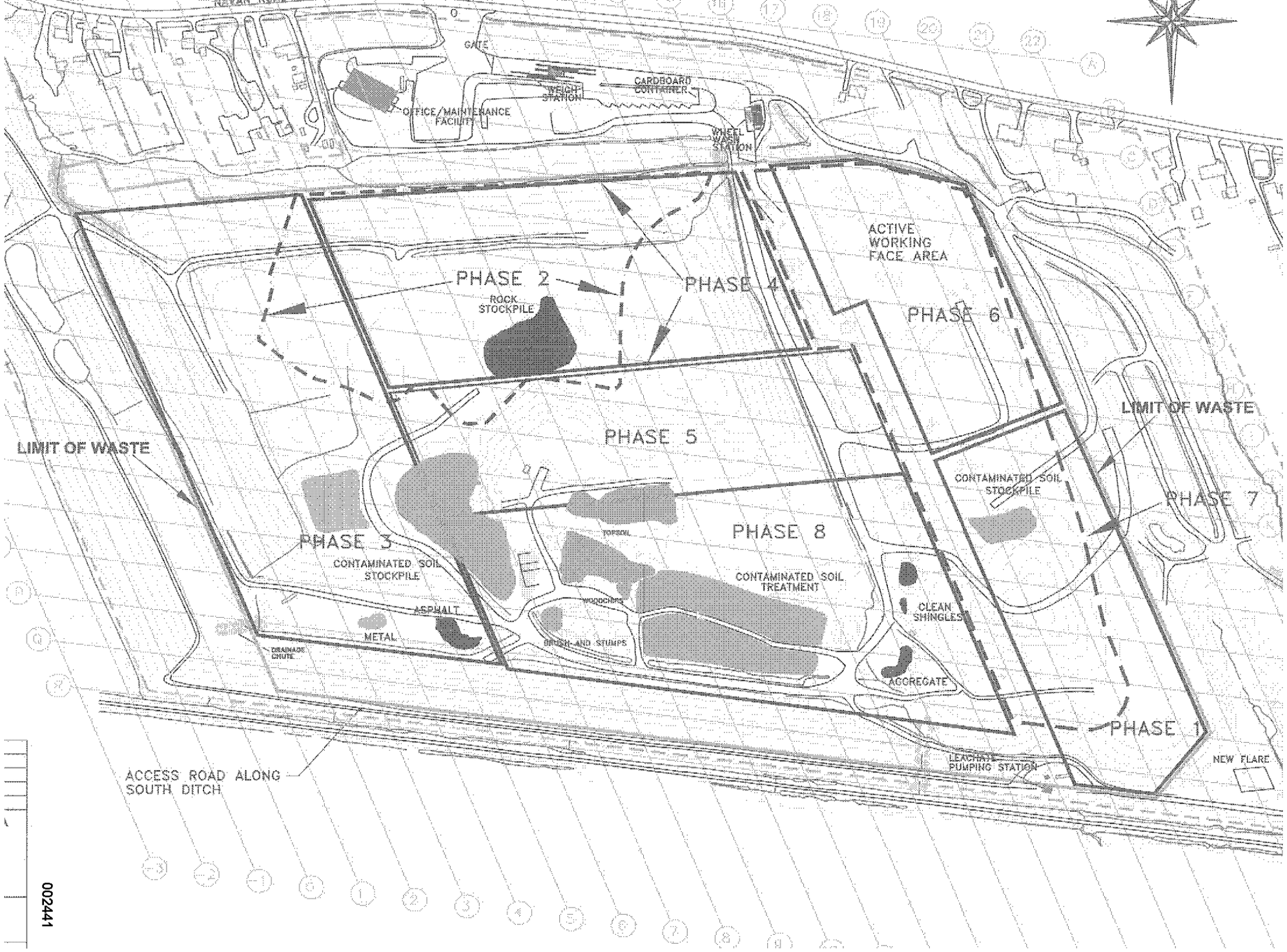
- Impacted soils treated or re-used on site totalled 95,846 tonnes (18.68%).

- Rock, brick, concrete, aggregate, shingles and rubble received and re-used on site as aggregate totalled 40,041 tonnes (7.8%); and

- Clean fill, topsoil and asphalt re-used on site for final grading, road/pad construction and engineered fill totalled 8,120 tonnes (1.58%).

Additional materials were recovered from on-site excavation such as soil, concrete, boulders, stumps and metals and re-used on site or recycled. These materials however, were already on site and were not part of the inbound receipts.

All weigh tickets are kept on site along with daily and monthly summaries, which are available for review. All rejected waste loads are reported to the MECP district office in Ottawa and a record of the report is kept on site. A monthly summary of material tonnage received in 2021 is provided as Schedule 'B' in Appendix '4'. The location of materials stockpiled on site is shown on Figure 4.1.


GATE
WEIGH STATION
CARDBOARD CONTAINER
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
ACTIVE WORKING FACE AREA
PHASE 2
PHASE 4
PHASE 6
ROCK STOCKPILE
LIMIT OF WASTE
PHASE 5
LIMIT OF WASTE
CONTAMINATED SOIL STOCKPILE
PHASE 7
PHASE 3
TOPSOIL
PHASE 8
CONTAMINATED SOIL STOCKPILE
CONTAMINATED SOIL TREATMENT
WOODCHIPS
ASPHALT
CLEAN SHINGLES
METAL
BRUSH AND STUMPS
DRAINAGE CHUTE
AGGREGATE
PHASE 1
LEACHATE PUMPING STATION
NEW FLARE
ACCESS ROAD ALONG SOUTH DITCH
002441

5. SITE CAPACITY AND LIFE EXPECTANCY

The capacity of the site is a measure of the amount of compacted waste that can be incorporated into the site in a series of lifts in accordance with the approved top of waste elevation contours as shown on Figure 3.1. The total site capacity includes the total volume of daily cover material used for lift and cell construction. The estimate of air space remaining does not include the final cover materials that WCC will place once the waste pile has reached the approved fill height.

Some of the factors that continue to influence the estimated life remaining at the Navan Waste Recycling and Disposal facility are as follows:

- Volume of waste permitted by the approved top of waste elevation contours;
- Annual and daily material tonnage received at the facility for landfilling;
- Characteristics (bulk density) of the waste materials being landfilled;
- Compaction energy provided during the placing of the waste;
- Volumetric cover to waste ratio;
- The degree of cell development optimisation;
- Operational factors such as recycled waste removed from the site and the exclusion of bulky, non-compactable materials that cannot be readily incorporated into the working face;
- The re-use of waste materials received as an alternative construction material for roads and unloading pads;
- The treatment of contaminated soils;
- The removal and re-use of rock and concrete from waste;
- The volume of loose non-compactable asbestos waste received at the site and cover material required to properly dispose of asbestos waste;
- Water infiltration and rate of biodegradation of the waste; and
- Settlement/consolidation of the waste pile and underlying soft clay soils.

Factors affecting the remaining life of a site are many and varied and in fact, some will change daily. Therefore, such calculations will only provide a theoretical approximation of the expected life remaining. A factor, which appears to be changing year over year, is the bulk density of waste landfilled. Increased recycling efforts at the source with the diversion of heavy materials such as concrete, rock, brick and rubble along with increased efforts to recycle and divert materials from landfill impact on the bulk density of the waste placed within the air space used. Other factors that affect the in-place density include the volume of impacted soils landfilled; the lift placement and compaction energy used to compact the waste; the volume of daily cover used; the volume of impacted soils treated rather than landfilled as a waste material and the volume of bulky asbestos waste that cannot be effectively compacted following burial of this waste.

Information related to site life expectancy is important for the proper management of landfill operations. Daily records of waste landfilled or stored at the site are therefore necessary.

5.1 *Estimate of Air Space Used (ASU) - 2021*

A simplistic approach to the calculation of air space used (ASU) consists of assigning assumed in-place compacted densities to the various types of waste materials landfilled as described below:

- 2.0 tonnes/m^3 for cover soil material;
- 0.9 tonnes/m^3 for IC&I, C&D, and general waste materials;
- 0.9 tonnes/m^3 for excavated waste materials;
- 1.2 tonnes/m^3 for roofing materials
- 1.5 tonnes/m^3 for Special Waste Materials (Industrial Waste, Screenings, etc.)
- 0.4 tonnes/m^3 for asbestos waste
- 0.4 tonnes/m^3 for wood waste; and
- 2.0 tonnes/m^3 for materials that are re-usable such as soil, concrete, brick and masonry.

Based on the assumed waste density distribution indicated above, the air space used by waste received, cover material and re-used materials placed within the air space during 2021 as presented in Table 5.1 is estimated at approximately 327,100 m^3 and excludes materials diverted off site for recycling and some materials re-used outside the air space. Based on this approach, the weighted average of the in-place density for all of the materials used in the air space calculation for 2021 is estimated to be 1.32 tonnes/m^3.

Table 5.1: ESTIMATED AIR SPACE USED (ASU), Jan.1 – Dec. 31, 2021

Material	Tonnage	Average Assumed Density, (tonnes/m^3)	Estimated Volume (m^3)
Waste Materials Landfilled	161,431	0.9	179,387.5
Special Waste Material	47,837	1.5	31,891.3
Asbestos Waste	2,306	0.4	5,764
Daily Cover Soils	173,546	2.0	86,773
Re-use materials (aggregates, asphalt)	43,021	2.0	21,510.4
Shingles used for sub base on road/turn areas	2,152.8	1.2	1,794
Estimated Air Space Used	430,294	1.32	327,100.2

Golder Associates Ltd. estimated the air space used by measuring the volumetric changes from topographic mapping generated from aerial photography obtained on May 1st, 2021 and the previous year on April 28th 2020. The net estimated air space used (ASU) between the last two aerial survey dates was reported to be 319,316 m^3 resulting in air space remaining of 1,497,213 m^3. Records indicate that the ASU during that period was consumed by approximately 380,715 tonnes of waste, daily cover material and other materials resulting in a density calculation of 1.19 tonnes/m^3 for a 5-year average of 1.42 tonnes/m^3. The variance between the density calculations could be attributed to many factors including optimization of cell excavation, settlement of the underlying soft clay soils and surcharge loading of the waste pile, which influence the year over year volume calculations.

Active landfilling of waste materials and daily cover throughout 2021 was carried out in the east cell or area outlined as Phase 6 (refer to Figure 2.4). Of the 269,391tonnes of impacted soils received in 2021, a total 95,845 tonnes were treated and re-used in the east buffer or re-used on site. 139,150 tonnes of impacted soils were re-used as daily and interim cover and as cover over asbestos waste in accordance with O. Reg. 347 (17). A balance of 34,396 tonnes received in 2021 was added to the soil stockpiled on site for re-use as cover material and located on the south side of Phase 6 as shown on Figure 4.1.

The remaining air space volume of the landfill estimated by Golder Associates Limited is 1,497,213 m^3(as of the latest Aerial Survey dated May 1st, 2021). Golder Associates Limited estimated the remaining life of the landfill to be 5.1 years as of December 31st, 2021. This estimate was based on the remaining air space calculated as of May 1st 2021, a projected 179,909 m^3 of airspace to be consumed between the May 1st, 2021 survey date and December 31st, 2021, a 5 year average density of 1.42 tonnes/m^3 and projected future annual waste receipts and daily cover soils of 344,750 tonnes/yr.

The actual tonnage landfilled and re-used within the air space between May 1st and December 31st, 2021 was 326,890 tonnes as shown in Table 5.2 consuming an estimated volume of 244,244 m^3 based on assumed waste type densities shown yielding an estimated overall density of 1.34 tonnes/m^3 and remaining air space of 1,252,969 m^3 as of December 31st, 2021. Allowing for future waste receipts and cover soils of 344,750

tonnes/year consuming 242,782 m^3/year at a 5 year average density of 1.42 tonnes/m^3, the estimated life remaining would be 5.2 years.

Table 5.2: ESTIMATED AIR SPACE USED (ASU), May 1 – Dec. 31, 2021

Material	Tonnage	Average Assumed Density, (tonnes/m^3)	Estimated Volume (m^3)
Waste Materials Landfilled	114,839	0.9	127,598.9
Special Waste Material	40,350	1.5	26,900
Asbestos Waste	1,637	0.4	4,092.5
Daily Cover Soils	139,812	2.0	69,906
Re-use materials (aggregates, asphalt)	28,391	2.0	14,195.5
Shingles used for sub base on road/turn areas	1,861	1.2	1550.8
Estimated Air Space Used	326,890	1.34	244,243.7

As of January 1st, 2022 the life expectancy remaining for the Navan Waste Recycling and Disposal Facility under the present Environmental Compliance Approval is estimated to be 5.1- 5.2 years (2027) based on future projected annual waste receipts and cover soils of 344,750 tonnes/yr and a 5 year average waste density of 1.42 tonnes/m^3 as discussed above. As indicated, the actual life of the landfill will vary significantly based on in-place waste densities and waste mix, but also on annual waste tonnage receipts, the amount of waste diversion and recycling initiatives at the landfill and settlement of the underlying soft clays.

5.2 *Financial Assurance*

In compliance with Condition 15 of the Environmental Compliance Approval #A460702, Financial Assurance for the site is currently in place with the MECP in the form of a Surety Bond in the amount of $13,566,246.00. Amendment Notice 11 to the ECA A460702 dated June 19th, 2018 requires that Financial Assurance be reviewed at intervals of three (3) years commencing on March 31, 2021 (Condition 15(b)); that commencing on March 31st, 2019 the owner shall prepare and maintain at the Site an updated re-evaluation of the amount of Financial Assurance required to implement the actions required under Condition 15(a) for each of the intervening years in which a re-evaluation is not required to be submitted to the Director under Condition 15(b). A Financial Assurance re-evaluation prepared by Golder Associates dated March 26th, 2021 was submitted to the MECP. Based on this latest Financial Assurance evaluation to be reviewed and approved by the MECP, the Financial Assurance for the site has increased to $13,724,172. The next re-evaluation report to be submitted to the MECP Director will be due on March 31, 2024.

6. ENVIRONMENTAL CONTROLS

6.1 *Overview*

The key components of the environmental controls at the site are as follows:

a) Surface Water Controls:

- Ditches have been constructed to divert external flows around the landfill. These consist of north, west, and east diversion ditches, including a 237 m long large diameter drainage culvert at the northwest corner of the site;
- Drainage water generated within the landfill that does not come into contact with waste is diverted to the perimeter ditches. Surface runoff water is directed from the top of the landfill down drainage chutes lined with erosion protection;
- The east diversion ditch was constructed as a fish habitat and was commissioned in late 2009 following the South Nation Conservation Authority approval;
- A pond exists in the southeast corner of the site which serves as a storm water retention pond. The north and east parts of the site drain to this pond prior to discharge to the east diversion ditch;
- A pond exists in the northwest corner of the site which serves as a storm water retention pond. The northwest and west parts of the site drain to this pond prior to discharge to the north diversion ditch.

b) Leachate Controls:

- The landfill is underlain with native low permeability clay soil (i.e. a natural liner);
- A perimeter leachate collection system has been constructed along the west and south perimeter of the waste pile;
- A leachate underdrain and collection system has been constructed below the waste in the north 1/3 of Phase 3; below the waste in the east part of Phase 8; below the waste in Phase 4; below the waste in the east half of Phase 5; below the waste in Phase 1; and below the waste in Phase 6;
- The landfill will be covered with low permeability final cover material to reduce water infiltration. Final cover has been completed in parts of the landfill as shown on Figure 3.2.

c) Landfill Gas Controls:

- Riser pipes for the leachate collection system along the north, east and west perimeters of the waste pile have been capped and the interim landfill gas odour control system consisting of a landfill gas collection and flaring system was approved by the TSSA and commissioned in April of 2012. This system has since been in operation on a continuous basis;

- The landfill gas collection system was extended to the top of Phase 3 below the final clay cover in late 2014 as well as a connection to the central MH to control odours generated from these areas. Additional horizontal gas collectors were added to this system in 2016 and 2017 and 2020. In 2017, 5 vertical wells were added in the Phase 3 area and 2 vertical wells were added in the south east corner of the Phase 1 area. In 2019, 4 vertical wells were added in the Phase 4 area of the waste footprint.

- The leachate collection system and maintenance holes along the west and south waste boundaries serve as a passive venting system.

- In 2017, a misting system comprising of a 300 m perforated HDPE line and blower powered by a diesel generator was constructed on the west side of the main access road that runs along Grid Line 14 as an added odour control system.

Environmental control systems for surface water, groundwater, leachate control, and erosion control systems are discussed in greater detail in the Design & Operations Report (Golder 2008). For the purpose of this report, a summary of the systems presently in use and/or proposed is provided in the following sub-sections. Surface water, groundwater, leachate and landfill gas monitoring undertaken by Golder Associates Ltd. are discussed in Sections 7 and 8 of this report.

6.2 *Surface Water Management*

The overall objectives for surface water management at the site are as follows:

- Divert surface run-off and shallow ground water flows originating upstream of the site around the outside perimeter of the waste footprint;

- Maintain the pre-development drainage conditions and water balance to each watershed;

- Minimize the amount of surface water that comes into contact with waste (which must then be managed as leachate); and

- Maximize the removal of suspended sediment from surface water generated on site prior to its release to the downstream drainage systems.

The regional surface water setting of the landfill is discussed in Section 2.7 and existing surface water control features are shown on Figure 6.1. Existing controls can be summarized as follows:

a) Upstream flows originate from the north and northwest of the site. These flows are diverted around the landfill via ditches located along the perimeters of the site buffer zones.

b) A diversion ditch has been constructed in the north buffer of the landfill flowing east from the office/maintenance facility. A large diameter culvert was added in 2019 at the northeast corner of the waste footprint. This northern diversion ditch and culvert discharges into the east perimeter ditch. The east perimeter ditch conveys water southward into a storm water retention pond located at the southeast corner of the site. This pond discharges into an existing ditch along the landfill's south property line. The southern ditch drains under the VIA ROW near Grid Lines R-16 and flows onto WCC property and to the Mer Bleue drainage basin.

c) A diversion ditch has been constructed in the north buffer area flowing west from the office/maintenance facility. This ditch discharges into a natural drainage channel, referred to as the west perimeter ditch, flowing southward along the west perimeter of the property east of Grid Line -2. This ditch discharges at a location near the intersection of Grid Lines R and -2 and conveys flows westward to the Mud Creek drainage basin. Land through which this ditch flows is subject to a proposed residential development.

d) Clay cover has been placed on the north, west and south facing slopes of the waste pile as well as the top of Phase 3, the north edge of Phase 4 and the south half of Phase 1 where final waste grades have been reached as shown on Figure 3.2. Finished slopes are covered with clay soil, a thin layer of topsoil, graded and seeded. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control.

e) Landfill operations are carried out such that surface water is directed away from the waste to minimize water infiltration.

Surface water monitoring is discussed in Section 7.

6.3 *Leachate Management*

Leachate is generated from a combination of infiltration of precipitation into the waste pile as well as surface water and groundwater discharge into the landfill despite efforts to divert water around the waste footprint. Generation of leachate is minimized by grading the waste surface and placing low permeability cover materials over areas of the landfill that have been filled with waste in efforts to reduce infiltration from precipitation and to promote surface runoff.

Leachate generated by the landfill is collected by a collection system consisting of four separate components that all drain to a leachate pumping station in the southeast corner of the site. Figure 6.2 presents the leachate collection system in plan view.

1. A perimeter leachate collection system has been constructed along the southern limit of the waste footprint extending from Grid line 15 to Grid Line 1 and then approximately 330 m north

along the west perimeter of the waste footprint along Grid Line 1 to just north of Grid Line K. The perimeter leachate collection system was designed with a slope varying between 0.4% and 0.6% to provide gravity drainage to a collection point at the southeast corner of the site. The waste in the north 1/3 area of Phase 3 (Northwest Cell) was placed on a drainage blanket that connects to the west perimeter leachate collection system. This system consists of a granular trench with a 250 mm diameter perforated HDPE (Boss 2000) drainage pipe. Along the southern perimeter, the leachate collection system has been constructed with lateral granular filled hydraulic connector trenches into the waste pile. Access to the western and southern leachate collection system is provided by a series of manholes spaced at approximately 100 m intervals for monitoring and maintenance purposes.

2. The north area of the site below Phase 4 was constructed with a grid-type drainage network within a stone drainage layer underlying the waste. The leachate collection system in this excavated cell consists of 200 mm diameter perforated HDPE (Boss 2000) drainage pipe surrounded by 50 mm clear stone and non-woven geotextile laid out in a grid pattern spaced no more than 45 m apart. A network of French drains, consisting of clear stone wrapped in non-woven geotextile, placed between the drainage pipes reduces the drainage path along the floor of the cell to approximately 15 m.

3. An underdrain leachate collection system has been constructed beneath the waste located between Grid Lines 14 and 16 and south of Grid Line N and just north of the pump station consisting of a stone drainage layer and perforated drainage piping similar to the system constructed in the Phase 4 area to the north. A clay berm was constructed along Grid Line N to separate the two leachate collection systems located on each side of Grid Line N.

4. A fourth component to the leachate collection system consists of the east lateral expansion cell (Phases 1 and 6) designed by Golder Associates Ltd. and approved by the MECP as an amendment to the ECA No. A460702 Notice 1 dated October 9th 2009. This system in Phase 1 was completed in 2015 with Phase 6 completed in 2019. QA/QC was carried out by Golder Associates Ltd. and as-built reports were prepared by Golder Associates for each of the completed cells and submitted to the MECP. A leachate sump and pump is located at the northwest corner of Phase 1 to drain leachate from both the Phase 1 and Phase 6 areas.

Presently, the disposal method of choice for leachate generated by the WCC Facility is pre-treatment using air stripping followed by direct discharge to the City sewer system via a WCC forcemain. The leachate pumping station located at the southeast corner of the landfill site and leachate forcemain connection to the municipal sewer system on Renaud Road were completed in 2007 and commissioned in early 2008. Pre-treatment of leachate to reduce the concentration of H_2S and Volatile Organic Carbons (VOCs) using an air stripping system is carried out prior to pumping leachate to the municipal system. In 2008, cleanouts were added along the leachate forcemain to provide easier access for cleaning and maintenance. In 2011, the leachate pre-treatment and pumping station was expanded with the addition of higher capacity treatment chambers and higher capacity pumps to maintain discharge flows at the approved 17L/sec. The forcemain discharging to the City of Ottawa sewer system was pressure washed on two separate occasions in 2021 to clean the line and maintain unobstructed flows.

In 2021, a total of 88,591 m^3 of pre-treated leachate was discharged to the City of Ottawa wastewater system, a 33.3 % reduction over 2020. The decrease is attributed to efforts to decrease surface water

runoff into the waste. The monthly leachate volumes discharged are summarized in Table 6.1. The monthly and cumulative volumes of leachate pumped are shown graphically on Figures 6.3, 6.4 and 6.5. The peak month was March with a volume of 12,585 m^3. The daily average for the period of operation was 242.7 m^3/day.

Table 6.1: Summary of Leachate Volumes Discharged Off-Site in 2021

Month	Leachate Volumes (m^3) Discharged to City Sewer	Cumulative Leachate Volumes (m^3)
January	7,576	7,576
February	4,493	12,069
March	12,585	24,654
April	6,254	30,908
May	3,832	34,740
June	11,937	46,677
July	11,282	57,959
August	7,155	65,114
September	6,681	71,795
October	6,856	78,651
November	8,077	86,728
December	1,863	88,591
Total:	88,591	

Leachate monitoring is discussed in Section 7.

6.4 *Landfill Gas Management*

Landfill gas generation at the site is limited although its presence can be identified in the waste pile area by signs of dying vegetation and/or localized snow melt during the winter. Landfill gas is produced when organic waste decomposes. It consists primarily of methane (50%) and carbon dioxide (50%) as well as water vapour, nitrogen, and trace amounts of other non-methane organic compounds (NMOC). Non-putrescible waste received at the landfill does not generate landfill gas and methane at the same rate as municipal solid waste (MSW). Methane, which is explosive at concentrations greater than 5%, presents a health and safety risk both on-site and off-site. As a result, monitoring of landfill gas is carried out at the property boundary and within facilities located on site. In addition, passive gas ventilation systems and an active gas collection system at the site prevent the off-site migration of landfill gas.

The perimeter leachate collection system extends below the water table and prevents off-site migration of gas. Figure 6.2 provides details of the perimeter leachate collection system along the southern limit of the landfill.

As part of a commitment to control potential odorous emissions from the site, WCC has installed an interim landfill gas odour control system which will operate until the full-scale landfill gas collection system is installed at the site, which is expected in 2022. This interim odour control system, constructed within the existing landfill footprint, includes connections to leachate collection cleanouts, existing vertical landfill gas extraction wells, and to horizontal wells. This system also includes the installation of lateral and header piping, condensate management facilities, an outdoor skid-mounted abstraction plant, and a candlestick flare. During construction, leachate collection system cleanouts were excavated and the perforated pipe replaced with solid pipe and air tight connections. Tees were installed in the header pipe to allow for expansion of the system as required.

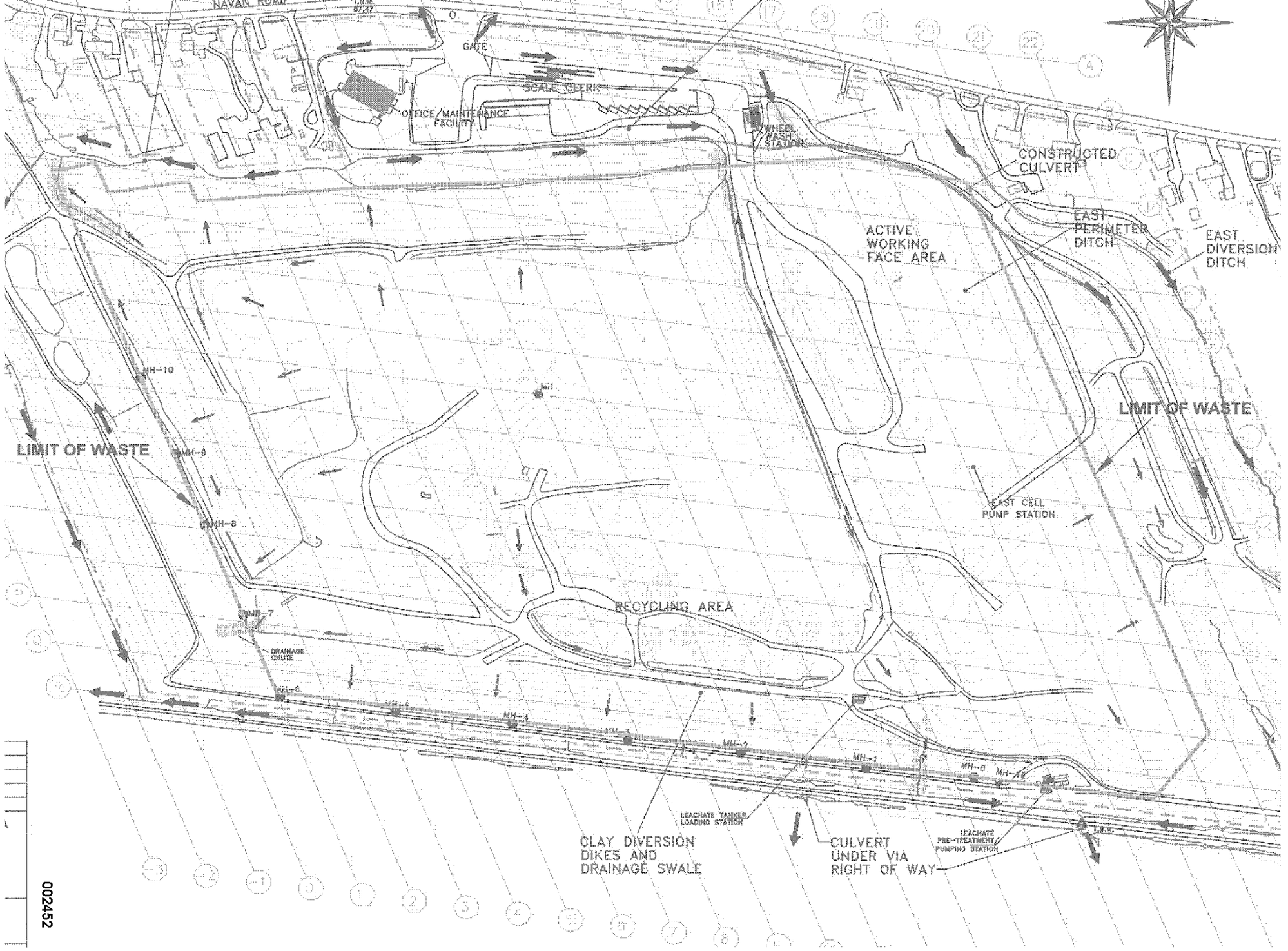
The interim landfill gas odour control system was installed in 2011 and commissioned in April of 2012. Additions to the LFG collection system which included horizontal and vertical wells were constructed in 2016, in 2017, in 2019 and in 2020. In 2021 the interim LFG system operated for 8,252 hrs at an average of 391 scfm with a totalizer reading indicating 5,801,695 m^3 of landfill gas was recovered at a methane (CH4) concentration of approximately 49.5%. A total of 2,871,839 m^3 of methane was flared using the interim landfill gas flaring system in 2021, a 1.81% increase in methane recovery from 2020 to 2021.

A monitoring program associated with the odour control system has also been implemented. Design of the full-scale landfill gas collection and flaring system has been completed by Golder Associates Ltd. and construction started in 2021.

Landfill Gas monitoring is discussed in Section 8.

6.5 *Buffer Zone*

The perimeter of the site is surrounded by a buffer zone which occupies an area of about 6.2 ha. In accordance with the ECA, a minimum buffer width of 30 m is maintained between the northern, eastern and western limits of the landfill area and the property boundary. A minimum buffer width of 10 m is maintained between the southern limit of the landfill area and a VIA Right-of-Way. WCC owns additional lands to the north, west and east of the landfill site as well as a 100m wide track of land south of the VIA ROW providing additional buffer space. No waste is deposited within the designated buffer zone. The limits of waste are illustrated on Figure 2.4.


NAVAN ROAD
GATE
SCALE CLERK
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
CONSTRUCTED CULVERT
EAST PERIMETER DITCH
EAST DIVERSION DITCH
ACTIVE WORKING FACE AREA
LIMIT OF WASTE
LIMIT OF WASTE
EAST CELL PUMP STATION
RECYCLING AREA
DRAINAGE CHUTE
MH-10
MH-9
MH-8
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-11
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT PUMPING STATION
CLAY DIVERSION DIKES AND DRAINAGE SWALE
CULVERT UNDER VIA RIGHT OF WAY

002452

NAVAN ROAD
GATE
SCALE CLERK
WEIGH STATION
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
NORTH WEST CELL
EXISTING 250mm DIA. I.D. PERFORATED HDPE PIPE
NORTHEAST CELL LEACHATE COLLECTION SYSTEM
MH-10
TOP MH 73.05
150mm DIA. I.D. HDPE LEACHATE FORCEMAIN
LIMIT OF WASTE
MH-9
TOP MH 73.07
MH-8
TOP MH 72.80
PHASE 3
PHASE 6
PHASE 7
EAST CELL PUMPING STATION
LIMIT OF WASTE
CLAY DYKE
PERIMETER LEACHATE COLLECTION SYSTEM
MH-7
DRAINAGE CHUTE
TOP MH 73.05
MH-6
TOP MH 72.75
MH-5
TOP MH 72.71
MH-4
TOP MH 72.64
MH-3
TOP MH 72.64
MH-2
TOP MH 72.64
MH-1
TOP MH 72.81
MH-11
150mm DIA. I.D. HDPE LEACHATE FORCEMAIN
SOUTH CELL
C.O.MH
LEACHATE TANKER LOADING STATION
LEACHATE PUMPING/ PRE-TREATMENT STATION

002453

Figure 6.3: Total Monthly Volume of Pre-treated Leachate Discharged to City of Ottawa Sewer

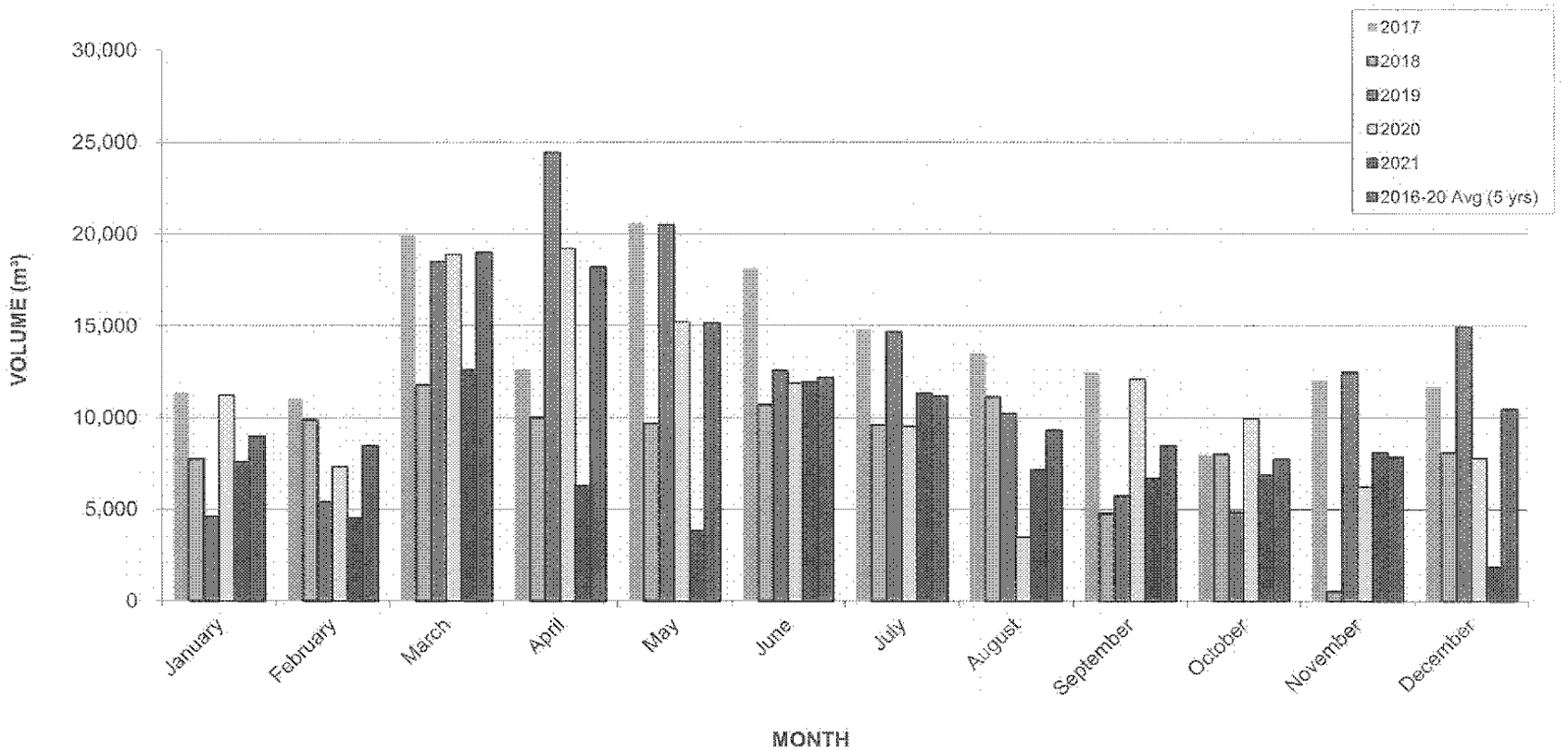


Figure 6.4: Cumulative Monthly Volume of Pre-treated Leachate Discharged to City of Ottawa Sewer

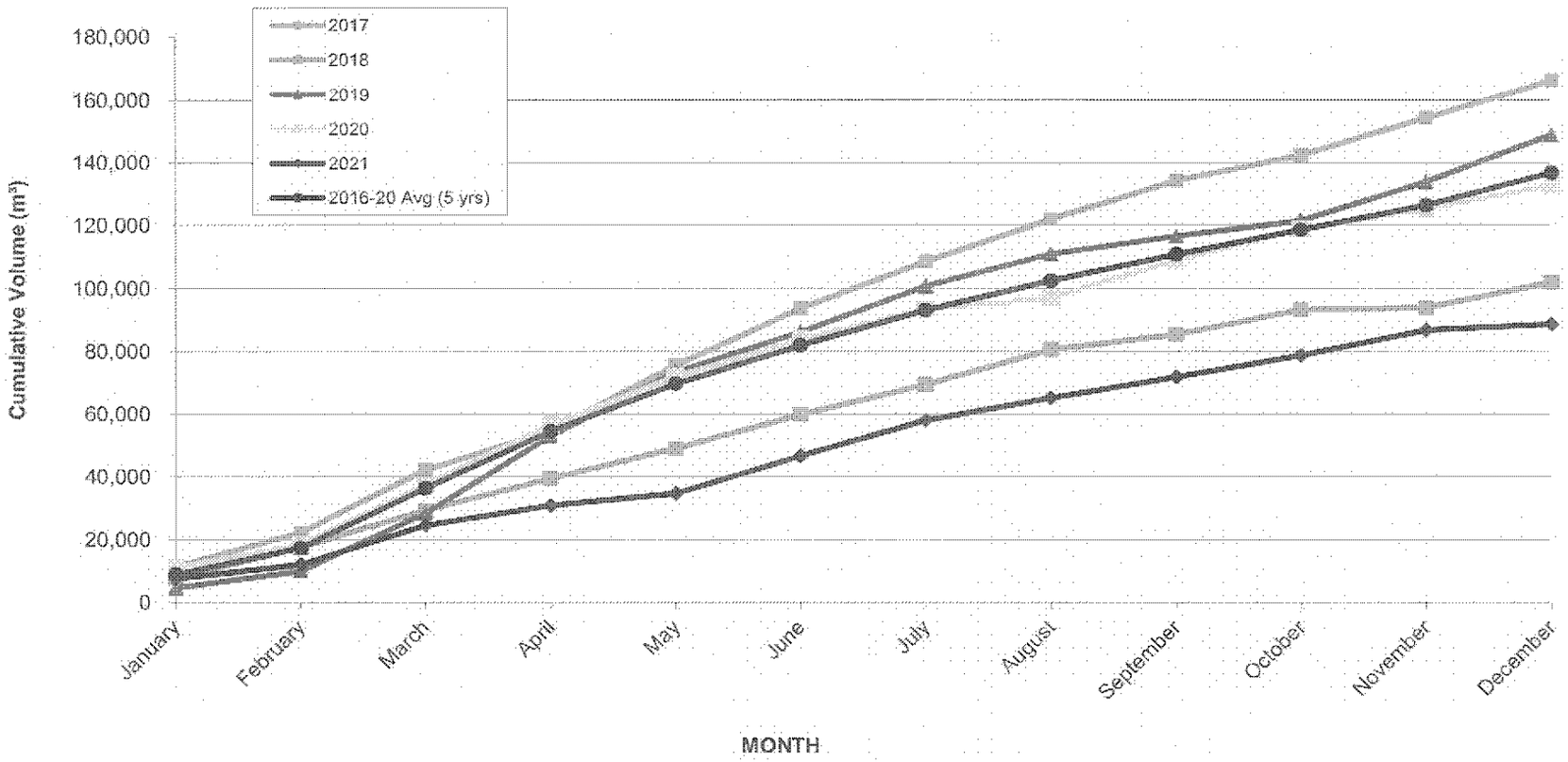
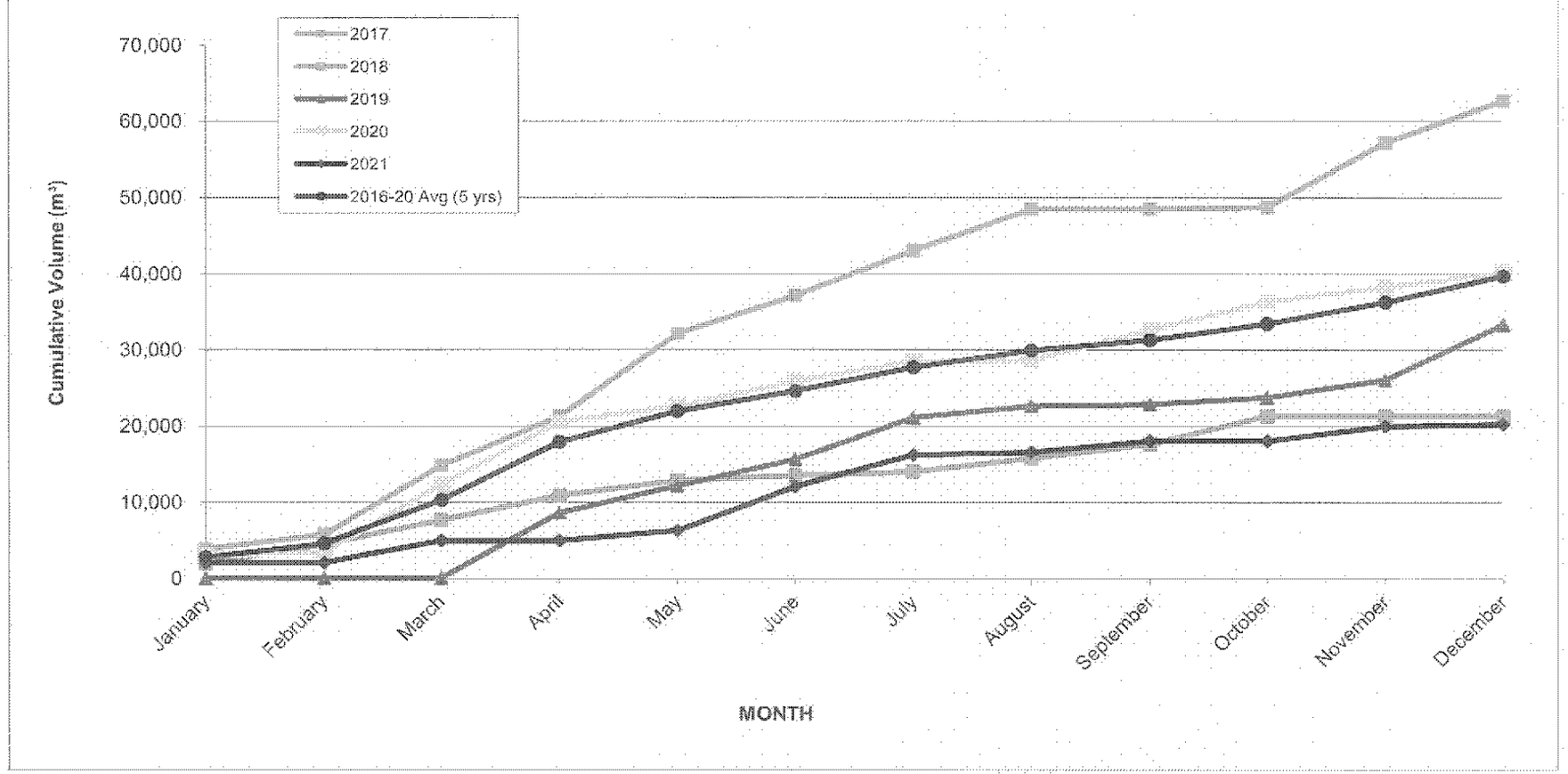


Figure 6.5: Cumulative Monthly Volume of Pre-treated Leachate From East Cell



7. WATER QUALITY MONITORING

Water quality monitoring undertaken to date at the Navan Waste Recycling and Disposal Facility consists of water quality analysis of surface water, groundwater, leachate and sediment. The location of water monitoring stations is shown on Figure 7.1. In 2021, Golder Associates Ltd. (GAL) was retained to carry out the annual water quality monitoring program and reporting requirements for the Navan Waste Recycling and Disposal Facility and prepare a report to fulfill the reporting requirements outlined in Conditions 135 and 136 of the Environmental Compliance Approval (ECA) No. A460702. The 2021 GAL report is attached in Appendix 1 and summarized below.

The following summary highlights key points only; for complete information and findings it is necessary for the reader to examine the GAL report provided in Appendix 1.

The monitoring program undertaken in 2021 was a continuation of the monitoring program carried out in 2020 and followed the program outlined in Conditions 109 and 112 of the ECA and Condition 10.1 of the Conditions of Environmental Assessment Approval. As per Condition 109, the monitoring program includes sampling of the monitoring wells located in BH09-1 in order to assess the groundwater quality in the Mer Bleue Bog. The original monitoring program indicated the wells would be sampled during the winter, when the Mer Bleue Bog is frozen and the wells are accessible. However, the groundwater in the monitoring wells has frequently been frozen during these events. In the 2013 monitoring report (Golder, 2014), it was proposed to sample them during the summer, rather than the winter, and this recommendation has carried forward to the present (monitoring is now completed either in summer or in fall, depending on site conditions). Groundwater samples were successfully collected at monitoring wells MW09-1A, MW09-1B, and MW09-C during the summer monitoring session in August, 2021 (no sample was collected from monitoring well MW09-D due to dry conditions).

Groundwater monitoring sessions in 2021 were carried out by GAL on May 26, August 24 and November 30. Surface water monitoring sessions were carried out by GAL on May 27, August 24 and November 24. Leachate quality analysis was undertaken on samples obtained by GAL from the pump station (L5) on May 27, August 24 and November 24. The following is a summary of the results of the monitoring sessions undertaken in 2021 presented in the GAL report provided in Appendix '1'. Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected in August 2021. The monitoring wells screened in the intact clay deposit and in the glacial till/upper bedrock zone will be sampled again in the spring of 2023.

During the spring monitoring session, the condition of each well within the monitoring well network at the site was assessed. A summary of the findings of the 2021 monitoring well network condition survey (properly cased, capped and locked) are provided in Table 3 of the GAL report attached in Appendix 1. At the time of the condition survey it was observed that all monitoring wells were in good condition.

In addition, sediment quality is also monitored at three locations within the Mer Bleue Bog. The sampling locations are the same as the surface water sampling stations located within the bog, i.e., SED-W was obtained at SW-W, SED-C at SW-C and SED-E at SW-E (refer to Figure 7.1). This program was initiated

in 2000 at the request of the National Capital Commission (NCC). In 2021, sediment samples were obtained by GAL on May 27 and November 24.

A Monitoring and Screening Checklist prepared and signed by a Competent Environmental Practitioner (CEP) is included with the Golder 2021 Landfill Monitoring Report attached as Appendix '1'.

The objectives of the 2021 environmental monitoring program were:

- To comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of Environmental Compliance Approval No. A460702;
- To assess any potential impacts on water quality at the site resulting from landfill operations;
- To continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill;
- To document the chemical composition of groundwater and surface water in the vicinity of the landfill;
- To assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate; and
- To document the chemical composition of sediment at three locations in the Mer Bleue Bog.

7.1 Groundwater Quality Assessment

Groundwater has been monitored at observation wells since 1981. However, since 1985, landfilling operations expanded over the original down-gradient observation wells which have since been replaced with the existing wells. Existing observation wells were installed in 1992, 1994, 1995, 1998, 2005, 2007, 2009, 2010 and 2011.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as follows:

- a shallow surface sand layer at depths ranging from 1.5 to 2.5 m below original grade
- the weathered clay zone of a thick clay deposit at depths ranging from 3.5 to 4.5 m below original grade
- the intact clay deposit at depths ranging from 7 to 8 m below original grade
- glacial till/bedrock contact zone at depths ranging from 22.3 to 37.1 m below original grade

Monitoring wells are present up-gradient, at the down-gradient edge (used to assess compliance) and further down-gradient of the landfill in each of these units. The two upper stratigraphic units, the sand and weathered clay units, were sampled for both the May and November monitoring events. The two lower stratigraphic units, the intact clay and near bedrock units, are sampled every 18 months. Groundwater samples from these units were collected in November 2021 and the next sampling session for the monitoring wells screened in these units will be in the spring of 2023.

Based on the groundwater levels obtained during the 2021 monitoring program, no significant change in groundwater flow patterns was observed.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

Traditional methods of site compliance provide very limited useful and/or reliable parameters for assessment of the WCC Navan Facility; therefore, an alternate method must be used. The difference in hydrogeology across the site coupled with the very saline environment of the clay deposit that underlies the Mer Bleue clay have resulted in the MECP accepting that Guideline B-7 (RUPO) is not applicable at this site. The MECP's position in this regard was documented in a November 2000 memorandum issued by the MECP (MOE, 2000). Therefore, the Leachate Indicator Parameter list and the method to determine if leachate from the site is impacting local groundwater was developed in the Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The Leachate Indicator Parameter list includes alkalinity, ammonia, boron, chloride, hardness, magnesium, manganese and potassium.

After the completion of a monitoring session, the concentration of each Leachate Indicator Parameter for all groundwater locations used to assess compliance should be visually checked. If a parameter concentration appears to be elevated, a comparison to the background concentration range should be completed. The potential for an increase in concentration of a Leachate Indicator Parameter will be investigated by comparing the concentrations for each parameter to the background range for its corresponding stratigraphic unit. The background range will be derived from the maximum and minimum data obtained at the locations used to assess compliance from 1998 to present in each stratigraphic unit. In addition, data from monitoring wells MW05-3A to D located to the east of the site and not impacted by landfill leachate will be used to define the background range. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each location used to assess compliance are presented in time-concentration graphs in Appendix F of the GAL report (provided in Appendix 1). The background ranges will be updated annually using the most recent data if it is not deemed impacted by landfill leachate. An exceedance of the background range is considered an exceedance of the trigger mechanism and the implementation of the trigger format outlined in the trigger mechanism report should proceed.

Following the confirmed exceedances reported in the 2018 annual monitoring report (Golder, 2019), in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. Trigger results of the spring and fall monitoring sessions were reported by Golder, on behalf of WCC, to the MECP Ottawa District Office via email on August 8, 2019 and December 24, 2019, respectively. In accordance with the proposed course of action presented to the MECP in the 2018 annual monitoring report and communications in 2019, WCC acquired a spare leachate pump to reduce down time when a pump requires servicing and WCC intends to proactively maintain the forcemain in good working condition in a continuing effort to achieve a drained state in the leachate collection system.

Leachate pumping and disposal operating issues reported in the fall 2018 had an impact to groundwater quality in the sand and weathered clay units in monitoring wells located immediately down gradient of the leachate collection system (less than 10 m south of the leachate collection system and close to the south toe collector).

Concentrations of some Leachate Indicator Parameters in the sand unit spiked in November 2018, but the efforts from WCC in 2019 were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented. Since the hydraulic conductivity of the sand is greater than the weathered clay, elevated concentrations have been taking longer to dissipate in the weathered clay unit.

Golder contacted the MECP Ottawa District Office via email on July 9, 2020 to update them on the trigger exceedances and to notify them that no trigger exceedance was reported in the spring of 2020 following two previous exceedances showing an increasing trend and that there was no need to implement a contingency plan at this time.

In 2021, WCC continued to implement the proposed voluntary action plan to control potential increases in concentrations. Manganese concentrations in the weathered clay at OW-92-10 in November 2021 marked a confirmed increase and the ammonia concentration in the intact clay at MW-07-1B also marked a confirmed exceedance. These two confirmed exceedances were reported to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in the attached Golder report (Appendix 1) and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions.

It is WCC's intention to continue implementing in 2022 the proposed voluntary action plan to control potential increases in concentrations.

A Phase II Environmental Site Assessment was conducted at the landfill by Intera (Intera, 2003). This assessment concluded that groundwater within the sand layer, the upper weathered clay and perhaps the deeper intact clay deposit on down-gradient lands has slightly elevated concentrations of parameters previously thought to be indicative of landfill leachate (e.g., boron, ammonia, TKN). However, there is no obvious spatial correlation of these parameters with proximity to the landfill or groundwater migration pathway. The lack of spatial correlation suggests that groundwater on down-gradient lands is representative of naturally elevated background groundwater quality associated with the Mer Bleue environment.

In addition, the groundwater and surface water trigger mechanism report prepared by Golder (Golder, 2007b) demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are not potential impacts from landfill activities. Naturally elevated parameters measured included boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

7.2 *Leachate Water Quality Assessment*

Prior to the construction of the leachate collection system (LCS) in 1991-1992, leachate was sampled and analysed in areas where surface breakout was observed. Breakout of leachate, when encountered, usually occurred at the down-gradient toe of the landfill.

The monitoring program for leachate quality has focused on the LCS. For the purpose of the annual monitoring report, leachate generated by the landfill is monitored at the down-gradient end of the south toe collector at L5 at the same time surface water is monitored. A more extensive leachate monitoring program is carried out throughout the year in accordance with a City of Ottawa Leachate Discharge Agreement for the discharge of treated leachate at the Robert O. Pickard Environmental Centre (ROPEC), the municipal wastewater treatment plant.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation. The landfill is underlain by a thick natural clay deposit which has a hydraulic conductivity, K, of less than 10^{-9} metres per second and as such performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater, but rather it is predominantly precipitation that has infiltrated through the waste pile. It should be noted that leachate at the site could also consist of pore water from the underlying clay as a result of upward gradients and/or consolidation, noting that pore water release to the leachate collection system is slowed by the low hydraulic conductivity of the clay.

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. The intrinsic biodegradability of municipal landfill leachate can be measured by a BOD:COD ratio. During the first several years of production, the BOD:COD ratio generally is in the 0.5 range. As the landfill ages, the ratio decreases to levels less than 0.1 suggesting a more or less biologically recalcitrant organic composition (Andreottola et al., 1989). Also, the concentration of ammonia tends to increase with landfill age since ammonia is a by-product of the stabilization of organic matter (Elefiniotis et al., 1989), although at a dry waste facility such as the WCC Facility, ammonia concentrations can be expected to remain relatively low.

Leachate quality monitoring results for 2021 indicate that the leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Concentrations of field measured dissolved oxygen, ammonia, boron, potassium, and TKN show a generally increasing trend over time although boron concentrations have been relatively stable in recent years. The concentration of chloride was previously indicated to be increasing but has been stable for approximately five years. The concentrations of DIC and manganese, show a general decreasing trend over time although they have stabilized in recent years. Previously reported decreasing trend in hardness appears to be stabilizing. The concentrations of certain parameters remain above the surface water and groundwater quality near the site.

7.3 *Surface Water Quality Assessment*

The WCC Navan Facility is located on a watershed divide resulting in drainage of surface water to both the east and west of the site. The east side of the site drains to the Bear Brook or Mer Bleue drainage basin and the west side into the Mud Creek drainage basin which drains into Green's Creek. The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog.

For the purpose of surface water quality assessment, the background surface water quality is assumed to be represented by the data available from stations located in close proximity to the landfill and up-gradient of surface water flow. For the 2021 monitoring program, the PWQO is being applied for the purpose of water quality assessment at the surface water sampling stations.

A total of eleven surface water stations continue to be monitored on an on-going basis at this site. The monitoring stations have been located to obtain representative information on water quality up-gradient from the landfill at stations S1, S3, S15, S16 and S17 (background), on water quality at compliance sites down-gradient from the landfill at stations S5, S8 and S9 and on water quality in the Mer Bleue Bog at S10 (SW-W), S11 (SW-C) and S12 (SW-E). Monitoring locations SW-W, SW-C and SW-E are location references used by the NCC.

The up-gradient surface water quality is characterized by concentrations of the following parameters which exceed or are outside the PWQO: cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorus. Occasional PWQO exceedances of cadmium, chromium, boron, and zinc have been observed in the past as well.

Surface water quality is generally consistent over time (with seasonal variability). An increasing trend in concentrations of alkalinity, chloride, and conductivity, can be observed at surface water station S1 over time. Previously observed overall increasing trends for concentrations of DIC, sodium, TDS, and hardness at surface water station S1, concentrations of alkalinity, ammonia, DIC and iron at surface water station S3, and concentrations of iron, magnesium, manganese, sodium and TDS at surface water station S15 appear to have stabilized, with seasonal variability remaining. Similarly, the previously observed decreasing trend in dissolved oxygen concentrations at surface water stations S3 appears to have stabilized with seasonal variability remaining. A slight increasing trend in magnesium is observed at S16 and S17. Hardness is also observed to be increasing at S16.

The current or historical increases in concentrations of parameters at these locations is not related to leachate impact as these stations are up gradient of the site.

The down-gradient surface water quality is characterized by dissolved oxygen, iron, and total phosphorus concentrations which exceed or are outside the PWQO. Occasional PWQO exceedances of boron, cadmium, cobalt, copper, chromium, phenols and zinc have been observed.

The concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the May, August and November 2021 monitoring sessions were generally similar to or slightly elevated compared to the surface water quality at the up-gradient station S16 during

the spring monitoring session. During the fall monitoring session, parameter concentrations tended to be similar or lower than at S16.

Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed with the exception of boron. Boron concentrations at S10, S11, and S12 were previously elevated in the mid to late 1990s, but have since decreased and remained stable, at concentrations slightly higher or similar to up-gradient surface water at most up-gradient stations for approximately 20 years.

Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. It becomes increasingly difficult to assess surface water site compliance with scattered data. The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater-based trigger mechanism is the appropriate approach for the WCC Navan Facility. Surface water quality monitoring will continue at the site, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the WCC Navan Facility.

7.4 Sediment Quality Assessment

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Analytical results on the sediment samples indicate that no parameters exceed the CCME Guidelines for freshwater sediment except for arsenic at SED-E. This is the highest arsenic concentration reported at SED-E (9.1 ug/g) with the previous highest concentration reported in May 2009 (7 ug/g). The laboratory was requested to re-analyze the sample and similar results were reported. Arsenic, copper, chromium and nickel concentrations exceed the MECP Table 1 sediment criteria. The analytical results observed at the sampling locations are consistent with historical results observed at the respective locations.

Analytical results on the sediment samples indicate that boron exceeds MECP Table 2 and Table 4 soil criteria during the spring monitoring sessions at each sampling location. Boron also exceeded MECP Table 2 and Table 4 during the fall monitoring session at SED-W. Selenium exceeded the CCME soil criteria during the spring monitoring session at SED-E and SED-W. In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

In 2002/2003, an assessment of the WCC Navan Facility operations was undertaken in support of a WCC-NCC (WSI-NCC) exchange of land parcels located south of the WCC Navan Facility along the

northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

7.5 *Proposed 2022 Monitoring Program*

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (these proposed changes were also listed in the 2020 Annual Monitoring Report).

In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in down gradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations of one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in down gradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As explained in Section 7.3, the MECP agreed that an excursion of landfill leachate would be apparent in the underlying stratigraphic units prior to a surface water impact and a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. Therefore, it is proposed to discontinue sediment monitoring and rely on the groundwater and surface water monitoring programs to assess off-site leachate impacts. With MECP concurrence, sediment monitoring could resume temporarily if leachate impacts and trigger exceedances are reported at the site.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during November 2021 monitoring session and will be monitored again in the spring of 2023.

NAVAN RD.
S17
S1
S2
MW-05-1
(A,B,C,D)
LIMIT OF WASTE
EAST CELL
PUMP STATION
S-8
OW-94-1/9
MW-05-R3
OW-95-1/3
(MW-W)
MW-C
MW-05-8
OW-92-1/8
S-5
MW-E
OW-92-9/11
MW-05-11
S-4
OW-95-9
OW-95-5/7
S10
(SW-W)
100 METRES
A
002465

8. LANDFILL GAS (LFG)

Golder Associates Ltd. (GAL) was retained to carry out the landfill gas monitoring program in 2021. The monitoring program undertaken was a continuation of the monitoring program already in place for this site and the results of the monitoring events undertaken are summarized below and presented in more detail in the GAL report provided in Appendix '2'.

8.1 *LFG Monitoring Results*

The report has been prepared to fulfill the reporting requirements outlined in Condition 110 of Environmental Compliance Approval No. A460702 dated April 16th, 2009.

LFG monitoring was undertaken on May 20th 2021, on August 25th 2021 and on December 16th 2021. At most locations monitored, methane gas was detected at concentrations lower than 1.25% by volume. Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system that also serves as a passive ventilation system, with methane concentrations measured in excess of 1.25% by volume at the following locations (refer to Fig 2, Appendix "2"):

- MH-2 (G-18-a), MH-3 (G-13a), MH-4 (G12-a), and MH-5 (G-11a) in August 2021
- MH-7 (G5-a), MH-9 (G3-a) and MH-10 (G2a) in December 2021

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the Navan Facility based on the 2021 monitoring results.

The Navan Facility is designed with a buffer area and natural barriers. The site has a favourable hydrogeological setting whereby the site is underlain and surrounded by a thick clay deposit of low permeability. The depth below grade to the water table at the perimeter of the site is shallow. The depth of the landfill between the ground surface and the water table is less than 2.5 metres. It is generally considered that methane gas migration of any significance may extend for a distance of ten times the depth of the landfill between the ground surface and the water table. Based on site conditions, this 10:1 general rule would suggest that methane migration could extend for a distance of 25 metres. The north, west,

south and east sides of the landfill footprint are surrounded by buffer zones of 30 to 70 metres, 100 metres, 10 metres and 140 metres, respectively. Note that on the south side of the landfill a 10-metre buffer zone exists between the south limits of the waste mound and the VIA Rail right-of-way (ROW) and an additional buffer strip with a width of 100 metres exists to the south of the VIA Rail ROW. These buffers would therefore, under present groundwater conditions, provide adequate natural venting. The natural barriers and the provision of adequate buffer area present at the Navan Facility are the preferred method of dealing with potential LFG migration. Although no monitoring locations are available below surface at the property boundary, based on the presence of a buffer area and natural barrier system, it is anticipated that the Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events with the exception of the following locations, which reported relatively low detection (1 part per million or 1 ppm):

MH-6 (G6a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), all in May 2021.

In the past, venting of LFG could be observed at ground surface along the west side of the landfill between MHs. The LFG venting was only noticeable once the ground surface was covered with snow. In 2021, venting of LFG at ground surface was not noticeable.

During the May 2021 monitoring session, faint odours were noted at the site, while no odours were noted during the August and December monitoring sessions by the Golder field technician. Gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2021, WCC personnel responded to one odour related complaints (received on October 14, 2021 from a resident west of the landfill).

It is noted that an interim LFG odour control system (refer to Section 6.4) was installed in 2011 and commissioned in April 2012. An extension to the LFG odour control system was installed in 2016, in 2017 and in 2019. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells (refer to Fig. 8.1). The additional vertical wells installed in 2017 and 2019 are intended to be part of the permanent LFG collection system. The purpose of this system is to control potential odorous emissions from the site until the full-scale LFG collection system is completed at the site. In 2021, construction of the permanent landfill gas collection system was started consisting of the construction of the 300 mm diameter HDPE landfill gas header pipe along the north, west and south perimeters of the waste footprint and construction of the concrete pads for the enclosed flare and abstraction plant.

In 2021 the interim LFG system operated for 8,252 hrs at an average of 391 scfm with a totalizer reading indicating 5,801,695 m^3 of landfill gas was recovered at a methane (CH4) concentration of approximately 49.5%. In 2021 a total of 2,871,839 m^3 of methane was flared using the interim landfill gas flaring system representing a 1.81% increase in methane recovery from 2020 to 2021.

8.2 *2019 Regulatory Reporting (NPRI, O.Reg. 127/01, O.Reg. 347, O.Reg 452/09 and Federal GHG)*

In 2021, Dillon Consulting Limited (Dillon) was retained by Waste Connections of Canada Inc. (WCC) to complete the following for the WCC Navan Facility:

- An assessment to determine the reporting requirements under the *National Pollutant Release Inventory* (NPRI) for the 2020 calendar year;
- Greenhouse Gas Reduction Reporting as required under *Ontario Regulation 347*;
- An assessment to determine the reporting requirements under *Ontario Regulation 390/18 – Greenhouse Gas Emissions: Quantification, Reporting and Verification (O.Reg. 390/18) and the Federal Government Greenhouse Gas Reporting for the 2020 calendar year;*
- An assessment to determine the reporting requirements under the Federal Government Greenhouse Gas Reporting Program (GHGRP) for the 2020 calendar year; and
- Assist with data input and submission for Environment Canada's online Single Window Information Manager (SWIM) module, if required.

The Navan Landfill has reported in past years to the NPRI program under ID 10967 and the GHGRP program under ID G10975. Site operations are identified by NAICS code number 562210 - Waste Treatment and Disposal.

Dillon conducted an assessment of facility operations and material usage in order to determine which substances must be reported to each of the programs mentioned above for the year 2020.

The reporting of releases to the NPRI is separated into on-site releases to air, land, and water, and off-site transfers for disposal and recycle for Part 1, 2 and 3 substances. Only air releases for Part 4 and 5 substances are reported to NPRI. Based on Dillon's assessment, the Navan Landfill was required to report in 2020 under the NPRI program for the year 2020. The total annual on-site releases and off-site transfers of the reportable NPRI Part 1, Part 2, and Part 3 substances are summarized in Table 8.1. Annual air releases for the NPRI Part 4 and Part 5 substances are also provided in Table 8.1.

The reports were made based on estimates and not measured values. Many of the parameters that are reportable are the result of handling high volumes of materials on site which are above the manufactured, processed or otherwise used reporting threshold, e.g. leachate and asbestos, but do not result in airborne emissions from the facility. The reporting of the emissions of particulate matter (PM10) was triggered by fugitive dust emissions from roads and is generally also reported by all industrial operations in Ontario due to very low thresholds.

It is noted that an interim landfill gas odour control system (refer to Section 6.4) was installed in 2011 and commissioned in April 2012. The purpose of this system is to control potential odorous emissions from the site until the full-scale landfill gas collection system is installed. The interim landfill gas odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical landfill gas extraction wells as shown on Figure 8.1.

Table 8.1: 2020 NPRI Reporting

NPRI Substance	On-site Releases (tonnes)			Off-site Transfers (tonnes)	
	Air	Land	Water	Disposal	Recycle
Part 1 Substances					
Asbestos	-	-	-	258.7 (on-site)	-
Part 2 Substances					
None	-	-	-	-	-
Part 3 Substances					
None	-	-	-	-	-
Part 4 Substances					
CO	72.80				
PM10	3.922	-	-	-	-
PM2.5	1.880	-	-	-	-
Part 5 Substances					
None	-	-	-	-	-

The reporting threshold for the federal Greenhouse Gas Emissions Reporting Program through Environment Canada is 10,000 tonnes of CO2 equivalent units.

Based on the assessment by Dillon, the Navan Landfill meets the GHG reporting requirements for the Federal reporting program and is therefore required to report for the 2020 calendar year. Table 8.2 provides the annual CO_2e release for comparison with the government reporting threshold. Only direct emissions are included in the annual totals shown. CO_2 emissions from biomass decomposition and emissions from indirect electricity consumption are not included in the federal threshold calculation for comparison purposes.

Table 8.2: 2020 GHG Reporting

Reporting Program	Annual CO_2e Release (tonnes)	Reporting Threshold (tonnes)	Required to Report (Y/N)
Environment Canada – Federal Greenhouse Gas Reporting	34,268	10,000	Y

The reporting threshold for O.Reg. 390/18 is 10,000 tonnes of CO_2 equivalent units. Table 8.3 provides the annual CO_2e release for comparison with the provincial government reporting threshold. Only direct emissions from stationary combustion are included in the annual totals shown.

The Navan Landfill is not required to report GHG emissions to the Province of Ontario as annual emissions are below the 10,000 tonnes CO_2e reporting threshold.

Table 8.3: 2020 Provincial GHG Reporting Requirements

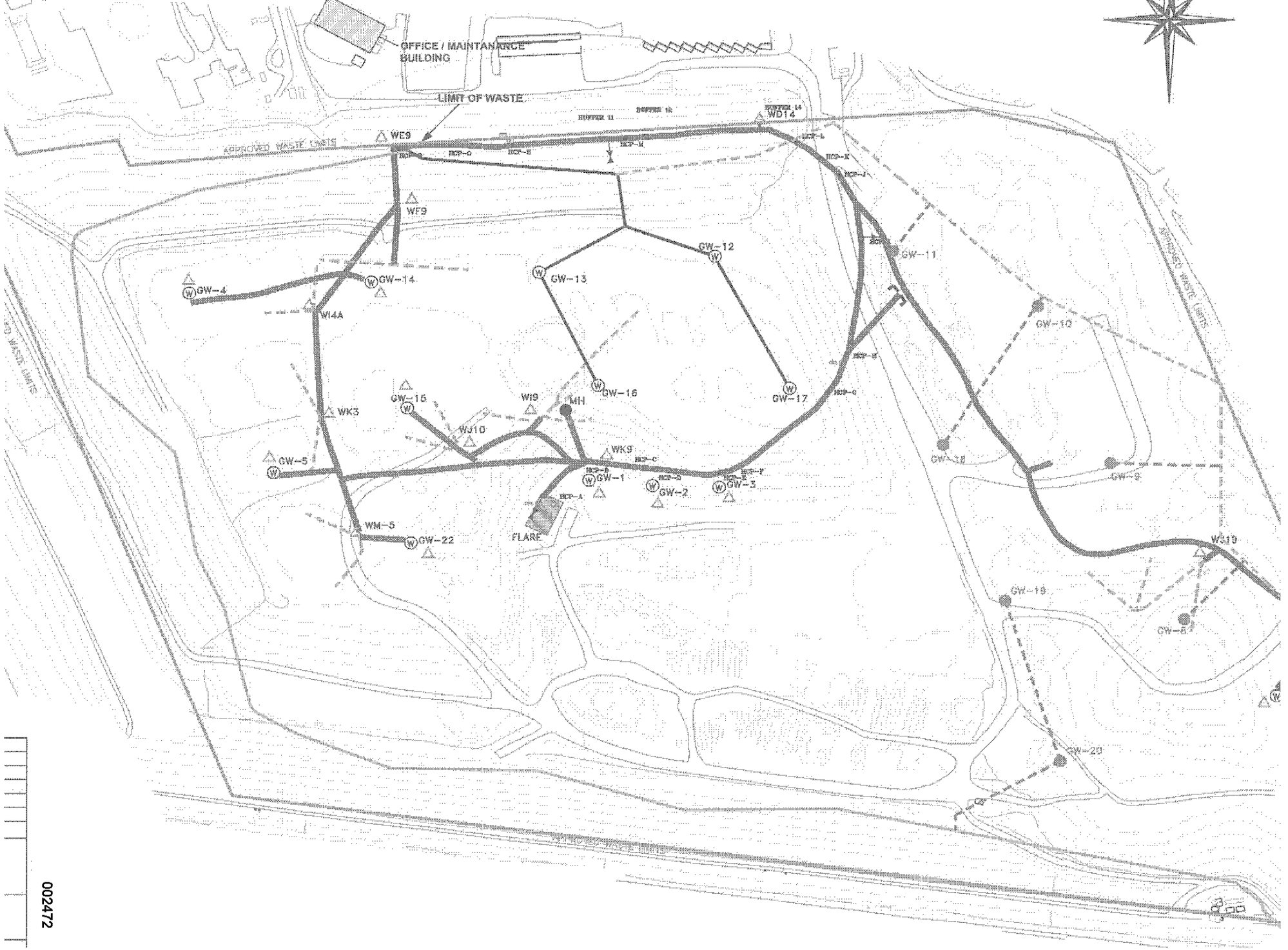
Reporting Program	Annual CO_2e Release (tonnes)	Reporting Threshold (tonnes)	Required to Report (Y/N)
O.Reg. 390/18 (with CO_2 from biomass)	14,604	-	-
O.Reg. 390/18 (without CO_2 from biomass)	1,055	10,000	N

Release Estimate Comparison: 2019 vs. 2020

Table 8.4 provides a comparison between 2019 and 2020 releases for reportable substances. Reasons for changes in release quantities for the two reporting years are provided for those substances/contaminants shown with a ±10% change in release quantity.

Table 8.4 – 2019 vs. 2020 Release Values

Substance	2019 Reported Value	2020 Reported Value	% Change	Reason/ Comments
Asbestos	Air = 0 tonnes Disposal = 369.4 tonnes Recycle = 0 tonnes	Air = 0 tonnes Disposal = 258.7 tonnes Recycle = 0 tonnes	(-) 30%	Decrease in asbestos waste received at the site
CO	Air = 75.54 tonnes	Air = 72.80 tonnes	(-) 4%	No significant change in air releases
PM_{10}	Air = 5,122 tonnes	Air = 3,922 tonnes	(-) 31%	Decrease distance traveled on unpaved roads
$PM_{2.5}$	Air = 2,056 tonnes	Air = 1,880 tonnes	(-) 9%	No significant change in air releases
CO_2e (Federal)	Air = 33,594 tonnes	Air = 34,268 tonnes	(+)2%	No significant change in GHG releases


OFFICE / MAINTANANCE BUILDING
LIMIT OF WASTE
APPROVED WASTE LIMITS
WE9
WD14
WF9
GW-12
GW-13
GW-11
GW-4
GW-14
WI4A
GW-10
GW-16
GW-17
GW-15
WI9
MH
WK3
WJ10
WK9
GW-5
GW-1
GW-2
GW-3
GW-9
WM-5
GW-22
FLARE
WJ19
GW-18
GW-8
GW-20
002472

9. PROCESSING/RECYCLING

9.1 *Diversion of Waste and Other Materials from Disposal*

Diversion through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the WCC Navan Waste Recycling and Disposal Facility. For example, all daily and intermediate cover needs are met by substitution of virgin soils with the re-use of significant quantities of impacted soils. Brick, concrete, asphalt and rubble are also recovered for re-use each year in the construction of access roads and container storage pads. Roofing shingles free of paper and other debris are also re-used on site as a sub-base for roads and pads over which is placed a layer of aggregate or recycled asphalt. In addition, steel, aluminum, wood and white goods are recovered daily from the active face of the landfill and recycled. The site also currently assists local landscape and tree removal contractors by receiving wood waste that is put through a grinding process and sent to markets off site for use as bio-mass or bulking agent for organic composting. Other waste materials removed from the site for recycling include cardboard, tires, glass, drywall, E-waste, large boulders and screened rock.

Materials received by the Navan Waste Recycling and Disposal Facility are those which IC&I generators, contractors and local residents have generally deemed to be waste and of no further value (i.e., post diversion at the source). Many of the waste generators serviced by waste collection contractors who bring waste to the site also divert materials from the landfill at their place of business prior to collection. Recycling within the IC&I sector is regulated by the Ministry of the Environment, Conservation and Parks under Regulations 101, 103 and 104. While the site receives post-diversion waste materials from the IC&I sector, WCC has procedures in place to screen the incoming waste for recyclable material in what is known as a "last chance harvest" which is a "positive" sort where the recyclable item must be removed from the mixed waste mass. In this case, the majority of the material is not recyclable (i.e., it is waste). This is very different than recycling from "source separated" material, which results in a "negative" sort, where the waste components are removed from what is predominantly recyclable material. WCC also encourages and receives "clean" recyclable materials such as wood, metals, drywall, glass and E-waste. Such materials are shipped to market in bulk in efforts to make the recycling of these materials more economically viable.

Management at the WCC Navan Waste Recycling and Disposal Facility is constantly searching for on-site and off-site diversion opportunities to ensure that approved disposal capacity is preserved and used for the disposal of waste material of least commercial value. Given the provincial policy and regulations concerning waste diversion from landfill, the WCC Facility will continue to support the City and the Province in their efforts to meet diversion targets while at the same time ensuring essential disposal capacity is available locally.

Approval for the treatment of contaminated soils was received from the MECP in June of 2015. The treatment of hydrocarbon contaminated soils was started soon after in the processing area of the site located within the waste footprint (refer to Figure 2.4). Treated soils are re-used on site as final cover material or as structural fill within the east buffer along the limit of waste. Soils which had not reached the treatment criteria by the end of 2021 remained on the treatment pad until the treatment objectives could be achieved or landfilled as waste.

The amount of waste diversion achieved from "last chance harvest" at the WCC Navan Waste Recycling and Disposal Facility over the past five years is summarized in Table 9.1.

Table 9.1: Diversion at Navan Waste Recycling and Disposal Facility (2017 - 2021)

Material	2017	2018	2019	2020	2021	5-Year Total
Off-Site recycling:						
Materials removed for off-Site recycling	10,249	14,712	11,025	6,017	5,074	47,077
On-Site reuse:						
Aggregate material re-used (rubble; brick; concrete; rock)	8,480	11,935	5,949	25,788	40,041	92,193
Asphalt, clean fill, clean shingles	7,262	5,623	11,151	7,916	8,120	40,072
Treated/re-used soils	31,096	31,726	67,249	35,249	95,846	261,166
Total Diversion (excluding daily cover soils)	**57,087**	**63,996**	**95,374**	**74,970**	**149,081**	**440,508**
Waste to Landfill	171,419	233,994	222,976	224,497	190,415	1,043,301
WCC Recycling and Disposal Facility "last chance harvest" diversion rate (excluding daily cover soils)	**25.0%**	**21.5%**	**29.9%**	**25.0%**	**43.9%**	**29.7%**

NOTE: All quantities are in tonnes

At the Navan Waste Recycling and Disposal Facility, loads of clean rubble, rock, asphalt, clean shingles or concrete that are received for disposal from a construction job site are set aside for re-use in the construction of on-site roads and pads. From 2017 to 2021, approximately 132,265 tonnes of these materials were diverted from disposal, avoiding the use of a more valuable resource such as quarried stone.

Heavy equipment, equipped with a large magnet and grappling attachments, is in use for the recovery of metals from within the waste received for disposal after it has been dumped at the landfill. Five people have been hired full-time to focus on recycling opportunities and are assisted by landfill personnel. All refrigerant containing appliances have the refrigerant removed by a licensed technician prior to recycling. Metals, recovered on site and stockpiled, are removed in bulk by a local contractor using tractor-trailers. Smaller loads of more valued metals such as copper, aluminum and brass, are shipped regularly to local scrap metal recyclers such as American Iron and Metal (AIM). In response to market interests in recycled wood products, wood is recovered from waste received at the site and then processed through a wood grinder to reduce the wood to a chip size that is suitable to an end market and then removed in bulk using tractor-trailers. Wood chips, shipped off-site to local mills, are re-used in the production of wood pellets or used directly as an alternative fuel source. Wood chips are also used as a bulking agent at organic composting sites. Glass is also collected and removed in bulk from the site for recycling. From 2017 to 2021, over 47,077 tonnes of materials have been shipped off site for recycling and diverted from disposal at the site.

As indicated in Table 9.1, the Navan Waste Recycling and Disposal Facility diverted over 149,081 tonnes of material from disposal in 2021, and over 440,508 tonnes during the past 5 years. This represents a "last chance harvest" diversion rate of 29.7% over the past 5 years and excludes the re-use of impacted soils for daily cover material. This is in addition to the diversion rate for IC&I waste that occurs at the source. WCC will continue to improve waste diversion and recycling initiatives at the Navan Facility and pursue economically viable waste diversion opportunities to help the local community and WCC clients achieve a better IC&I recycling rate.

9.2 *Recycling*

For years, an independent contractor has undertaken processing (recycling) of steel and wood at the active face of the landfill. In 2009, the use of heavy equipment and permanent staff were introduced to improve health and safety as well as productivity. Daily records of materials received for processing and materials recycled and/or reused are maintained on site. In 2021, there were no operational problems reported related to the processing (recycling) facility.

A total of 5,074 tonnes of waste materials consisting of aluminium, wood, glass, drywall, e-waste, white goods, tires and ferrous metals were recycled and removed from the site in 2021. At the end of the year some materials remained stockpiled for removal in bulk at a later date such as white goods and metals. Wood waste also remained stockpiled in the material recycling area for further size reduction with the use of a wood grinder prior to shipment to off-site markets.

Brick, aggregate, rock and rubble received at the site and re-used in 2021 as aggregate for road construction totalled 40,041 tonnes. Clean fill, clean shingles and asphalt re-used on site as final grading, road/pad construction and engineered fill totalled 8,120 tonnes.

Drywall material received at the site free of debris was stored in a designated area for recycling and when sufficient volumes were received, drywall was processed through a grinder and re-used in powder form as a soil amendment.

Glass received at the site free of debris was stored in a designated area and when a sufficient volume was received, the glass was shipped in bulk to a recycling facility in Montreal, Quebec or Guelph, Ontario.

Treatment of hydrocarbon contaminated soils was started at the site in 2015 following the receipt of MECP approval. Treated soils were re-used on site as final cover material and as structural fill along the waste limit within the east buffer. Soils which had not reached the treatment criteria by the end of 2021 remained on the treatment pad until the treatment objectives could be achieved or were landfilled as waste. In 2021, 95,846 tonnes of hydrocarbon impacted soils were treated at the recycling facility for re-use in the east buffer or re-used within the landfill footprint as construction materials.

10. PROPOSED 2022 OPERATIONS

10.1 *Landfill Development*

10.1.1 Phasing of Remaining Operations

In 2022, WCC will continue to develop the landfill in a manner consistent with their past operating practices and proceed with capital projects required for the site operations as presented in the revised D&O (Golder, 2008). Over the past number of years, landfilling has progressed in a counter-clockwise pattern starting in the northwest corner of the site (area indicated as north half of Phase 3 on Figure 10.1). To date waste has been placed over the entire permitted waste footprint of the landfill as shown on Figure 10.1 with Phases 2 and 3 having been completed. In areas where significant settlement has occurred, re-grading will be carried out. In 2022, landfilling will continue in the last completed cell identified as Phase 6 with closure work to be carried out over the completed north slope of Phase 6 and the east slope of Phases 1 and 6 as shown on Figure 3.2.

The landfill development strategy for the 2022 operating period is presented on Figures 10.1 A & B and 10.2 and described in more detail in Section 10.1.2.

10.1.2 Development Schedule

The schedule for developing the remaining landfill capacity is driven by the on-going rate of waste receipts for disposal and readily available constructed landfill air space. Under the revised ECA (April 2009), the life expectancy remaining for the WCC Landfill as of January 1st, 2022 is estimated to be 5.1-5.2 years (2027) based on future projected annual waste receipts of 344,750 tonnes/yr and a 5 year average waste density of 1.42 tonnes/m^3 (refer to Chapter 5). The actual life of the landfill will vary based on the actual annual fill rate, waste densities achieved, waste diversion and recycling initiatives at the landfill and the rate of air space development.

Other site operations will evolve together with the on-going landfilling operation as follows:

a) Landscaping

- Continue applying topsoil and providing additional landscaping to completed final cover areas on the north surface of Phase 4 as well as planting additional trees in previously completed areas. This will include removing trees previously planted and re-planting them in other areas of the landfill that have been completed.

b) Final Cover Construction

- Complete filling to final grade in the north area of Phase 6 and east areas of Phases 1 and 6 (refer to Fig. 3.2). Complete final cover construction in completed areas of fill.

c) Surface Water Management

- As waste elevations in Phase 6 increase above the natural grade of the east buffer, re-align surface runoff away from the waste fill areas.
- Raise grades in the east buffer adjacent to the waste footprint and grade to direct surface runoff away from the landfilled waste.
- Place cover clay in areas where final waste elevations have been reached to direct surface runoff water to collection swales and ditches.

d) Recycling Operations

- "Last Chance Harvest" of recyclable waste will continue in the active face using specialized heavy equipment as per present practice.
- Increase efforts to sort and divert waste from small vehicles at the small vehicle drop-off area and provide incentives to clients to sort materials at source prior to arrival at the site.
- Establish markets for new recyclable materials in efforts to increase the types of materials to be recycled at the site.
- Enhance treatment of contaminated soil.
- Continue the screening of rock out of the contaminated soils received for re-use on and off site.
- Expand the working pad in the area of Phase 8 further north for recycling activities.

e) Landfill Gas Flaring System

- Where required, add additional wells (horizontal and/or vertical) to the landfill gas collection system to control fugitive gas in fill areas and enhance the odour control system (e.g. GW-8, GW-9 and GW-10).
- Construct the permanent perimeter landfill gas forcemain along the east perimeter as designed by Golder Associates and connect it to the existing landfill gas system.
- Construct, install and commission the permanent abstraction and flaring plant.
- De-commission the existing temporary landfill gas flaring plant.

f) East Cell Construction (Phase 6)

- Complete landfilling on the north and northeast cell slopes in Phase 6 to above the perimeter grade to allow for improved surface runoff.
- Construct a barrier wall in the east buffer at the limit of waste.

g) Access Road Construction

- Construct an access road extending from the east of Phase 6 onto the top of Phase 1.
- Excavate the existing access road running north to south through the landfill west of Phase 6 and Phase 1.

10.1.3 Soil Management

The development of the remaining landfill capacity in the area of Phase 6 (east cell) requires filling and compacting material including side slopes. Soil management practices will include the following:

- Excavation of clay from the Phase 8 area will occur in the first three quarters of 2022;
- Sediment control measures will be taken so that inactive areas such as soil stockpile side slopes are seeded; silt fences are installed as required around the perimeter of disturbed areas; and surface runoff from the stockpile areas will be channeled to the internal ditch system which will drain to the site's stormwater retention ponds.

10.2 *Proposed Surface Water Control Improvements*

The current surface water management system is described in the "Design and Operations Report - Navan Landfill Site Expansion Approvals" (Golder 2008). The surface water management system operates at the site to maintain the pre-landfill drainage conditions to each watershed; to divert surface water and shallow groundwater flows originating upstream of the site around the landfill; to minimize the amount of surface water that comes into contact with waste; and to maximize the removal of suspended sediment from surface water generated prior to it's release to the downstream watersheds. Water that comes into contact with waste is collected and managed as leachate. For the revision and updating of the D&O plan, the existing surface water system was assessed in regards to the storm flows that can be transmitted and these flows were compared to the requirements of the Landfill Standards. Improvements were proposed where the existing system was deficient relative to the Standards. Further modifications have been proposed in support of the EPA/OWRA application for the landfill expansion. As a result of these assessments, WCC has proceeded with changes to the surface water management system at the site in order to improve the overall system. The proposed changes to the drainage system are described as follows:

- The east diversion ditch has been deemed a fish habitat and its construction included various features to promote and support fish habitat. This work was completed and continues to be maintained. However, base flow volumes to this ditch originating north of Navan Road will cease due to residential development and new storm water management practices on these lands.
- A storm water management pond was constructed in the southeast corner of the site and a ditch discharging surface runoff water to the pond was constructed along the east access road connecting the pond to the north drainage ditch. In 2022, inspection of sediment accumulation should be carried out and if required, dredging could be planned and budgeted for 2023. In 2019, construction of a

HDPE drainage culvert in the existing ditch alignment along the north and north-east edge of the waste cell was completed and the clay cut-off wall above the culvert was constructed in 2020. In 2022, the east cell wall at the waste limit will be completed.

- A stormwater management pond located in the northwest corner of the site was constructed in 2012 to manage runoff water from the west side of the site. Landscaping consisting of the planting of shrubs and trees in this area is on-going. Drainage chutes in the northwest and southwest corners of Phase 3 were constructed in 2015 to control surface runoff water from the completed surface of Phase 3 and Phase 4. As the access roads at the top of Phase 3 and Phase 4 continue to be extended, swales to promote drainage and seeding will also be carried out;

- Efforts will be made on a continuing basis to maximize the diversion of surface runoff from the active working face in order to reduce leachate generation. This will involve the redirection of internal ditching on an as-needed basis to direct runoff water from capped and stabilized areas to the perimeter ditch system.

10.3 *Leachate Management*

All leachate collected in the existing leachate collection system is designed to drain to a collection well and pump station located at the southeast corner of the existing waste footprint near Grids Q-16. A forcemain connection allowing treated leachate to be pumped directly to the municipal sewage system for conveyance to the city waste water treatment plant has been constructed and an agreement is in place with the City of Ottawa to discharge pre-treated leachate to the City sewer system. The forcemain was commissioned in early 2008 and has since been successfully in use. The use of the forcemain to discharge leachate from the site to the City of Ottawa sewer system is anticipated to continue throughout 2022. Connection to a new City sewer line located at the north-west corner of the site is anticipated in late 2022. This will effectively eliminate the need for the forcemain to run along the south shoulder of Navan Road and east shoulder of Renaud Road and reduce the length of the existing leachate forcemain in half.

Approved modifications to the pre-treatment/pumping system were completed in 2011. These improvements were initiated in advance of the east expansion cell construction to improve the treatment efficiency and capacity of the system and to increase the pump station flow rates as well as reduce maintenance. The system improvements were commissioned in early 2012 and will continue operations throughout 2022.

The "Navan Landfill Leachate Collection and Maintenance System Lateral Expansion Area – Quality Assurance/Quality Control Plan and Specifications" prepared by Golder Associates was submitted and approved by the MECP in 2009. Excavation and construction of the east expansion cell, Phase 1, was completed in 2015 with Phase 6 completed in 2019 which included the construction of the drainage layer and leachate drainage features and the east cell pumping system. This system will continue to be in full operation in 2022 discharging collected leachate from the east cells to the leachate treatment system. Completing the east wall within the east buffer should occur in 2022.

A vertical manhole, connected to the leachate collection system in the centre of the existing waste footprint (referred to as "the central manhole"), provides an alternative point of access to evacuate leachate from this

part of the leachate collection system in the event positive drainage to the wet well and pump station cannot be maintained due to sub-grade settlement. This manhole has been raised to an elevation of 101 metres and will require that it be raised with additional MH sections in 2022. Water levels within this manhole should be measured to assess the depth of leachate ponding on top of the leachate collection system in this area and if required, consideration be given to installing a pump at the base of this manhole.

10.4 *Surface Water, Groundwater and Leachate Monitoring*

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021. As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or fall) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the fall of 2021 monitoring session and will be monitored again in the spring of 2023.

The objectives of the 2022 environmental monitoring program are:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

10.5 *Landfill Gas Management*

Construction of an approved landfill gas collection and flaring system to serve as an interim odour control system was completed in 2011. Commissioning of this system was carried out in April 2012. In 2022, the permanent landfill gas collection system will be constructed consisting of a closed flare and abstraction plant located at the south-east corner of the landfill. A gas collection forcemain extending along the south, west and north perimeter of the waste footprint was constructed in 2021. Extending and completing this forcemain along the east waste limit will occur in 2022. This forcemain will also be connected to the existing

landfill gas collection system. The exiting interim landfill gas flaring plant will be de-commissioned as soon as the new flaring plant is commissioned and running.

The landfill gas monitoring program undertaken by Golder Associates in 2021 will be continued in 2022. Monitoring of landfill gas is carried out three times per year at the property boundary and within facilities located on the site. Monitoring of the odour control and flaring system will also be part of this program.

Assessment of air emissions will again be undertaken for the landfill site in accordance with MECP Reg.127/01 and NPRI reporting requirements.

10.6 *Recycling and Small Vehicle Unloading Facility*

Recycling will continue at the WCC Landfill site in 2022. Heavy equipment equipped with a large magnet and grappler is used for the removal of metal and wood from waste received at the active face of the landfill. A small vehicle unloading pad consisting of a raised paved surface with concrete retaining walls has been constructed at the front of the site east of the new site entrance to serve as an area for small vehicles to unload and sort materials. Concrete bunkers for the receipt of small loads of recyclable materials such as clean fill, asphalt, aggregates, and roofing shingles were added just south of the scale house with access from the small vehicle pad to the east. This small vehicle unloading area improves safety at the site by eliminating the need for small vehicles to access the active face. The facility is grade separated such that bins for various types of wastes and recyclables are easily accessible (i.e., with the top of the bins at or near the ground surface in the drop off area). A utility road has been included to provide access to collect or drop off roll-off containers. Small vehicles are required to be weighed on the scales when entering and exiting the site.

Another recycling area is located within the waste footprint along the southern edge of the area identified as Phase 8. This area is used for the storage of processed materials for later removal in bulk and shipment to local markets. White goods containing refrigerants are also stored in this area for refrigerant removal by an on-site technician. Recycling activities in this area consist of tires, drywall, glass, clean shingles, metals and wood. In 2022, it is proposed to construct a recycling pad at the south end of Phase 1 and expand the east end of the existing pad north into Phase 8.

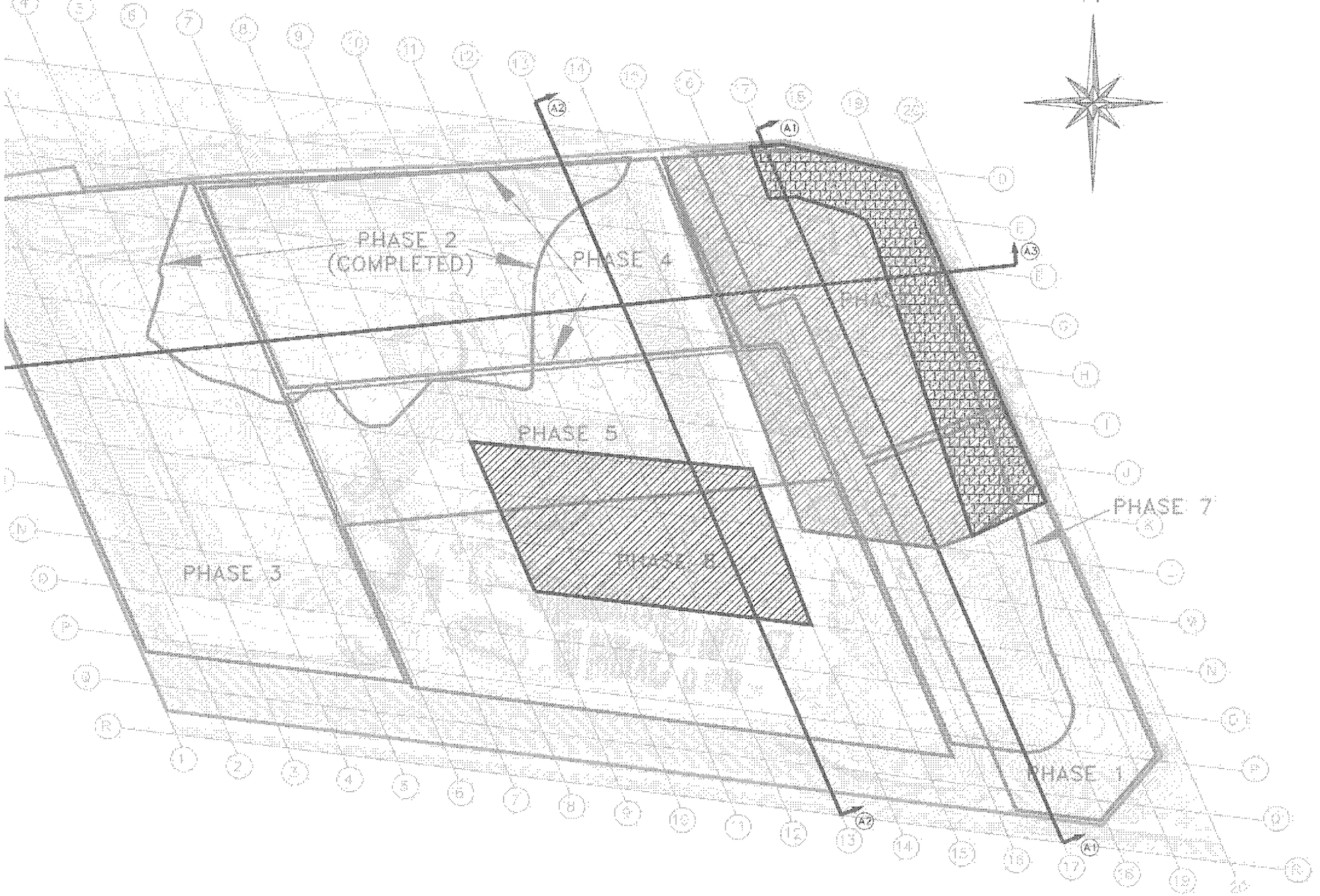
E-waste recycling services are also offered for the benefit of the local community.

The treatment of contaminated soil as part of the recycling initiatives at the site was approved by the MECP in 2015. Contaminated soils will be treated to a level sufficient for an alternative use on-site and/or off-site. The treatment of impacted soils will continue throughout 2022.

These recycling activities will continue throughout 2022 as will efforts to expand on recycling services and finding new markets for recycled materials.

10.7 *Capital Improvements*

A major capital improvement project to take place in 2022 will be the completion of construction of the permanent landfill gas collection and flaring plant. Connecting the existing leachate forcemain to a new sewer line under construction on Navan Road is anticipated for the end of 2022. The acquisition of a new dozer is also being considered for 2022 to assist landfill operations. No other capital site improvement projects other than on-going access road construction, landscaping and minor site improvements are anticipated. The access road running along the north and east perimeter of Phase 6 will be extended onto the top of Phase 1 and connect to existing internal landfill access roads. Landscaping efforts will continue on the north, west, south and southeast facing slopes where cover construction has been completed. Preserving existing vegetation by transplanting trees to the east and north sides of the landfill in addition to adding new trees and shrubs will also continue.


PHASE 2
(COMPLETED)
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PHASE 5
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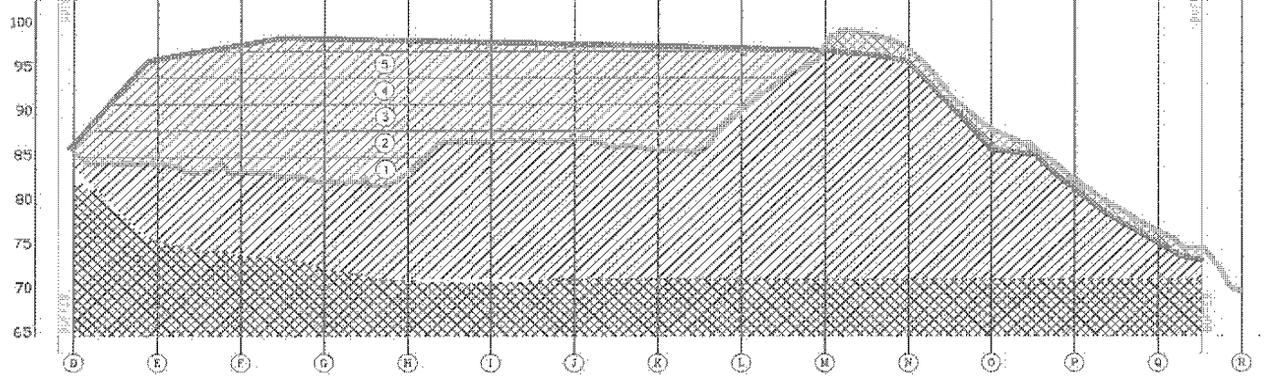
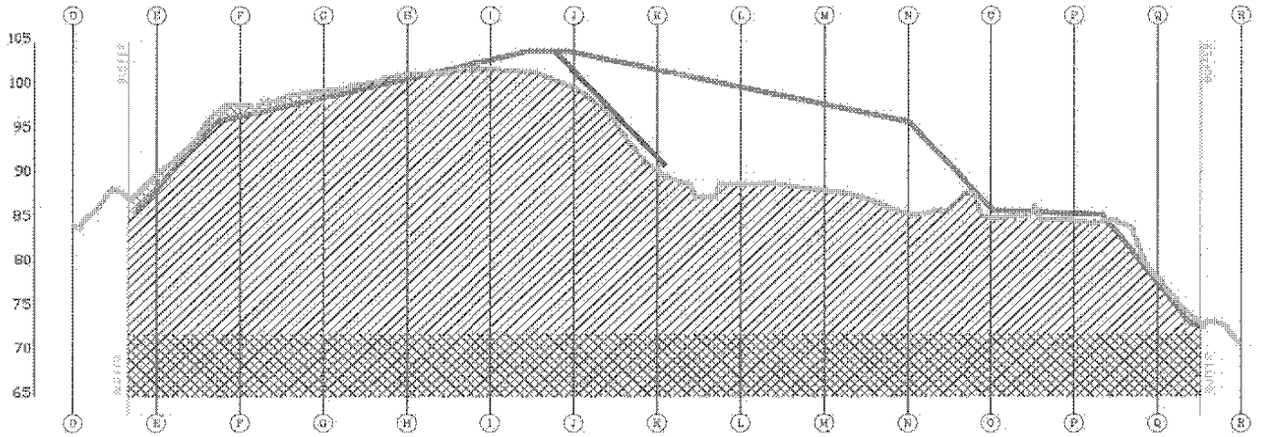


SECTION A2–A2



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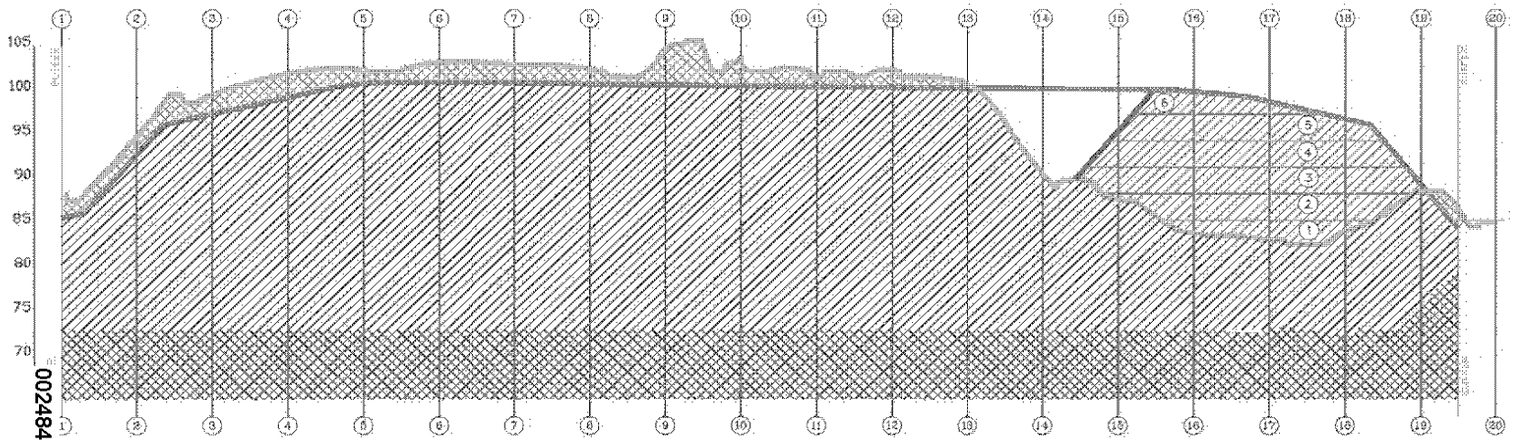

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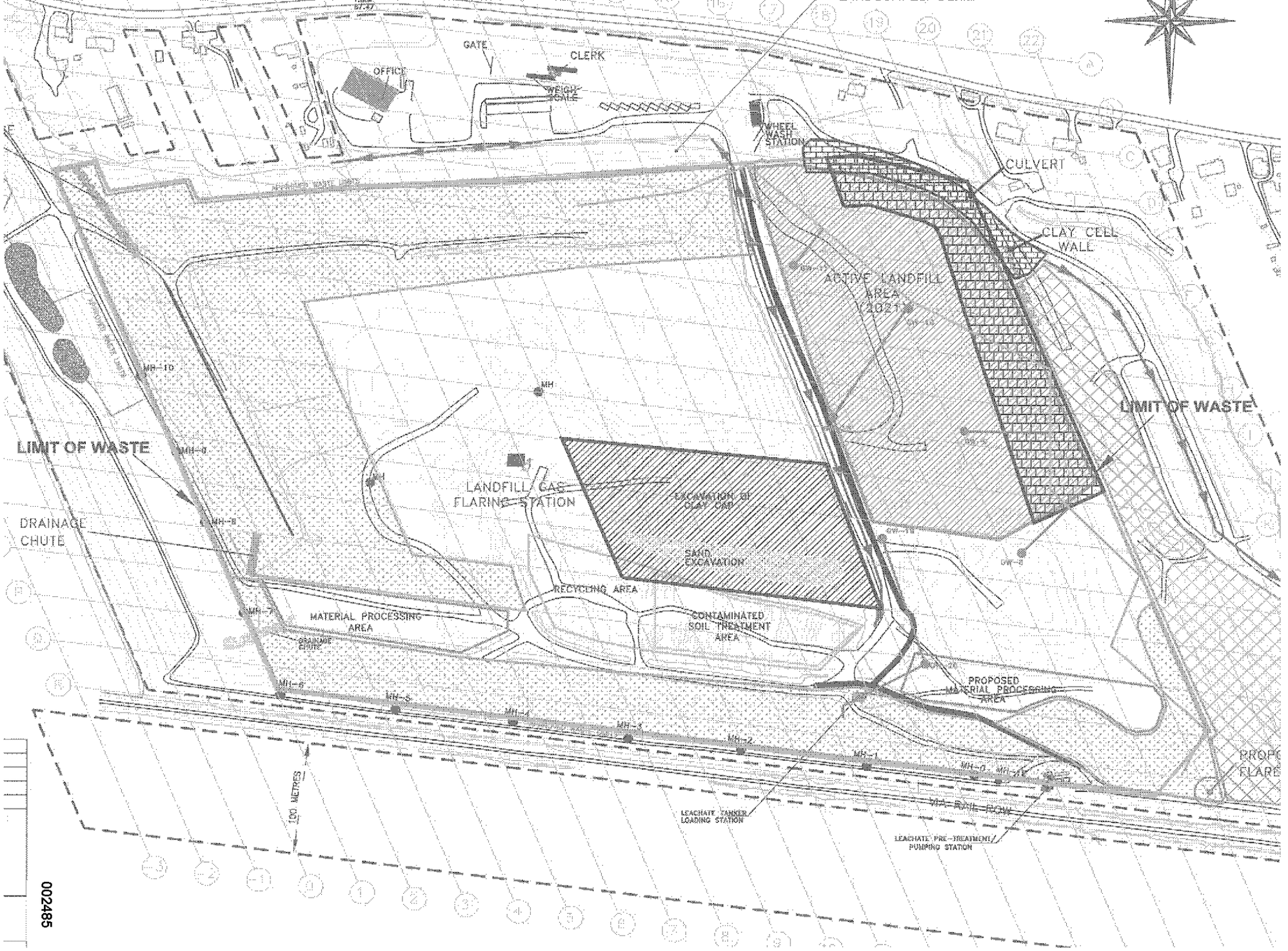
GATE
CLERK
OFFICE
WEIGH SCALE
WHEEL WASH STATION
CULVERT
CLAY CELL WALL
ACTIVE LANDFILL AREA (2021)
LIMIT OF WASTE
LIMIT OF WASTE
MH-10
MH-9
MH
DRAINAGE CHUTE
MH-8
LANDFILL GAS FLARING STATION
EXCAVATION OF CLAY CAP
SAND EXCAVATION
RECYCLING AREA
MH-7
MATERIAL PROCESSING AREA
DRAINAGE CHUTE
CONTAMINATED SOIL TREATMENT AREA
PROPOSED MATERIAL PROCESSING AREA
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-11
MH-12
100 METRES
RAIL SPUR
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT/ PUMPING STATION
002485

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Appendix '1'

Golder 2021 Landfill Monitoring Report

GOLDER

REPORT

2021 Landfill Monitoring

Waste Connections of Canada
Navan Waste Recycling and Disposal Facility
Ottawa, ON

Submitted to:

Waste Connections of Canada
Waste Connections of Canada
3354 Navan Road
Ottawa, Ontario
K4B 1H9

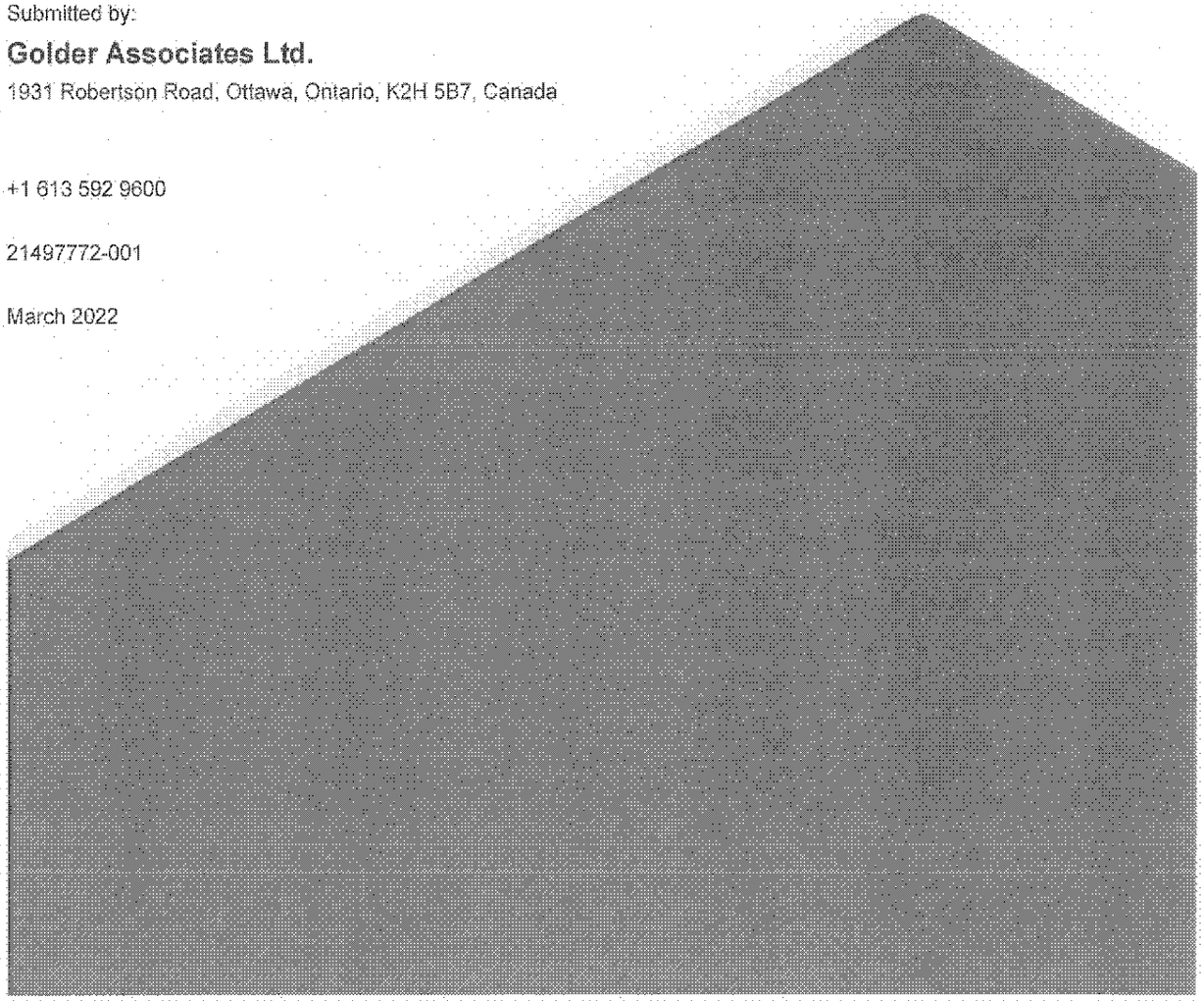
Submitted by:

Golder Associates Ltd.
1931 Robertson Road, Ottawa, Ontario, K2H 5B7, Canada

+1 613 592 9600

21497772-001

March 2022



Appendix D-Monitoring and Screening Checklist
General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.
Instructions: A complete checklist consists of:
(a) completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
(b) completed contact information for the Competent Environmental Practitioner (CEP)
(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:
For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:
(a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..
Definition of Surface water CEP:
A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site (WDS) Name	Navan Waste Recycling and Disposal Facility
Location (e.g. street address, lot, concession)	3354 Navan Road. Parts of Lots 2, 3 and 4, Concession IV
GPS Location (taken within the property boundary at front gate/ front entry)	460569.6m E 5030570.0m N (Zone 18)
Municipality	City of Ottawa (formerly City of Gloucester)
Client and/or Site Owner	Waste Connections of Canada
Monitoring Period (Year)	2021
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval (ECA) Number (formerly "Certificate of Approval" (C of A)) :	No. A460702
Director's Order No.:	N/A
Provincial Officer's Order No.:	N/A

Other:	N/A		
Report Submission Frequency	(•) **Annual** ( ) **Other**	Due March 31	
The site is: **(Operation Status)**	(•) **Open** ( ) **Inactive** ( ) **Closed**		
Is there an active waste transfer station at the site?	( ) **Yes** (•) **No**		
Does this WDS have a Closure Plan?	(•) **Not yet submitted** ( ) **Submitted and under review** ( ) **Submitted and approved**		
Total Approved Capacity	7,600,000 (excl. final cover)	*Units*	Cubic Metres
Maximum Approved Fill Rate	1,500	*Units*	Tonnes per Day
Total Waste Received within Monitoring Period (Year)	190,415	*Units*	Tonnes
Total Waste Received within Monitoring Period (Year) *Describe the methodology used to determine this quantity*	Weighed		
Estimated Remaining Capacity	1,252,969	*Units*	Cubic Metres
Estimated Remaining Capacity *Describe the methodology used to determine this quantity*	Estimation		
Estimated Remaining Capacity *Date Last Determined*	31-Dec-2021		
Non-Hazardous Approved Waste Types	[x] Domestic [x] Industrial, Commercial & Institutional (IC&I) [ ] Source Separated Organics (Green Bin) [ ] Tires	[x] Contaminated Soil [x] Wood Waste [ ] Blue Box Material [ ] Processed Organics [ ] Leaf and Yard Waste	[ ] Food Processing/Preparation Operations Waste [ ] Hauled Sewage Other: Asbestos waste. Petruscible waste are not accepted for landfilling.
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*	None		

Year Site Opened *(enter the Calendar Year only)*	1960	**Current ECA Issue Date**	April 16, 2009, not incl. notices
Is your Site required to submit Financial Assurance?		◉ **Yes** ○ **No**	
Describe how your WDS is designed.		○ Natural Attenuation only ◉ Fully engineered Facility ○ Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		○ **Yes** ◉ **No**	
If closed, specify ECA, control or authorizing document closure date:		N/A	
Has the nature of the operations at the site changed during this monitoring period?		○ **Yes** ◉ **No**	
If yes, provide details:			

Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)	○ Yes ◉ No

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) **The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:**	◉ **Yes** ○ **No**	
2) **All groundwater, leachate and landfill gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by ECA or other relevant authorizing/ control document(s):**	○ **Yes** ◉ **No** ○ **Not Applicable**	If no, list exceptions below or attach information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
MW09-1A, 1B, 1C, and 1D	Those groundwater monitoring locations were not sampled during the winter of 2022 due to historical conditions of frozen water in the monitoring wells. Instead, they were monitored in August 2021. MW09-1D was dry at the time and no sample was collected at this location.	24-Aug-2021

3) a) **Some or all groundwater, leachate and landfill gas sampling and monitoring requirements have been established or defined outside of a ministry ECA, authorizing, or control document** *. or Ministry concurrence.*	○ Yes ◉ No ○ Not Applicable	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	○ Yes ○ No ◉ Not Applicable	If no, list exceptions below or attach additional information.

Groundwater Sampling Location	**Description/Explanation for change (change in name or location, additions, deletions)**	**Date**

4) **All field work for groundwater investigations was done in accordance with Standard Operating Procedures (SOP) as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):**	○ Yes ◉ No	Golder Associates Ltd. standard practices were followed as described in the report.
Sampling and Monitoring Program Results/WDS Conditions and Assessment:		
5) **The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/ or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.**	◉ Yes ○ No	
6) **The site meets compliance and assessment criteria.**	○ Yes ◉ No	In 2021, two confirmed (continued increase in concentration beyond the background range) trigger exceedances of the background range were reported in the weathered clay and intact clay stratigraphic units. Manganese exceeded at monitoring well OW-92-10 in the weathered clay and ammonia exceeded at monitoring well 07-1B in the intact clay.
7) **The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.**	◉ Yes ○ No	Trigger exceedances are not interpreted to be a result of further migration of landfill leachate. Results will be monitored in the future.

1) Is one or more of the following risk reduction practices in place at the site: *(a)* There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or *(b)* There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or *(c)* The site meets the following two conditions (typically achieved after 15 years or longer of site operation): *i.* The site has developed stable leachate mound(s) and stable leachate plume geometry/ concentrations; and *ii.* Seasonal and annual water levels and water quality fluctuations are well understood.	◉ Yes ○ No	Note which practice(s):	☒ (a) ☒ (b) ☐ (c)
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	◉ Yes ○ No ○ Not Applicable	In 2021, two confirmed (continued increase in concentration beyond the background range) trigger exceedances of the background range were reported in the weathered clay and intact clay stratigraphic units. Manganese exceeded at monitoring well OW-92-10 in the weathered clay and ammonia exceeded at monitoring well 07-1B in the intact clay.	

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

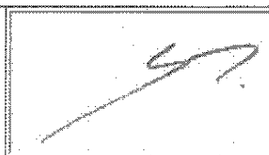
I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

○ **No changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/ are recommended:**	Due to on-going inability to collect water samples in monitoring wells MW09-1A through D located in Mer Bleue because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or fall). It is also proposed to remove VOCs from the list of parameters of the groundwater monitoring program as well as discontinue sediment monitoring (see rationale in Section 9.0).
◉ **No Changes to site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/are recommended:**	
Name:	Yannick Marcerou, M.Eng., P.Eng.
Seal:	

Signature:		**Date:**	16-Mar-2022
CEP Contact Information:			
Company:	Golder Associates Ltd.		
Address:	1931 Robertson Road, Ottawa, Ontario, K2H 5B7		
Telephone No.:	613-592-9600	Fax No.:	613-592-9601
E-mail Address:	Yannick_Marcerou@golder.com		
Co-signers for additional expertise provided:			
Signature:		**Date:**	
Signature:		**Date:**	

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):

Name (s)	See Attachment A.

Distance(s)	N/A

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	(•) Yes ( ) No	
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the ECA or relevant authorizing/control document(s) (if applicable):	(•) Yes ( ) No ( ) Not applicable	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry ECA or authorizing/control document, or Ministry concurrence.	( ) Yes (•) No ( ) Not Applicable	
b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:	( ) Yes ( ) No (•) Not Applicable	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

All field work for surface water investigations was done in accordance with SOP, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	○ Yes ◉ No	Golder Associates Ltd. standard practices were followed as described in the report.

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):	◉ Yes ○ No

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table on the following page or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. ECA limit, PWQO, background	e.g. X% above PWQO
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	(•) **Yes** ( ) **No**	There are no exceedances as there is no surface water-related compliance criteria (see question 7).

All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.	(•) **Yes** ( ) **No**	The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility. The MECP has agreed that this is the preferred approach for the WCC Navan Facility.
8) **For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g., PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):**	( ) Yes ( ) No ( ) Not Known (•) Not Applicable	
9) **Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):**	( ) **Yes** ( ) **No** (•) **Not Applicable**	

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

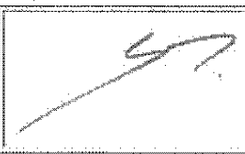
I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025-2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

○ **No Changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/are recommended:**	It is proposed to discontinue sediment monitoring (see rationale in Section 9.0).
◉ **No changes to the site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/ are recommended:**	

CEP Signature	
Relevant Discipline	P.Eng. with demonstrated relevant experience.
Date:	16-Mar-2022
CEP Contact Information:	Yannick Marcerou, M.Eng., P.Eng.
Company:	Golder Associates Ltd.
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Telephone No.:	613-592-9600
Fax No. :	613-592-9601
E-mail Address:	Yannick_Marcerou@golder.com
Save As	**Print Form**

Attachment A

In the event that leachate-impacted water was to reach either stormwater management ponds or ditches on the site, the source of the impact would be determined and then intercepted, as required. If necessary, the affected pond and/or ditches could then be emptied through a temporary pumping operation and the pumped water could be combined with the leachate and directed for off-site treatment. Therefore, there are no surface water bodies potentially receiving waste disposal site effluent.

002506

Distribution List

10 copies	Waste Connections of Canada
1 copy	National Capital Commission
1 e-copy	Golder Associates Ltd.

Executive Summary

This report serves as the annual environmental monitoring portion of the 2021 site operations and monitoring report and presents the results of groundwater, surface water, leachate and sediment monitoring activities carried out during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility). This report has been prepared to fulfill the reporting requirements outlined in Conditions 135 and 136 of Environmental Compliance Approval (ECA) No. A460702.

The following executive summary highlights key points only; for complete information and findings it is necessary for the reader to examine the complete report.

Based on the groundwater levels obtained during the 2021 monitoring program, no significant change in groundwater flow patterns has been observed.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (un-weathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present up-gradient, at the down-gradient edge (used to assess compliance) and further down-gradient of the landfill in each of these units.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2020 background range.

Leachate quality monitoring results for 2021 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Trigger concentration exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

WCC's efforts were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented.

In 2021, there were two confirmed exceedances (continued increase in concentration beyond the background range), manganese concentration in the weathered clay at OW-92-10 in November 2021 and the ammonia concentration in the intact clay at MW-07-1B in November 2021. These two confirmed exceedances were reported to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in this report and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions. The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (see Section 9.0). As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or the fall depending on site conditions) as has been done between 2014 and 2021.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the November 2021 monitoring session and will be monitored again in the spring of 2023.

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Figure 2: Site Plan

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APPENDIX A
Record of Borehole Sheets

APPENDIX B
Laboratory Certificates of Analysis

APPENDIX C
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1.0 INTRODUCTION

This report serves as the 2021 annual monitoring report and presents the results of monitoring activities carried out during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility).

The WCC Navan Facility is a 91.87 hectare (ha) waste management facility that includes a 40 ha landfill, as well as processing (recycling). The site is located on parts of Lots 2, 3 and 4, of Concession IV, Ottawa Front in the City of Ottawa (formerly the city of Gloucester), Ontario (see Key Plan, Figure 1). This site has been in operation since 1960 and operates under Environmental Compliance Approval (ECA) No. A460702. In April 2009, WCC received *Environmental Protection Act* approval for the expansion of the WCC Navan Facility.

The monitoring program undertaken in 2021 by Golder Associates Ltd. (Golder) is outlined in Tables 1a through 1c. Monitoring to date at the WCC Navan Facility consists of water quality analysis of surface water, groundwater and leachate. The 2021 monitoring program was a continuation of the monitoring program carried out in 2020 and followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and Condition 10.1 of the Conditions of Environmental Assessment Approval. As per Condition 109 of ECA No. A460702, the monitoring program includes sampling of the monitoring wells located in BH09-1, in order to assess the groundwater quality in the Mer Bleue Bog. The original monitoring program indicated that the wells would be sampled during the winter, when the Mer Bleue Bog is frozen and the wells are accessible. However, the groundwater in the monitoring wells has frequently been frozen during these events. In the 2013 monitoring report (Golder, 2014), it was proposed to sample them during the summer, rather than winter, and this recommendation has carried forward to present (monitoring is now completed either in summer or in the fall, depending on site conditions). Groundwater samples were successfully collected at monitoring well MW09-1A, MW09-1B, and MW09-C, during the summer monitoring session (no sample was collected from monitoring well MW09-1D due to dry conditions).

In addition, sediment quality monitoring which started in 2000 at the request of the National Capital Commission (NCC) at three locations within the Mer Bleue Bog is also documented in this report. Results of landfill gas, noise and odour monitoring undertaken in 2021 are provided under separate covers in Attachments 2 and 3.

2.0 FIELD PROCEDURES

2.1 Objectives

The objectives of the 2021 water quality monitoring program were:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

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2.2 Environmental Monitoring Program

2.2.1 Groundwater Component

The 2021 groundwater monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and satisfies objectives listed above. Water quality monitoring at the WCC Navan Facility was initiated in 1981. Since 1991, semi-annual monitoring programs were undertaken. Observation wells were added in 1992, 1994, 1995, 1998, 2000, 2005, 2007, 2009, 2010 and 2011. Groundwater monitoring sessions were carried out on May 26, August 24, and November 30, 2021. The groundwater monitors are outlined in Tables 1a, 1b and 1c and illustrated on the Site Plan (Figure 2). Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected in November 2021. The monitoring wells screened in the intact clay deposit and in the glacial till/upper bedrock zone will be sampled again in the spring of 2023.

The approved groundwater monitoring program was followed, except that as discussed in Section 1.0, groundwater monitoring locations BH09-1A, BH09-1B, BH09-1C and BH09-1D were not sampled during the winter of 2021 due to historical conditions of frozen water in the monitoring wells. Monitoring wells BH09-1A, BH09-1B, and BH09-1C were sampled during the summer session on August 24, 2021 (monitoring well BH09-1D was dry and therefore no sample could be collected at the time).

Detailed logs of the subsurface conditions encountered in each borehole are provided on the Record of Borehole sheets in Appendix A for most of the groundwater monitors included in the 2021 groundwater monitoring program. The top of pipe and ground surface elevations at each groundwater monitor location were surveyed with reference to geodetic datum following completion of the corresponding borehole drilling and groundwater installation program. The top of pipe for each of the monitoring wells included in the groundwater monitoring program were re-surveyed by WCC during November 2011 to account for any movement of the monitors over time.

The groundwater levels in the monitors included in the sampling sessions were measured on May 19, 2021 and November 23, 2021.

All monitors sampled during 2021 were developed through the removal of at least one standing volume of water using dedicated samplers which have been provided in each groundwater monitor. Sampling of groundwater was generally performed one week after monitor development, because the wells recover slowly.

As part of the Quality Assurance/Quality Control (QA/QC) program, a total of five field groundwater samples duplicates were prepared (two in the spring and three in the fall) along with three field blanks (one in the spring, one in the summer, and one in the fall) and three trip blanks (one in the spring, one in the summer, and one in the fall).

The temperature, pH and electrical conductivity of the groundwater samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private certified analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol provided below was followed for the groundwater samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, hardness (calcium and magnesium), potassium, sodium, manganese and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
total dissolved solids (TDS), alkalinity, sulphate, nitrate, nitrite, chloride, bicarbonate, and carbonate	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with hydrochloric acid or sodium bisulphate

Notes: * Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.

Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario performed all laboratory chemical and physical analyses on the groundwater samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The reportable detection limits (RDLs) for the specific groundwater analyses were generally commensurate with the standards established in the Ontario Drinking Water Quality Standards, Objectives and Guidelines (referred to as ODWQS, MOE, 2006, revised January 1, 2020).

2.2.2 Leachate Component

The leachate monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702. Leachate quality analysis was undertaken on samples obtained from the pump station (L5) during the May 27, August 24 and November 24 monitoring sessions as outlined in Tables 1a through 1c. The location of the leachate monitor is illustrated on the Site Plan (Figure 2).

As part of the QA/QC program, one field blank and one trip blank for the volatile organic compounds (VOCs) were prepared during the August sampling session.

The temperature, pH, electrical conductivity and dissolved oxygen of the collected leachate samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All leachate samples were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2.

The sample preparation and preservation protocol outlined below was followed for the leachate samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, hardness (calcium and magnesium), potassium, sodium and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, total suspended solids (TSS), and biochemical oxygen demand (BOD)	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)**, dissolved organic carbon (DOC)	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with hydrochloric acid or sodium bisulphate

Notes:
* Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.
** Dissolved inorganic carbon (DIC) calculated based on laboratory dissolved organic carbon (DOC) and total dissolved carbon

Paracel performed all laboratory chemical and physical analyses on the leachate samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific leachate analyses were commensurate with the standards established in the ODWQS (MOE, 2006, revised January 1, 2020).

2.2.3 Surface Water

The 2021 surface water monitoring program followed the program outlined in Condition 109 of ECA No. A460702. The 2021 surface water monitoring program is outlined in Tables 1a through 1c and monitoring stations are illustrated on Figure 2. Surface water samples were obtained on May 27, August 24, and November 24, 2021.

The only deviations from the approved surface water monitoring program were due to dry or stagnant conditions. Surface water monitoring station S5 was not sampling May 2021, stations S5, S8, S10, S11, and S16 were not sampled in August 2021 and station S5 in November 2021.

The estimation of surface water flow was obtained concurrently with surface water sampling on May 27, August 24 and November 24, 2021.

One field duplicate was prepared during the May, August, and November sampling sessions as part of the QA/QC program.

The temperature, pH, electrical conductivity and dissolved oxygen of the surface water samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The same preparation and preservation protocol below was followed for each of the surface water samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, hardness (calcium and magnesium), potassium, sodium, manganese and zinc	plastic bottle, unfiltered and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, TSS, and BOD	plastic bottle, unfiltered and unpreserved
ammonia*, total phosphorus, dissolved organic carbon (DOC), phenols, COD and TKN	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)	amber glass bottle, unfiltered and unpreserved

Notes: * Unionized ammonia calculated based on laboratory ammonia concentration, field temperature and pH measurements.

Paracel performed all laboratory chemical and physical analyses on the surface water samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific surface water analyses were generally commensurate with the standards established in the Provincial Water Quality Objectives (referred to as PWQO, MOE, 1994, reprinted 1999).

2.3 Sediments

Sediment quality was monitored at three locations within the Mer Bleue Bog. The sampling locations are the same as the surface water sampling stations located within the bog, i.e., SED-W was obtained at SW-W, SED-C at SW-C and SED-E at SW-E (refer to Figure 2). Sediment quality monitoring in the Mer Bleue Bog was added to the monitoring program in 2000 and sediment samples were obtained in 2021 at three locations on May 27 and November 24.

All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol outlined below was followed for the sediment samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium and zinc	glass jar, with a plastic lid

Paracel performed all laboratory chemical and physical analyses on the sediment samples. The Report of Analyses sheets from Paracel are provided in Appendix B.

2.4 Status of Monitoring Well Network

During the spring monitoring session, the condition of each well within the monitoring well network at the site was assessed. A summary of the findings of the 2021 monitoring well network condition survey (properly cased, capped and locked) are provided in Table 3. At the time of the condition survey it was observed that all monitoring wells were in good condition.

3.0 WATER LEVEL DATA

3.1 Groundwater Levels

Records of monitoring well water elevations obtained in May and November 2021 are provided in Tables C-1 and C-2, Appendix C and are shown graphically on Figures C1 through C10. Water level changes for 2021 are discussed in the following sub-sections. It should be noted that all monitoring wells were resurveyed in 2011 which resulted in an increase in water elevations at some locations. This reflects the more accurate survey data and does not necessarily reflect changes in the groundwater elevations.

3.1.1 Up-Gradient Control Wells

The results of water levels measured at the up-gradient wells are shown graphically on Figure C1 through Figure C4 in Appendix C. There are no significant changes indicated in groundwater levels measured at these locations. The results indicate the shallow water table to be typically located approximately 1 to 2 metres (m) below ground surface at up-gradient wells OW-92-12 to OW-92-19 and MW05-1A to MW05-1D. There are only small fluctuations in water levels indicated for recent years, except for an unusually elevated groundwater level recorded in November 2017 at monitoring location OW-92-15 which returned to levels similar to historical levels during 2018.

Hydraulic head profiles for monitoring wells OW-92-12 to OW-92-19 for May and November 2021 are shown on Figure 3 illustrating a downward hydraulic gradient. The only variation in the direction of the hydraulic gradient is indicated in the upper 5.6 m to 10.4 m below ground surface in the spring and in the upper 6.4 m to 10.4 m in the fall, from a downward gradient to an upward gradient in the intact clay and weathered clay. This result may be attributed to a perched water table at the interface of the weathered clay and the intact clay. The relatively weak downward gradient from the sand to the weathered clay suggests a hydraulic interconnection between these units. The downward gradient is quite pronounced from the weathered clay down to the lower reaches of the intact clay deposit. It is interpreted that the intact clay deposit at depth beneath the landfill site acts as a barrier to groundwater flow.

3.1.2 Immediate Down-Gradient Wells and Wells in Line with Immediate Down-Gradient Wells

The results of the water levels measured at the large down-gradient nest of observation wells (OW-92-1 to OW-92-8 and MW05-8) are shown graphically on Figure C5 provided in Appendix C. These results indicate the shallow groundwater table lies within the sand deposit close to the original ground surface ranging in elevation from about 68.58 m to 71.46 m. Similar results are indicated at observation wells OW-92-9 to OW-92-11 and MW05-11 as well as OW-94-1 to OW-94-3 and MW05-R3 as shown graphically on Figures C6 and C7, respectively. Seasonal variations of nearly 1 m have previously been indicated. The high water levels generally occur during the wet spring whereas the lower water levels are recorded during the dry summer months and fall. Similar trends were observed in 2021 at most wells, with the higher spring elevations being more pronounced in the spring of 2021.

Hydraulic head profiles for the nest of observation wells OW-92-1 to OW-92-8 are presented on Figure 3. Unlike the up-gradient groundwater level profiles, the down-gradient profiles historically have indicated a slight upward vertical gradient and a localized weak downward gradient observed at times between the upper 6.3 m to 7.6 m within the weathered clay. Similar to 2019 and 2020, a slight downward gradient is observed from the sand to the weathered clay in 2021. A slight downward gradient was also observed from the weathered clay to the intact clay in the fall of 2021. The upper four wells historically have appeared to be hydraulically connected with near vertical or

hydrostatic water level profiles. A slight upward gradient from the bedrock to the weathered clay at the down-gradient boundary of the landfill would suggest there is upward vertical flow at this location, which would retard the potential for leachate migration into the deeper groundwater system. In the spring and fall of 2021, there was near vertical or a hydrostatic water level profile between the bedrock and weathered clay.

3.1.3 Mer Bleue/Down-Gradient Control Wells

Water levels obtained at the down-gradient control wells are shown graphically on Figures C8, C9 and C10 in Appendix C. These results indicate artesian conditions at OW-94-4 to OW-94-6, OW-95-5 to OW-95-7 and OW-95-9, while at OW-95-1 to OW-95-3, the shallow groundwater table is close to the ground surface within the upper sand, weathered and intact clay. Monitoring well OW-95-9 and OW-95-5 were frozen during the fall 2021 monitoring session.

Hydraulic head profiles for the nest of observation wells OW-95-5 to 95-7 and OW-95-9, as shown on Figure 3, illustrate an upward gradient through most of the profile with a weak downward gradient from the sand to the weathered clay. Historically, there has been an upward gradient through the entire profile. The presence of an upward gradient suggests upward groundwater flow is occurring south of the landfill. These results may also suggest upward leaching of porewater from the Champlain Sea clay, a brackish water deposit, may be occurring at the southern boundary of the landfill. North of the landfill, downward leaching of the clay porewater is indicated. Hydraulic gradients between 95-9 and 95-5 were unable to be determined the fall monitoring session due to frozen conditions.

3.1.4 Horizontal Hydraulic Gradients

The horizontal hydraulic gradient in the shallow sand deposit and weathered clay at this site is consistent with the relief of the property which changes in elevation by approximately 15 m to 18 m between the up-gradient and down-gradient boundaries of the landfill. Since the shallow water table appears to be a reflection of the original surface topography, horizontal hydraulic gradients are expected to vary between 0.007 in the plateau above the escarpment and 0.014 in the valley below. Water levels measured south of the landfill indicate shallow groundwater is flowing in a south to southwest direction with a small hydraulic gradient ranging between 0.005 and 0.025. The horizontal gradients in the bog area are influenced by seasonal fluctuations in the surface water levels. Hydraulic gradients could also be influenced by the leachate collection system (LCS) located along the south toe of the landfill. Keeping the LCS drained could result in a lowering of the water table at the southeast corner of the landfill by more than 3 m below the original grade at the southeast corner of the landfill and by 2 m at the southwest corner. This water table lowering could significantly influence the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient side of the LCS was constructed to alleviate any potential problems related to lowering of the groundwater table south of the landfill.

Water levels measured in the up-gradient and down-gradient deep wells (OW-92-12 and OW-95-9) indicate a typical difference in water levels of about 6 m, which represents a hydraulic gradient of approximately 0.01 (0.008 in spring 2021) across the site within the glacial till/upper bedrock.

Many factors, such as mounding within the waste pile, the installation of the leachate collection system and the construction of waste cells with under drainage will influence the rate of groundwater flow across the site.

002520

3.2 Surface Water Flow Measurements

Estimates of surface water flow measurements for 2021 are summarised below along with the historical minimum and maximum flow rates estimated at each monitoring station.

Monitoring Station	Minimum Flow L/s	Maximum Flow L/s	Expected Dry Weather Flow L/s	Estimated Flow May 27, 2021 L/s	Estimated Flow Aug. 24, 2021 L/s	Estimated Flow Nov. 24, 2021 L/s
S-1	No flow	73	0.5 – 2	0.2	0.2	21
S-3	No flow	140	<0.5	No flow	0.4	No flow
S-5	No flow	No flow	No flow	Dry	Dry	No flow
S-8	No flow	5 – 10	0.5 – 2	No flow	Dry	No flow
S-9	No flow	94	2 – 5	0.2	1.6	7.0
S-10 (SW-W) [a]	No flow	No flow	No flow	No flow	No flow	No flow
S-11 (SW-C) [a]	No flow	No flow	No flow	No flow	No flow	No flow
S-12 (SW-E) [a]	No flow	No flow	No flow	No flow	No flow	No flow
S-15	No flow	120	0.3 – 2	3	No flow	1.5
S-16	No flow	56	No flow	8.3	Dry	No flow
S-17	No flow	44	0.5 – 2	No flow	No flow	13.0

Notes:
[a] Monitoring stations S-10 (SW-W), S-11 (SW-C) and S-12 (SW-E) are located at the northern edge of the Mer Bleue Bog and consist of stagnant bog water.

Input: ETB
Checked: RPM

4.0 GROUNDWATER QUALITY ASSESSMENT

Groundwater has been monitored at observation wells since 1981. However, since 1985, landfilling operations expanded over the original down-gradient observation wells which have since been replaced with the existing wells. Existing observation wells were installed in 1992, 1994, 1995, 1998, 2005, 2007, 2009, 2010 and 2011.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as follows:

- a shallow surface sand layer at depths ranging from 1.5 to 2.5 m below original grade
- the weathered clay zone of a thick clay deposit at depths ranging from 3.5 to 4.5 m below original grade
- the intact clay deposit at depths ranging from 7 to 8 m below original grade
- glacial till/bedrock contact zone at depths ranging from 22.3 to 37.1 m below original grade

The two upper stratigraphic units, the sand and weathered clay units, were sampled for both the May and November monitoring events. The two lower stratigraphic units, the intact clay and near bedrock units, are sampled every 18 months. Groundwater samples from these units were collected in November 2021 and the next sampling session for the monitoring wells screened in these units will be in the spring of 2023. The observation wells monitored in 2021 are listed in Tables 1a, 1b and 1c and illustrated on Figure 2.

As previously discussed, Condition 109 of the ECA requires groundwater monitoring locations MW09-1A, MW09-1B, MW09-1C and MW09-1D to be sampled once per year. Due to expected frozen conditions in the winter, MW09-1A, MW09-1B, MW09-1C and MW09-D have been monitored during the summer sessions starting

in 2014. Due to dry conditions, no sample could be collected from monitoring well MW09-1D in August 2021. Data from these wells is being collected to assess the groundwater quality in the area of the Mer Bleue as part of the expansion of the landfill.

Current and historical analytical results for groundwater in all units are presented in Appendix D.

4.1 Quality Assurance/Quality Control

The 2021 QA/QC protocol included the following: (i) preparation of one laboratory trip blank and one field blank for the May and November 2021 monitoring session to be analyzed for VOCs; (ii) the collection and analysis of two blind groundwater sample duplicate for the May 2021 sampling session and (iii) two blind groundwater sample duplicates for the November 2021 sampling session. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the RPD between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All QA/QC results for groundwater were within acceptable tolerance limits during the May 2021 monitoring session, except for the TKN concentration in the sample collected from MW95-8 (identified as 95-8 in the laboratory report) and its duplicate (identified as Dupe-3 in the laboratory report). A data check was requested for the sample collected at MW95-8 in May 2021 and its duplicate; it was determined that there was an error on the original and duplicate TKN concentrations and a revised report was issued. Following the revised report, the TKN concentration does not exceed the acceptable tolerance limits. MW-95-8 and its duplicate had TKN concentrations consistent with historical results.

Three blind groundwater sample duplicates were analyzed during the November 2021 session. All QA/QC results for groundwater were within acceptable tolerance limits during the November 2021 monitoring session except for the copper concentrations, iron concentrations, and phosphorous concentrations in the sample collected from MW95-8 (identified as 95-8 in the laboratory report) and its duplicate (identified as Dupe-2 in the laboratory report) as well as the manganese concentrations in the sample collected from MW92-7 (identified as 92-7 in the laboratory report) and its duplicate (identified as Dupe-3 in the laboratory report). The sample collected at MW95-8 and its duplicate were re-analyzed by the laboratory and the results demonstrated that the QC on the original sample concentrations was acceptable. Copper and iron concentrations are consistent with historical results for both MW95-8 and its duplicate. The phosphorous concentration reported at MW95-8 in the fall was elevated compared to recent historical concentrations, but still within historical concentrations at this location. Manganese concentrations reported at MW92-7 in the primary and duplicate samples were both within the range of historical concentrations for this parameter at this location (which have been typically variable) and the laboratory could not explain the discrepancy.

It is believed that the discrepancies noted should not affect the interpretation of the groundwater results.

The results of the VOCs analyses of the field blanks and trip blank (identified respectively as Field Blank and Trip Blank in the laboratory report from the May and November 2021 monitoring sessions) were within acceptable tolerance limits with all parameters concentrations below their respective RDL.

002522

4.2 Up-Gradient Control Wells

Monitoring of groundwater quality up-gradient from the site was made possible with the use of observation wells installed in 1992 behind the WCC administration office at 3354 Navan Road (OW-92-12 to OW-92-19). In 1995, two additional wells were installed within the shallow sand deposit to the southeast (OW-95-4) and west (OW-95-8) of the administration office. Four additional wells were installed in the fall of 1998 at the up-gradient corners of the waste footprint (OW-98-1 to 98-4). In August 2011, a borehole was drilled and a new observation well was installed to replace OW-98-2 in the intact clay deposit, as it was filled with sand. Monitoring wells OW-95-4, OW-98-4 and OW-98-3 were decommissioned in 2012 and replaced by existing monitoring wells MW05-1A to D as per Item 42 listed in Schedule A of ECA No. A460702. All these wells are referred to as the up-gradient control wells. The up-gradient groundwater quality in each stratigraphic unit was compared to the ODWQS for which aesthetic objectives or maximum or interim maximum acceptable concentrations exist.

4.2.1 Sand Layer

The background groundwater quality within the sand layer was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-19, MW05-1D (replacing OW-95-4), and OW-95-8.

The groundwater quality during 2021 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-19	TDS and manganese	Chloride, manganese, sodium and TDS
05-1D	Chloride and TDS	Chloride and TDS
95-8	Manganese and TDS	Iron, manganese and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, manganese, iron, sodium and TDS that exceed the ODWQS.

4.2.2 Weathered Clay Deposit

The background groundwater quality within the weathered clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-18, OW-98-1 and MW05-1C (replacing OW-98-4).

The groundwater quality during 2021 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-18	Chloride and TDS	Chloride, manganese and TDS
98-1	Chloride, sodium and TDS	Chloride, iron, manganese, sodium and TDS
05-1C	Manganese	[None]

Input: ETB
Checked: RPM

002523

As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS that exceed the ODWQS.

4.2.3 Intact Clay Deposit

The background groundwater quality within the intact clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-16, MW11-1 (replacing OW-98-2) and MW-05-1B (replacing OW-98-3).

The groundwater quality during 2021 at the intact clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-16	[None]
05-1B	[None]
11-1	Chloride, sodium, manganese and TDS

Input: ETB
Checked: YJM

As apparent from the above table and historical data, the groundwater quality within the intact clay deposit is characterized by concentrations of chloride, manganese, sodium and TDS that exceed the ODWQS.

4.2.4 Glacial Till/Upper Bedrock Zone

The background groundwater quality within the glacial till/upper bedrock was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-12 and MW-05-1A.

The groundwater quality during 2021 at the glacial till/upper bedrock groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-12	Sodium and TDS
05-1A	Sodium and TDS

Input: ETB
Checked: RPM

As apparent from the above table, the groundwater quality within the glacial till/upper bedrock is characterized by concentrations of sodium and TDS which regularly exceed the ODWQS.

002524

4.3 Mer Bleue/Down-Gradient Control Wells

Groundwater further down-gradient from the landfill is monitored with the use of nested observation wells installed in 1994 and 1995 south of the landfill at the northern edge of the Mer Bleue Bog. These observation wells were installed to obtain a better understanding of the hydrogeology of the area and geochemistry of the groundwater south of the landfill. The nested wells are located in line with the eastern limits of the landfill (OW-94-4, OW-94-5 and OW-94-6), east of the landfill centre line (OW-95-5, OW-95-6, OW-95-7 and OW-95-9) and in line with the western limits of the existing landfill (OW-95-1, OW-95-2 and OW-95-3). All these wells are referred to as the down-gradient control wells. The groundwater quality of the down-gradient control wells in each stratigraphic unit was compared to the ODWQS for aesthetic objectives or maximum or interim maximum acceptable concentrations.

4.3.1 Sand Layer

The down-gradient groundwater quality within the sand layer was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-6, OW-95-3, and OW-95-7.

The groundwater quality during 2021 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
94-6	Iron, manganese, and TDS	Sodium, manganese, and TDS
95-3	Manganese, sodium and TDS	Manganese, sodium and TDS
95-7	Chloride, iron, manganese, sodium and TDS	Chloride, manganese, sodium and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, iron, manganese, sodium and TDS that exceed the ODWQS. Similar ODWQS exceedances for these parameters were also observed in the up-gradient groundwater at similar concentrations.

4.3.2 Weathered Clay Deposit

The down-gradient groundwater quality within the weathered clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-5, OW-95-2, and OW-95-6.

The groundwater quality during 2021 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
94-5	Chloride, iron, manganese, sodium, and TDS	Chloride, manganese, sodium, and TDS
95-2	Chloride, manganese, sodium, and TDS	Chloride, sodium, and TDS
95-6	Chloride, manganese, sodium, and TDS	Chloride, manganese, sodium, and TDS

Input: ETB
Checked: RPM

002525

As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS that exceed the ODWQS, similarly to groundwater quality within the same deposit upgradient of the landfill.

4.3.3 Intact Clay Deposit

The down-gradient groundwater quality within the intact clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-4, OW-95-1, and OW-95-5.

The groundwater quality during 2021 at the intact clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
94-4	Chloride, manganese, sodium, and TDS
95-1	[monitoring location was frozen]
95-5	Chloride, manganese, sodium, and TDS

Input: ETB
Checked: RPM

As apparent from the above table as well as historical data, the groundwater quality within the intact clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS which exceed the ODWQS. Up-gradient groundwater quality is different than down-gradient water quality, even though similar parameters exceed ODWQS at up-gradient observation well MW11-1. The concentrations observed at the down-gradient locations were generally higher than at the up-gradient locations.

4.3.4 Glacial Till/Upper Bedrock Zone

The down-gradient groundwater quality within the glacial till/upper bedrock zone was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitor OW-95-9.

The groundwater quality during 2021 at the glacial till/upper bedrock zone groundwater monitor met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
95-9	[monitoring location was frozen]

Input: ETB
Checked: RPM

As apparent from historical data, the groundwater quality within the glacial till/upper bedrock zone is characterized by concentrations of chloride, sodium, and TDS that regularly exceed the ODWQS. Historically, concentrations of iron and manganese have occasionally exceeded the ODWQS. The concentrations of chloride and sodium in the down-gradient groundwater quality are typically higher than in the up-gradient groundwater quality.

002526

4.4 Results

Piper trilinear diagrams for groundwater in the sand layer during May and November 2021 are shown on Figures 4 and 5, respectively. The diagrams indicate that shallow groundwater at the immediately down-gradient locations is somewhat variable and has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the sand within the Mer Bleue Bog. Similar to past observations, the distribution of up-gradient groundwater quality on the Piper diagrams is reflecting elevated but stable chloride and hardness (calcium and magnesium) concentrations at MW05-1D since 2012.

Figures 6 and 7 indicate that groundwater in the weathered clay at the immediately down-gradient site OW-92-10 has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the weathered clay within the Mer Bleue Bog (with a fingerprint very similar to leachate quality). Groundwater at other compliance sites is more like groundwater in the weathered clay within the Mer Bleue Bog. These diagrams also indicate that groundwater in the weathered clay deposit up-gradient of the landfill is different from groundwater in the bog. There are no significant changes from the previous year.

Figure 8 indicates that groundwater in the intact clay downgradient of the site has a geochemical fingerprint similar to groundwater quality in the intact clay in the Mer Bleue Bog. Although historically a similar observation was reported for groundwater quality in the glacial till/upper bedrock zone, this comparison could not be done in 2021 because the only Mer Bleue Bog well in this stratum (OW-95-9) was frozen in November 2021 (see Figure 9).

A Phase II Environmental Site Assessment was conducted at the landfill by Intera (Intera, 2003). This assessment concluded that groundwater within the sand layer, the upper weathered clay and perhaps the deeper intact clay deposit on down-gradient lands has slightly elevated concentrations of parameters previously thought to be indicative of landfill leachate (e.g., boron, ammonia, TKN). However, there is no obvious spatial correlation of these parameters with proximity to the landfill or groundwater migration pathway. The lack of spatial correlation suggests that groundwater on down-gradient lands is representative of naturally elevated background groundwater quality associated with the Mer Bleue environment.

In addition, the groundwater and surface water trigger mechanism report prepared by Golder (Golder, 2007b) demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are not potential impacts from landfill activities. Naturally elevated parameters measured included boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

5.0 LEACHATE CHARACTERISTICS

Prior to the construction of the leachate collection system (LCS) in 1991-1992, leachate was sampled and analysed in areas where surface breakout was observed. Breakout of leachate, when encountered, usually occurred at the down-gradient toe of the landfill.

The monitoring program for leachate quality has focused on the LCS. For the purpose of the annual monitoring report, leachate generated by the landfill is monitored at the down-gradient end of the south toe collector at L5 at the same time surface water is monitored. A more extensive leachate monitoring program is carried out throughout the year in accordance with a City of Ottawa Leachate Discharge Agreement for the discharge of treated leachate at the Robert O. Pickard Environmental Centre (ROPEC), the municipal wastewater treatment plant.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation. The landfill is underlain by a thick natural clay deposit which has a hydraulic conductivity, K, of less than 10^{-9} metres per second and as such performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater, but rather it is predominantly precipitation that has infiltrated through the waste pile. It should be noted that leachate at the site could also consist of porewater from the underlying clay as a result of upward gradients and/or consolidation, noting that porewater release to the leachate collection system is slowed by the low hydraulic conductivity of the clay.

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. The intrinsic biodegradability of municipal landfill leachate can be measured by a BOD:COD ratio. During the first several years of production, the BOD:COD ratio generally is in the 0.5 range. As the landfill ages, the ratio decreases to levels less than 0.1 suggesting a more or less biologically recalcitrant organic composition (Andreottola et al., 1989). Also, the concentration of ammonia tends to increase with landfill age since ammonia is a by-product of the stabilisation of organic matter (Elefiniotis et al., 1989), although at a dry waste facility such as the WCC Navan Facility, ammonia concentrations can be expected to remain relatively low.

Typical parameter concentrations in leachate are provided in the tables below. Average concentrations indicate that the WCC Navan Facility leachate is distinctly different from most other landfill sites in Ontario, including the City of Ottawa Trail Waste Facility, with most analytes measured in the WCC Navan Facility leachate having much lower concentrations. The concentration of various parameters listed below suggests a comparatively low strength leachate is generated at the WCC Navan Facility. The concentration of the traditional indicators of environmental quality (conventional pollutants) such as BOD_5, suspended solids, ammonia and metals such as iron and zinc are relatively low. The WCC Navan Facility leachate has much lower concentrations because it is not generated from municipal waste.

Parameter	WCC Navan Waste Recycling and Disposal Facility L5 *			Trail Road & Nepean Landfills [1]			Ontario Landfills [2]		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
Boron	0.37	29.3	15.3	3.92	6.22	5.348	0.8	52	10.4
Ammonia	0.01	112	44.5	----	----	----	7.6	1,820	175
BOD_5	1.6	662	99.9	111	1,790	652	1	66,000	4,975
Conductivity	669	5,640	3,866	----	----	----	475	26,100	6,088
TDS	1,690	10,300	2,853	----	----	----	196	9,030	4,327
Sodium	53.9	850	541.4	----	----	----	13.8	16,000	936
Manganese	0.066	13.2	1.25	0.0879	1.62	0.627	0.03	793	3.54
COD	69.2	1,240	441	380	4,700	1,493	1	47,300	7,855
Iron	0.003	32.7	7.8	0.798	58.3	13.26	0.01	1,300	58
Copper	<0.0005	0.254	0.011	0.0165	0.374	0.1567	0.007	7	0.045
TSS	<2	1,190	109	2	12,400	92.1	3	8,130	445
Chloride	76.5	1,000	478.8	1,000	1,640	1,308	0.4	12,000	270
Lead	<0.00002	0.1	0.008	<0.05	0.276	----	0.001	2.1	0.070
Zinc	<0.005	4.54[3]	0.11	0.0366	2.21	0.62	----	16	1.42

Notes:
All concentrations are in mg/L except conductivity (µS/cm)

Updated by: ETB
Checked by: RPM

* Calculated using all historical data collected for the Annual Monitoring Report since 1992 for L5.

< Denotes concentration is lower than the Reportable Detection Limit (RDL).

[1] City of Ottawa Trail Road Annual Operating and Monitoring Report – 2000.

[2] Howard and Livingston, "Contaminant Source Audits and Groundwater Quality", Environmental Geology of Urban Areas, 104-116, Ed. by N. Eyles, Geological Association of Canada, 1997.

[3] The concentration of zinc reported in August 2020 is considered anomalous but has been used in the calculation of the average zinc concentration in the leachate monitor.

Water impacted by leachate will typically have high concentrations of dissolved constituents with chemical concentrations ten to several hundred times higher than those measured at reference monitoring locations. Chemical concentrations have a high temporal variability due to variations in the composition, age and moisture of the waste and meteorological conditions.

Leachate monitored in 2021 to assist with assessment of surface water and groundwater quality was sampled on May 27, August 24 and November 24, 2021. Results of the chemical analysis undertaken by Paracel and the field measured parameters are provided along with historical data in Appendix E. The results indicate that leachate generated at the WCC Navan Facility continues to be a relatively weak wastewater when compared to municipal landfill leachate.

One field blank and one laboratory trip blank were analyzed during the August 2021 monitoring session. The results of the VOCs analyses for these two samples were within acceptable tolerance limits with all parameters concentrations below the RDL.

Leachate quality monitoring results for 2021 indicate that the leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Concentrations of field measured dissolved oxygen ammonia, boron, potassium, and TKN show a generally increasing trend over time although boron concentrations have been relatively stable in recent years. The concentration of chloride was previously indicated to be increasing but has been stable for approximately five years. The concentrations of DIC and manganese, show a general decreasing trend over time although they have stabilized in recent years. Previously reported decreasing trend in hardness appears to be stabilizing. The concentrations of certain parameters remain above the surface water and groundwater quality near the site.

6.0 GROUNDWATER COMPLIANCE ASSESSMENT

6.1 Compliance Mechanism

The objectives of groundwater trigger mechanisms at the WCC Navan Facility are to utilize the results of the ongoing groundwater monitoring program to assess site compliance and to trigger implementation of the contingency plans, when and if necessary. The purpose of the trigger mechanisms is to prevent leachate-impacted groundwater exceeding a certain negative threshold level from occurring. The trigger mechanism was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the Navan Facility.

Traditional methods of site compliance provide very limited useful and/or reliable parameters for assessment of the WCC Navan Facility; therefore, an alternate method must be used. The difference in hydrogeology across the site coupled with the very saline environment of the clay deposit that underlies the Mer Bleue clay have resulted in the MECP accepting that Guideline B-7 (RUPO) is not applicable at this site. The MECP's position in this regard was documented in a November 2000 memorandum issued by the MECP (MOE, 2000). Therefore, the Leachate Indicator Parameter list and the method to determine if leachate from the site is impacting local groundwater was developed in the Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The Leachate Indicator Parameter list includes alkalinity, ammonia, boron, chloride, hardness, magnesium, manganese and potassium.

After the completion of a monitoring session, the concentration of each Leachate Indicator Parameter for all groundwater locations used to assess compliance should be visually checked. If a parameter concentration appears to be elevated, a comparison to the background concentration range should be completed. The potential for an increase in concentration of a Leachate Indicator Parameter will be investigated by comparing the concentrations for each parameter to the background range for its corresponding stratigraphic unit. The background range will be derived from the maximum and minimum data obtained at the locations used to assess compliance from 1998 to present in each stratigraphic unit. In addition, data from monitoring wells MW05-3A to D located to the east of the site and not impacted by landfill leachate will be used to define the background range. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each location used to assess compliance are presented in time-concentration graphs in Appendix F. The background ranges will be updated annually using the most recent data if it is not deemed impacted by landfill leachate. An exceedance of the background range is considered an exceedance of the trigger mechanism and the implementation of the trigger format outlined in the trigger mechanism report should proceed.

No comments from the MECP have been received on the groundwater aspects of the 2020 annual monitoring report at the time this report was completed.

6.2 Immediately Down-Gradient Wells Used to Assess Compliance

At the down-gradient limit of the landfill, groundwater quality was monitored at three nests of observation wells installed in 1992 and 1994. These wells are located at the southeast corner of the landfill (OW-92-9, OW-92-10 and OW-92-11), east of the landfill centre line at grid line 9 (OW-92-1 to OW-92-8) and at the southwest corner of the landfill (OW-94-1, OW-94-2 and OW-94-3). Two additional wells, MW-C and MW-E, were installed within the upper sand unit and shallow clay in 2000 at the northern boundary of the NCC property (now WCC property) located south of the VIA ROW. These observation wells are referred to as wells used to assess compliance.

MW07-1 is located in line with the wells used to assess compliance, to the southeast of the landfill in an area that has historically not been impacted by landfill leachate. These wells were installed in 2007 and their purpose is to monitor the future performance of the landfill expansion. With the commencement of landfilling operations in the expansion area east of the historical landfill footprint in 2016, these wells will be used along with the wells used in past reports to assess compliance along the southern property line.

New trigger concentrations were proposed in the 2020 monitoring report (Golder, 2021). These trigger concentrations are implemented herein.

In 2005, three sand layer wells used to assess compliance were installed to evaluate some unusual results at OW-94-3, OW-92-8 and OW-92-11. The monitoring wells are called MW05-R3, MW05-8 and MW05-11 and have replaced OW-94-3, OW-92-8 and OW-92-11 for groundwater quality results, respectively, as of November 2006.

6.2.1 Sand Layer

The down-gradient compliance site groundwater quality within the sand layer was monitored during the 2021 groundwater monitoring program through the inclusion of monitors MW05-R3, MW05-8, MW05-11, MW-C, MW-E and MW07-1D.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the sand layer are presented in time-concentration graphs in Appendix F-A.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	May 2021 Monitoring Session	November 2021 Monitoring Session
MW-C	None	None
MW-E	None	None
05-R3	None	None
05-8	Manganese	Alkalinity and manganese
05-11	None	None
07-1D	None	None

Input: ETB
Checked: RPM

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6.2.2 Weathered Clay Deposit

The down-gradient compliance site groundwater quality within the weathered clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of monitors OW-92-7, OW-92-10, OW-94-2 and MW07-1C.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the weathered clay deposit are presented in time-concentration graphs in Appendix F-B.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	May 2021 Monitoring Session	November 2021 Monitoring Session
92-7	None	None
92-10	Hardness, magnesium, and manganese	Manganese
94-2	None	None
07-1C	None	None

Input: ETB
Checked: RPM

6.2.3 Intact Clay Deposit

The down-gradient compliance site groundwater quality within the intact clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of monitors OW-94-1, OW-92-5, OW-92-9 and MW07-1B.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the intact clay deposit are presented in time-concentration graphs in Appendix F-C.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations
	November 2021 Monitoring Session
94-1	None
92-5	None
92-9	None
07-1B	Ammonia

Input: ETB
Checked: RPM

The manganese concentration reported at OW-94-1 in May 2020 was unusually elevated and returned to typical historic concentration levels in November 2021, below the trigger concentration.

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6.2.4 Glacial Till/Upper Bedrock Zone

The down-gradient compliance site groundwater quality within the glacial till/upper bedrock zone was monitored during the 2021 groundwater monitoring program through the inclusion of monitors OW-92-1 and MW-07-1A.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the glacial till/upper bedrock zone are presented in time-concentration graphs in Appendix F-D.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations November 2021 Monitoring Session
92-1	None
07-1A	Hardness, magnesium

Input: ETB
Checked: RPM

The manganese concentration reported at OW-92-1 in May 2020 was unusually elevated but not as high as has been observed historically. The concentration of manganese at OW-92-1 returned to typical historic concentration levels below the trigger concentration in 2021.

6.3 Results

The Leachate Indicator Parameters at all groundwater monitoring locations used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2020 background range.

As proposed in the 2020 Annual Monitoring Report (Golder, 2021), the maximum background potassium concentration in the sand stratigraphic unit was increased to 18.3 mg/L and the maximum background manganese concentration in the glacial till stratigraphic unit was increased to 0.025 mg/L.

After the reported 2018 increases in several parameter concentrations above the background ranges observed in the sand stratigraphic unit, the increasing trend for manganese at MW05-8 has stabilized in 2020 with concentrations reported lower than in 2019, although still above the trigger concentration. Manganese concentrations at MW05-8 in 2021 were lower than 2020, but still elevated above the trigger concentration.

Manganese concentrations at this location have been variable in the past but overall there is a general increasing trend. The maximum historical manganese concentration observed in the groundwater at MW05-8 is slightly higher than the maximum concentration of manganese reported for leachate from L5 (13.2 mg/L). As such, it is possible that the overall increasing trend of manganese concentrations is not caused entirely by landfill leachate.

Exceedances of trigger concentration for alkalinity in November 2021 at MW05-8 does not appear to be a part of an overall increasing trend. Previously reported increasing concentrations at MW05-11 for ammonia, continued to decrease in 2021 and are below the trigger concentration.

Therefore, there were no continued increases throughout 2021 above the background ranges observed in the sand stratigraphic unit in 2021 at trigger locations.

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There were no continued increases above the background ranges observed in the weathered clay stratigraphic unit in 2021 at trigger locations except for the manganese concentration at OW-92-10 in May and November 2021. The concentration in May (1.33 mg/L) increased from the previous concentration in November 2020 of 0.911 mg/L. This increase was followed by another increase in November 2021 to 1.65 mg/L which marks a confirmed exceedance. In November 2018, there were spikes in concentrations of leachate indicator parameters in the sand unit. As a contingency measure, WCC purchased a spare leachate pump to reduce the downtime when pumps require servicing. This course of action effectively reduced parameter concentrations in the sand unit. Some of these concentration increases were also observed in the weathered clay unit, including manganese. Due to the lower hydraulic conductivity within the weather clay unit compared to the sand unit, the parameter concentrations are taking longer to dissipate in the weathered clay. However, the manganese concentrations in the sand unit are still elevated above the respective trigger concentration. The water quality within the sand unit influences the water quality in the weathered clay unit due to the slight downward hydraulic gradient from the sand to the weathered clay. The maximum manganese concentration in the sand unit is elevated above the maximum leachate concentration, indicating that elevated manganese concentrations are likely not entirely caused by landfill leachate. Therefore, the elevated manganese concentrations in the weathered clay unit may be a delayed result of the implementation of the parameter spike increase and slower dissipation but may also not be entirely resulting from landfill leachate.

Concentrations of hardness and magnesium at OW-92-10 exceeded their corresponding background concentrations in May 2021 (550 mg/L for hardness and 79.7 mg/L for magnesium, respectively). In both cases, they decreased slightly in the fall 2021 below the maximum background concentrations. While other leachate indicator parameters at this location were reported to be well within the background range, an increasing trend since 2012 in concentrations of alkalinity and ammonia has been observed. The concentrations of alkalinity, ammonia, and chloride in the groundwater from the weathered clay are lower than the concentrations observed in the groundwater from the underlying intact clay. The historic upward gradients between the intact clay and weathered clay and potential release of porewater within the intact clay may, at least in part, be the source of the increased concentrations overtime observed in the weathered clay.

Groundwater quality in the intact clay and glacial till/upper bedrock unit was monitored during the fall 2021 monitoring session. Monitoring of these stratigraphic units occurs every 18 months with the next scheduled session in spring 2023.

Concentrations of Leachate Indicator Parameters in groundwater samples collected in 2021 from compliance monitors screened in the intact clay unit were all below the respective trigger concentrations, except for the concentration of ammonia at MW07-1B. The exceedance for ammonia at MW07-1B was preceded by a concentration reported above the maximum background level, marking two increased concentrations and a confirmed exceedance. If future results do not reflect an upward trend and the data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in the MW07-1B monitoring well is still considered unimpacted by landfill leachate.

Concentrations of Leachate Indicator Parameters in groundwater samples collected from compliance monitors screened in the glacial till/upper bedrock unit in 2021 were all below the respective trigger concentrations, except for the concentrations of hardness and magnesium from monitoring well MW07-1A reported in November 2021. Both concentrations reported at MW07-1A follow exceedances reported in the spring of 2017, the fall of 2018, and the spring of 2020 with a slight decrease in both concentrations in the fall of 2021. This is two consecutive monitoring sessions marking a decrease in both concentrations since the fall of 2018. Leachate indicator parameter concentrations within the intact clay are fairly stable and there are no increasing trends amongst other parameters or

monitoring wells. Previous exceedances have been reported at MW07-1B and other monitoring wells within the intact clay but typically decrease below the max background during the next scheduled monitoring session. Given the lack of increasing trends amongst other monitoring wells and parameters, it is not interpreted that this exceedance is a result of landfill leachate. If future results do not reflect an upward trend and the data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in this monitoring well is still considered unimpacted by landfill leachate.

6.3.1 Confirmed Exceedances and Proposed Course of Action

As mentioned above, there are two confirmed exceedances (continued increase above the background range) of the trigger concentrations for the weathered clay and intact clay stratigraphic units in the 2021 monitoring session.

Following the confirmed exceedances reported in the 2018 annual monitoring report (Golder, 2019), in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. Trigger results of the spring and fall monitoring sessions were reported by Golder, on behalf of WCC, to the MECP Ottawa District Office via email on August 8, 2019 and December 24, 2019, respectively. In accordance with the proposed course of action presented to the MECP in the 2018 annual monitoring report and communications in 2019, WCC acquired a spare leachate pump to reduce down time when a pump requires servicing and WCC intends to proactively maintain the forcemain in good working condition in a continuing effort to achieve a drained state in the leachate collection system.

Leachate pumping and disposal operating issues reported in the fall 2018 had an impact to groundwater quality in the sand and weathered clay units in monitoring wells located immediately downgradient of the leachate collection system (less than 10 m south of the leachate collection system and close to the south toe collector).

Concentrations of some Leachate Indicator Parameters in the sand unit spiked in November 2018, but the efforts from WCC in 2019 were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented. Since the hydraulic conductivity of the sand is greater than the weathered clay, elevated concentrations have been taking longer to dissipate in the weathered clay unit.

Golder contacted the MECP Ottawa District Office via email on July 9, 2020 to update them on the trigger exceedances and notify them that no trigger exceedance reported in the spring of 2020 was following two previous exceedances showing an increasing trend and that there was no need to implement a contingency plan at this time.

In 2021, WCC continued to implement the proposed voluntary action plan to control potential increases in concentrations. Manganese concentration in the weathered clay at OW-92-10 in November 2021 marked a confirmed increase and the ammonia concentration in the intact clay at MW-07-1B also marked a confirmed exceedance. These two confirmed exceedances were reported to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in this report and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions. A copy of this correspondence is provided in Appendix H.

It is WCC's intention to continue implementing in 2022 the proposed voluntary action plan to control potential increases in concentrations.

7.0 SURFACE WATER QUALITY ASSESSMENT

7.1 Quality Control/Quality Assurance

One blind sample duplicate was analyzed per surface water monitoring session in 2021 as part of the QA/QC protocol. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the RPD between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All duplicate results for surface water were within acceptable tolerance limits in 2021 with the exception of manganese and total suspended solids (TSS) concentrations in August 2021 from the sample collected from S9 (identified as S-9 in the laboratory report) and its duplicate (identified as Dupe-1 in the laboratory report). A data check was requested for the sample collected at S9 in August 2021 and its duplicate; it was determined that there was more particulate matter in the duplicate sample than the original. Higher metals concentrations were also noted in the duplicate compared to the original which could be attributed to the variability in results. The surface water analytical results are considered acceptable.

7.2 Surface Water Quality Monitoring

A total of eleven surface water stations continue to be monitored on an on-going basis at this site. The monitoring stations have been located to obtain representative information on water quality up-gradient from the landfill at stations S1, S3, S15, S16 and S17 (background), on water quality at compliance sites down-gradient from the landfill at stations S5, S8 and S9 and on water quality in the Mer Bleue Bog at S10 (SW-W), S11 (SW-C) and S12 (SW-E). Monitoring locations SW-W, SW-C and SW-E are location references used by the NCC.

Stations S1 and S17 are located northeast and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Stations S3, S15 and S16 are located to the west/northwest and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Station S1 is located at the northeast corner of the landfill below a culvert that discharges into a south flowing east perimeter ditch. Station S3 is located at the northwest corner within the site buffer, down-gradient from where a north diversion ditch flows into a west drainage channel. Station S15 is located to the west of the landfill where the north ditch flows into a southward flowing west perimeter ditch. Station S16 is located northwest of the site in a ditch along the south side of Navan Road and up-gradient from station S15. Station S17 is located in an east ditch along the south side of Navan Road and up-gradient from station S1. These stations are considered to be representative of up-gradient background surface water quality.

Stations S5, S8 and S9 are located down-gradient from the landfill. Station S5 is located at a culvert beneath the VIA Rail right-of-way (ROW) just east of the landfill centre line near grid line 10 and is dry throughout most of the year. Station S8 is located in a wide and shallow westward flowing channel having a swamp environment and is down-gradient from the southwest corner of the landfill and north of the VIA ROW, immediately west from where the west drainage channel discharges into the ditch. Station S9 is located near a large concrete box culvert beneath the VIA ROW and down-gradient from the southeast corner of the landfill. Since the fall of 2013, water has been backing up upstream of surface water station S9 as a result of blockage in the box culvert by aggressive beaver activity. Steps were taken by WCC in spring 2017 to reduce the beaver activity in the area and no blockage was observed during the fall monitoring session. No specific beaver activity was noted in 2021.

Surface water sampling stations S10, S11 and S12, also referred to by the NCC in other reports as SW-W, SW-C and SW-E, respectively, are located south of the landfill at the northern edge of the Mer Bleue Bog and consist of stagnant bog water. Stations S10, S11 and S12 were added in 1995 to obtain data considered to be representative of water quality in the receiving water at the perimeter of the bog.

For the purpose of surface water quality assessment, the background surface water quality is assumed to be represented by the data available from stations located in close proximity to the landfill and up-gradient of surface water flow. For the 2021 monitoring program, the PWQO is being applied for the purpose of water quality assessment at the surface water sampling stations.

Surface water monitoring for 2021 was carried out on May 27, August 24, and November 24 at up-gradient control sites S1, S3, S15, S16 and S17, sites S5, S8 and S9 and the down-gradient control sites S10, S11 and S12. Analytical test reports submitted by Paracel for water samples obtained in 2021 are provided in Appendix B. Historical data are also provided in Appendix G.

Station S5, S8, and S16 were found to be dry during the summer monitoring session in 2021. Station S5 was also dry in the spring monitoring session. Therefore, samples could not be collected at these stations at those times.

Water quality data was compared to historical data obtained at each station and trends in the concentration of key indicator parameters were examined.

The PWQO criteria for chromium changed in 1999 from chromium to chromium III and chromium VI. The laboratory reports total chromium and the exceedances noted in the tables in the following sections are values of total chromium that are greater than the PWQO for chromium III, i.e. 8.9 µg/L (there is no PWQO for total chromium). Should current data show an increasing trend, attempts will be made to separate the analysis into chromium III and chromium VI.

7.2.1 Up-Gradient Control Stations

The up-gradient surface water quality was monitored during the 2021 monitoring program through the inclusion of up-gradient stations S1, S3, S15, S16 and S17.

The surface water quality during 2021 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Station	Parameter(s) Exceeding or Outside PWQO		
	May 2021 Monitoring Session	August 2021 Monitoring Session	November 2021 Monitoring Session
S1	Dissolved oxygen, iron, and phenols	Iron	Cobalt, copper, iron, and phenols
S3	Dissolved oxygen, total phosphorous, cobalt, iron, and phenols	Dissolved oxygen, total phosphorous, cobalt, iron, and zinc	Dissolved oxygen, cobalt, iron total phosphorous, zinc, and phenols
S15	Iron and phenols	Dissolved oxygen and iron	Iron and phenols
S16	Cobalt, iron, and phenols	[No sample collected due to dry conditions]	Dissolved oxygen, total phosphorous, cadmium, chromium, cobalt, copper, lead, zinc, and phenols
S17	Total phosphorus, iron and phenols	Iron	Phenols

Input: ETB
Checked: RPM

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As apparent from the above table, the up-gradient surface water quality is characterized by concentrations of the following parameters which exceed or are outside the PWQO: cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorus. Occasional PWQO exceedances of cadmium, chromium, boron, and zinc have been observed in the past as well.

Surface water quality is generally consistent over time (with seasonal variability). An increasing trend in concentrations of alkalinity, chloride, and conductivity, can be observed at surface water station S1 over time. Previously observed overall increasing trends for concentrations of DIC, sodium, TDS, and hardness at surface water station S1, concentrations of alkalinity, ammonia, DIC and iron at surface water station S3, and concentrations of iron, magnesium, manganese, sodium and TDS at surface water station S15 appear to have stabilized, with seasonal variability remaining. Similarly, the previously observed decreasing trend in dissolved oxygen concentrations at surface water stations S3 appears to have stabilized with seasonal variability remaining. A slight increasing trend in magnesium is observed at S16 and S17. Hardness is also observed to be increasing at S16.

The current or historical increases in concentrations of parameters at these locations is not related to leachate impact as these stations are up-gradient of the site.

7.2.2 Down-Gradient Control Stations

The down-gradient surface water quality was monitored during the 2021 monitoring program through the inclusion of down-gradient stations S10, S11 and S12.

The surface water quality during 2021 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Monitor	Parameter(s) Exceeding or Outside PWQO		
	May 2021 Monitoring Session	August 2021 Monitoring Session	November 2021 Monitoring Session
S10	Dissolved oxygen, iron, total phosphorous, cadmium, chromium, cobalt, copper, lead, zinc, and phenols	Dissolved oxygen, pH, total phosphorous, cobalt, copper, iron, lead, and phenols	Dissolved oxygen, cobalt, iron, zinc, phenols and total phosphorus
S11	Dissolved oxygen, cobalt, iron, total phosphorus, and phenols	Dissolved oxygen, total phosphorous, cadmium, chromium, cobalt, copper, iron, lead, and zinc	Cobalt, dissolved oxygen, iron, phenols, and total phosphorus
S12	Dissolved oxygen, cobalt, iron, total phosphorus, and phenols	Dissolved oxygen, iron, phenols, and total phosphorous	Dissolved oxygen, iron, phenols, and total phosphorus

Input: ETB
Checked: RPM

As apparent from the above table, the down-gradient surface water quality is characterized by dissolved oxygen, iron, and total phosphorus concentrations which exceed or are outside the PWQO. Occasional PWQO exceedances of boron, cadmium, cobalt, copper, chromium, phenols and zinc have been observed.

The concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the May, August and November 2021 monitoring sessions were generally similar or slightly elevated compared to the surface water quality at the up-gradient station S16 during the spring monitoring session. During the fall monitoring session, parameter concentrations tended to be similar or lower than at S16.

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Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed with the exception of boron. Boron concentrations at S10, S11, and S12 were previously elevated in the mid to late 1990s, but have since decreased and remained stable, at concentrations slightly higher or similar to up-gradient surface water quality at most up-gradient stations for approximately 20 years.

7.3 Surface Water Compliance Assessment

As previously mentioned, surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. It becomes increasingly difficult to assess surface water site compliance with scattered data. The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater-based trigger mechanism is the appropriate approach for the WCC Navan Facility. Surface water quality monitoring will continue at the site, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the WCC Navan Facility.

8.0 SEDIMENTS

Sediment samples SED-W, SED-C and SED-E were obtained at the surface water sampling stations SW-10, SW-11 and SW-12, respectively, on May 27 and November 24, 2021. Laboratory reports are presented in Appendix B and the results are summarized in Table 4 and Table 5. Included for comparison in Table 4 and Table 5 are the MECP Table 1 sediment criteria and Table 2 and Table 4 Recreation/Parkland soil criteria (MOE, 2011) and the CCME freshwater sediment and Recreation/Parkland soil criteria (CCME, 1999). The table below summarizes the parameters which exceeded sediment criteria.

Sediment Monitor	Parameter(s) Exceeding MECP Table 1 Sediment		Parameter(s) Exceeding CCME Freshwater Sediment	
	May 2021 Monitoring Session	November 2021 Monitoring Session	May 2021 Monitoring Session	November 2021 Monitoring Session
SED-E	Arsenic, chromium, copper, nickel	[None]	[None]	Arsenic
SED-C	[None]	Copper	[None]	[None]
SED-W	Chromium, copper, nickel	Copper	[None]	[None]

Input: ETB
Checked: RPM

Analytical results on the sediment samples indicate that no parameters exceed the CCME Guidelines for freshwater sediment except for arsenic at SED-E. This is the highest arsenic concentration reported at SED-E (9.1 ug/g) with the previous highest concentration reported in May 2009 (7 ug/g). The laboratory was requested to re-analyzed the sample and similar results were reported. Arsenic, copper, chromium and nickel concentrations exceed the MECP Table 1 sediment criteria. The analytical results observed at the sampling locations are consistent with historical results observed at the respective locations.

The following table summarizes the parameters which exceeded the soil criteria in 2021.

Sediment Monitor	Parameter(s) Exceeding MECP Table 2/Table 4 Soil		Parameter(s) Exceeding CCME Soil	
	May 2021 Monitoring Session	November 2021 Monitoring Session	May 2021 Monitoring Session	November 2021 Monitoring Session
SED-E	Boron	[None]	Selenium	[None]
SED-C	Boron	[None]	[None]	[None]
SED-W	Boron	Boron	Selenium	[None]

Input: ETB
Checked: RPM

Analytical results on the sediment samples indicate that boron exceeds MECP Table 2 and Table 4 soil criteria during the spring monitoring session at each sampling location. Boron also exceeded MECP Table 2 and Table 4 during the fall monitoring session at SED-W. Selenium exceeded the CCME soil criteria during the spring monitoring session at SED-E and SED-W. In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Natural wetland systems have been used to treat a variety of wastewater including agricultural and surface mine runoff, irrigation return flows, leachate, urban storm water discharge and other sources of water pollution (U.S. Environmental Protection Agency, 1987). Today, increasing attention is being given to artificial wetlands for the treatment of wastewater. Approximately 90% of Canada's 127 million hectares of wetlands are classified as peatlands where peaty soils are predominant (NAWCC, 1994). The value of peat as an agent for pollution prevention and control has been recognized during the last three decades. Peat's value is directly related to its unique physical and chemical properties. Compared to other mineral soils, peat has a very high organic content (60% carbon), with lignin and cellulose as its main constituents. Peat has a large specific area and is highly porous, properties similar to natural zeolites and activated carbon, which makes it a good adsorbent material (McLellan and Rock, 1988). These contain some functional organic groups such as carboxyl and amino groups that form complexes with metal ions (Dissanayake and Weerasooriya, 1981). Peat is also reported to exhibit ion exchange capacities (Sharma and Froster, 1993). The combination of the above mentioned properties, i.e., being a good adsorbent, forming complexes with metals and having ion exchange capacity makes peat an excellent metal trapping media. Peat is proven to be effective in removal of lead, cadmium, zinc and chromium from raw wastewater (Zhipie et al., 1984), removal of hexavalent chromium from wastewater, removal of copper, iron, manganese, zinc, lead and potassium from industrial wastewater (Cameron, 1978). Sphagnum peat, such as the peat found in eastern Ontario, is reported to be the most suitable peat to use for wastewater treatment systems, in terms of decay resistance (Warith, 1996).

The peat deposit in the Mer Bleue Bog predates any human activity in this area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink. Water levels in the Mer Bleue Bog fluctuate naturally from time to time and have been aggressively drained (in the early 1930's) to promote agricultural exploitation of the bog. Drainage of the Mer Bleue Bog is now under the management of the NCC. In more recent years, water levels have been allowed to rise and agricultural use of the bog has been significantly reduced. From time to time, given the right water levels and environment,

the release of constituents absorbed by the peat can be expected. Therefore, it would appear that metals in excess of sediment criteria are the result of natural peat processes and not impacts from the landfill.

In 2002/2003, an assessment of the WCC site operations was undertaken in support of a WCC-NCC exchange of land parcels located south of the Navan landfill along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

9.0 PROPOSED 2022 MONITORING PROGRAM

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (these proposed changes were also listed in the 2020 Annual Monitoring Report).

In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in downgradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations of one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in downgradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As explained in Section 7.3, the MECP agreed that an excursion of landfill leachate would be apparent in the underlying stratigraphic units prior to a surface water impact and a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. Therefore, it is proposed to discontinue sediment monitoring and rely on the groundwater and surface water monitoring programs to assess off-site leachate impacts. With MECP concurrence, sediment monitoring could resume temporarily if leachate impacts and trigger exceedances are reported at the site.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during November 2021 monitoring session and will be monitored again in the spring of 2023.

The objectives of the 2022 environmental monitoring program are:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

10.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Waste Connections of Canada. The report, which specifically includes all tables and figures, is based on data and information collected by Golder and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder as described in this report.

Golder has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Groundwater, leachate and/or surface water quality conditions may vary from these sampled locations.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Signature Page

We trust this report satisfies your current requirements. If you have any further questions regarding this report, please contact the undersigned.

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Table 1a: Summary of Water Sampling Stations for May 2021

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5* S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-4/05-1D 95-8	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2 05-3C 07-1C	94-5 95-2 95-6
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Table 1b: Summary of Water Sampling Stations for August 2021

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16* S17	S5* S8* S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer			09-1D*
Weathered Clay Deposit			09-1C
Intact Clay Deposit			09-1B
Glacial Till/Upper Bedrock			09-1A
Leachate	L-5		

Notes: * Dry conditions did not permit sampling at this station.

Prepared by: ETB
Checked by: RPM

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Table 1c: Summary of Water Sampling Stations for November 2021

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5 S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-8 95-4/05-1D	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2 05-3C 07-1C	94-5 95-2 95-6
Intact Clay Deposit	92-16 98-3/05-1B 98-2/11-1	92-5 92-9 94-1 05-3B 07-1B	94-4 95-1** 95-5
Glacial Till/Upper Bedrock	92-12 05-1A	92-1 05-3A 07-1A	95-9**
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Notes:
* Monitoring location was dry during this sampling event. No sample was collected.
** Monitoring location was frozen during this sampling event. No sample was collected.

Prepared by: ETB
Checked by: RPM

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Table 2: List of Parameters Analyzed or Calculated in 2021

Parameter	Surface Water	Leachate	Groundwater	Sediments
Hardness ($CaCO_3$)	X	X	X	
Alkalinity ($CaCO_3$)	X	X	X	
Total Suspended Solids	X	X		
Bicarbonate (HCO_3)			X	
Carbonate (CO_3)			X	
Calcium	X	X	X	
Chloride	X	X	X	
Magnesium	X	X	X	
Total Phosphorous	X	X	X	
Potassium	X	X	X	
Sodium	X	X	X	
Sulphate	X	X	X	
Nitrate nitrogen	X	X	X	
Nitrite nitrogen	X	X	X	
Ammonia nitrogen[1]	X	X	X	
Total Kjeldahl nitrogen	X	X	X	
TDS	X	X	X	
Metals				
Arsenic	X	X	X	X
Boron	X	X	X	X
Cadmium	X	X	X	X
Chromium	X	X	X	X
Cobalt	X	X	X	X
Copper	X	X	X	X
Iron	X	X	X	X
Lead	X	X	X	X
Manganese	X	X	X	X
Mercury				X
Molybdenum				X
Nickel				X
Selenium				X
Zinc	X	X	X	X

Parameter	Surface Water	Leachate	Groundwater	Sediments
Bulk Organics				
Phenols	X	X	X	
BOD_5	X	X		
COD (Chemical Oxygen Demand)	X	X	X	
DIC (Dissolved Inorganic Carbon)	X	X		
DOC (Dissolved Organic Carbon)	X	X		
1,1-Dichloroethane		X	X	
Benzene		X	X	
Ethylbenzene		X	X	
Methylene Chloride		X	X	
Toluene		X	X	
Vinyl Chloride		X	X	
Xylene – m/p		X	X	
Xylene – o		X	X	
Field Measured Parameters				
pH	X	X	X	
Conductivity	X	X	X	
Temperature	X	X	X	
Dissolved Oxygen	X	X		
Flow	X			

Notes: [1] Unionized ammonia calculated for surface water.

Prepared by: ETB
Checked by: RPM

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Table 3: 2021 Monitoring Well Network Condition Survey

Well Number	Properly Cased?	Cap?	Lock?	Comments
OW-92-1	√	√	√	
OW-92-2	√	√	√	
OW-92-3	√	√	√	
OW-92-4	√	√	√	
OW-92-5	√	√	√	
OW-92-6	√	√	√	
OW-92-7	√	√	√	
OW-92-8	√	√	√	
OW-92-9	√	√	√	
OW-92-10	√	√	√	
OW-92-11	√	√	√	
OW-92-12	√	√	√	
OW-92-13	√	√	√	
OW-92-14	√	√	√	
OW-92-15	√	√	√	
OW-92-16	√	√	√	
OW-92-17	√	√	√	
OW-92-18	√	√	√	
OW-92-19	√	√	√	
OW-94-1	√	√	√	
OW-94-2	√	√	√	
OW-94-3	√	√	√	
OW-94-4	√	√	√	
OW-94-5	√	√	√	
OW-94-6	√	√	√	
OW-95-1	√	√	√	
OW-95-2	√	√	√	
OW-95-3	√	√	√	
OW-95-4				Abandoned, well removed.
OW-95-5	√	√	√	
OW-95-6	√	√	√	
OW-95-7	√	√	√	
OW-95-8	√	√	√	
OW-95-9	√	√	√	
OW-98-1	√	√	√	
OW-98-3				Abandoned, well removed.
OW-98-4				Abandoned, well removed.
MW05-R3	√	√	√	
MW05-8	√	√	√	
MW05-11	√	√	√	
MW-C	√	√	√	
MW-E	√	√	√	

Well Number	Properly Cased?	Cap?	Lock?	Comments
MW05-1A	√	√	√	
MW05-1B	√	√	√	
MW05-1C	√	√	√	
MW05-1D	√	√	√	
MW05-2A	√	√	√	
MW05-2B	√	√	√	
MW05-2C	√	√	√	
MW05-2D	√	√	√	
MW05-3A	√	√	√	
MW05-3B	√	√	√	
MW05-3C	√	√	√	
MW05-3D	√	√	√	
MW07-1A	√	√	√	
MW07-1B	√	√	√	
MW07-1C	√	√	√	
MW07-1D	√	√	√	
MW09-1A	√	√	√	
MW09-1B	√	√	√	
MW09-1C	√	√	√	
MW09-1D	√	√	√	
MW11-1	√	√	√	

Entered by: ETB
Checked by: RPM

Table 4: Summary of Analytical Results – Sediments (May 2021)

Parameter	May 27, 2021			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	**9.1**	1.1	3.4	18	18	12	6	5.9
Boron*	**4.2**	**1.9**	**10.6**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	**35.8**	13.3	**30.5**	160	160	64	26	37.3
Cobalt	7.9	2.0	5.4	22	22	50	50	nac
Copper	**17.1**	<5.0	**23.7**	180	180	63	16	35.7
Iron	82,800	4,950	13,100	nac	nac	nac	nac	nac
Lead	10.0	4.2	10.6	120	120	140	31	35.0
Manganese	1,260	88	322	nac	nac	nac	nac	nac
Mercury	<0.1	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	1.3	<1	3.9	6.9	6.9	10	nac	nac
Nickel	**22.5**	6.2	**19.2**	130	130	45	16	nac
Selenium	**1.2**	<1	**1.4**	2.4	2.4	1	nac	nac
Zinc	76.5	<20.0	72.8	340	340	250	120	123

Notes:
All concentrations are reported in µg/g dry.
nac - no applicable criteria for this parameter. **Bold** indicates that a concentration exceeds one or more of the applicable soil quality guidelines in this table.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2018 (CCME, 1999).
* Criteria based on a hot water extract for available boron.

Prepared by: ETB
Checked by: RPM

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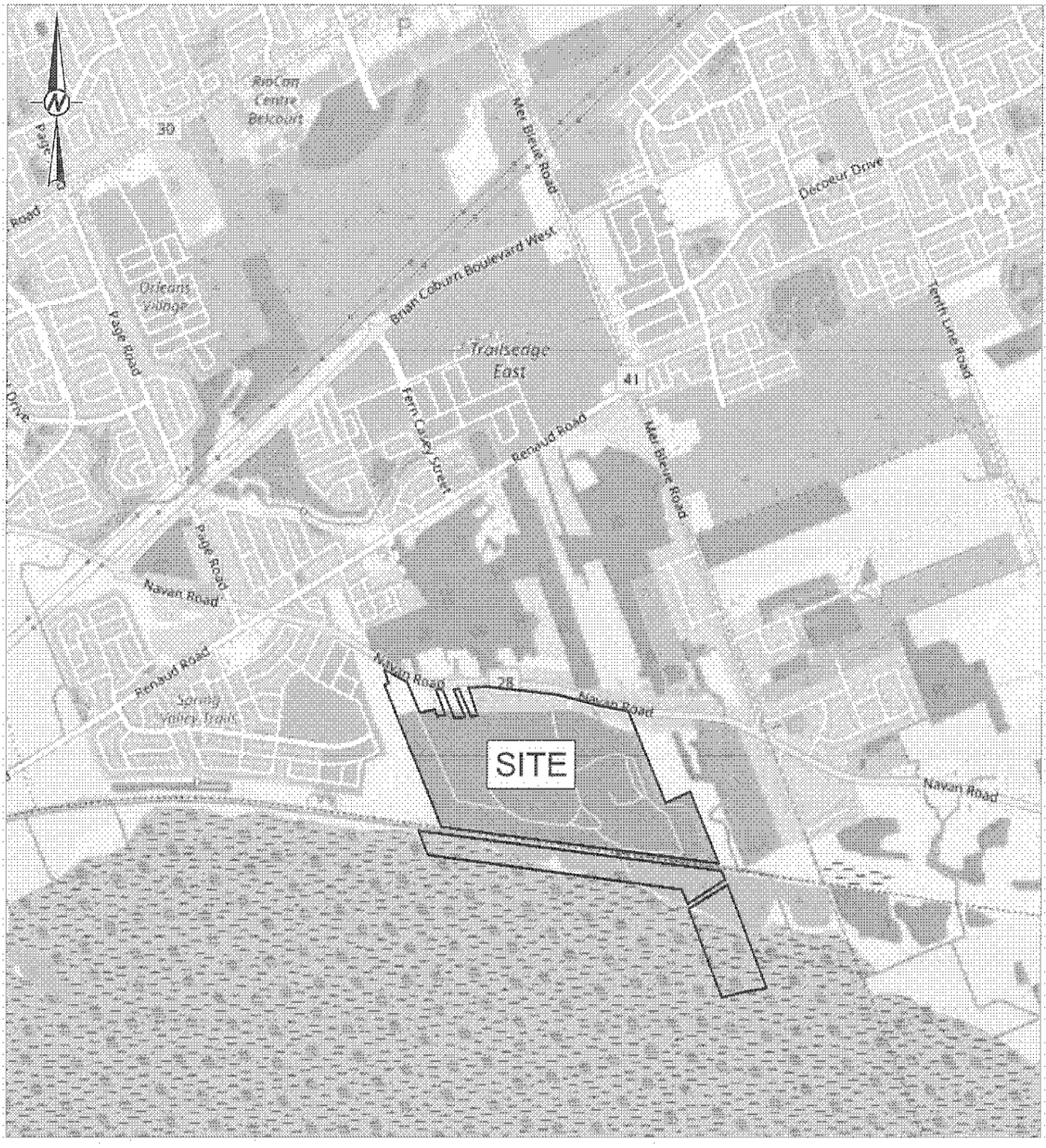
Table 5: Summary of Analytical Results – Sediments (November 2021)

Parameter	November 24, 2021			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	<1	1.5	2.1	18	18	12	6	5.9
Boron*	<0.5	1.0	**7.2**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	10.5	13.5	16.2	160	160	64	26	37.3
Cobalt	1.6	2.0	3.2	22	22	50	50	nac
Copper	<5.0	**16.2**	**16.3**	180	180	63	16	35.7
Iron	6,290	5,100	8,340	nac	nac	nac	nac	nac
Lead	4.8	4.2	6.2	120	120	140	31	35.0
Manganese	68	74	268	nac	nac	nac	nac	nac
Mercury	<0.1	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	<1	<1	2.1	6.9	6.9	10	nac	nac
Nickel	<5.0	6.2	11.6	130	130	45	16	nac
Selenium	<1	<1	<1	2.4	2.4	1	nac	nac
Zinc	<20	<20	54.9	340	340	200	120	123

Prepared by: ETB
Checked by: RPM

Notes:
All concentrations are reported in µg/g dry.
nac - no applicable criteria for this parameter. **Bold** indicates that a concentration exceeds one or more of the applicable soil quality guidelines in this table.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2007 (CCME, 1999).
* Criteria based on a hot water extract for available boron.



WASTE CONNECTIONS OF CANADA

0 500 1,000
1:25,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

CLIENT
WASTE CONNECTIONS OF CANADA

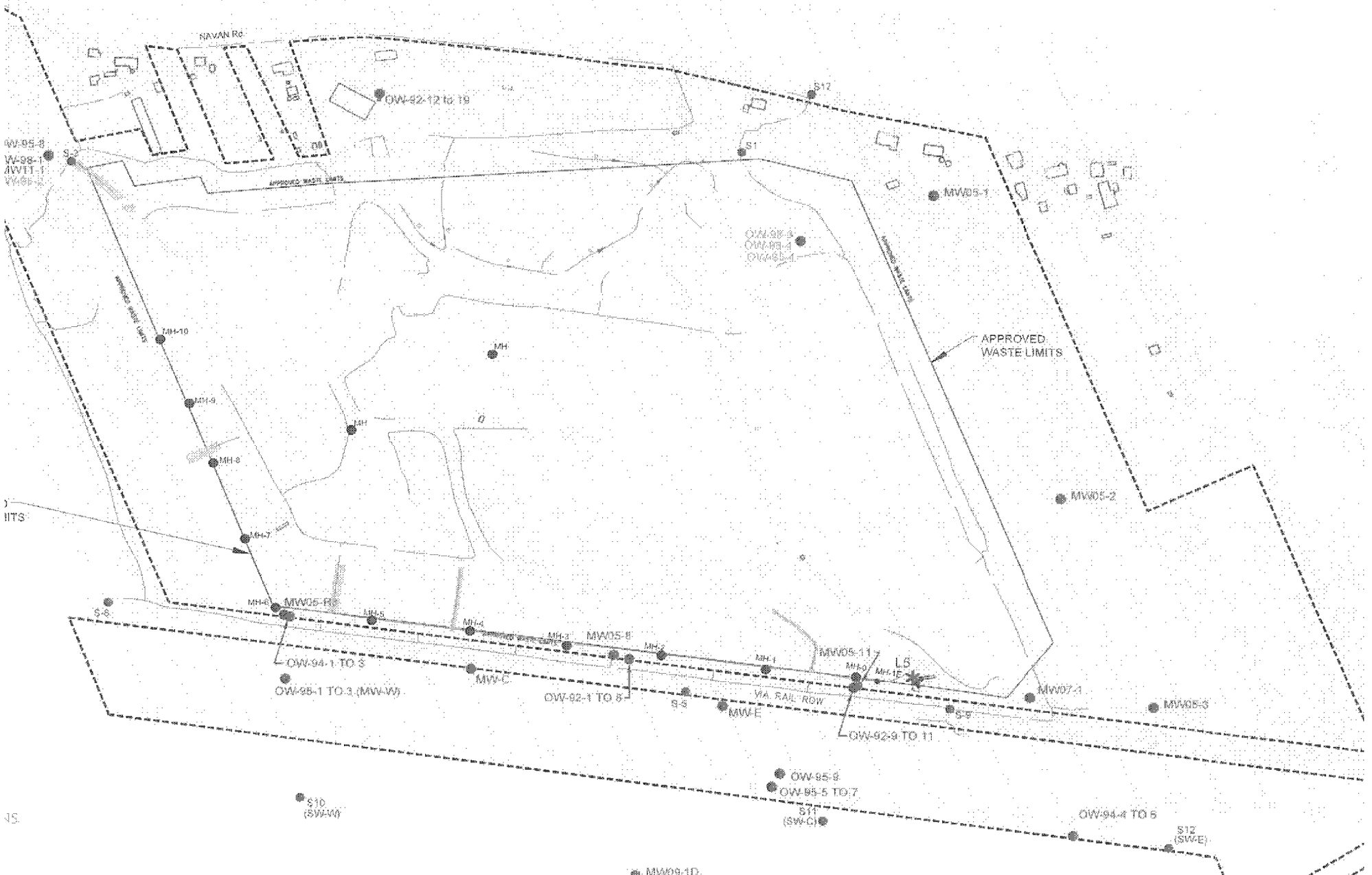
CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-01-05
DESIGNED	YJM
PREPARED	ABD
REVIEWED	YJM
APPROVED	PLE

PROJECT
REPORT ON 2021 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
21497772	0002	0	002552



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REFERENCE(S)

1. PROPERTY LINE PROVIDED IN ELECTRONIC FORMAT BY: FARLEY, SMITH & DENIS SURVEYING LTD. FILE NO.: 508-95, DATED: APRIL 13, 2007.
2. BASE INFORMATION PROVIDED BY THE BASE MAPPING CO. LTD. IN A DIGITAL FORMAT FROM CONTRACT No. 2748,21, DATED MAY 1, 2021.
3. COORDINATE SYSTEM NAD 83-UTM, VERTICAL DATUM: GEODETIC

CLIENT
WASTE CONNECTIONS OF CANADA

PROJECT
REPORT ON 2021 I
NAVAN WASTE RE
3354 NAVAN ROAD

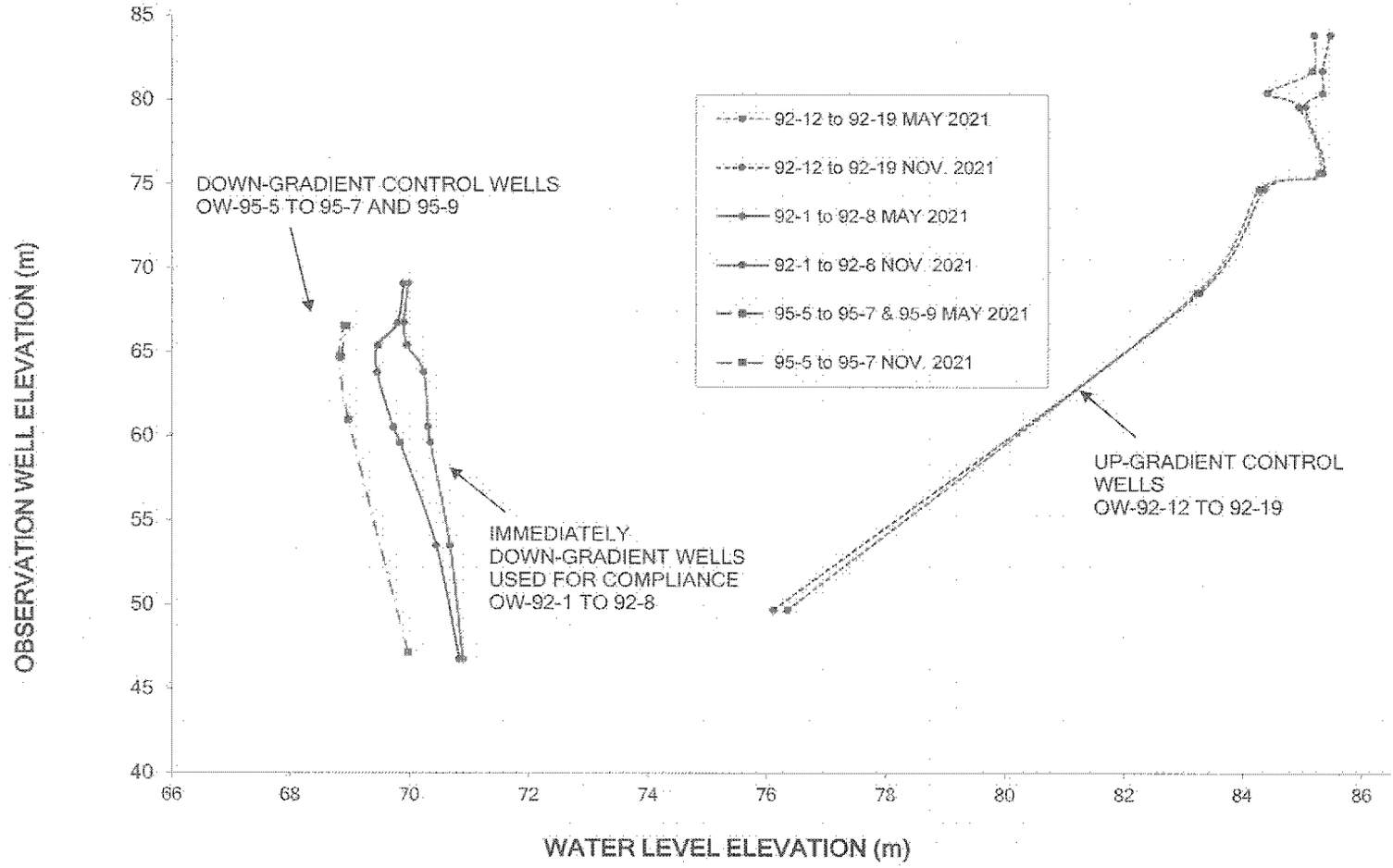

FIGURE 3

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

HYDRAULIC HEAD PROFILES

WSP GOLDER

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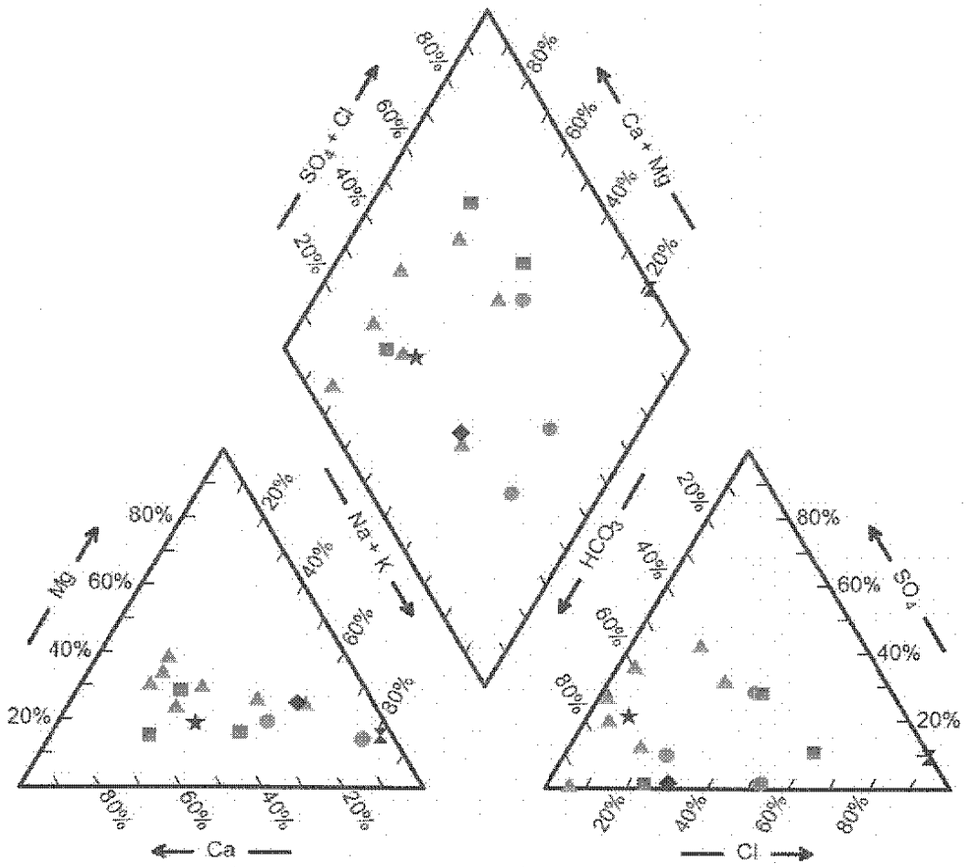
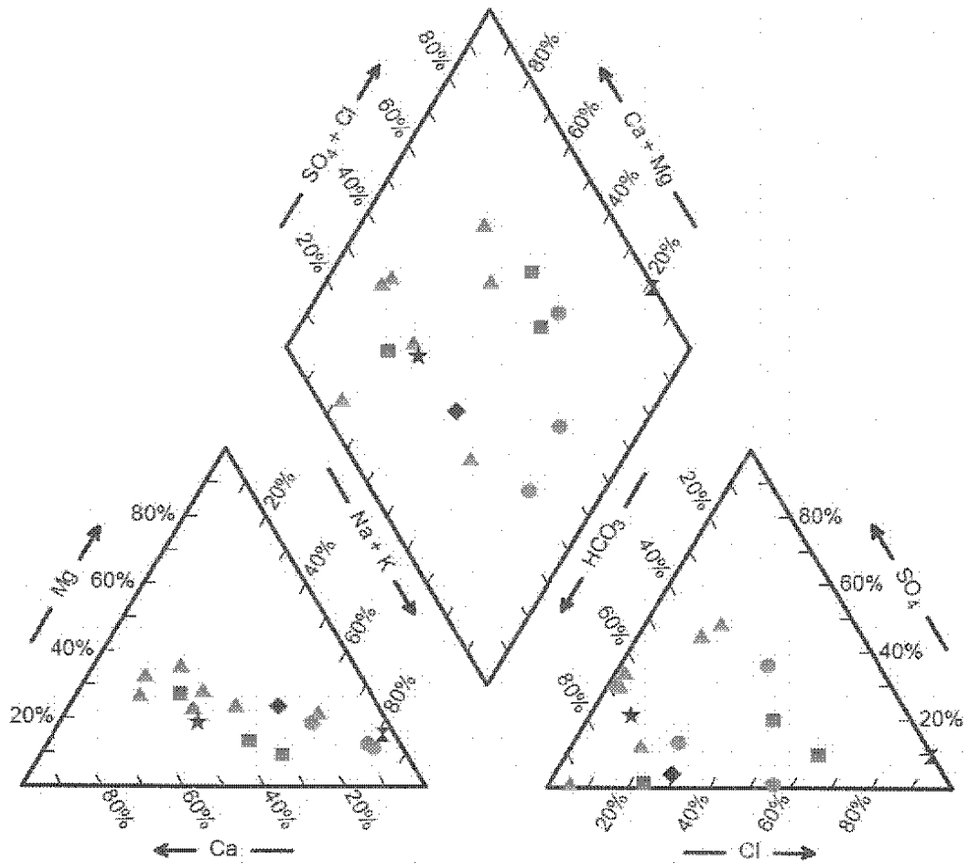


WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Sand Deposit (May 2021)
	Checked By	ETB	
	Reviewed By	PLE	March 2022 | 21497772-02 | Figure 4

002555



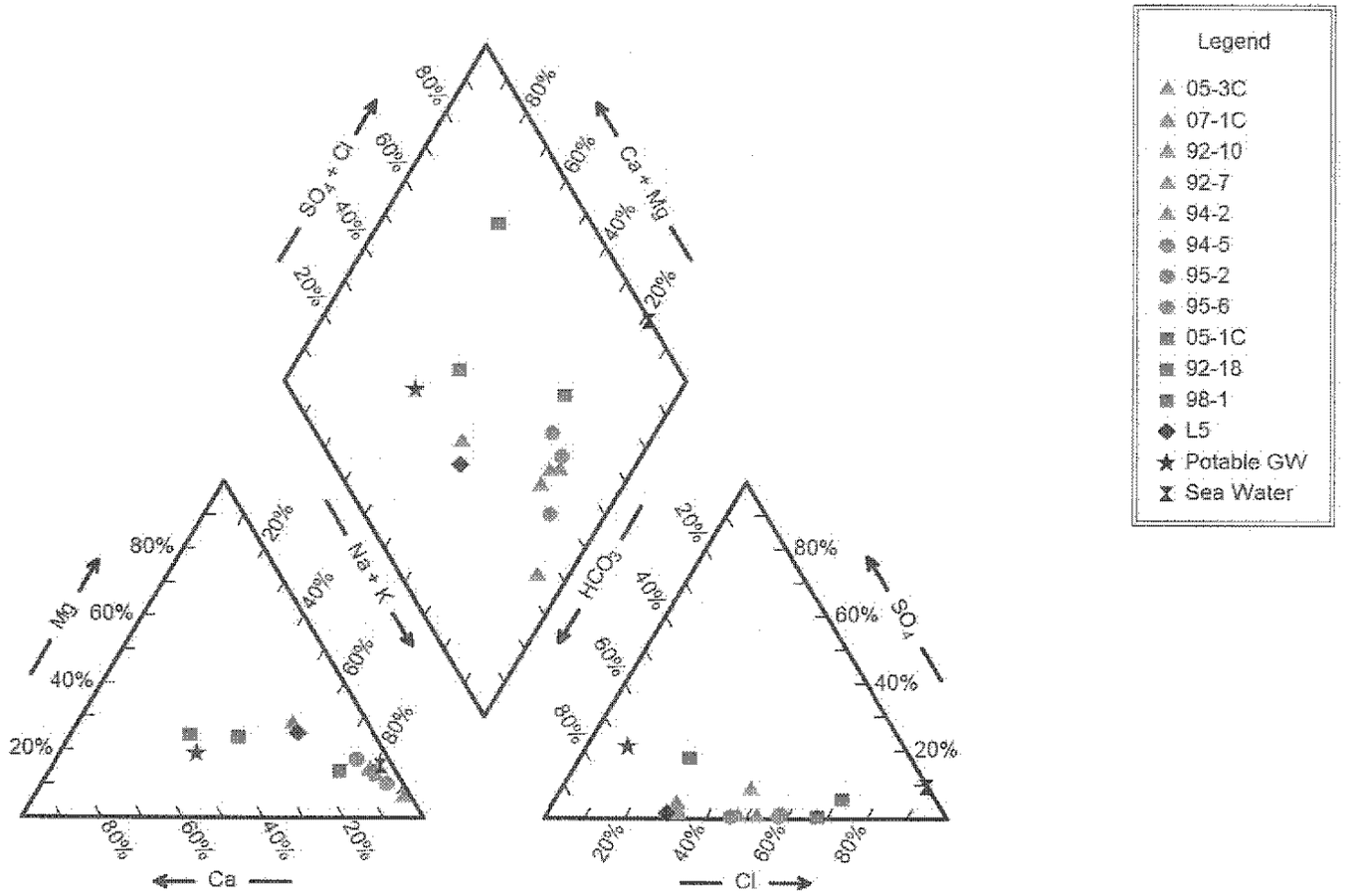
Legend

- 05-11
- 05-3D
- 05-8
- 05-R3
- 07-1D
- MW-C
- MW-E
- 94-6
- 95-3
- 95-7
- 05-1D
- 92-19
- 95-8
- L5
- Potable GW
- Sea Water

WCC NAVAN FACILITY

wsp GOLDER	Drawn By:	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Sand Deposit (November 2021)	
	Checked By:	ETB		
	Reviewed By:	PLE	March 2022	21497772-02	Figure 5

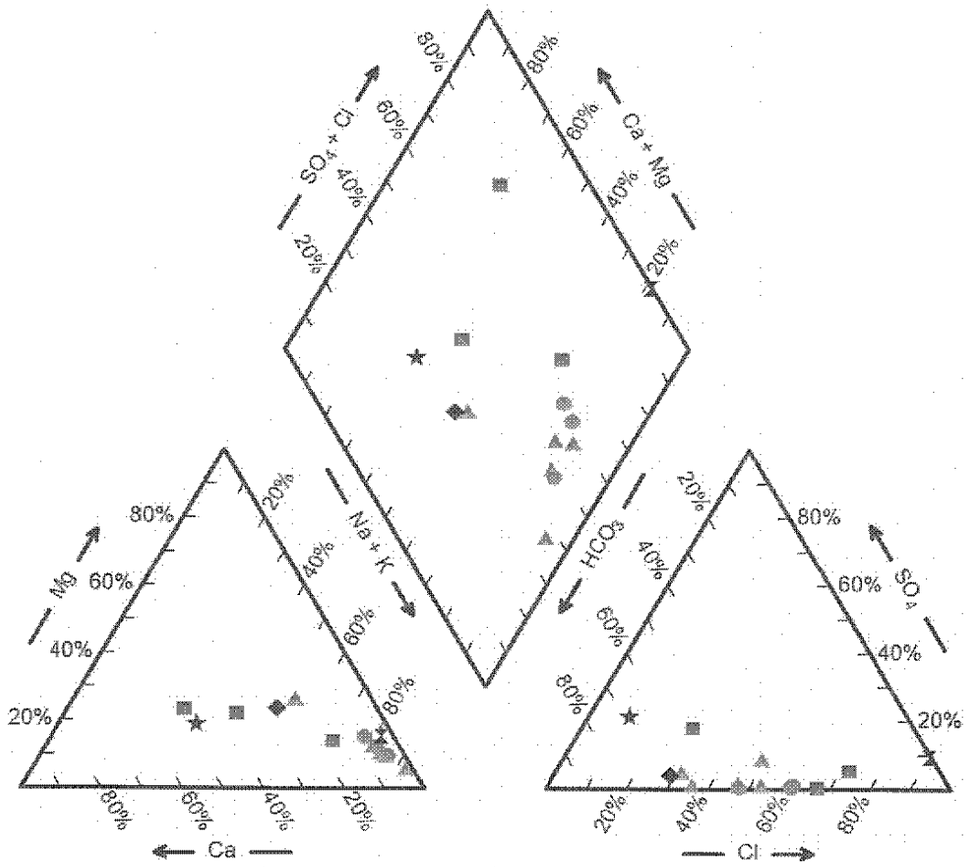
002556



WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Weathered Clay Deposit (May 2021)
	Checked By	ETB	
	Reviewed By	PLE	March 2022 | 21497772-02 | Figure 6

002557



Legend

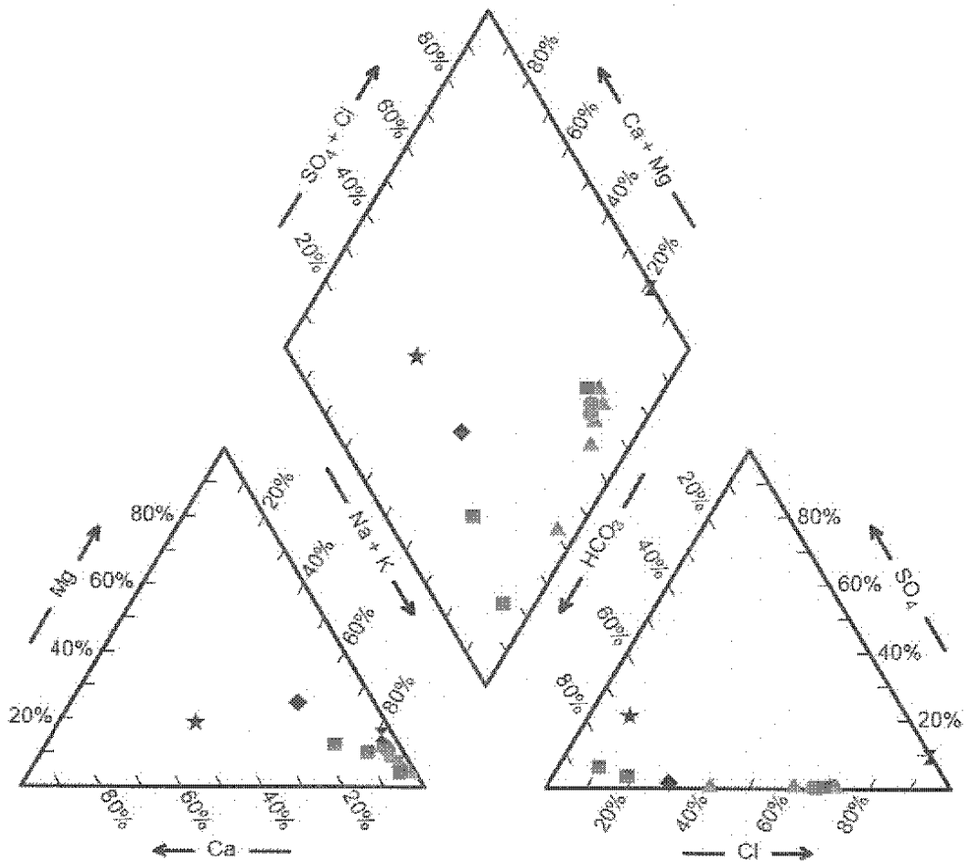
- 05-3C
- 07-1C
- 92-10
- 92-7
- 94-2
- 94-5
- 95-2
- 95-6
- 05-1C
- 92-18
- 98-1
- L5
- Potable GW
- Sea Water

WCC NAVAN FACILITY

Chemical Analyses of Groundwater
Plotted on a Piper Trilinear Diagram
Weathered Clay Deposit (November 2021)

GOLDER	Drawn By	YJM	March 2021	21497772-02	Figure 7
	Checked By	ETB		
	Reviewed By	PLE		

002558



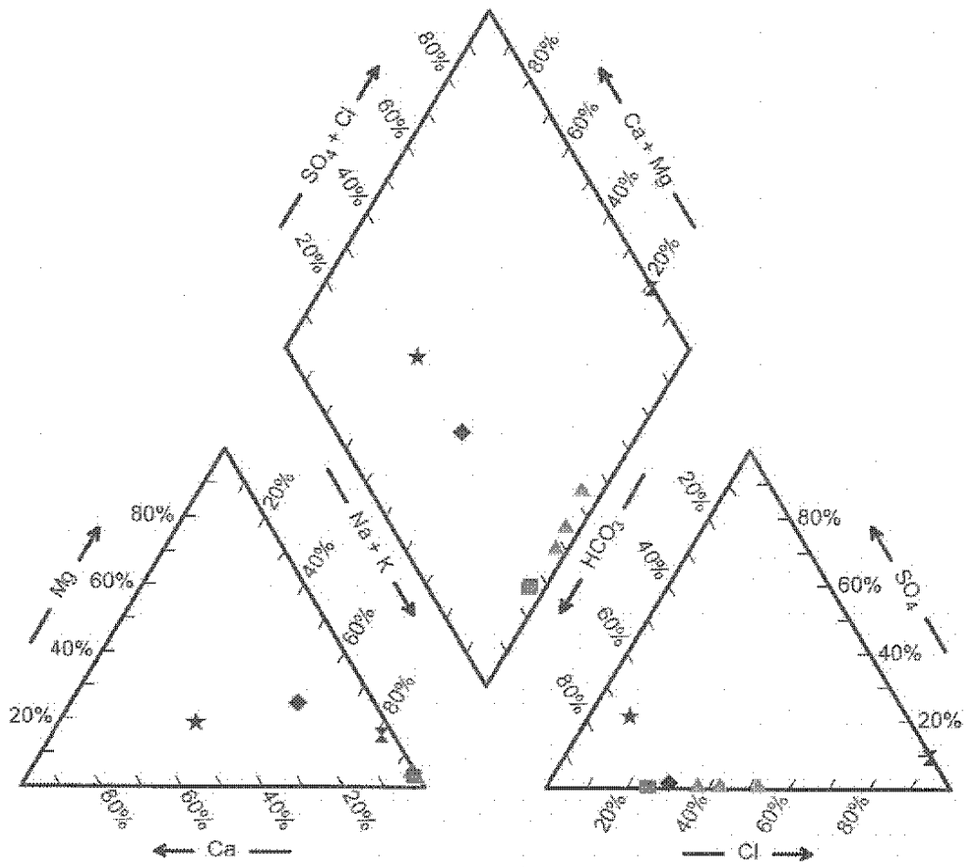
Legend

- 05-3B
- 07-1B
- 92-5
- 92-9
- 94-1
- 94-4
- 95-1 (Frozen)
- 95-5
- 05-1B
- 11-1
- 92-16
- L5
- Potable GW
- Sea Water

WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Intact Clay Deposit (November 2021)	
	Checked By	ETB		
	Reviewed By	PLE	March 2022	21497772-02	Figure 8

002559



WCC NAVAN FACILITY

Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Glacial Till / Upper Bedrock Zone (November 2021)	
Checked By	ETB		
Reviewed By	PLE		
March 2022	21497772-02	Figure 9	

GOLDER

002560

APPENDIX A

Record of Borehole Sheets

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX B

Laboratory Certificates of Analysis

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX C

Groundwater Level Records

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	24-Mar-92 Elevation	25-Mar-92 Elevation	26-Mar-92 Elevation	30-Mar-92 Elevation	31-Mar-92 Elevation	01-Apr-92 Elevation	02-Apr-92 Elevation	03-Apr-92 Elevation	06-Apr-9 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	71.10	70.00	70.00	69.96		69.95		69.80	
73.50		71.10	18.32	53.53	52.03	53.25	58.88	60.78	67.15		68.15		69.28	
73.64		71.10	12.22	59.63	58.13		63.48	64.58	67.28		67.78		68.38	
73.67		71.10	g	60.54	59.04		62.54	63.09	65.12		65.73		66.69	
73.64		71.10	8.06	63.79	62.29		65.04	65.54	67.22		67.67		68.29	
73.74		71.10	6.47	65.38	63.88		69.06	69.30	69.76		69.73		69.63	
73.59		71.10	5.13	66.72	65.22		69.32	69.41	69.84		69.87		69.77	
73.52		71.10	2.8	69.05	67.55		69.49	69.58	69.85		69.84		69.69	
73.39		70.67	7.6	63.82	62.32			64.27	66.67		67.44		68.12	
73.27		70.70	4.6	66.85	65.35			69.35	69.75		69.75		69.75	
73.33		70.75	2.6	68.9	67.4			69.40	69.78		69.79		69.76	
87.41		86.03	37.1	49.68	48.18					74.31	74.25	74.25	74.25	74.25
87.26		86.03	18.22	68.56	67.06							80.61	81.01	81.68
87.24		86.03	12.11	74.67	73.17								79.12	82.95
87.35		86.03	11.11	75.67	74.17								76.62	79.92
87.19		86.03	7.19	79.59	78.09								81.36	82.72
87.37		86.03	6.38	80.4	78.9								83.75	84.29
87.28		86.03	5.05	81.73	80.23								84.12	84.92
87.22		86.03	2.93	83.85	82.35								84.35	85.39
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02									
72.84		71.33	4.57	67.51	66.01									
72.74		71.33	2.58	69.5	68									
69.61		68.7	8.38	61.07	59.57									
70.2		68.7	3.55	65.9	64.4									
70.13		68.7	1.91	67.54	66.04									
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ied in November 2005

002566

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-May-92 Elevation	01-Jun-92 Elevation	17-Jun-92 Elevation	30-Jun-92 Elevation	21-Jul-92 Elevation	05-Aug-92 Elevation	19-Jul-93 Elevation	02-Nov-93 Elevation	04-Apr-[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	60.49	66.30	68.85	69.35	69.63	69.66	69.81	69.82	69.85
73.50		71.10	18.32	53.53	52.03	67.93	69.51	69.58	69.60	69.60	69.58	69.65	69.58	69.50
73.64		71.10	12.22	59.63	58.13	67.66	69.16	69.40	69.43	69.42	69.44	69.63	69.42	69.27
73.67		71.10	g	60.54	59.04	65.99	68.60	69.29	69.37	69.38	69.43	69.62	69.40	69.24
73.64		71.10	8.06	63.79	62.29	68.54	69.17	69.28	69.25	69.31	69.36	69.38	69.43	69.09
73.74		71.10	6.47	65.38	63.88	69.44	69.45	69.13	69.14	69.59	69.67	69.10	69.43	69.74
73.59		71.10	5.13	66.72	65.22	69.29	69.50	69.12	69.17	69.55	69.67	69.11	69.41	69.85
73.52		71.10	2.8	69.05	67.55	69.40	69.49	69.12	69.16	69.54	69.66	69.07	69.37	69.75
73.39		70.67	7.6	63.82	62.32	67.29	69.09	69.14	69.12	69.23	69.23	69.14	69.22	68.95
73.27		70.70	4.6	66.85	65.35	69.29	69.34	69.12	69.16	69.38	69.44	68.94	69.24	69.36
73.33		70.75	2.6	68.9	67.4	69.33	69.38	69.15	69.17	69.40	69.46	68.98	69.27	69.40
87.41		86.03	37.1	49.68	48.18	74.64	74.68	74.57	74.53	74.64	74.65	74.72	74.43	
87.26		86.03	18.22	68.56	67.06	81.01	82.31	82.44	82.46	82.51	82.50	82.42	82.46	82.47
87.24		86.03	12.11	74.67	73.17	83.34	83.50	83.56	83.58	83.62	83.63	83.57	83.55	83.41
87.35		86.03	11.11	75.67	74.17	82.12	83.70	83.78	83.78	83.83	83.82	83.77	83.76	83.57
87.19		86.03	7.19	79.59	78.09	83.32	84.18	84.32	84.29	84.41	84.43	84.32	84.41	84.12
87.37		86.03	6.38	80.4	78.9	84.19	84.50	84.55	84.49	84.75	84.72	84.51	84.69	84.44
87.26		86.03	5.05	81.73	80.23	84.19	84.58	84.62	84.56	84.86	84.82	84.57	84.75	84.92
87.22		86.03	2.93	83.85	82.35	84.74	84.88	84.56	84.57	85.14	85.29	84.48	84.82	85.24
		86.96				-	84.61	84.49	85.13	84.99	84.56			
		71.99				68.67	70.37	70.32	70.28	70.56	70.46			
		72.00				68.99	70.41	70.64	70.59	70.62	70.52			
72.83		71.33	8.56	63.52	62.02									
72.84		71.33	4.57	67.51	66.01									
72.74		71.33	2.58	69.5	68									
69.61		68.7	8.38	61.07	59.57									
70.2		68.7	3.55	65.9	64.4									
70.13		68.7	1.91	67.54	66.04									
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ied in November 2005

002567

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	25-Oct-94 Elevation	06-Dec-94 Elevation	28-Mar-95 Elevation	20-Apr-95 Elevation	16-May-95 Elevation	23-Jun-95 Elevation	12-Jul-95 Elevation	26-Jul-95 Elevation	09-Aug- Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	69.88	69.83	69.90	69.88	69.92	69.92			
73.50		71.10	18.32	53.53	52.03	69.56	69.50	69.81	69.77	69.72	69.70			
73.64		71.10	12.22	59.63	58.13	69.39	69.28	69.61	69.63	69.57	69.58			
73.67		71.10	g	60.54	59.04	69.35	69.21	69.54	69.57	69.53	69.56			
73.64		71.10	8.06	63.79	62.29	69.15	69.27	69.45	69.43	69.40	69.50			
73.74		71.10	6.47	65.38	63.88	69.01	69.51	69.49	69.48	69.72	69.21			
73.59		71.10	5.13	66.72	65.22	69.00	69.50	69.48	69.49	69.82	69.23			
73.52		71.10	2.8	69.05	67.55	68.94	69.43	69.05	69.43	69.76	69.20			
73.39		70.67	7.6	63.82	62.32	69.05	69.15	69.17	69.21	69.16	69.18			
73.27		70.70	4.6	66.85	65.35	68.90	69.32	69.25	69.32	69.44	69.08			
73.33		70.75	2.6	68.9	67.4	68.92	69.36	69.29	69.35	69.50	69.11			
87.41		86.03	37.1	49.68	48.18	74.57	74.33	74.59	74.69	74.97	74.86			
87.26		86.03	18.22	68.56	67.06	82.47	82.50	82.52	82.49	82.47	82.44			
87.24		86.03	12.11	74.67	73.17	83.48	83.49	83.48	83.48	83.50	83.50			
87.35		86.03	11.11	75.67	74.17	83.65	83.68	83.65	83.65	83.66	83.71			
87.19		86.03	7.19	79.59	78.09	84.18	84.26	84.15	84.24	84.20	84.26			
87.37		86.03	6.38	80.4	78.9	84.40	84.54	84.46	84.52	84.45	84.47			
87.28		86.03	5.05	81.73	80.23	84.52	84.63	84.55	84.62	84.85	84.54			
87.22		86.03	2.93	83.85	82.35	84.48	84.85	84.85	84.73	84.46	84.45			
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02					71.09	71.09			
72.84		71.33	4.57	67.51	66.01					70.52	70.47			
72.74		71.33	2.58	69.5	68					70.39	70.33			
69.61		68.7	8.38	61.07	59.57					68.54	68.54			
70.2		68.7	3.55	65.9	64.4					68.51	68.35			
70.13		68.7	1.91	67.54	66.04					68.42	68.32			
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ied in November 2005

002568

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	21-Aug-95 Elevation	28-Aug-95 Elevation	13-Sep-95 Elevation	18-Sep-95 Elevation	29-Sep-95 Elevation	11-Nov-96 Elevation	06-Jun-96 Elevation	08-Aug-96 Elevation	04-Sep-9 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25					69.8	69.97	69.89	69.9	69.89
73.50		71.10	18.32	53.53	52.03					69.95	69.92	69.7	69.63	69.6
73.64		71.10	12.22	59.63	58.13					69.89	69.9	69.62	69.39	69.45
73.67		71.10	g	60.54	59.04					69.89	69.87	69.62	69.38	69.44
73.64		71.10	8.06	63.79	62.29					69.45	69.77	69.54	69.24	69.34
73.74		71.10	6.47	65.38	63.88					69.13	69.55	69.35	69.2	69.17
73.59		71.10	5.13	66.72	65.22					69.13	69.5	69.4	69.17	69.17
73.52		71.10	2.8	69.05	67.55					69.1	69.46	69.35	69.11	69.17
73.39		70.67	7.6	63.82	62.32					68.99	69.36	69.21	69.08	69.15
73.27		70.70	4.6	66.85	65.35					68.92	69.34	69.22	68.97	69
73.33		70.75	2.6	68.9	67.4					68.91	69.36	69.23	68.99	69.03
87.41		86.03	37.1	49.68	48.18					74.67	74.69	74.82	74.62	74.49
87.26		86.03	18.22	68.56	67.06					82.4	82.45	82.62	82.58	82.77
87.24		86.03	12.11	74.67	73.17					83.41	83.55	83.72	83.56	83.51
87.35		86.03	11.11	75.67	74.17					83.6	83.74	83.9	83.7	83.67
87.19		86.03	7.19	79.59	78.09					84.04	84.37	84.42	84.25	84.24
87.37		86.03	6.38	80.4	78.9					84.22	84.63	84.58	84.47	84.42
87.28		86.03	5.05	81.73	80.23					84.24	84.66	84.64	84.62	84.47
87.22		86.03	2.93	83.85	82.35					84.24	84.79	84.57	84.47	84.41
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02					69.13	69.29	69.626	69.316	68.81
72.84		71.33	4.57	67.51	66.01					68.65	69.31	68.911	68.951	68.91
72.74		71.33	2.58	69.5	68					68.62	69.62	69.041	68.891	68.85
69.61		68.7	8.38	61.07	59.57					67.7	68.08	68.51	68.25	68.28
70.2		68.7	3.55	65.9	64.4					68.13	68.5	68.38	67.95	67.54
70.13		68.7	1.91	67.54	66.04					68.83	69.02	68.35	68.01	67.51
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ed in November 2005

002569

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-Aug-98 Elevation	26-Oct-98 Elevation	03-May-99 Elevation	11-Oct-99 Elevation	02-May-00 Elevation	20-Oct-00 Elevation	08-Jun-01 Elevation	03-Oct-01 Elevation	17-May-[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	70.01	70.01	70.2	70.12	70.2	70.28	70.32	70.31	70.37
73.50		71.10	18.32	53.53	52.03	70.08	70.15	69.81	70.16	69.87	70.18	70.24	70.23	70.4
73.64		71.10	12.22	59.63	58.13	69.92	69.86	69.31	69.67	69.97	69.79	69.91	69.74	70.2
73.67		71.10	g	60.54	59.04				69.57	69.97	69.7	69.84	69.6	70.27
73.64		71.10	8.06	63.79	62.29	69.35	69.54	68.95	69.17	69.97	69.2	69.51	68.98	69.91
73.74		71.10	6.47	65.38	63.88	69.08	69.36	69.4	69.02	69.84	68.95	69.4	69.07	69.89
73.59		71.10	5.13	66.72	65.22	69.03	69.33	69.4	68.96	69.69	68.85	69.37	68.79	69.95
73.52		71.10	2.8	69.05	67.55	69.07	69.34	69.39	68.96	69.74	68.86	69.41	68.8	69.97
73.39		70.67	7.6	63.82	62.32	69.06	69.2	69.29	68.99	69.33	68.96	69.63	69.02	69.59
73.27		70.70	4.6	66.85	65.35	68.99	69.21	69.21		69.28	68.82	69.3	68.88	69.66
73.33		70.75	2.6	68.9	67.4	69.12	69.23	69.18	68.96	69.25	68.76	69.27	68.86	69.67
87.41		86.03	37.1	49.68	48.18	74.61	74.6	75.13	74.58	74.89	74.89	75.04	74.66	75.16
87.26		86.03	18.22	68.56	67.06	82.53	82.57	82.61	82.61	82.6	82.6	82.62	82.55	82.58
87.24		86.03	12.11	74.67	73.17	83.52	83.58	83.69	83.61	83.65	83.57	83.59	83.46	83.52
87.35		86.03	11.11	75.67	74.17	83.7	83.75	84.01	83.76	83.85	83.82	84.23	83.65	84.42
87.19		86.03	7.19	79.59	78.09	84.18	84.32	84.46	84.35	84.53	84.17	84.31	84.04	84.52
87.37		86.03	6.38	80.4	78.9	84.36	84.32	84.67	84.6	84.78	84.33	84.49	84.21	84.72
87.28		86.03	5.05	81.73	80.23	84.43	84.54	84.77	84.76	84.89	84.46	84.74	84.5	84.72
87.22		86.03	2.93	83.85	82.35	84.34	84.54	84.67	84.59	84.81	84.3	84.49	84.2	85.2
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02	69.2	69.29	69.52	68.9	69.6	69.2	69.41	69.4	69.77
72.84		71.33	4.57	67.51	66.01	68.68	69.01	69.25	68.52	69.51	68.72	69.17	69.28	69.65
72.74		71.33	2.58	69.5	68	68.64	68.98	69.21	68.53	69.46	68.69	69.06	69.22	69.69
69.61		68.7	8.38	61.07	59.57	68.25	68.48	68.58	68.13	68.58	68.52	68.6	68.08	68.65
70.2		68.7	3.55	65.9	64.4	67.66	68.36	68.34	68.27	68.45	68.31	68.4	67.92	68.46
70.13		68.7	1.91	67.54	66.04	67.74	68.44	68.38	68.32	68.48	68.32	68.43	67.93	68.48
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ied in November 2005

002570

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	05-Nov-03 Elevation	08-May-04 Elevation	05-Nov-04 Elevation	29-May-05 Elevation	16-Nov-05 Elevation	19-May-06 Elevation	14-Nov-06 Elevation	07-May-07 Elevation	19-Nov-0[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	70.49	70.51	70.53	70.47	70.4	70.48	70.57	70.52	70.47
73.50		71.10	18.32	53.53	52.03	70.35	70.40	70.20	70.32	70.14	70.27	70.35	70.35	70.44
73.64		71.10	12.22	59.63	58.13	69.87	70.09	69.84	70.07	69.63	70.03	70.07	70.02	69.94
73.67		71.10	g	60.54	59.04	69.77	70.05	69.76	70.02	69.55	69.99	70.015	70.03	69.84
73.64		71.10	8.06	63.79	62.29	69.48	69.88	69.33	69.83	69.11	69.78	69.899	69.88	69.41
73.74		71.10	6.47	65.38	63.88	69.52	69.80	69.2	69.61	68.98	70.13	69.818	69.73	69.33
73.59		71.10	5.13	66.72	65.22	69.57	69.70	69.25	69.44	69.94	70.22	70.16	69.60	69.34
73.52		71.10	2.6	69.05	67.55	69.57	69.70	69.25	69.44	68.93	70.21	70.24	69.60	69.37
73.39		70.67	7.6	63.82	62.32	69.55	69.67	69.32	69.59	69.22	69.61	69.679	69.53	69.33
73.27		70.70	4.6	66.85	65.35	69.63	69.61	69.19	69.34	69.16	70.1	70.165	69.46	69.32
73.33		70.75	2.6	68.9	67.4	69.64	69.59	69.27	69.42	69.15	70.09	70.102	69.45	69.44
87.41		86.03	37.1	49.68	48.18	74.80	75.16	74.88	75.23	74.84	75.35	75.33	75.46	75.36
87.26		86.03	18.22	68.56	67.06	82.57	82.59	82.54	82.58	82.53	82.63	82.675	82.70	82.59
87.24		86.03	12.11	74.67	73.17	83.55	83.54	83.46	83.63	83.52	83.72	83.756	83.71	83.51
87.35		86.03	11.11	75.67	74.17	85.00	85.02	84.69	85	84.87	85.15	85.057	85.19	84.57
87.19		86.03	7.19	79.59	78.09	84.32	84.43	84.20	84.44	84.22	84.6	84.606	84.55	84.17
87.37		86.03	6.38	80.4	78.9	84.59	84.66	84.36	84.63	84.44	84.88	84.841	84.76	84.37
87.28		86.03	5.05	81.73	80.23	84.66	84.75	84.42	83.7	84.5	84.81	84.9	84.85	82.87
87.22		86.03	2.93	83.85	82.35	85.00	84.92	84.53	84.69	84.67	85.42	85.486	84.81	84.52
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02	69.60	69.76	69.55	69.756	69.506	69.756	70.03	69.91	70.06
72.84		71.33	4.57	67.51	66.01	69.52	69.53	68.99	69.331	69.361	69.671	69.576	69.45	69.22
72.74		71.33	2.58	69.5	68	69.56	69.56	69.06	69.301	69.361	69.841	70.111	69.42	69.21
69.61		68.7	8.38	61.07	59.57	68.48	68.55	68.63	68.67	68.49	68.69	68.755	68.67	68.45
70.2		68.7	3.55	65.9	64.4	68.56	68.51	68.50	68.47	68.44	68.46	68.485	68.37	68.30
70.13		68.7	1.91	67.54	66.04	68.54	68.51	68.51	68.48	68.45	68.56	68.507	68.41	68.35
70.23														
70.87														
86.27													78.55	78.68
86.33													84.275	83.975
86.34													84.915	84.625
86.39													84.88	84.58
81.38													66.21	66.11
81.31													68.195	67.535
81.20													70.38	67.99
81.25													71.2	68.02
70.93	74.53												70.02	70.02
70.85	74.47												69.9	69.91
70.80	74.52												69.46	69.43
70.91	74.46												69.355	69.405

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002571

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	18-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	16-May-11 Elevation	22-Nov-11 Elevation	23-May-12 Elevation	20-Nov-12 Elevation	21-May-13 Elevation	20-Nov-[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	70.49	70.52	70.01	70.38	70.49	70.59	70.53	70.62	70.56
73.50		71.10	18.32	53.53	52.03	70.35	70.37	70.03	70.20	70.33	70.43	70.24	70.37	70.26
73.64		71.10	12.22	59.63	58.13	69.96	70.21	69.69	70.09	69.86	70.21	69.87	70.17	69.85
73.67		71.10	g	60.54	59.04	69.90	70.28	69.63	70.07	69.78	70.20	69.80	70.15	69.78
73.64		71.10	8.06	63.79	62.29	69.47	69.88	69.60	70.00	69.23	70.03	69.45	69.92	69.48
73.74		71.10	6.47	65.38	63.88	70.27	69.55	69.72	69.95	69.02	69.94	69.32	69.82	69.46
73.59		71.10	5.13	66.72	65.22	69.17	69.40	69.89	70.05	68.93	69.77	69.23	69.69	69.63
73.52		71.10	2.8	69.05	67.55	69.10	69.41	69.66	69.44	68.93	69.77	69.26	69.73	69.59
73.39		70.67	7.6	63.82	62.32	69.39	69.76	69.64	69.61	69.73	69.80	69.62	69.65	69.65
73.27		70.70	4.6	66.85	65.35	69.19	69.41	69.66	69.80	69.85	69.73	69.63	69.62	69.88
73.33		70.75	2.6	68.9	67.4	69.18	69.42	69.16	69.80	69.81	69.68	69.59	69.58	69.86
87.41		86.03	37.1	49.68	48.18	75.46	75.36	74.71	75.43	75.00	75.01	75.35	75.81	75.64
87.26		86.03	18.22	68.56	67.06	82.90	82.84	82.94	83.03	83.13	83.21	83.18	83.23	83.24
87.24		86.03	12.11	74.67	73.17	83.94	83.83	83.91	84.05	84.13	84.32	84.30	84.33	84.31
87.35		86.03	11.11	75.67	74.17	84.57	84.58	85.15	85.32	84.70	85.46	85.11	85.32	84.73
87.19		86.03	7.19	79.59	78.09	84.50	84.57	84.70	84.77	84.60	85.01	84.86	84.99	84.78
87.37		86.03	6.38	80.4	78.9	84.62	84.74	84.94	84.96	84.81	85.24	85.05	85.20	85.00
87.28		86.03	5.05	81.73	80.23	84.60	84.81	85.03	85.04	84.73	85.26	85.01	85.22	85.01
87.22		86.03	2.93	83.85	82.35	84.51	84.80	85.01	85.27	84.74	85.35	85.00	85.20	85.15
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02	69.57	68.79	69.53	69.86	69.58	69.96	69.81	70.00	69.65
72.84		71.33	4.57	67.51	66.01	69.05	69.11	69.51	69.53	68.97	69.60	69.31	69.44	69.17
72.74		71.33	2.58	69.5	68	69.04	69.13	69.50	69.67	68.92	69.45	69.28	69.39	69.20
69.61		68.7	8.36	61.07	59.57	67.69	68.72	68.71	68.73	69.07	69.10	69.17	69.08	69.14
70.2		68.7	3.55	65.9	64.4	68.38	68.39	68.41	68.46	68.89	68.98	68.96	68.99	68.96
70.13		68.7	1.91	67.54	66.04	68.40	68.46	68.46	68.55	68.89	68.98	68.97	68.99	68.98
70.23										68.31	69.16	69.00	69.16	68.83
70.87										68.79	69.74	69.40	69.68	69.05
86.27						78.43	78.66	78.16	78.70	78.43	78.50	78.17	78.37	78.38
86.33						83.82	83.71	83.65	83.67	83.60	83.61	83.60	83.71	83.56
86.34						84.26	84.22	84.45	84.73	84.13	84.34	84.23	84.30	84.34
86.39						84.27	84.21	85.01	84.81	84.18	84.36	84.28	84.31	84.42
81.38						66.23	66.27	65.72	66.28	73.94	74.05	74.32	74.66	74.54
81.31						67.97	68.14	67.75	68.11	76.00	76.29	75.99	76.33	76.42
81.20						69.50	69.70	69.82	69.93	77.37	78.00	77.92	78.10	78.07
81.25						70.34	70.04	71.01	71.17	77.80	78.65	78.55	78.55	78.99
70.93	74.53					69.99	70.05	69.65	69.87	70.18	70.19	70.13	70.23	70.15
70.85	74.47					70.14	70.17	70.17	70.22	70.44	70.51	70.52	70.72	70.83
70.80	74.52					69.77	69.86	69.82	69.80	70.07	70.14	70.29	70.47	70.62
70.91	74.46					69.60	69.60	69.67	69.71	70.04	70.12	70.28	70.43	70.54

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002572

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	26-Aug-15 Elevation	19-Nov-15 Elevation	19-May-16 Elevation	18-Aug-16 Elevation	10-Nov-16 Elevation	17-May-17 Elevation	28-Aug-17 Elevation	22-Nov-17 Elevation	15-May-18 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25		70.77	70.88		70.81	71.00		70.98	71.06
73.50		71.10	18.32	53.53	52.03		70.25	70.53		70.22	70.50		70.78	71.10
73.64		71.10	12.22	59.63	58.13		69.77	70.37		69.70	70.34		70.31	71.00
73.67		71.10	g	60.54	59.04		69.67	70.35		69.60	70.33		70.22	70.99
73.64		71.10	8.06	63.79	62.29		69.18	70.06		69.16	70.78		70.41	71.18
73.74		71.10	6.47	65.38	63.88		69.07	69.92		69.09	71.07		70.51	71.18
73.59		71.10	5.13	66.72	65.22		69.07	69.78		69.16	71.03		70.64	71.34
73.52		71.10	2.8	69.05	67.55		69.06	69.79		69.04	71.07		70.74	71.46
73.39		70.67	7.6	63.82	62.32		69.57	69.79		69.56	70.11		70.06	70.45
73.27		70.70	4.6	66.85	65.35		69.75	69.63		69.78	70.22		70.12	70.32
73.33		70.75	2.6	68.9	67.4		69.72	69.59		69.75	70.23		70.11	70.34
87.41		86.03	37.1	49.68	48.18		75.90	76.23		75.99	76.73		76.45	76.69
87.26		86.03	18.22	68.56	67.06		83.23	83.29		83.20	83.30		83.39	83.36
87.24		86.03	12.11	74.67	73.17		84.22	84.40		84.21	84.44		84.41	84.41
87.35		86.03	11.11	75.67	74.17		84.74	85.32		84.62	85.54		86.17	85.34
87.19		86.03	7.19	79.59	78.09		84.76	85.02		84.79	85.27		85.06	85.08
87.37		86.03	6.38	80.4	78.9		84.97	85.21		85.05	85.56		85.39	85.30
87.28		86.03	5.05	81.73	80.23		84.99	85.23		85.06	85.63		85.37	85.34
87.22		86.03	2.93	83.85	82.35		85.08	85.23		85.13	85.53		85.47	85.34
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02		69.59	70.09		69.50	70.25		70.09	70.55
72.84		71.33	4.57	67.51	66.01		69.02	69.37		68.94	69.80		69.62	69.84
72.74		71.33	2.58	69.5	68		69.03	69.38		68.94	69.75		69.66	69.80
69.61		68.7	8.38	61.07	59.57		69.16	69.12		69.02	69.13		69.18	69.15
70.2		68.7	3.55	65.9	64.4		68.86	68.86		68.88	68.86		68.89	68.85
70.13		68.7	1.91	67.54	66.04		68.96	68.95		68.96	68.97		68.99	68.94
70.23							68.63	69.15		68.08	69.24		69.24	69.24
70.87							69.24	69.69		69.26	69.80		69.83	69.74
86.27							78.44	78.32		78.25	78.83		78.45	78.75
86.33							83.56	83.78		83.44	83.78		83.71	83.80
86.34							84.33	84.33		84.18	84.68		84.51	84.46
86.39							84.37	84.32		84.23	84.59		84.65	84.41
81.38							74.74	75.08		74.82	75.55		75.31	75.52
81.31							76.55	76.82		76.51	76.86		76.96	77.10
81.20							78.07	78.49		77.90	78.71		78.42	78.76
81.25							78.81	78.94			79.36		79.21	79.19
70.93	74.53						70.33	70.49		70.92	70.59		70.64	70.73
70.85	74.47						70.85	70.85		72.18	71.32		71.49	71.46
70.80	74.52						70.57	70.65		71.46	70.81		70.80	70.99
70.91	74.46						70.54	70.57			70.83		70.87	70.75

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002573

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	13-Jun-19 Elevation	14-Nov-19 Elevation	13-May-20 Elevation	17-Nov-20 Elevation	19-May-21 Elevation	23-Nov-21 Elevation
m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	71.12	70.95	70.95	70.87	70.90	70.84
73.50		71.10	18.32	53.53	52.03	71.04	70.63	70.70	70.48	70.68	70.45
73.64		71.10	12.22	59.63	58.13	70.69	69.95	70.38	69.85	70.35	69.84
73.67		71.10	g	60.54	59.04	70.63	69.82	70.35	69.73	70.31	69.73
73.64		71.10	8.06	63.79	62.29	70.19	69.45	70.37	69.35	70.24	69.46
73.74		71.10	6.47	65.38	63.88	69.92	69.32	70.26	69.21	69.96	69.47
73.59		71.10	5.13	66.72	65.22	69.95	69.47	70.13	69.30	69.91	69.80
73.52		71.10	2.8	69.05	67.55	70.04	69.57	70.21	69.38	69.98	69.90
73.39		70.67	7.6	63.82	62.32	70.09	69.72	70.13	69.85	70.01	69.99
73.27		70.70	4.6	66.85	65.35	69.86	69.87	69.82	69.68	69.68	70.09
73.33		70.75	2.6	68.9	67.4	69.84	69.84	69.79	69.65	69.66	70.07
87.41		86.03	37.1	49.68	48.18	76.74	76.30	76.59	76.16	76.35	76.12
87.26		86.03	18.22	68.56	67.06	83.29	83.26	83.27	83.21	83.23	83.28
87.24		86.03	12.11	74.67	73.17	84.39	84.27	84.34	84.21	84.28	84.36
87.35		86.03	11.11	75.67	74.17	85.33	85.25	85.41	84.63	85.29	85.35
87.19		86.03	7.19	79.59	78.09	85.04	84.80	85.04	84.74	84.94	85.05
87.37		86.03	6.38	80.4	78.9	85.23	85.10	85.26	84.99	84.41	85.34
87.28		86.03	5.05	81.73	80.23	85.28	85.10	85.30	84.94	85.16	85.34
87.22		86.03	2.93	83.85	82.35	85.34	85.16	85.28	84.96	85.20	85.47
		86.96									
		71.99									
		72.00									
72.83		71.33	8.56	63.52	62.02	70.21	69.61	70.13	69.61	69.99	69.68
72.84		71.33	4.57	67.51	66.01	69.41	69.27	69.58	69.14	69.44	69.53
72.74		71.33	2.58	69.5	68	69.37	69.30	69.57	69.08	69.35	69.50
69.61		68.7	8.38	61.07	59.57	69.16	68.74	69.12	69.03	69.09	69.21
70.2		68.7	3.55	65.9	64.4	68.85	68.74	68.82	68.78	68.77	68.84
70.13		68.7	1.91	67.54	66.04	68.97	68.88	68.92	68.89	68.89	68.95
70.23						69.10	68.55	69.18	68.32	69.04	69.00
70.87						69.59	69.07	69.76	68.98	69.61	69.68
86.27						78.58	78.39	78.66	77.85	78.13	78.11
86.33						83.79	83.44	83.75	83.49	83.71	83.49
86.34						84.31	84.18	84.41	84.14	84.24	84.38
86.39						84.26	84.26	84.39	84.22	84.23	84.47
81.38						75.54	75.14	75.38	75.02	75.15	74.94
81.31						77.26	77.07	77.04	76.86	77.09	76.87
81.20						78.72	78.35	78.71	78.28	78.64	78.45
81.25						79.04	79.01	79.21	78.83	78.97	79.45
70.93	74.53					70.81	70.64	70.66	70.55	70.60	70.53
70.85	74.47					71.32	71.29	71.30	71.26	71.22	71.23
70.80	74.52					70.90	70.87	70.87	70.92	70.81	70.86
70.91	74.46					70.77	70.77	70.75	70.66	70.69	70.75

ed in November 2005

002574

2009 op of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	23-Jun-95 Elevation	12-Jul-95 Elevation	26-Jul-95 Elevation	9-Aug-95 Elevation	13-Sep-95 Elevation	15-Aug-95 Elevation	18-Aug-95 Elevation	21-Aug-95 Elevation	25-Aug-95 Elevation	28-A Elev
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.8	68.576	68.686				68.736			
	69.65	69.232	4.57	64.7	63.95	68.6	68.206	68.366				68.596			
	69.81	69.232	2.33	66.7	66.325	68.52	68.276	68.486				68.536			
	85.67	85.312	2.72	83.34	82.59	83.01	82.57	83.46				83.22			
	69.73	68.477	8.25	60.98	60.23	68.55	68.367	68.437				68.507			
	69.7	68.477	4.52	64.71	63.96	68.46	68.27	68.352				68.432			
	69.83	68.477	2.31	66.55	66.18	68.45	68.41	68.377				68.427			
84.46	84.62	79.32	2.72	77.35	76.6	78.38	79.1	78.99				78.68			
	70.93	68.73	22.30	47.18	46.43	68.96	69.222	69.282				69.232			
84.3		79.32	4.57	75.5	74.75										
84.79	84.4	79.32	8.19	71.88	71.13										
	85.84	85.312	7.09	78.97	78.22										
	85.87	85.312	4.51	81.55	80.8										
	85.08				73.58										
			3.06				69.888		70.988	70.888	70.918	70.988	70.708	70.928	71.
			2.54				70.246		70.946	70.886	70.986	71.016	70.876	71.086	71.
			2.05				70.696		70.856	70.936	71.086	71.116	71.096	71.346	71.
			1.52				DRY		70.758	71.038	71.108	71.118	71.198	71.488	71.
			3.07				69.745		70.925	70.845	70.905	70.985	70.705	70.925	71.
			2.5				70.578		70.828	70.868	71.018	71.068	70.918	71.168	71.
			2.04				70.783		70.753	70.883	71.023	71.073	71.033	71.283	71.
			1.53				DRY		70.599	71.079	71.079	71.109	71.189	71.469	71.
			3.04				69.89		70.84	70.81	70.83	70.92	70.62	70.75	71
			2.52				70.326		70.826	70.786	70.846	70.956	70.756	70.876	71.
			2.01				70.631		70.351	70.881	71.061	71.081	71.021	71.201	71.
			1.52				DRY		69.974	71.414	71.134	71.124	71.204	71.474	71.
			3.05				69.752		70.822	70.692	70.792	70.852	70.502	70.562	71.
			2.49				70.192		70.562	70.812	70.962	71.012	70.822	70.972	71.
			2.01				70.505		70.305	70.905	71.085	71.105	71.025	71.205	71.
			1.53				DRY		70.058	71.308	71.108	71.108	71.198	71.418	71.
			3.05				69.782		71.042	70.902	70.892	70.912	70.602	71.392	71.
			2.56				70.353		70.863	70.943	71.083	71.143	70.953	71.16	71.
			2.02				70.684		70.724	71.184	71.144	71.164	71.114	71.414	71.
			1.53				DRY		70.66	71.28	71.11	71.12	71.21	71.53	71
												70.821	70.791	70.681	70.
												70.857	70.837	70.737	70.
	73.85			57.86	55.36										
	74.11			58.48	55.98										
	73.858			58.655	56.155										
	71.645		23.9	47.49	46.73										
	71.605		8.53	62.86	62.1										
	71.635		4.72	66.64	65.88										
	71.815		2.44	68.925	68.16										
	69.87														
	69.79														
	69.79														

. 20 ew survey done in Nov. 2011 for top of riser.
d fo November 2015 groundwater elevation
p ol ed in November 2015 compared to the

002575

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	16-Oct-95 Elevation	29-Oct-95 Elevation	11-Nov-95 Elevation	6-Jun-96 Elevation	8-Aug-96 Elevation	4-Sep-96 Elevation	9-Jun-97 Elevation	12-Oct-97 Elevation	3-Jun-98 Elevation	14-Aug-9_ Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45			68.756	68.756	68.589	68.636		68.376		
	69.65	69.232	4.57	64.7	63.95			68.576	68.506	68.386	68.316	68.426	68.106	68.356	68.326
	69.81	69.232	2.33	66.7	66.325			68.536	68.436	68.266	68.096	68.286	67.966	68.256	
	85.67	85.312	2.72	83.34	82.59			84.24	82.79	82.56	82.56	82.76	82.59	82.67	82.6
	69.73	68.477	8.25	60.98	60.23			68.507	68.447	68.327	68.297		67.957		
	69.7	68.477	4.52	64.71	63.96			68.382	68.312	68.052	67.752	68.232	68.972	68.062	67.982
	69.83	68.477	2.31	66.55	66.18			68.427	68.387	68.027	67.727	68.217	67.627	68.047	67.917
84.46	84.62	79.32	2.72	77.35	76.6			77.81	78.79	78.48	78.26	78.4	78.23	79.45	78.2
	70.93	68.73	22.30	47.18	46.43			69.292	69.182	69.282	69.282			69.232	69.282
84.3		79.32	4.57	75.5	74.75										
84.79	84.4	79.32	8.19	71.88	71.13										
	85.84	85.312	7.09	78.97	78.22										
	85.87	85.312	4.51	81.55	80.8										
	85.08				73.58										
			3.06			71.448	71.428								69.838
			2.54			71.456	71.356								70.006
			2.05			71.426	70.966								70.516
			1.52			71.458	70.258								71.188
			3.07			71.445	71.345								69.965
			2.5			71.428	71.158								70.438
			2.04			71.433	70.983								71.413
			1.53			71.419	70.089								71.139
			3.04			71.46	71.43								69.72
			2.52			71.466	71.426								70.426
			2.01			71.441	71.021								71.011
			1.52			70.434	70.214								71.224
			3.05			71.462	71.422								69.932
			2.49			71.342	71.212								70.242
			2.01			71.406	70.925								70.745
			1.53			71.428	70.188								71.228
			3.05			71.472	71.462								69.452
			2.56			71.483	71.153								70.173
			2.02			71.474	70.244								70.654
			1.53			71.47	2.54								71.36
						71.021	71.061				69.911				70.941
						71.127	71.107				70.147				70.877
	73.85			57.86	55.36										
	74.11			58.48	55.98										
	73.858			58.655	56.155										
	71.645		23.9	47.49	46.73										
	71.605		8.53	62.86	62.1										
	71.635		4.72	66.64	65.88										
	71.815		2.44	68.925	68.16										
	69.87														
	69.79														
	69.79														

20(ew survey done in Nov. 2011 for top of riser.
d for November 2015 groundwater elevation
p ol d in November 2015 compared to the

002576

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	18-Oct-00 Elevation	8-Jun-01 Elevation	3-Oct-01 Elevation	17-May-02 Elevation	30-Oct-02 Elevation	22-May-03 Elevation	1-Oct-03 Elevation	5-Nov-03 Elevation	8-May-04 Elevation	5-Nov-0 Elevatio
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.806	68.76	68.51	68.78	68.386	68.67	68.54	68.71	68.84	68.76
	69.65	69.232	4.57	64.7	63.95	68.566	68.55	68.29	68.56	68.186	68.55	68.28	68.49	68.59	68.52
	69.81	69.232	2.33	66.7	66.325	68.476	68.48	68.28	68.51	68.146	68.5	68.24	68.47	68.46	68.44
	85.67	85.312	2.72	83.34	82.59	82.68	82.68	82.43	82.19	81.98	82.53	82.59	82.60	82.59	82.34
	69.73	68.477	8.25	60.98	60.23	68.507	68.49	68.07	68.54	68.047	68.34	67.95	68.37	68.53	68.48
	69.7	68.477	4.52	64.71	63.96	68.402	68.43	67.99	68.51	67.972	68.41	68.05	68.41	68.44	68.40
	69.83	68.477	2.31	66.55	66.18	68.297	68.32	67.92	68.37	67.897	68.18	67.90	68.41	68.43	68.40
84.46	84.62	79.32	2.72	77.35	76.6	78.71	78.92	78.45	79.13	78.42	79.08	78.61	79.15	79.12	79.15
	70.93	68.73	22.30	47.18	46.43	69.432	69.48	69.38	69.48	69.482	69.4	69.90	69.98	69.98	70.00
84.3		79.32	4.57	75.5	74.75	79.01	78.07	78.42	79.09	78.39	79.03	78.59	79.14	79.08	79.12
84.79	84.4	79.32	8.19	71.88	71.13	79.02	77.87	78.02	78.9	77.91	78.82	78.34	78.93	78.88	78.96
	85.84	85.312	7.09	78.97	78.22	81.43	81.39	81.24	81.51	81.31	81.44	81.34	81.48	81.44	81.46
	85.87	85.312	4.51	81.55	80.8	82.01	82.03	81.94	82.16	81.95	82.09	81.93	81.99	82.07	82.03
	85.08				73.58										
			3.06												
			2.54												
			2.05												
			1.52												
			3.07												
			2.5												
			2.04												
			1.53												
			3.04												
			2.52												
			2.01												
			1.52												
			3.05												
			2.49												
			2.01												
			1.53												
			3.05												
			2.56												
			2.02												
			1.53												
	73.85			57.86	55.36										
	74.11			58.48	55.98										
	73.858			58.655	56.155										
	71.645		23.9	47.49	46.73										
	71.605		8.53	62.86	62.1										
	71.635		4.72	66.64	65.88										
	71.815		2.44	68.925	68.16										
	69.87														
	69.79														
	69.79														

, 20(ew survey done in Nov. 2011 for top of riser.
d for November 2015 groundwater elevation
p of d in November 2015 compared to the

002577

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	14-Nov-06 Elevation	7-May-07 Elevation	19-Nov-07 Elevation	13-May-08 Elevation	3-Nov-08 Elevation	11-May-09 Elevation	18-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	16-I Eleva
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.896	68.82	68.826	68.78	68.83	68.83	frozen	68.86	68.85	68.
	69.65	69.232	4.57	64.7	63.95	68.579	68.61	67.416	68.56	68.67	68.67	68.57	68.57	68.59	68.
	69.81	69.232	2.33	66.7	66.325	68.351	68.31	68.226	68.30	68.39	68.39	68.32	68.31	68.55	68.
	85.67	85.312	2.72	83.34	82.59	82.665	82.55	82.44	82.63	81.53	81.53	82.43	82.44	81.53	82.
	69.73	68.477	8.25	60.98	60.23	68.632	68.60	68.337	68.51	68.57	68.57	68.40	68.61	68.62	68.
	69.7	68.477	4.52	64.71	63.96	68.507	68.44	68.282	68.42	68.49	68.49	68.38	68.43	68.47	68.
	69.83	68.477	2.31	66.55	66.18	68.36	68.27	68.127	68.34	68.33	68.33	68.31	68.25	68.29	68.
84.46	84.62	79.32	2.72	77.35	76.6	79.178	79.12	78.8	79.06	79.16	79.16	79.80	79.74	79.66	79.
	70.93	68.73	22.30	47.18	46.43	68.769	68.68	68.762	68.72	68.82	68.82	68.67		68.30	68.
84.3		79.32	4.57	75.5	74.75	79.16	79.08	78.78	79.03	79.14	79.14	79.92	79.53	79.54	79.
84.79	84.4	79.32	8.19	71.88	71.13	79.005	78.90	76.99	78.86	78.88	78.88	80.02	80.24	80.24	80.
	85.84	85.312	7.09	78.97	78.22	81.784	81.73	81.57	81.76	81.65	81.65	81.67	81.65	81.71	81.
	85.87	85.312	4.51	81.55	80.8	82.255	82.19	81.98	82.28	82.12	82.12	81.98	82.08	82.21	82.
	85.08				73.58										
			3.06												
			2.54												
			2.05												
			1.52												
			3.07												
			2.5												
			2.04												
			1.53												
			3.04												
			2.52												
			2.01												
			1.52												
			3.05												
			2.49												
			2.01												
			1.53												
			3.05												
			2.56												
			2.02												
			1.53												
	73.85			57.86	55.36	69.43	68.82	68.60	68.87	68.60	68.83	68.39	68.51	68.90	69.
	74.11			58.48	55.98	69.52	68.99	68.80	69.63	68.98	69.17	68.58	68.79	69.08	69.
	73.858			58.655	56.155	69.56	68.87	68.78	69.22	68.94	69.06	68.60	68.91	69.08	69.
	71.645		23.9	47.49	46.73			69.87	69.94	69.90	69.92	69.85	69.93	69.56	69.
	71.605		8.53	62.86	62.1			69.33	69.46	69.46	69.54	69.50	69.61	69.57	69.
	71.635		4.72	66.64	65.88			69.23	69.21	69.55	69.47	69.41	69.25	69.66	69.
	71.815		2.44	68.925	68.16			69.23	69.21	69.50	69.45	69.39	69.24	69.70	69.
	69.87												69.51	69.41	69.
	69.79												68.65	68.77	68.
	69.79												68.56	68.58	68.
													69.20	69.25	69.

. 20 ew survey done in Nov. 2011 for top of riser.
d fo November 2015 groundwater elevation
p o ed in November 2015 compared to the

002578

2009 op of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	21-May-13 Elevation	20-Nov-13 Elevation	23-May-14 Elevation	27-Aug-14 Elevation	12-Nov-14 Elevation	26-May-15 Elevation	26-Aug-15 Elevation	19-Nov-15 Elevation	19-May-16 Elevation	1° Ele
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
		69.232	8.12	61.2	60.45	68.79	68.85	68.82		68.84	68.81		68.74	68.79	
	69.65	69.232	4.57	64.7	63.95	68.83	68.80	68.81		68.83	68.73		68.74	68.76	
	69.81	69.232	2.33	66.7	66.325	68.79	68.80	68.80		68.82	68.80		68.78	68.74	
	85.67	85.312	2.72	83.34	82.59										
	69.73	68.477	8.25	60.98	60.23	68.94	69.05	68.98		69.04	68.99		69.01	69.00	
	69.7	68.477	4.52	64.71	63.96	68.88	68.90	68.92		68.92	68.89		68.90	68.88	
	69.63	68.477	2.31	66.55	66.18	68.92	68.93	68.95		69.00	68.94		68.97	68.91	
84.46	84.62	79.32	2.72	77.35	76.6	80.32	79.79	80.41		80.04	80.18		79.97	80.48	
	70.93	68.73	22.30	47.18	46.43	69.79		69.93		69.89	69.91		69.88	69.96	
84.3		79.32	4.57	75.5	74.75	80.20	79.71	80.30		79.92	80.06		79.85	80.34	
84.79	84.4	79.32	8.19	71.88	71.13										
	85.84	85.312	7.09	78.97	78.22										
	85.87	85.312	4.51	81.55	80.8										
	85.08				73.58	80.52	79.98	80.58		80.24	80.33		80.09	80.61	
			3.06												
			2.54												
			2.05												
			1.52												
			3.07												
			2.5												
			2.04												
			1.53												
			3.04												
			2.52												
			2.01												
			1.52												
			3.05												
			2.49												
			2.01												
			1.53												
			3.05												
			2.56												
			2.02												
			1.53												
	73.85			57.86	55.36	69.48	69.30	69.78		69.33	69.38		69.11	69.46	
	74.11			58.48	55.98	69.67	69.61	70.13		69.38	69.63		69.05	69.78	
	73.858			58.655	56.155	69.61	69.89	69.81		69.92	69.73		69.74	69.62	
	71.645		23.9	47.49	46.73	69.95	69.86	70.02		70.02	70.03		70.01	70.19	
	71.605		8.53	62.86	62.1	69.82	69.99	69.94		70.18	69.85		69.87	69.94	
	71.635		4.72	66.64	65.88	69.73	69.85	69.80		70.09	69.81		69.85	69.73	
	71.815		2.44	68.925	68.16	69.87	69.98	69.93		70.22	69.94		69.98	69.87	
	69.87					69.47	68.52	69.40	69.45	69.47	69.45	69.43	69.73	69.60	6
	69.79					68.60	68.75	68.75	68.76	68.80	68.81	68.71	68.81	68.84	6
	69.79					68.73	69.43	68.62	68.60	68.63	68.62	68.56	68.61	68.61	6
									69.25	70.80		69.17			6

. 20(ew survey done in Nov. 2011 for top of riser.
d fol November 2015 groundwater elevation
p ol d in November 2015 compared to the

002579

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	22-Nov-17 Elevation	15-May-18 Elevation	3-Aug-18 Elevation	22-Nov-18 Elevation	13-Jun-19 Elevation	14-Nov-19 Elevation	13-May-20 Elevation	17-Nov-20 Elevation	19-May-21 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.87	68.87		68.88	68.83	68.73	68.67	68.71	68.77
	69.65	69.232	4.57	64.7	63.95	68.82	68.79		68.74	68.76	68.76	68.93	68.73	68.74
	69.81	69.232	2.33	66.7	66.325	68.80	68.77		68.73	68.76	68.72	68.77	68.72	68.71
	85.67	85.312	2.72	83.34	82.59									
	69.73	68.477	8.25	60.98	60.23	68.89	69.03		69.09	69.02	68.95	69.02	68.93	68.97
	69.7	68.477	4.52	64.71	63.96	68.90	68.86		68.88	68.84	68.79	68.83	68.81	68.82
	69.83	68.477	2.31	66.55	66.18	68.96	68.94		68.96	68.94	68.87	68.90	68.90	68.90
84.46	84.62	79.32	2.72	77.35	76.6	80.29	80.76		79.97	80.76	80.08	80.47	80.00	80.38
	70.93	68.73	22.30	47.18	46.43	70.03	70.11		frozen	70.11	frozen	70.00	69.93	69.97
84.3		79.32	4.57	75.5	74.75	80.14	80.62		79.83	80.63	79.94	80.34	79.89	80.27
84.79	84.4	79.32	8.19	71.88	71.13									
	85.84	85.312	7.09	78.97	78.22									
	85.87	85.312	4.51	81.55	80.8									
	85.08				73.58	80.43	80.87		80.10	80.83	80.16	80.58	80.15	80.51
			3.06											
			2.54											
			2.05											
			1.52											
			3.07											
			2.5											
			2.04											
			1.53											
			3.04											
			2.52											
			2.01											
			1.52											
			3.05											
			2.49											
			2.01											
			1.53											
			3.05											
			2.56											
			2.02											
			1.53											
	73.85			57.86	55.36	69.83	70.36		69.67	69.53	69.45	69.69	69.18	69.49
	74.11			58.48	55.98	70.58	71.32		70.21	69.86	69.43	70.05	69.26	69.82
	73.858			58.655	56.155	70.13	70.35		70.13	69.86	69.86	69.82	69.67	69.67
	71.645		23.9	47.49	46.73	70.33	70.39		70.30	70.46	70.29	70.29	70.21	70.26
	71.605		8.53	62.86	62.1	70.28	70.23		70.12	70.16	70.09	70.12	70.05	70.08
	71.635		4.72	66.64	65.88	70.05	69.83		69.81	69.91	69.90	69.91	69.88	69.81
	71.815		2.44	68.925	68.16	70.20	69.96		69.94	70.04	70.03	70.04	70.02	69.94
	69.87					Frozen	69.70	69.69	frozen	artesian	frozen	69.67	69.58	69.67
	69.79					70.20	68.90	68.76	70.20	68.88	68.74	68.86	68.83	68.86
	69.79					70.20	68.63	68.47	70.20	68.62	68.58	68.61	68.62	68.62
						70.20	69.28	69.18	70.20	Not monitored	69.22	Not monitored	69.16	Not monitored

: 20 ew survey done in Nov. 2011 for top of riser.
d fo November 2015 groundwater elevation
p o ed in November 2015 compared to the

002580

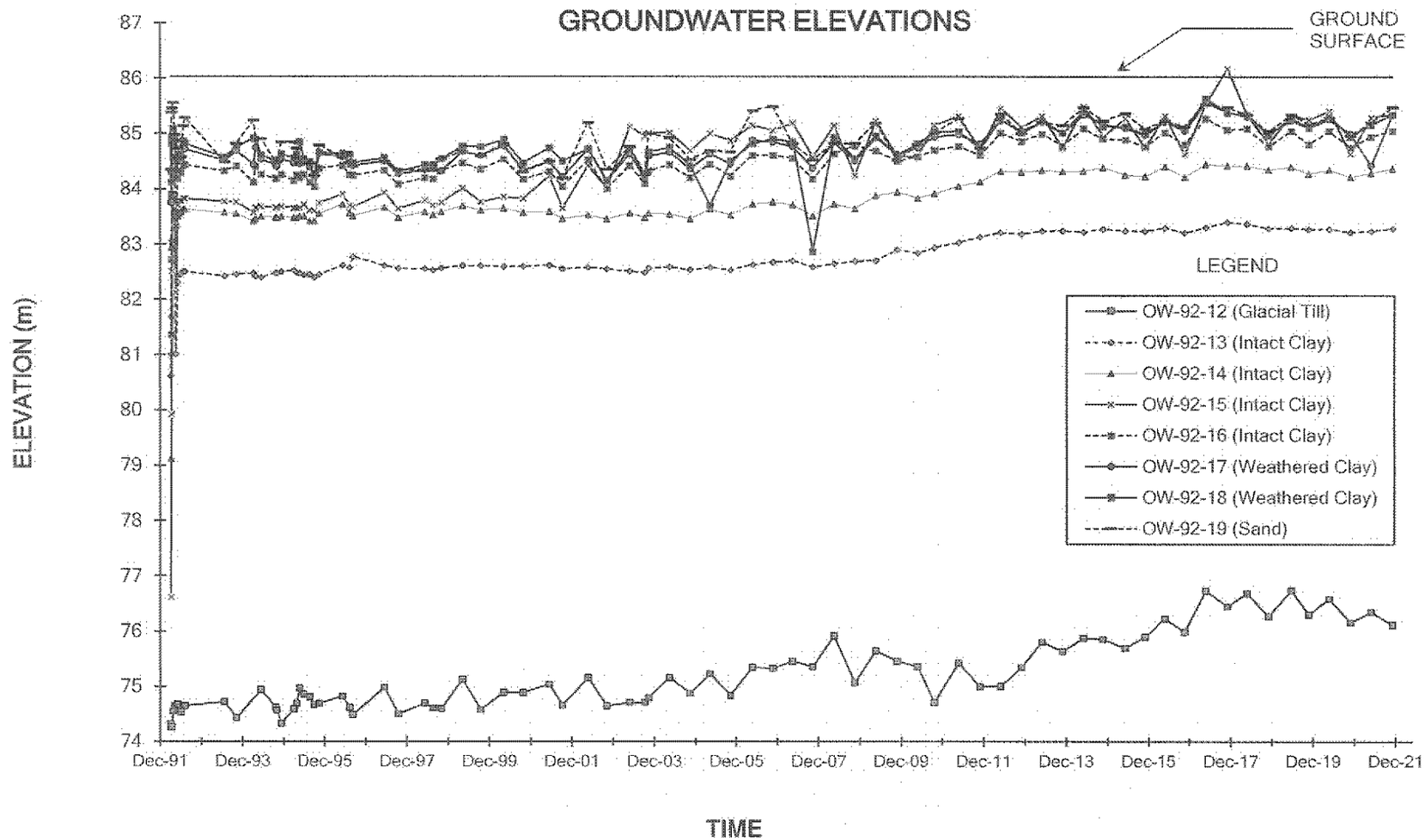

FIGURE C1

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-12 TO OW-92-19

wsp GOLDER

002581

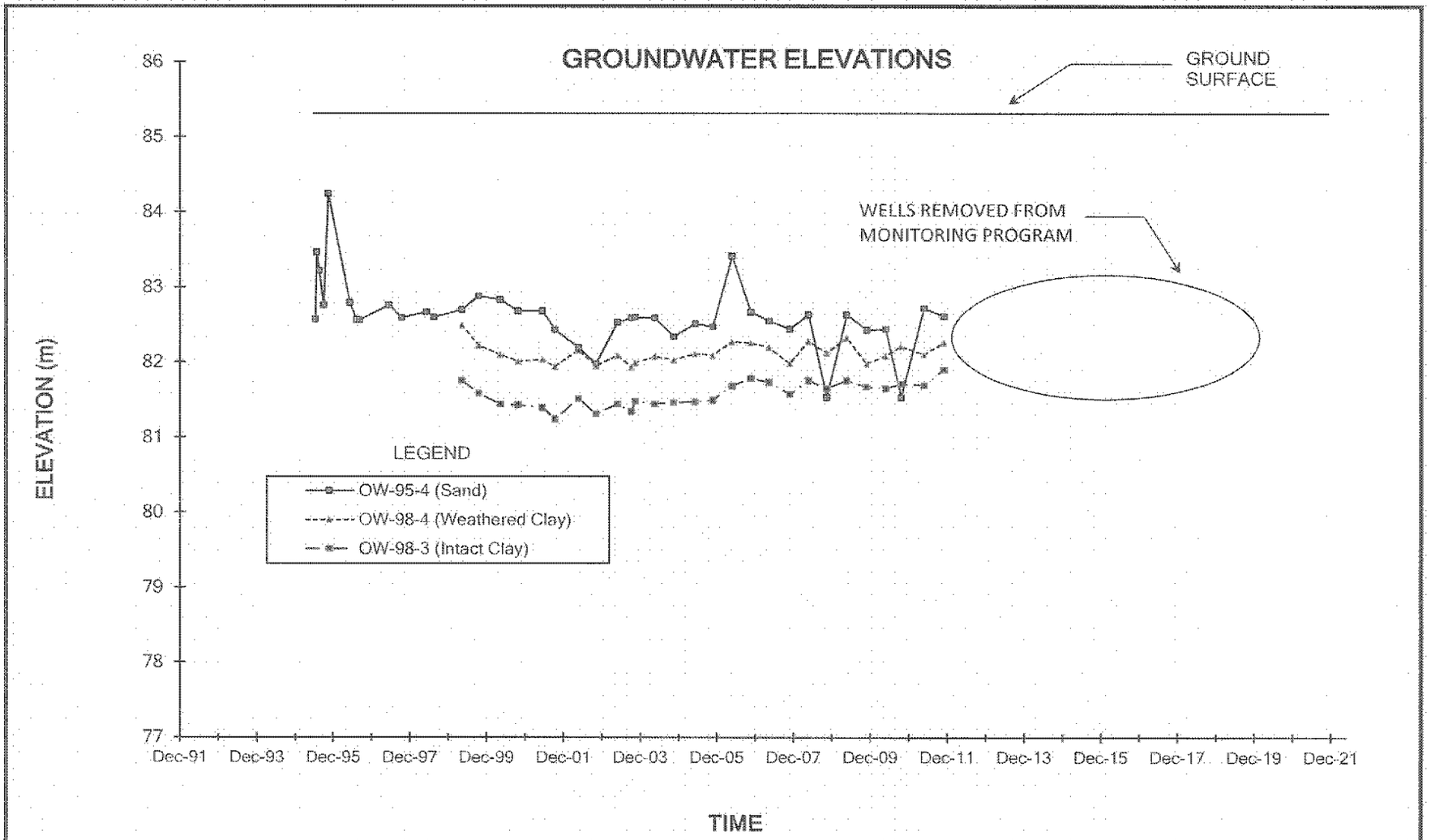

FIGURE C2

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-4 & OW-98-3 & 4

WSP GOLDER

002582

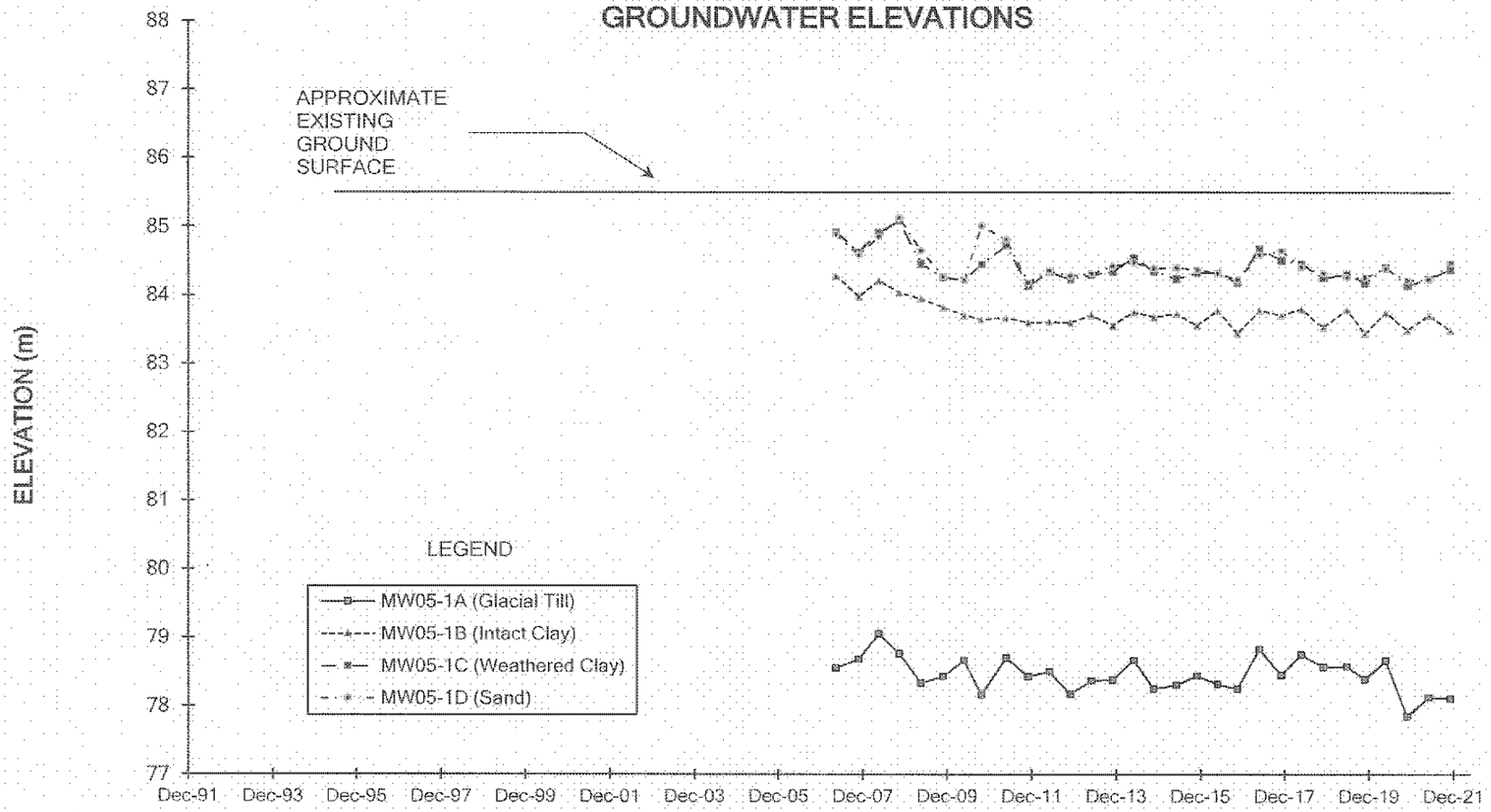

FIGURE C3

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS MW05-1A to MW05-1D

wsp GOLDER

002583

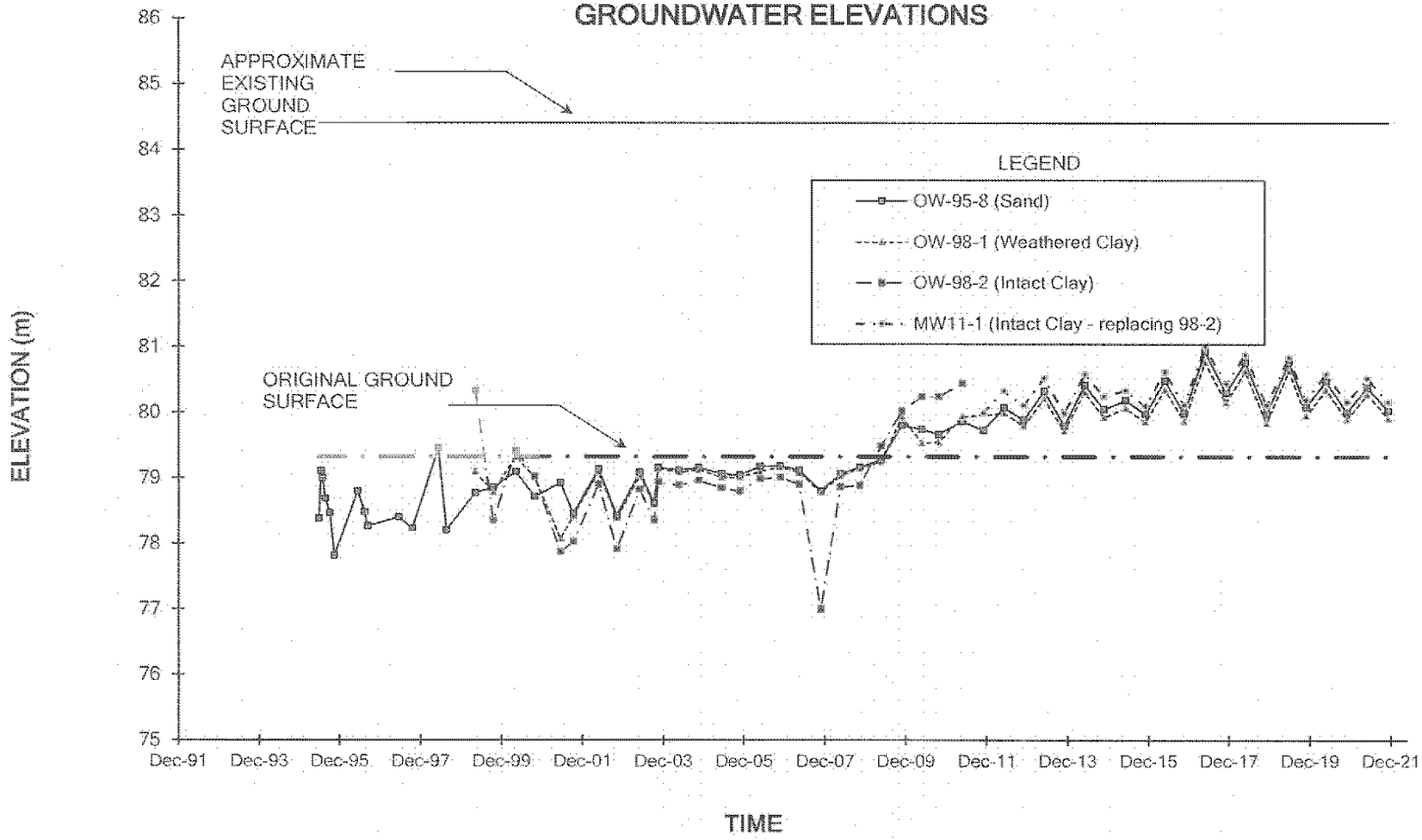

FIGURE C4

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-8, OW-98-1-2 & MW11-1

wsp GOLDER

002584

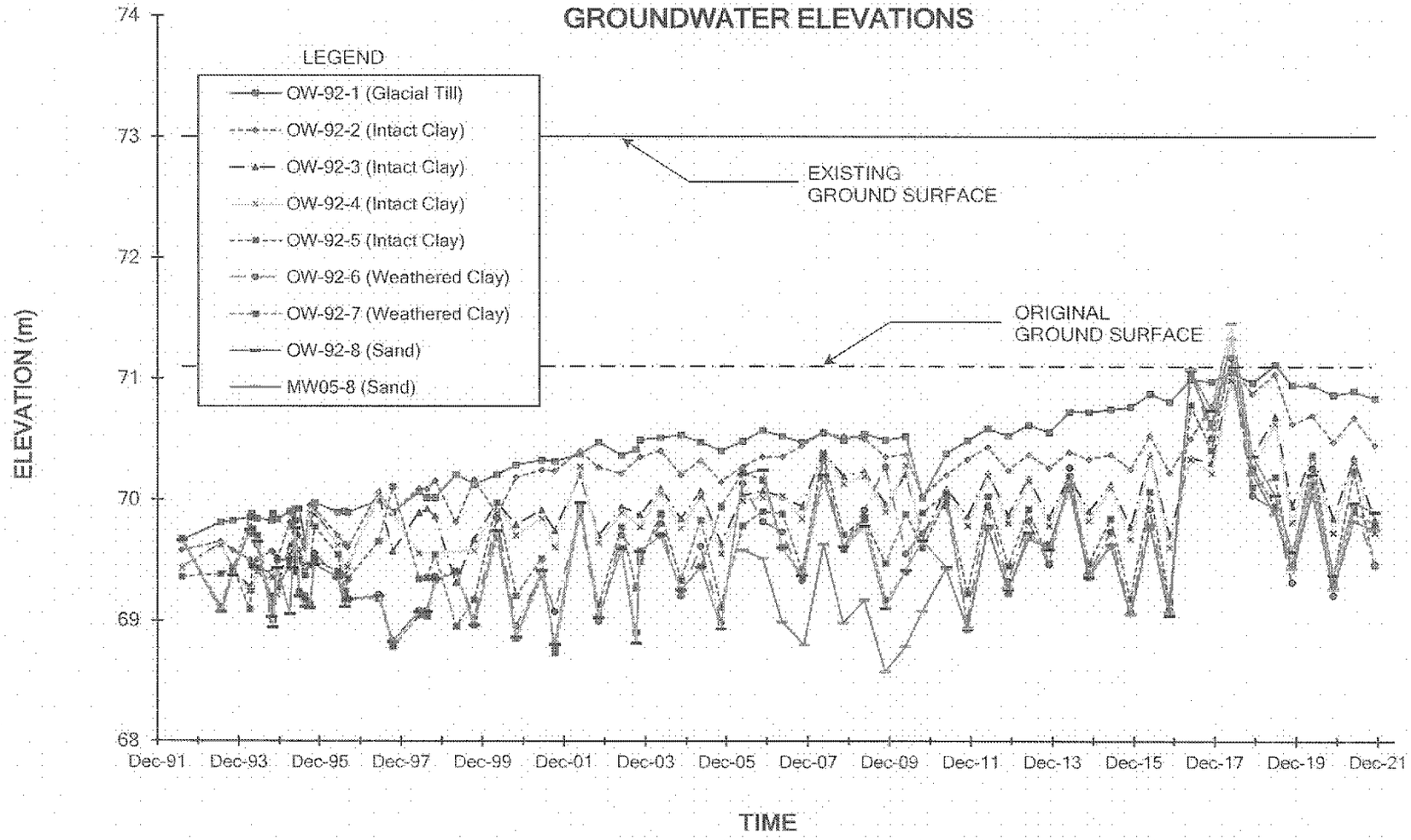

FIGURE C5

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-1 TO 92-8 & MW05-8

wsp GOLDER

002585

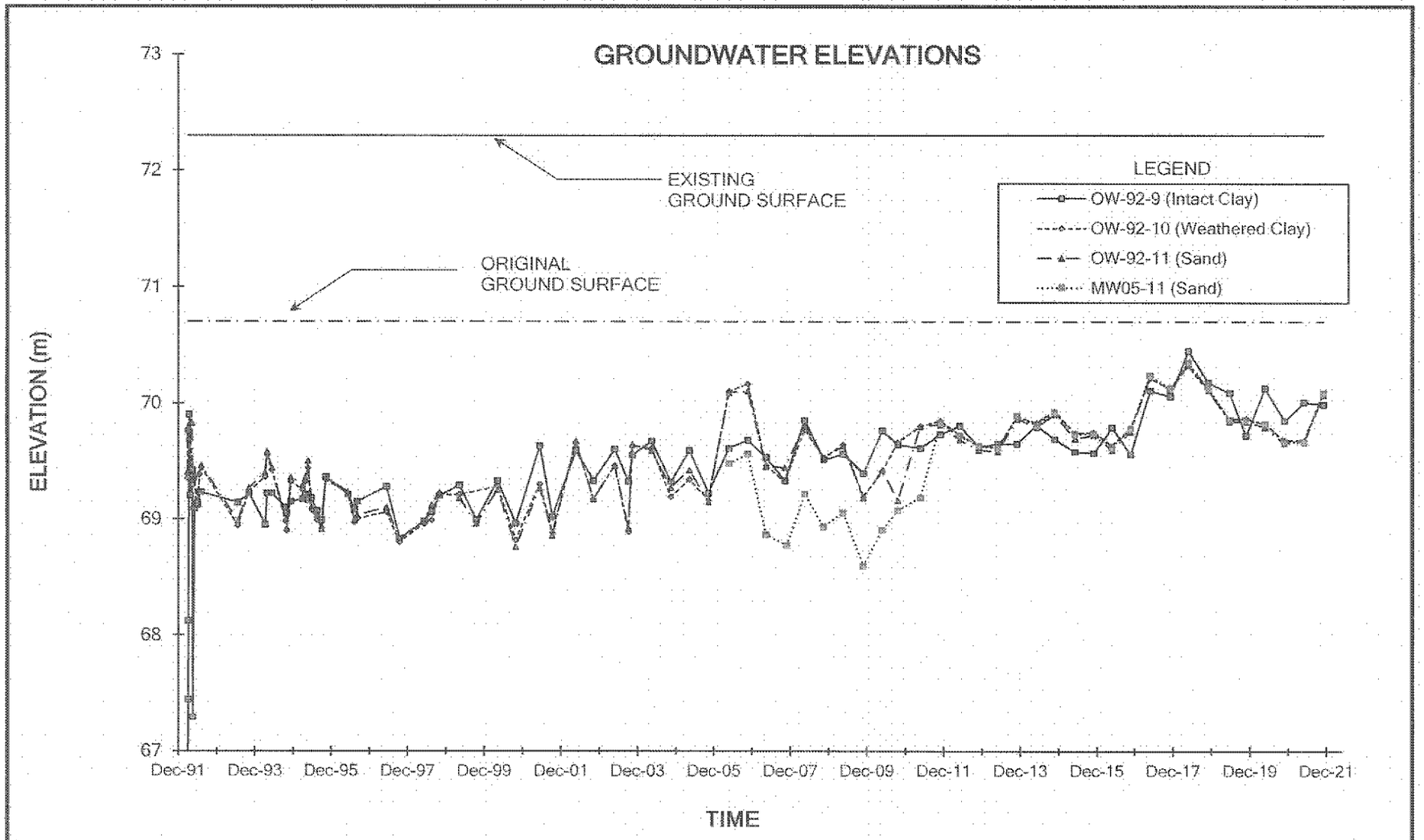

FIGURE C6

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-9 TO 92-11 & MW05-11

GOLDER

002586

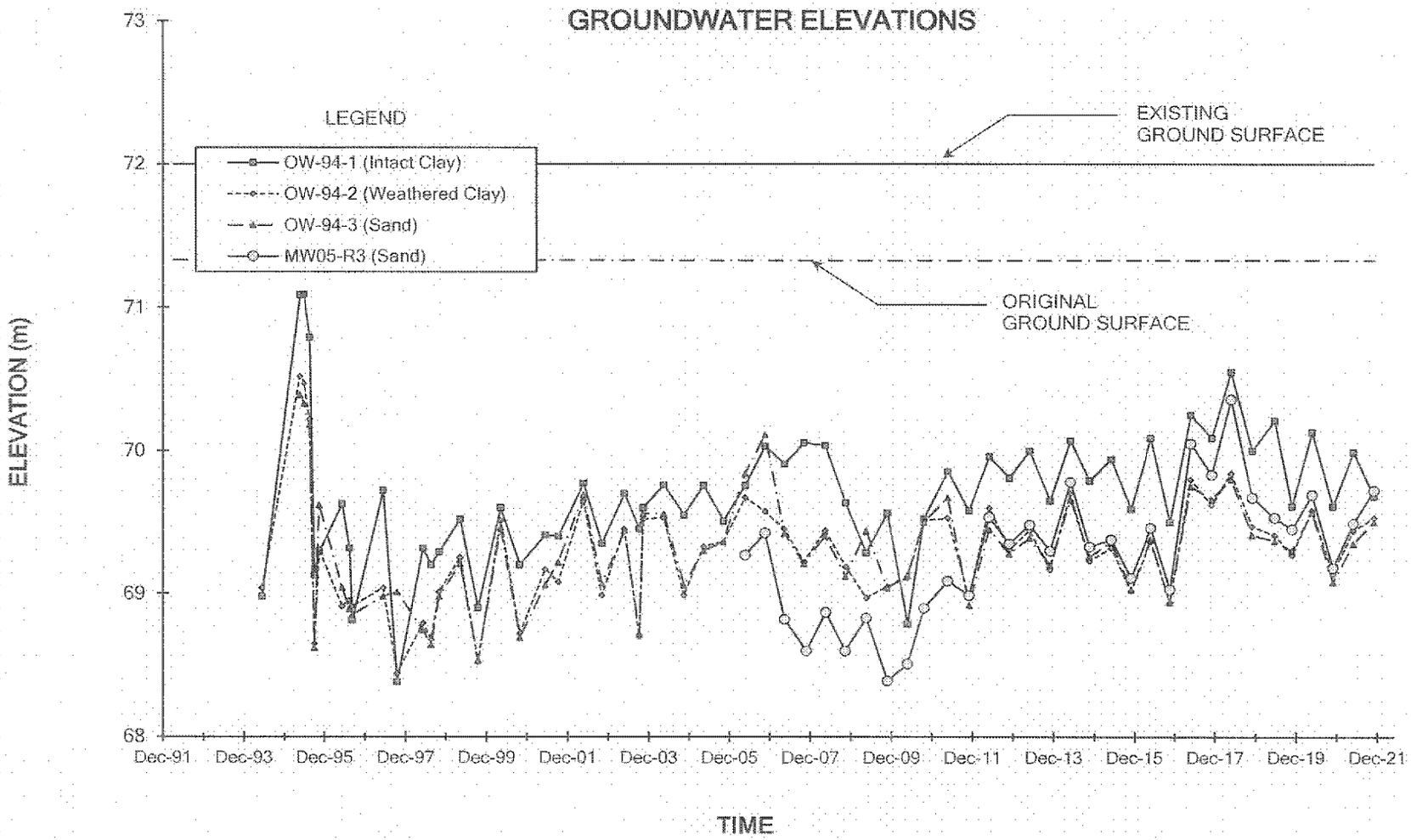

FIGURE C7

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-1 TO 94-3 & MW05-R3

WSP GOLDER

0025B7

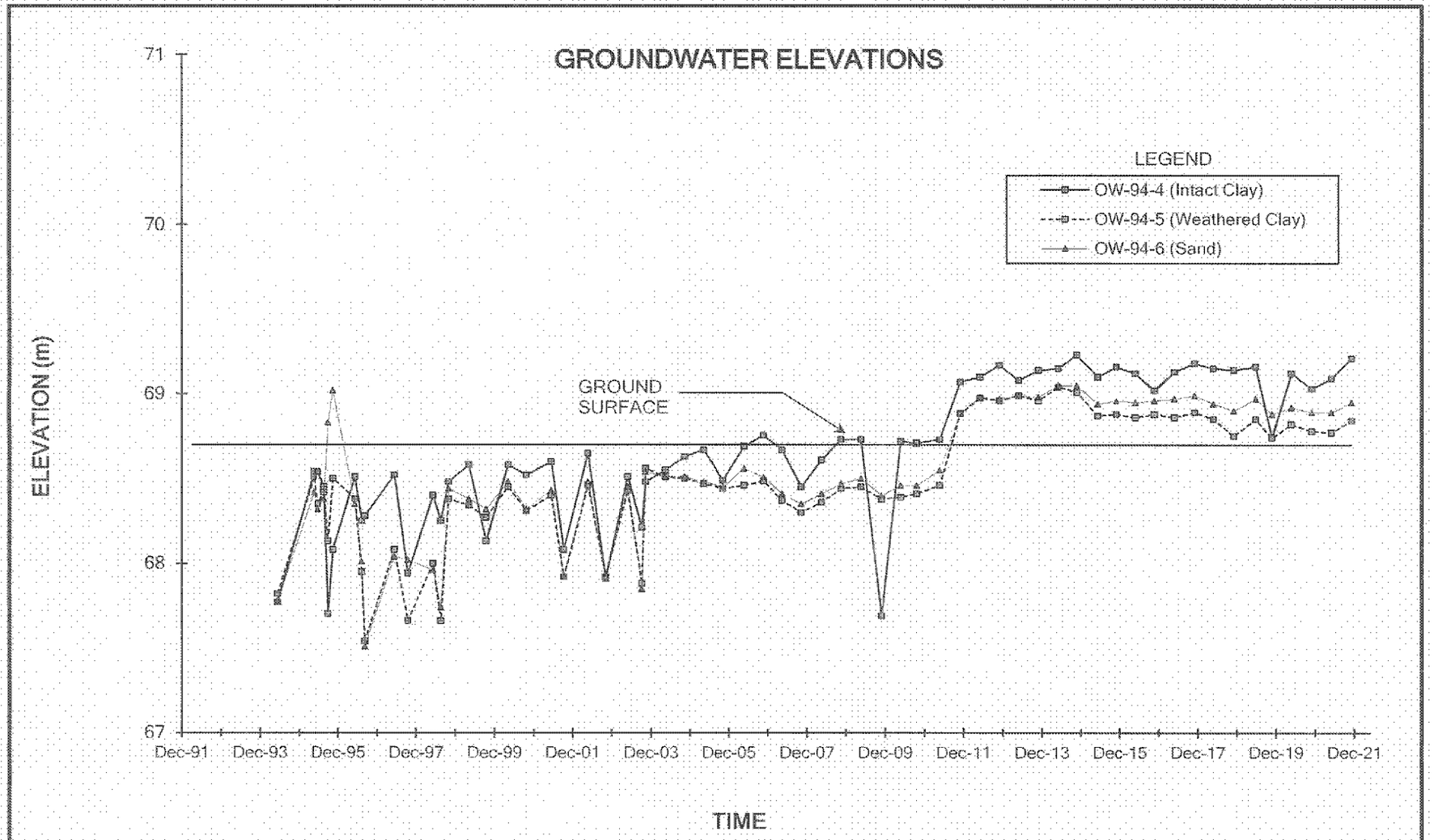

FIGURE C8

Project No. 20412275
Prepared by: ETB
Checked by: YJM June 2021

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-4 TO 94-6

wsp GOLDER

002588

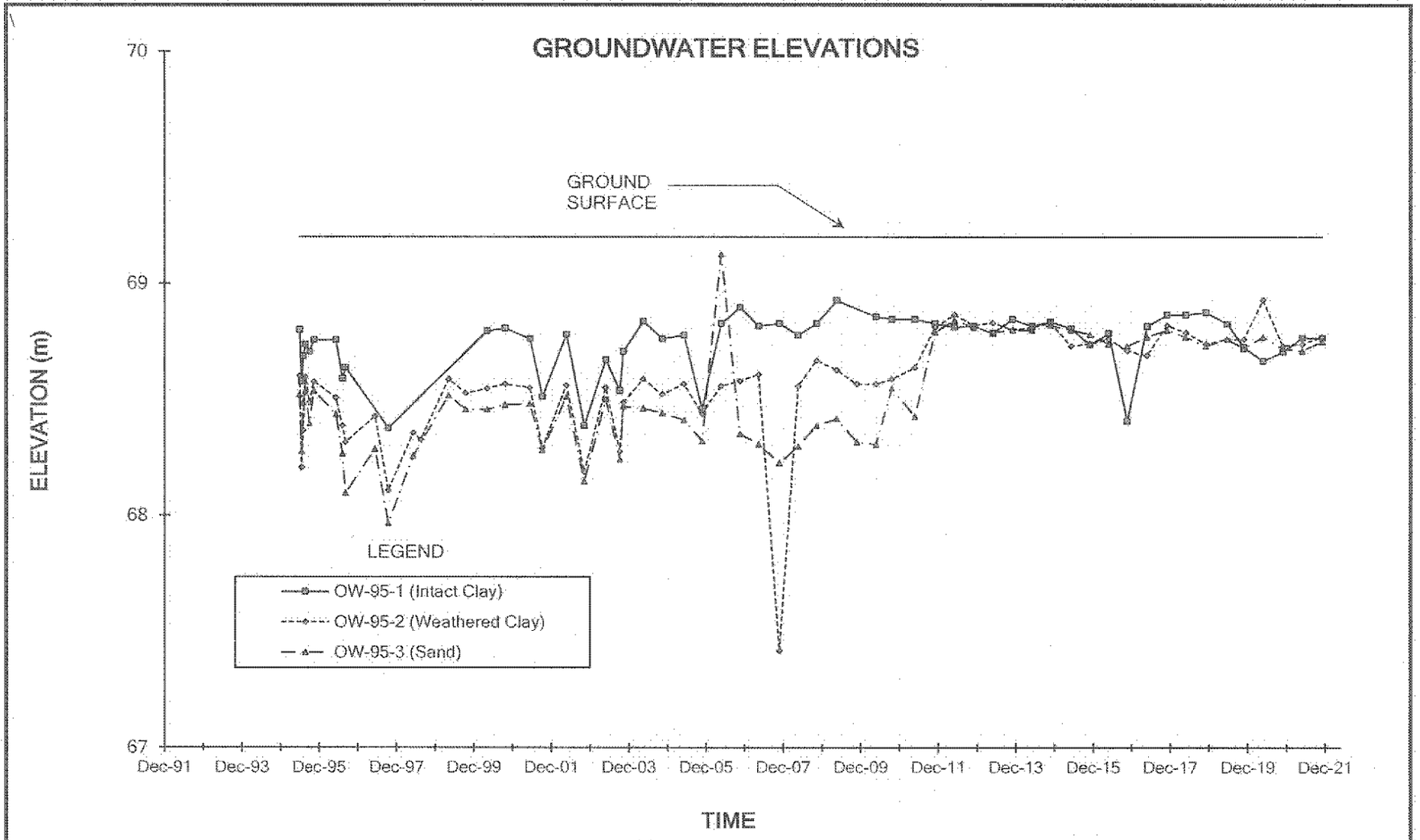

FIGURE C9

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-1 TO 95-3

wsp GOLDER

002589

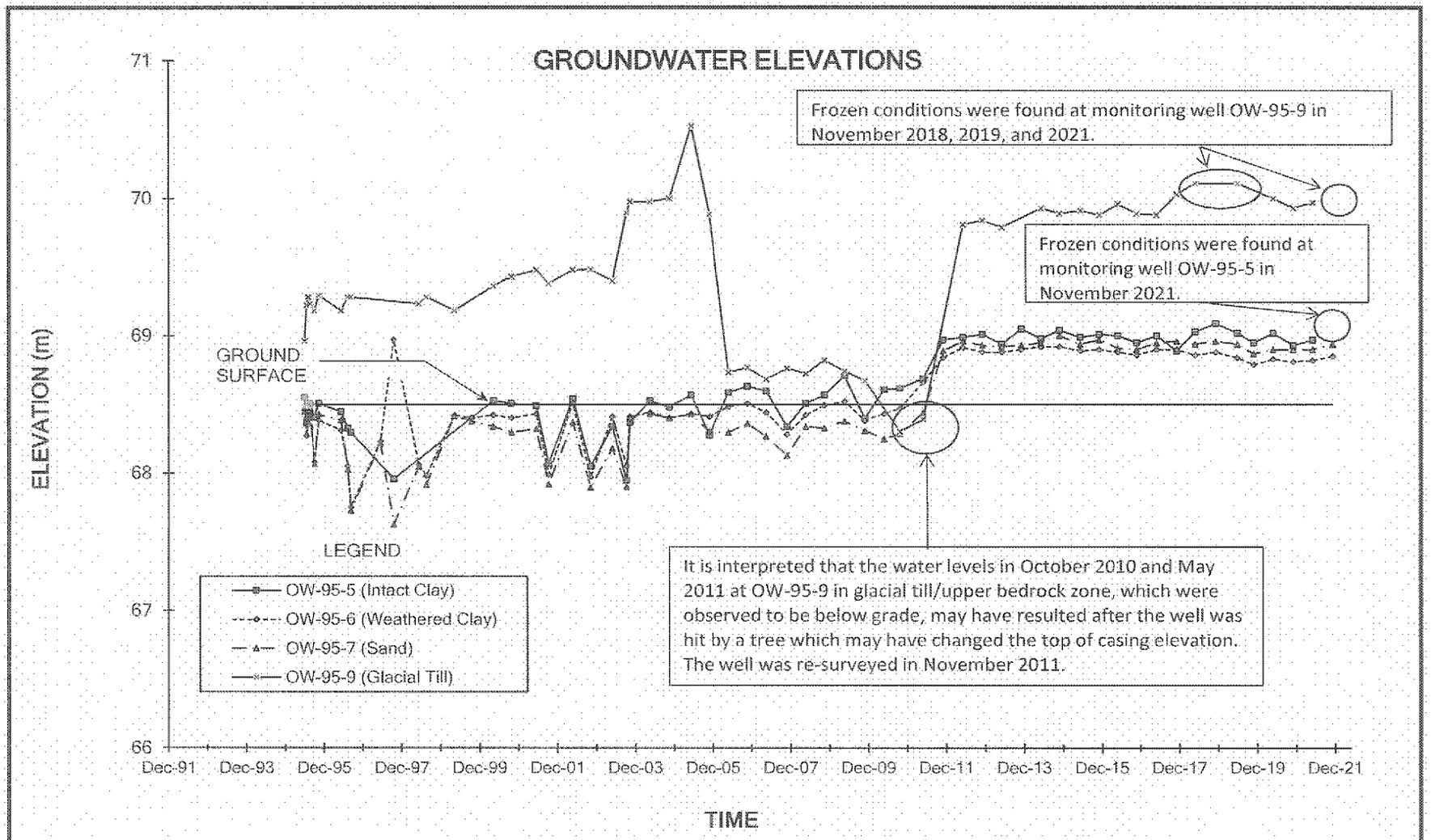

FIGURE C10

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-5 TO 95-7 & 95-9

WSP GOLDER

002590

APPENDIX D

Groundwater Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX E

Leachate Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX F

Groundwater Leachate Indicator Parameter Concentrations

Appendix F-A – Sand Layer

Appendix F-B – Weathered Clay Deposit

Appendix F-C – Intact Clay Deposit

Appendix F-D – Glacial Till/Upper Bedrock Zone

APPENDIX F-A

Sand Layer

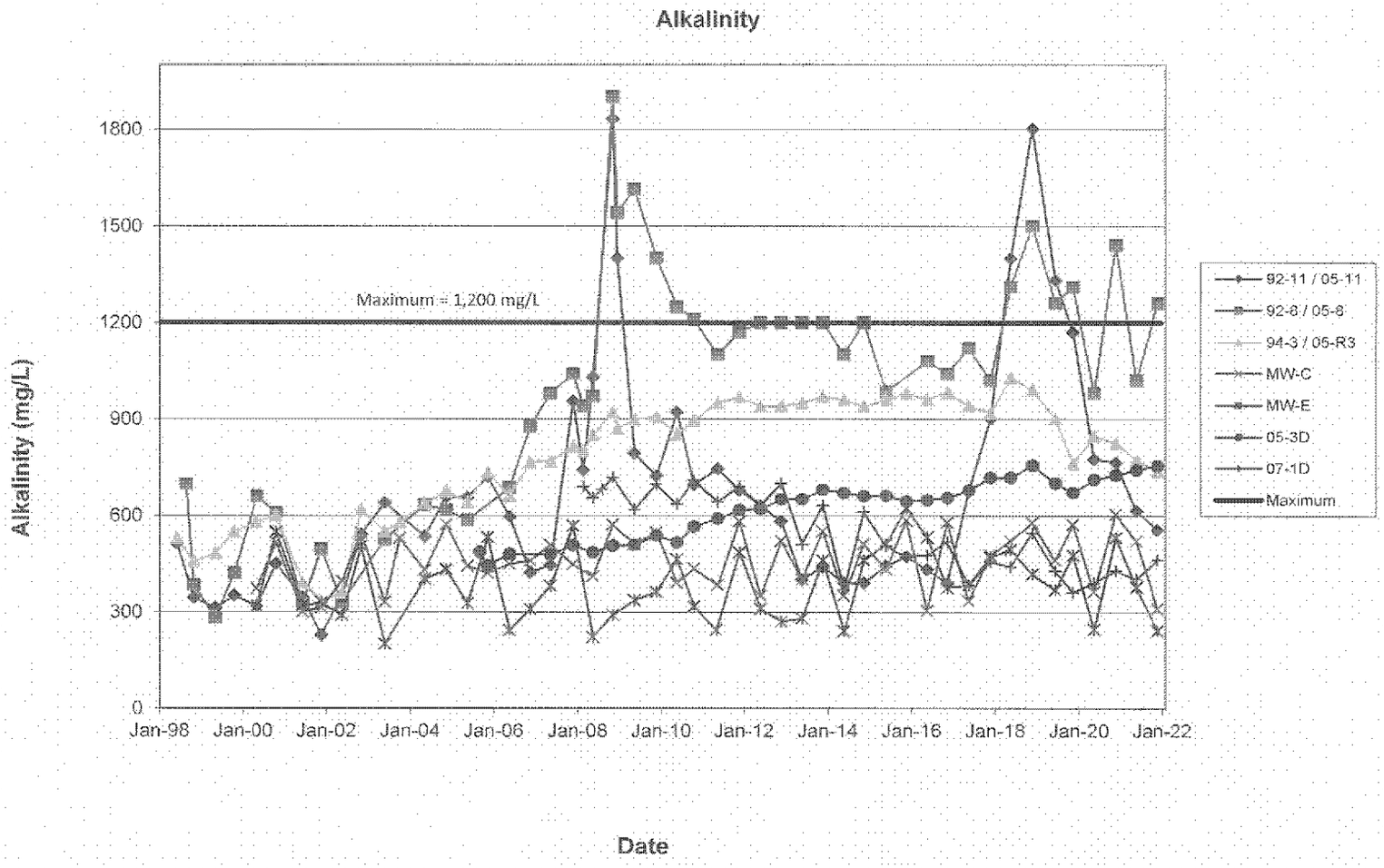

FIGURE FA1

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

002597

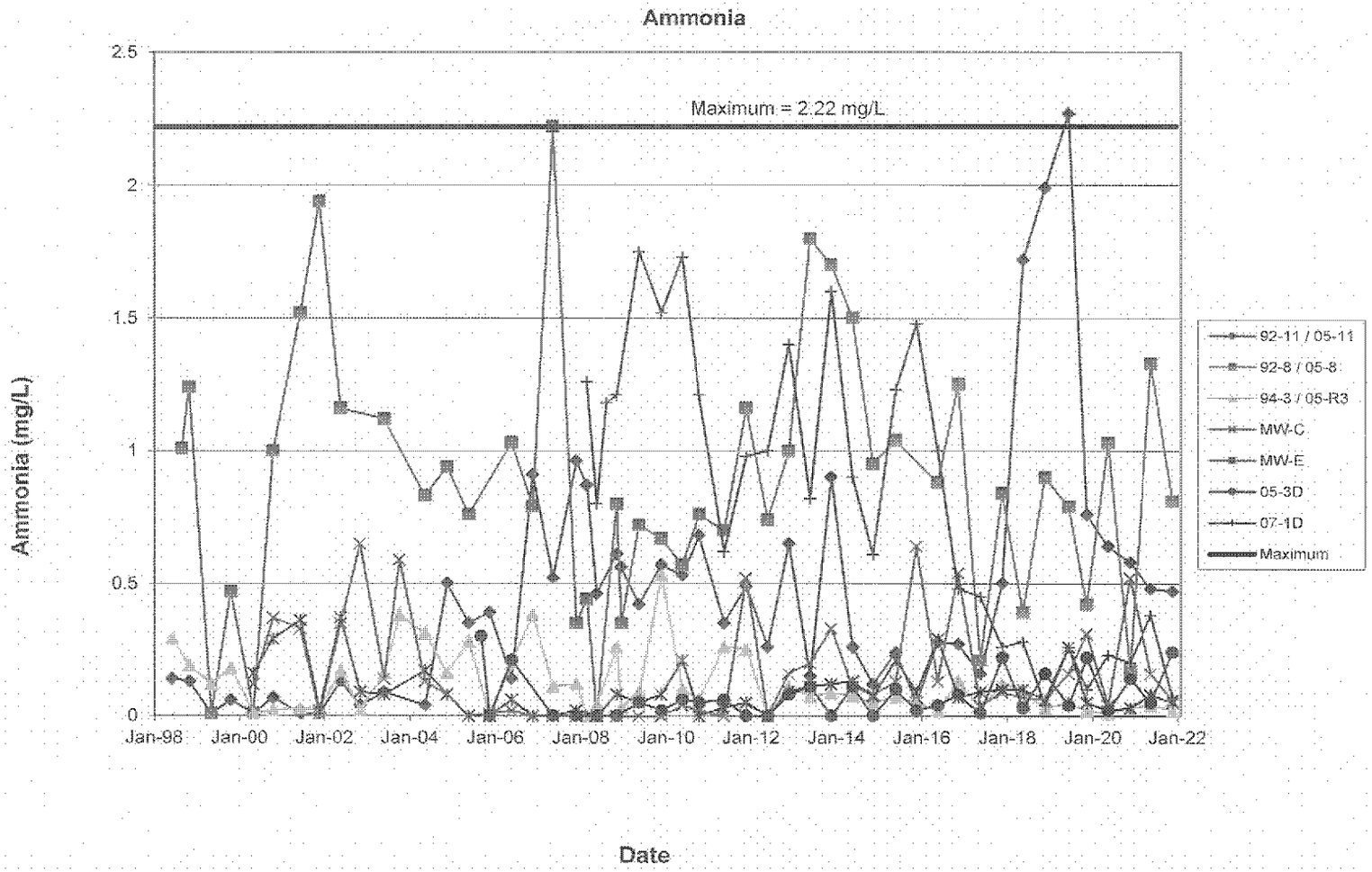

FIGURE FA2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

002598

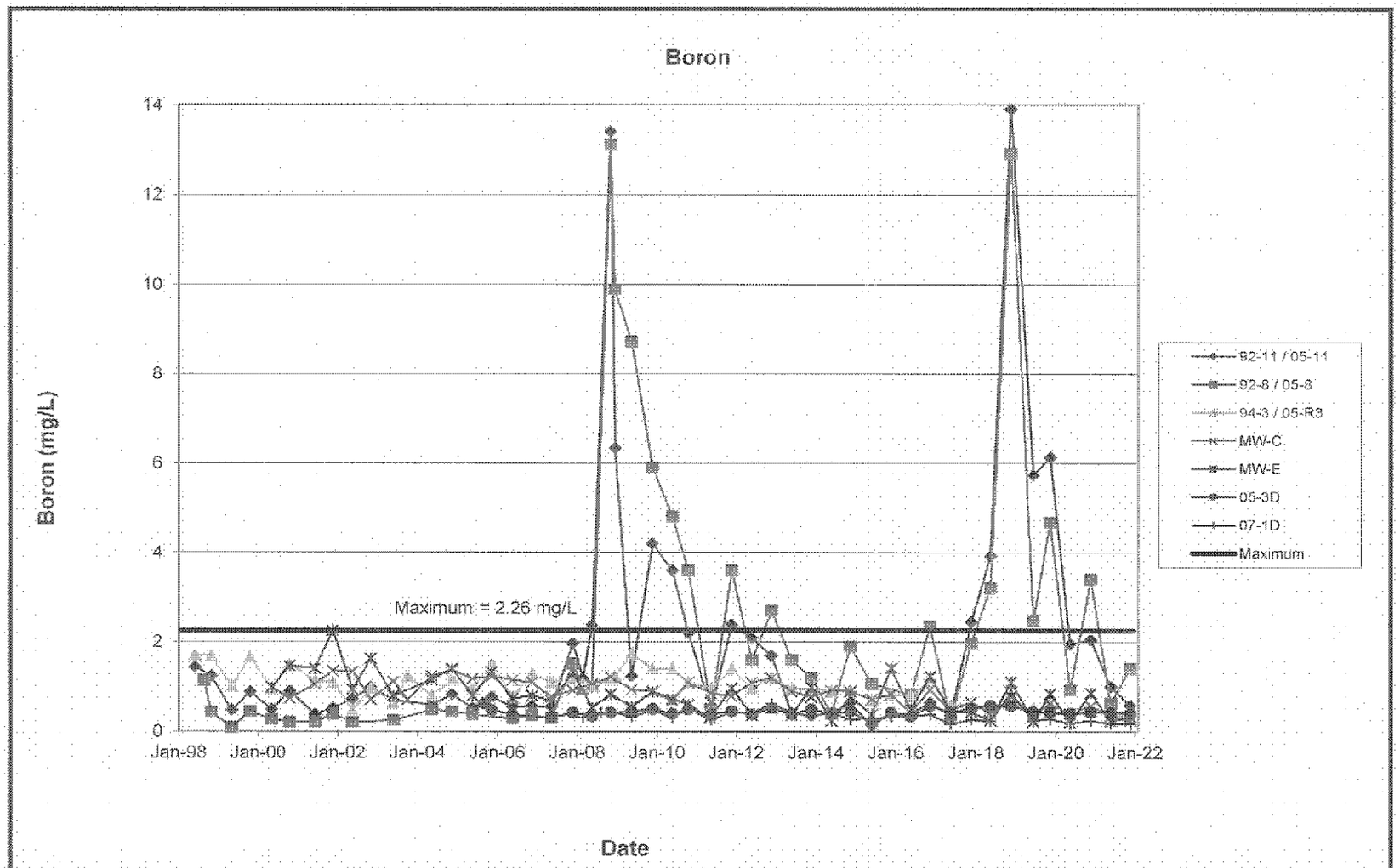

FIGURE FA3

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

002599

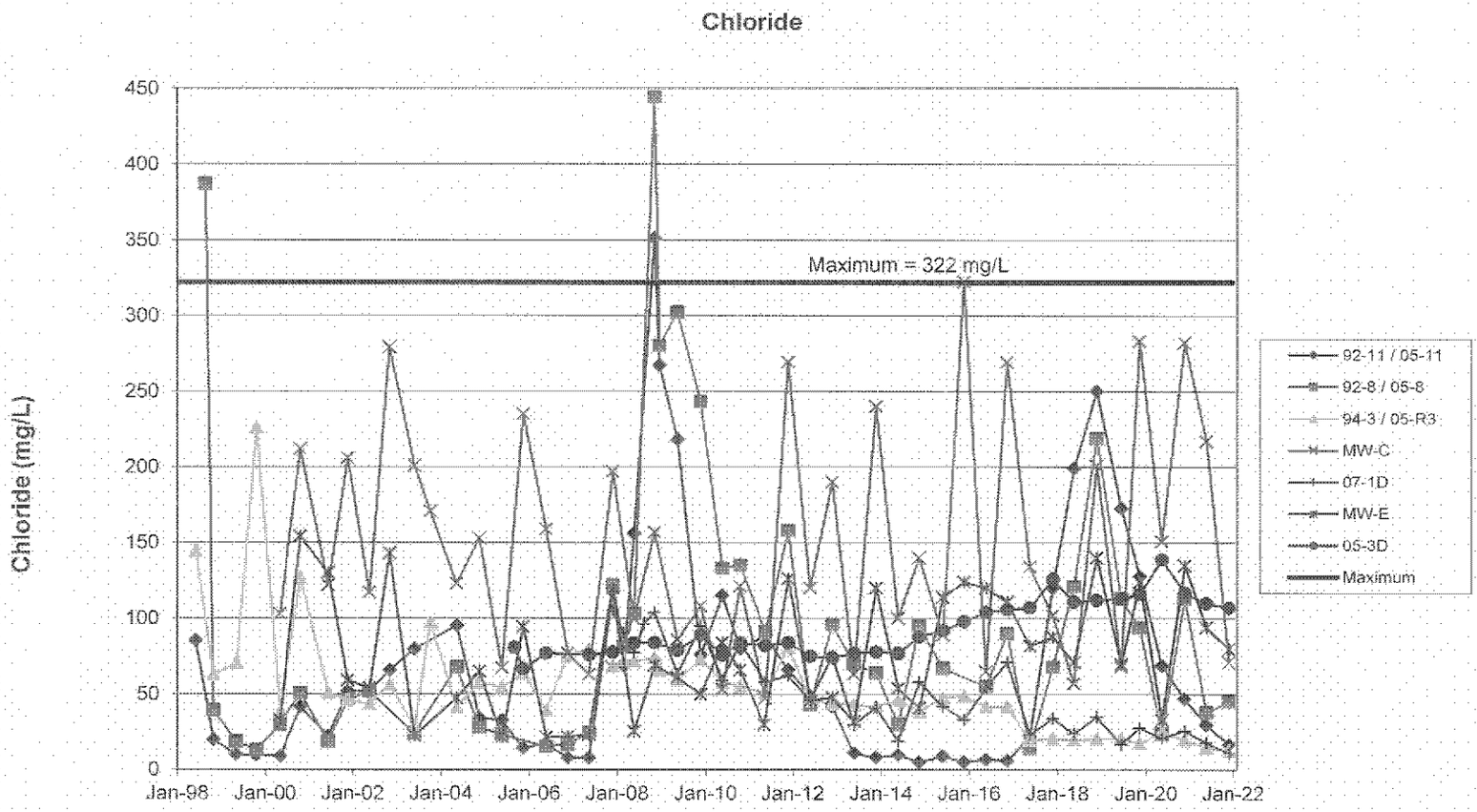

FIGURE FA4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

WSP GOLDER

002600

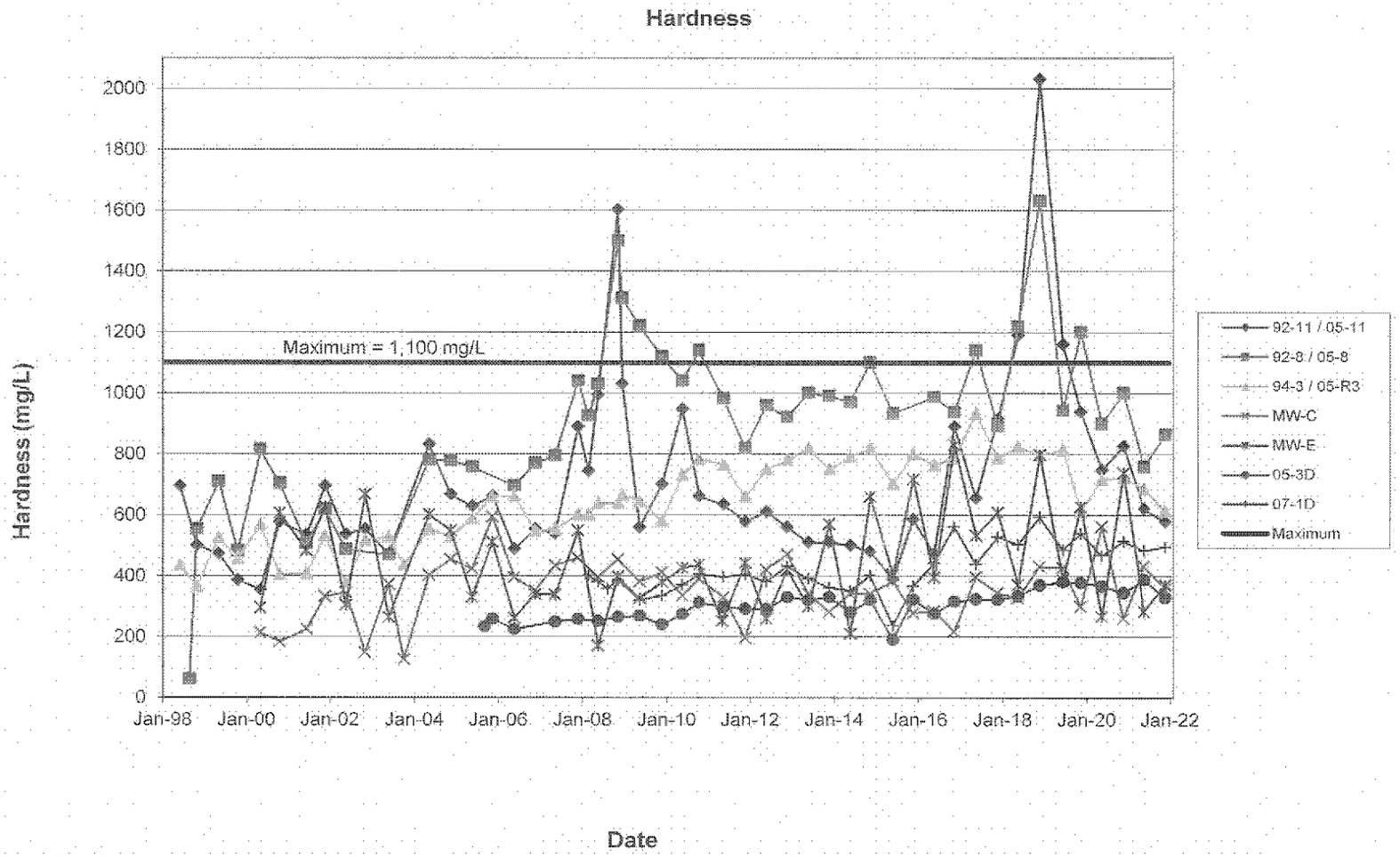

FIGURE FA5 Project No. 21497772 Prepared by: ETB Checked by: YJM March 2022	**WCC NAVAN FACILITY** **GROUNDWATER** **SAND**	GOLDER

002601

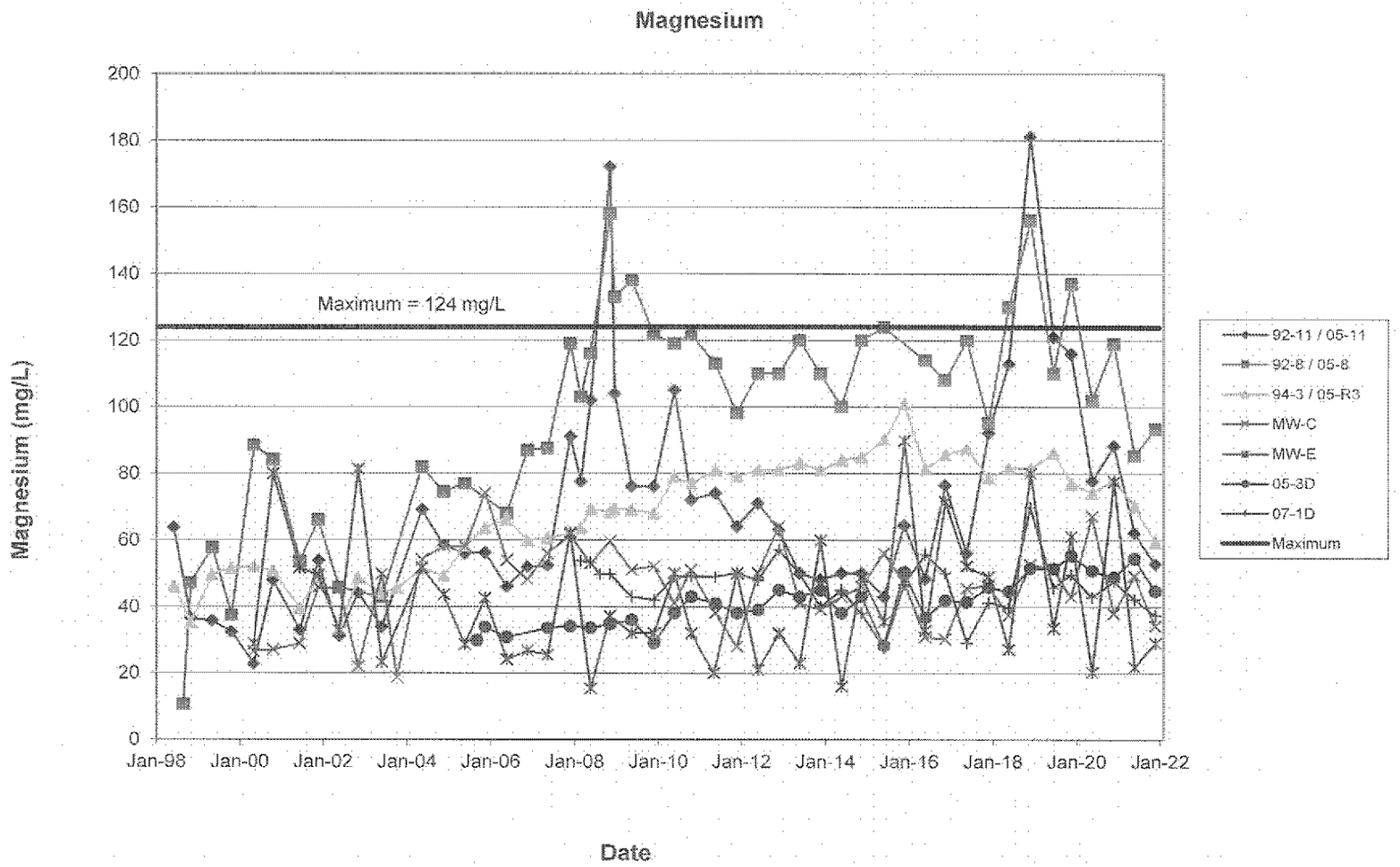

FIGURE FA6

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

002602

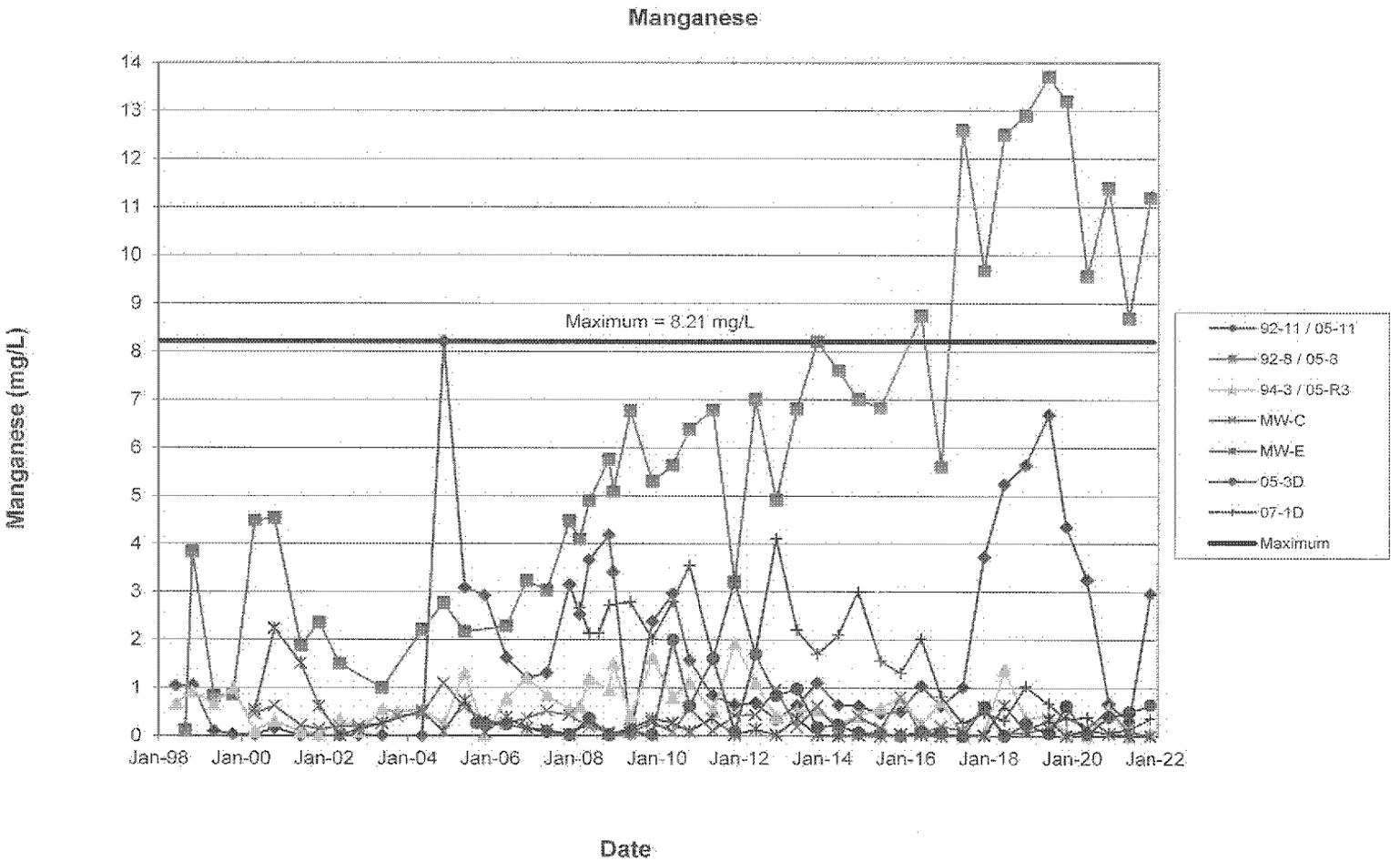

FIGURE FA7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

SAND

WSP GOLDER

002603

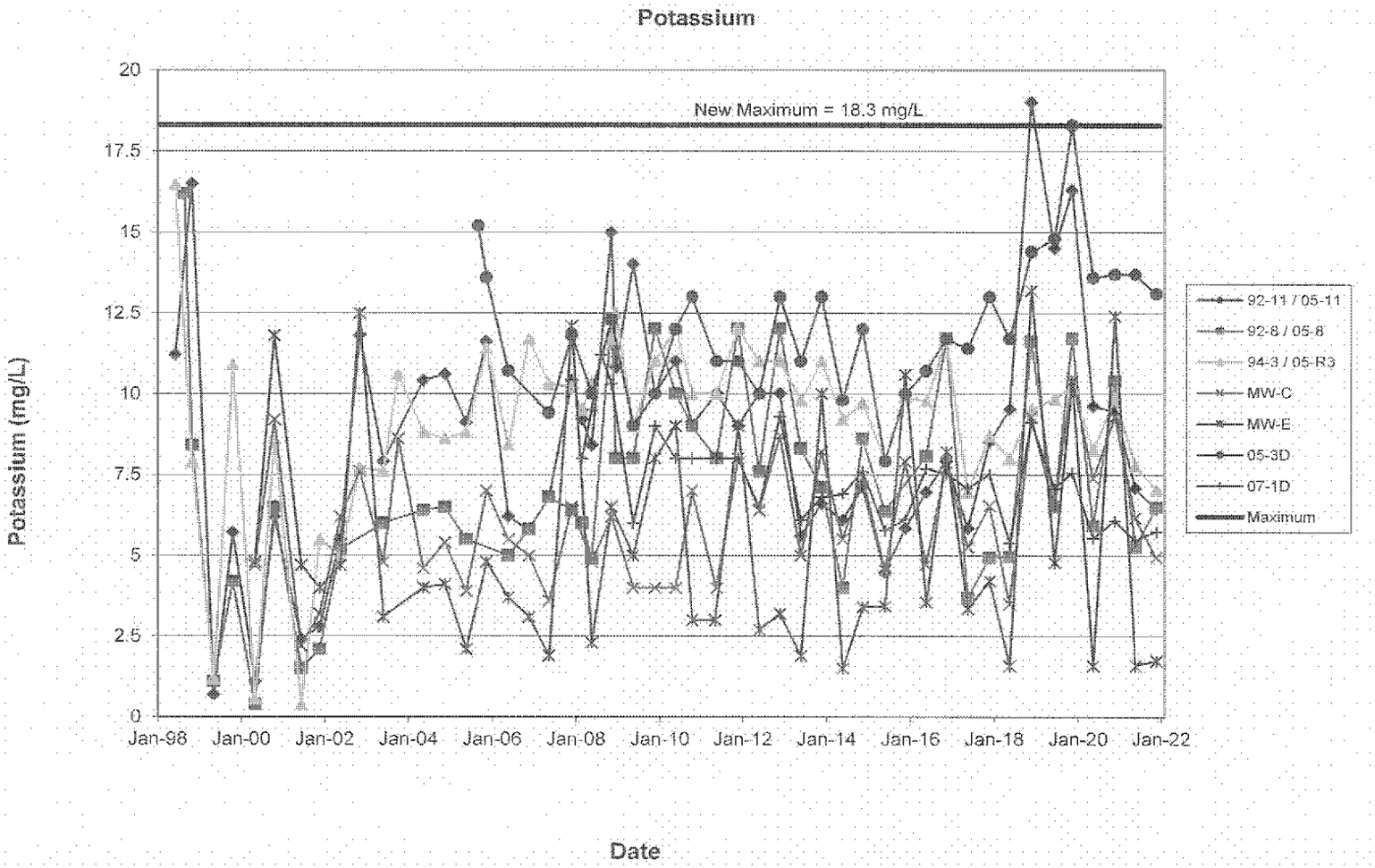

FIGURE FA8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

002604

APPENDIX F-B

Weathered Clay Deposit

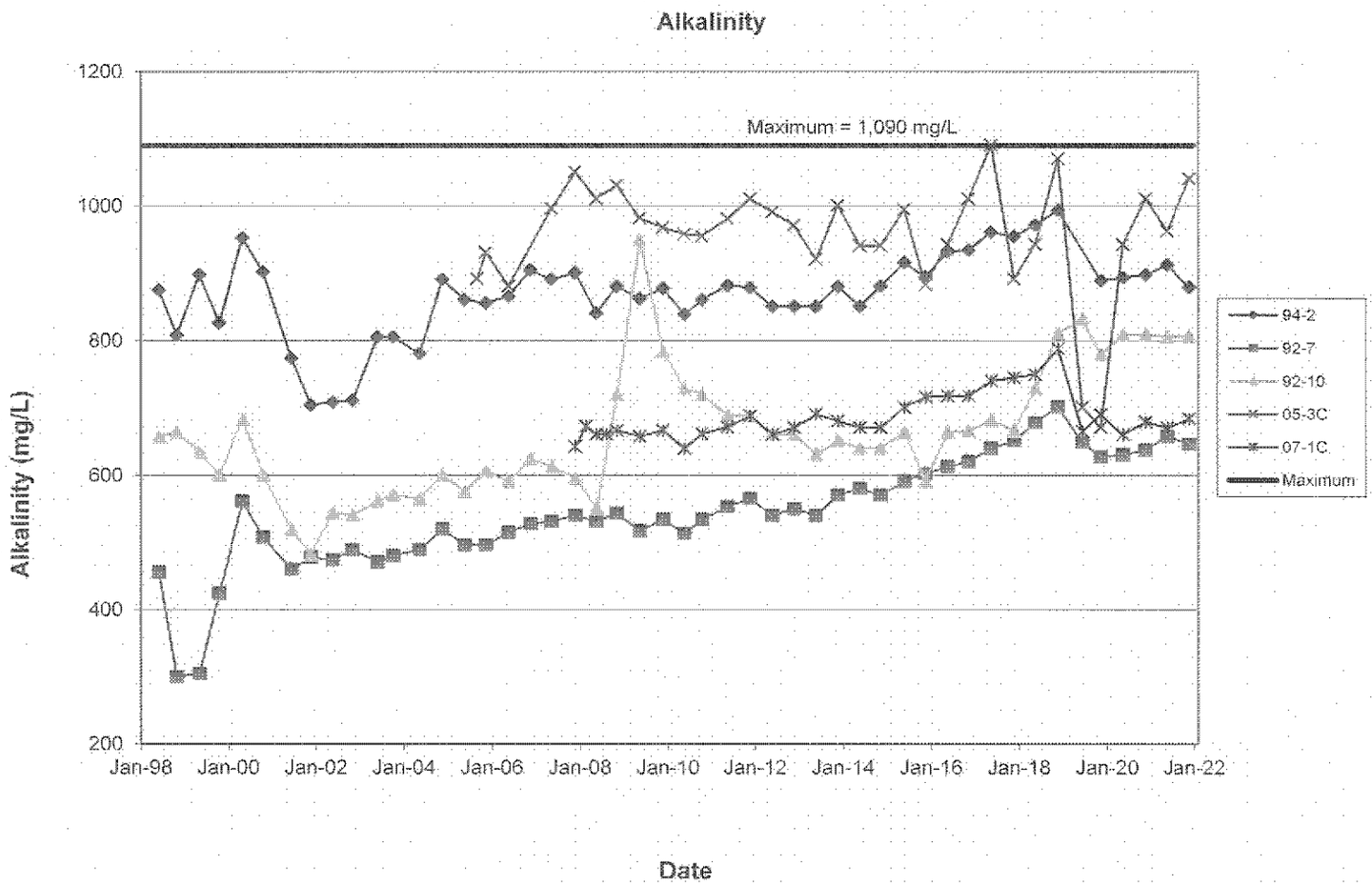

FIGURE FB1

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

WSP GOLDER

002606

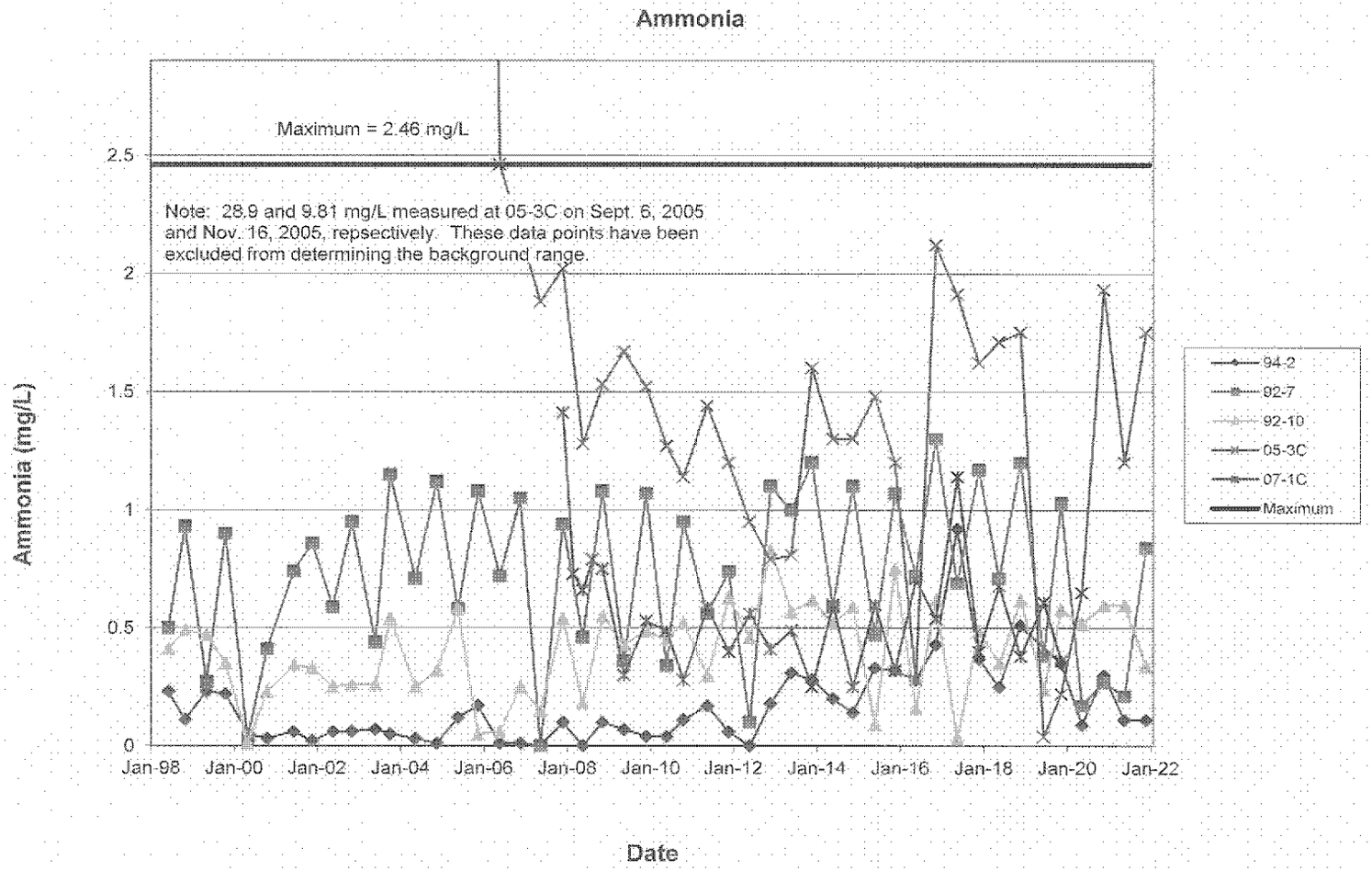

FIGURE FB2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

WSP GOLDER

002607

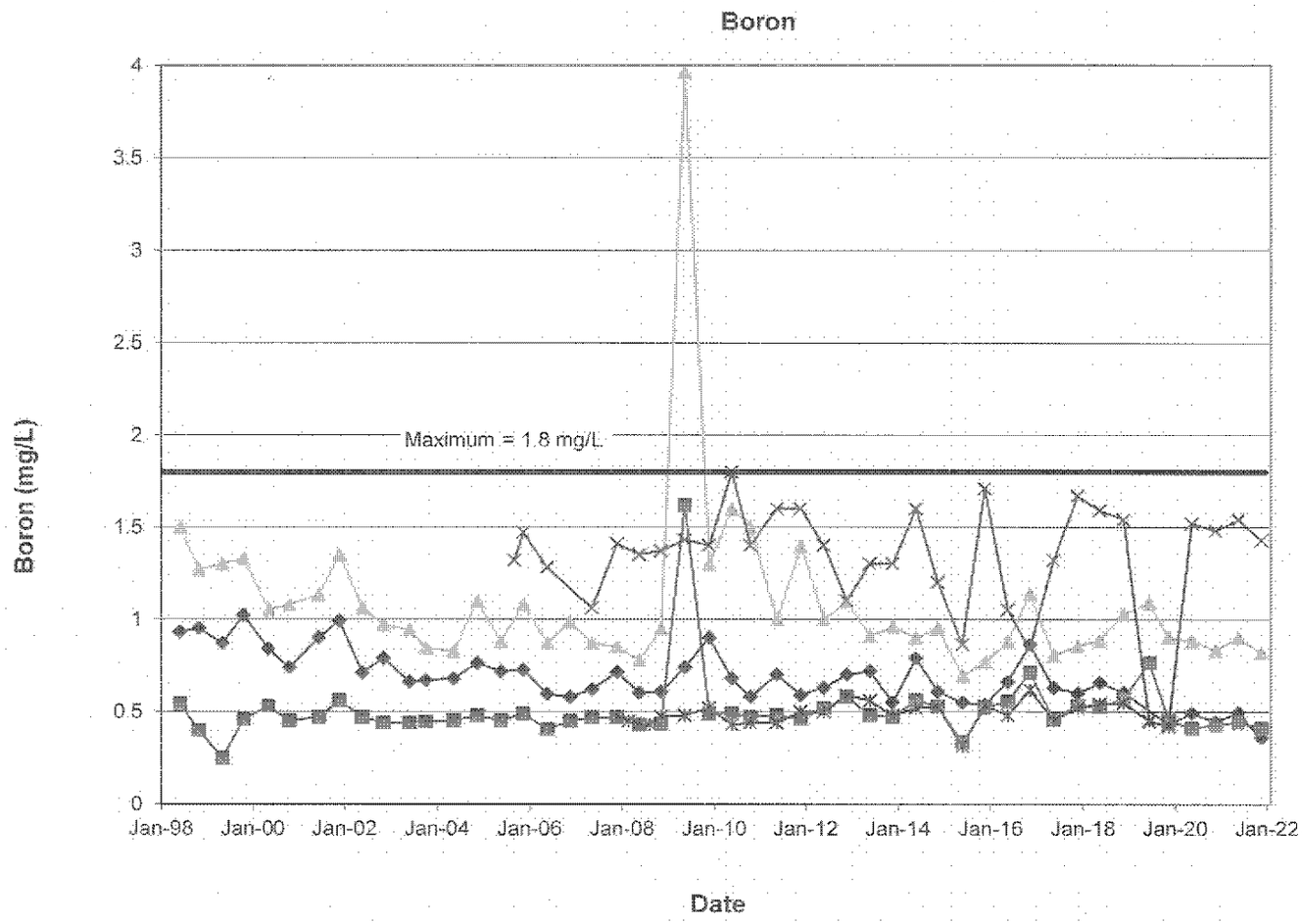

FIGURE FB3

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

WSP GOLDER

002608

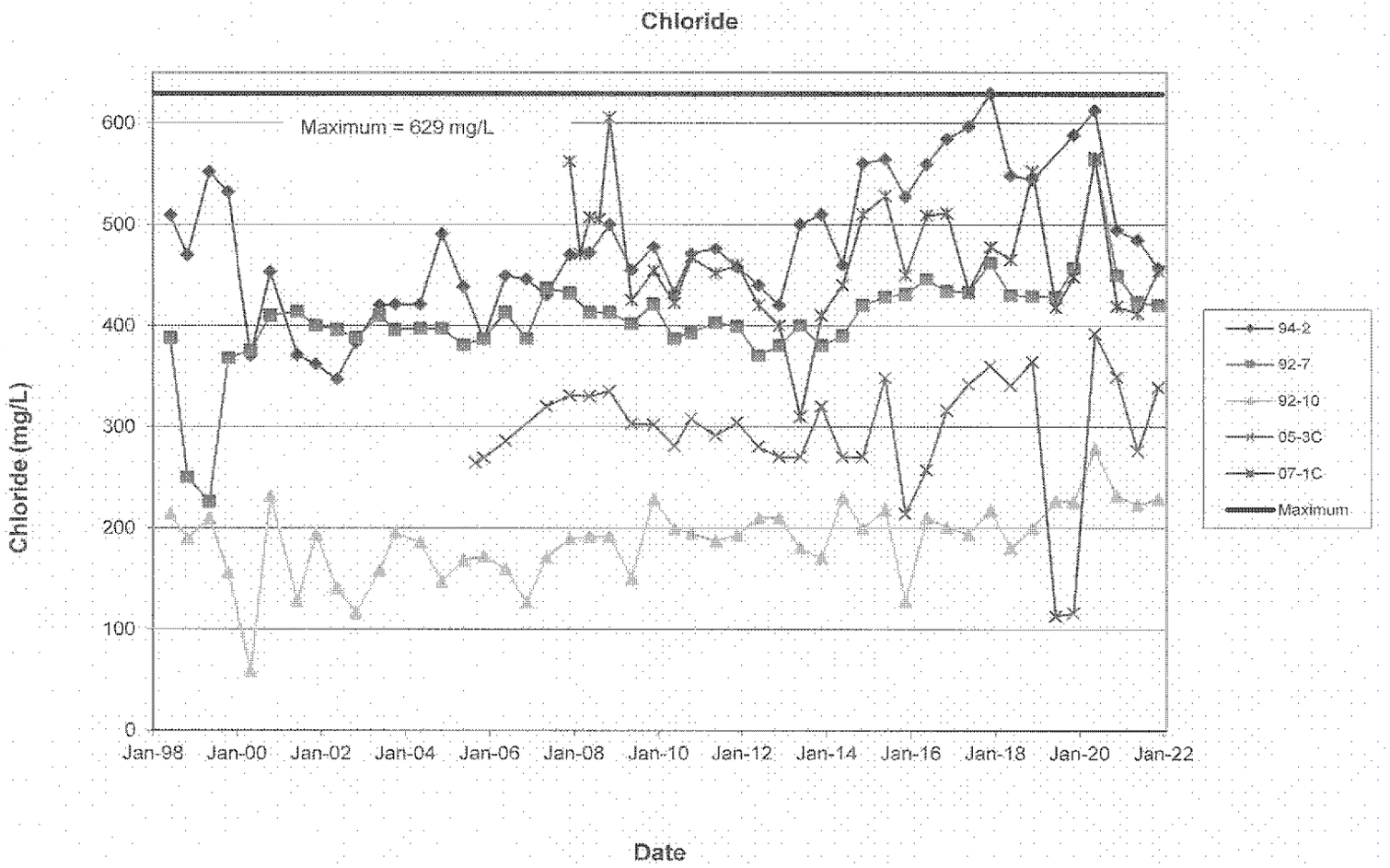

FIGURE FB4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002609

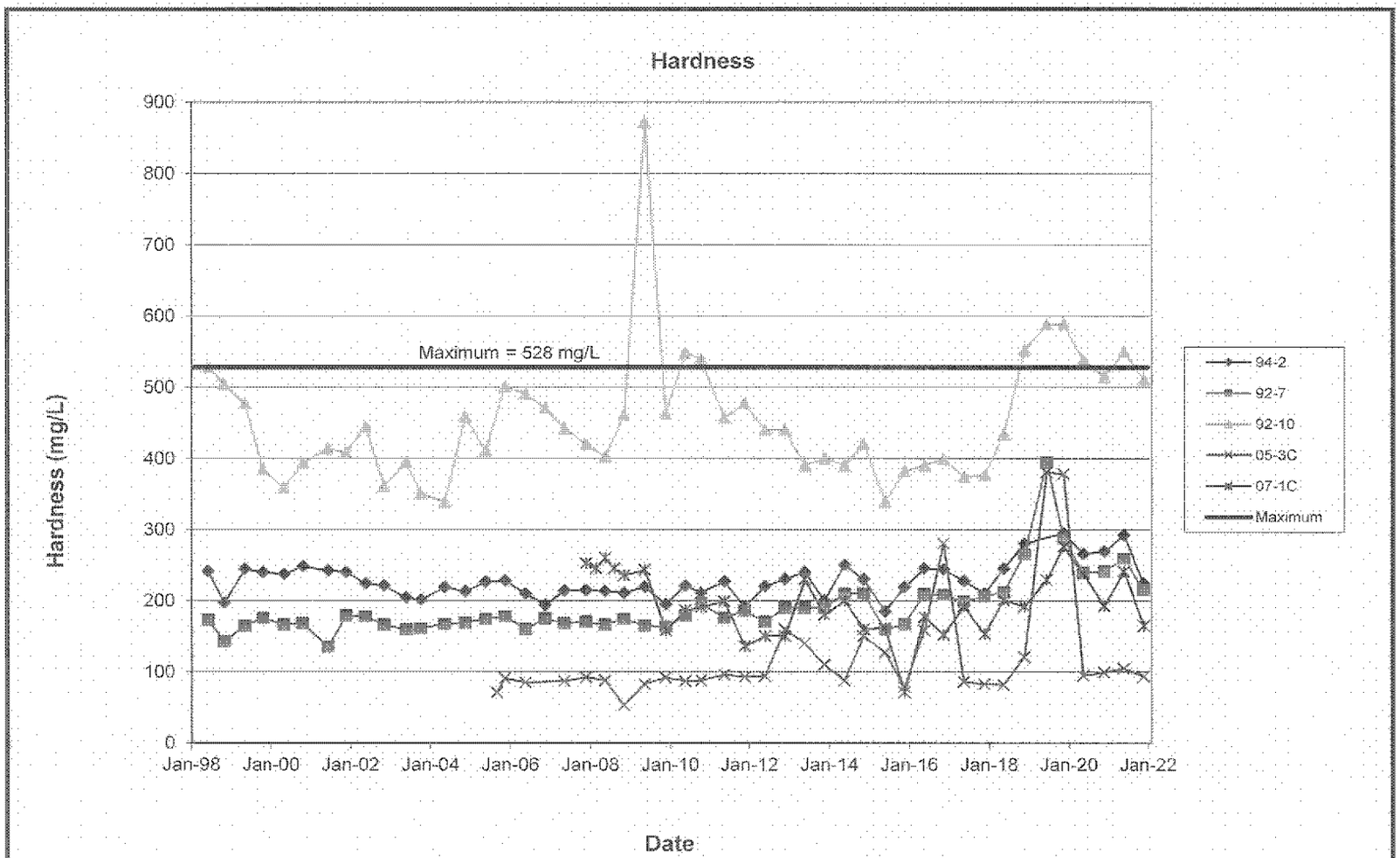

FIGURE FB5

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002610

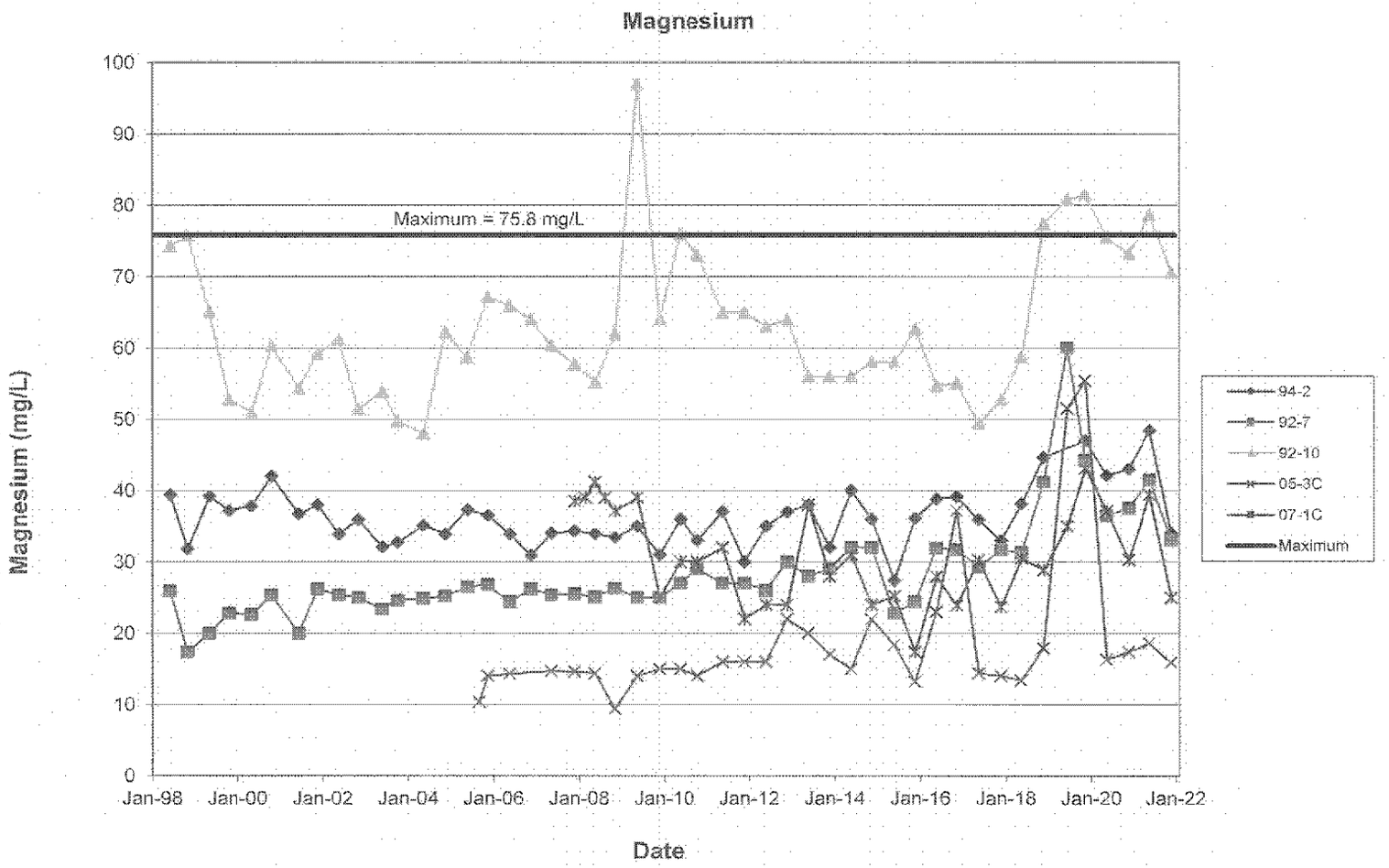

FIGURE FB6

Project No: 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

WSP GOLDER

002611

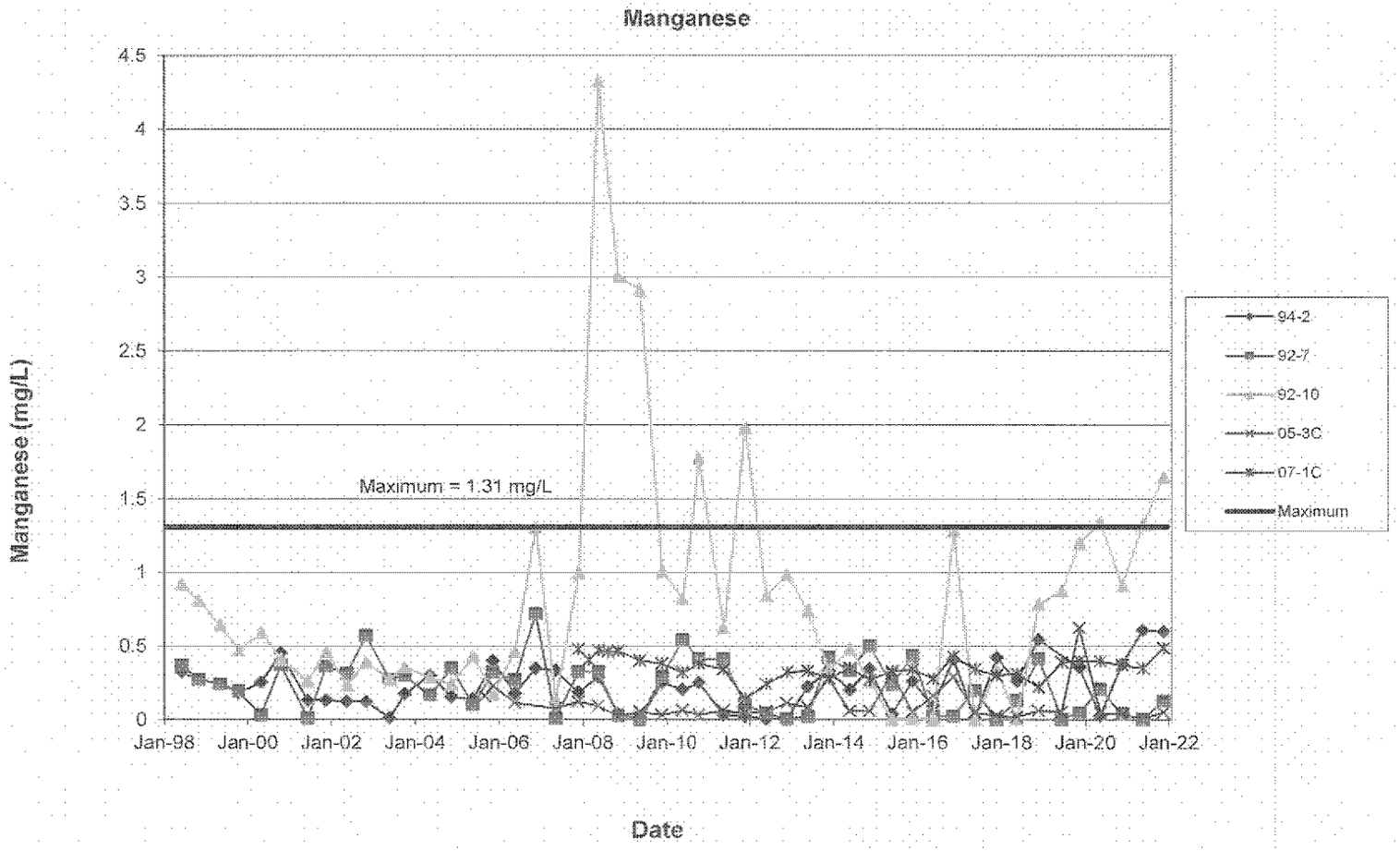

FIGURE FB7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002612

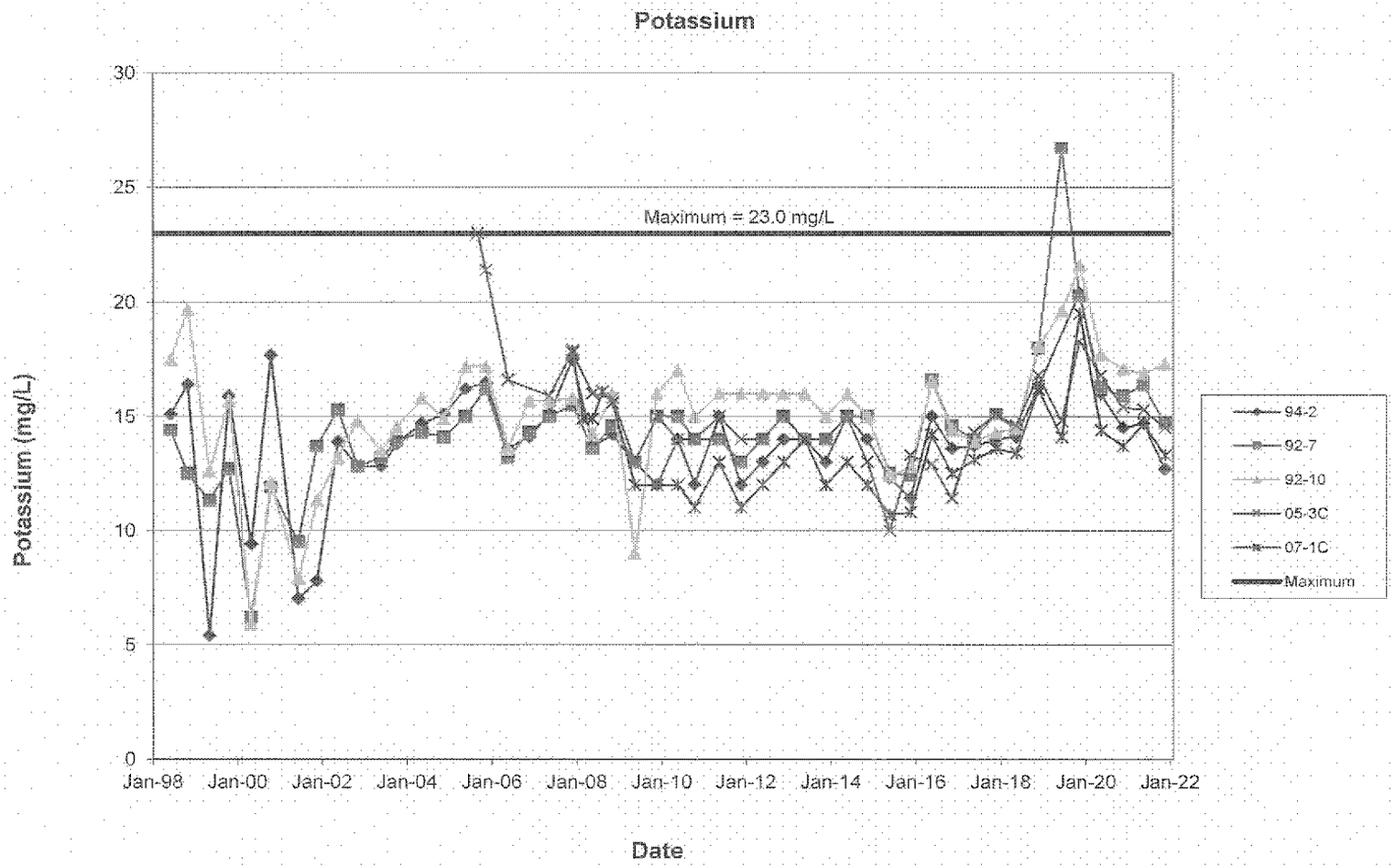

FIGURE FB8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

WSP GOLDER

002613

APPENDIX F-C

Intact Clay Deposit

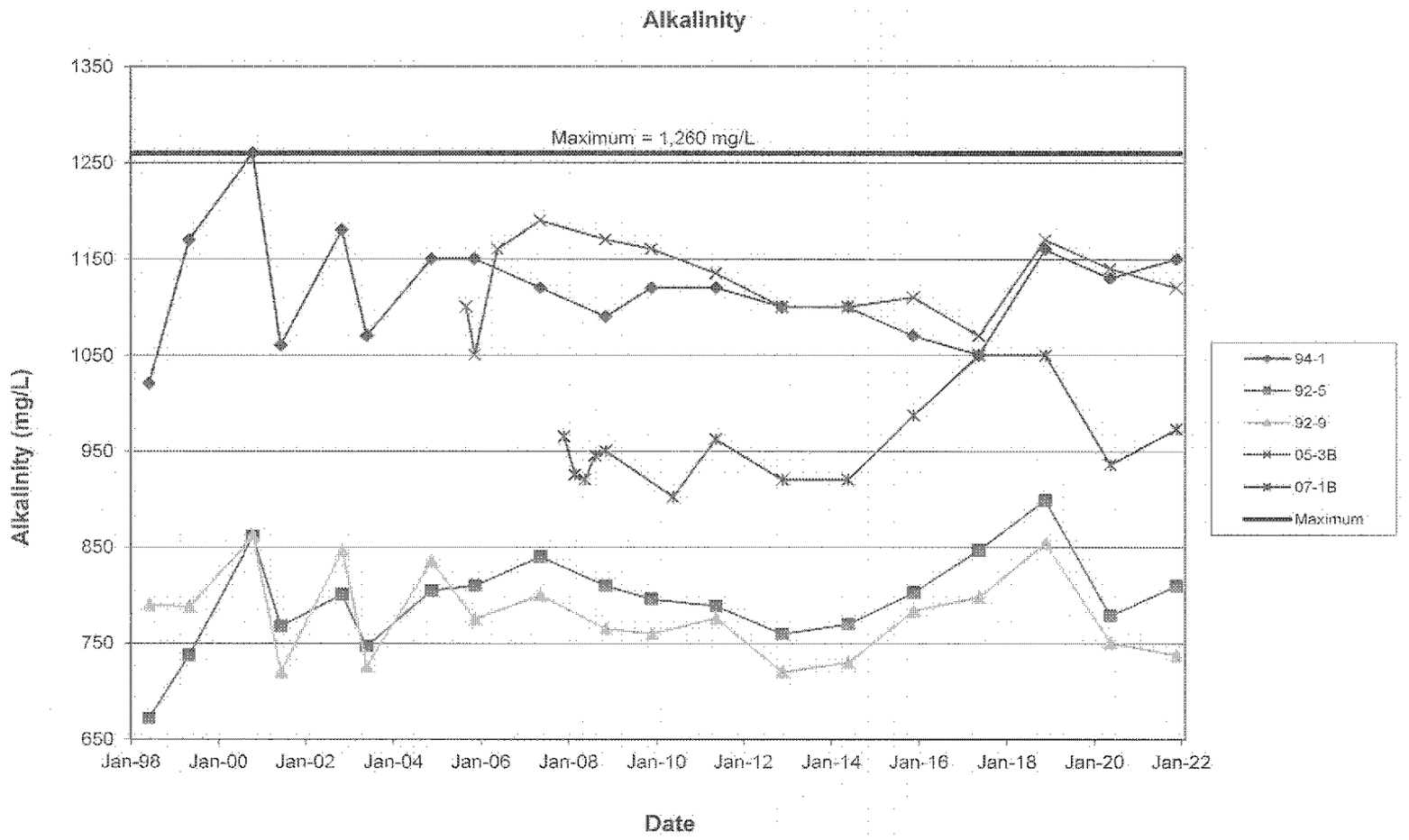

FIGURE FC1

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

WSP GOLDER

002615

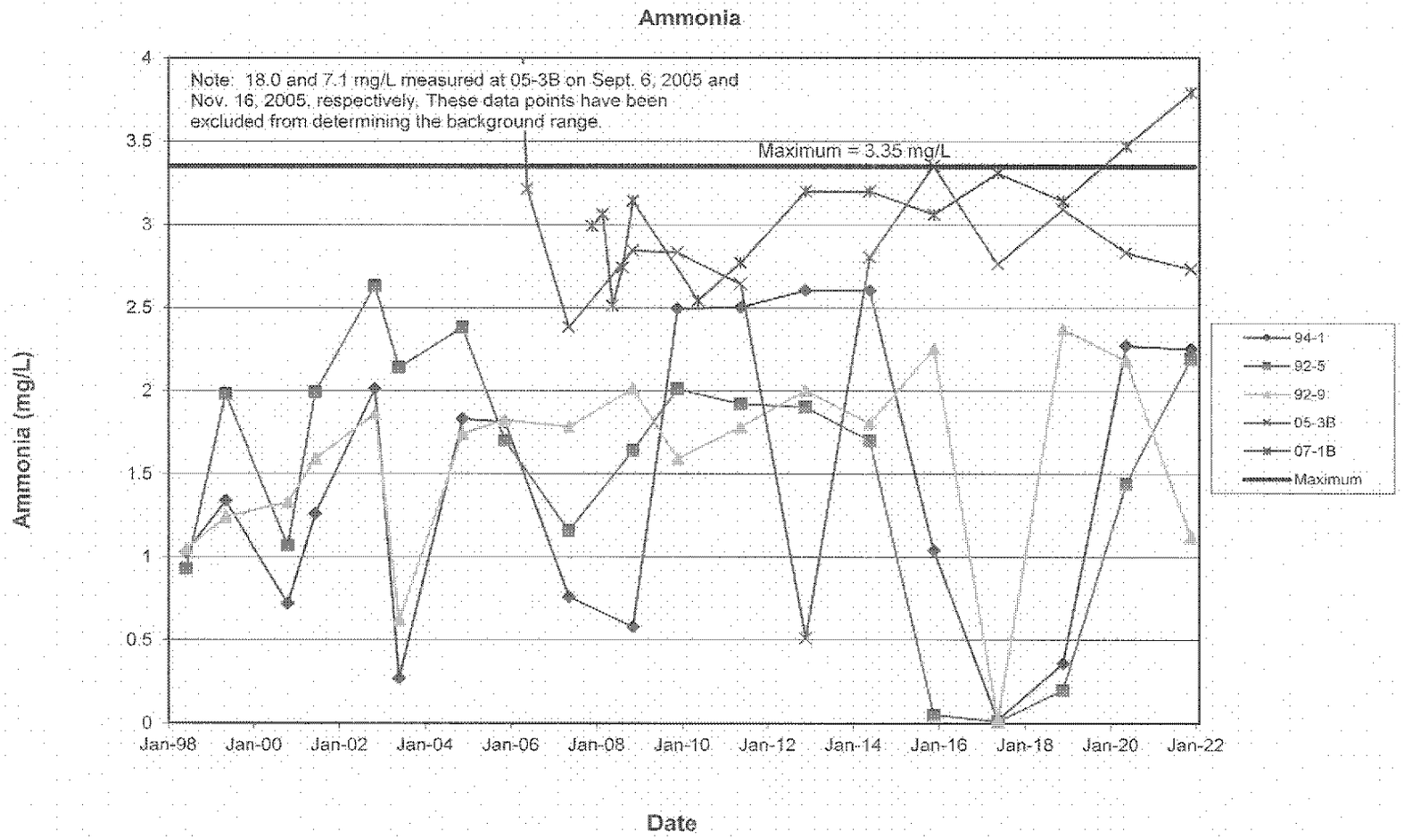

FIGURE FC2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002616

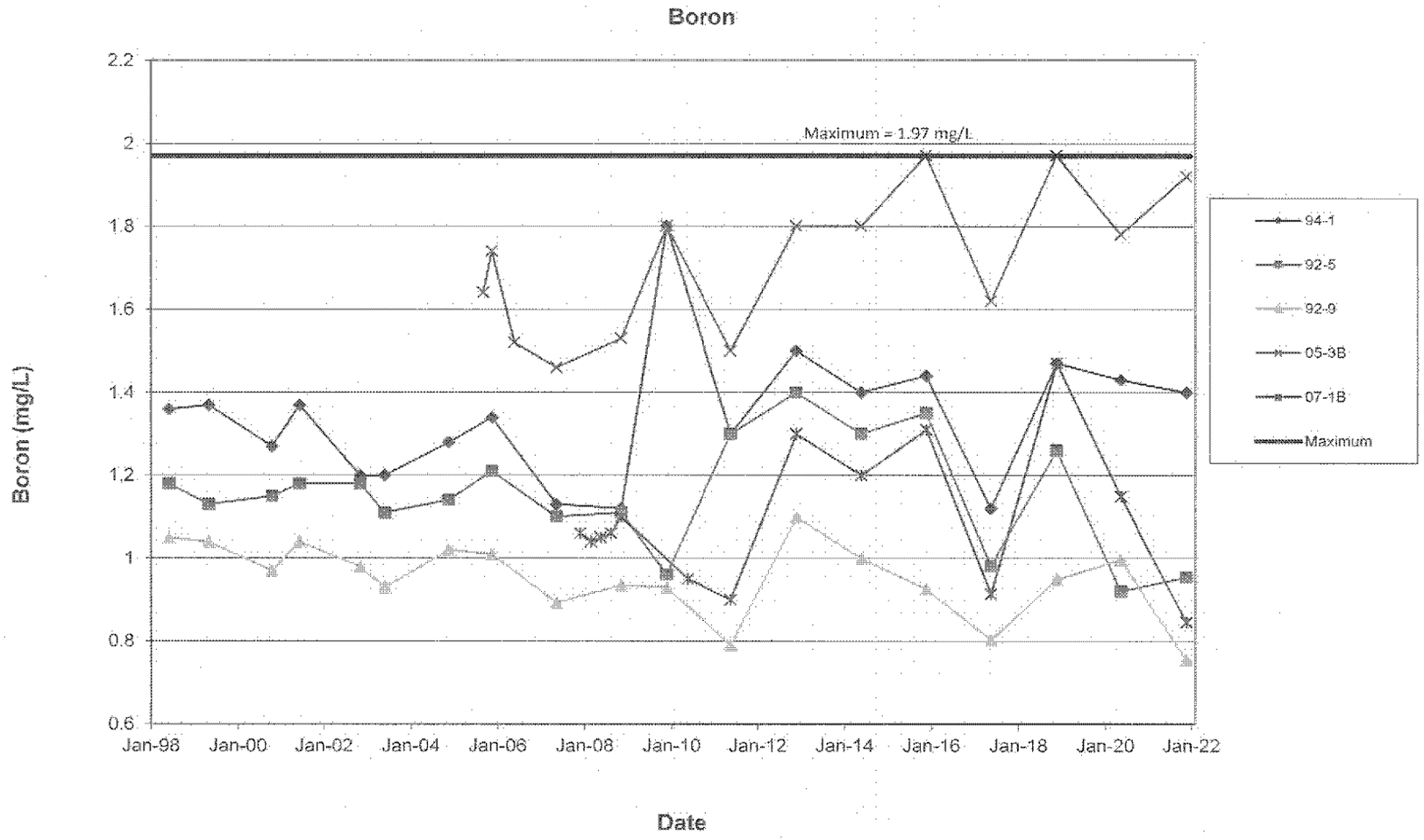

FIGURE FC3

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

WSP GOLDER

002617

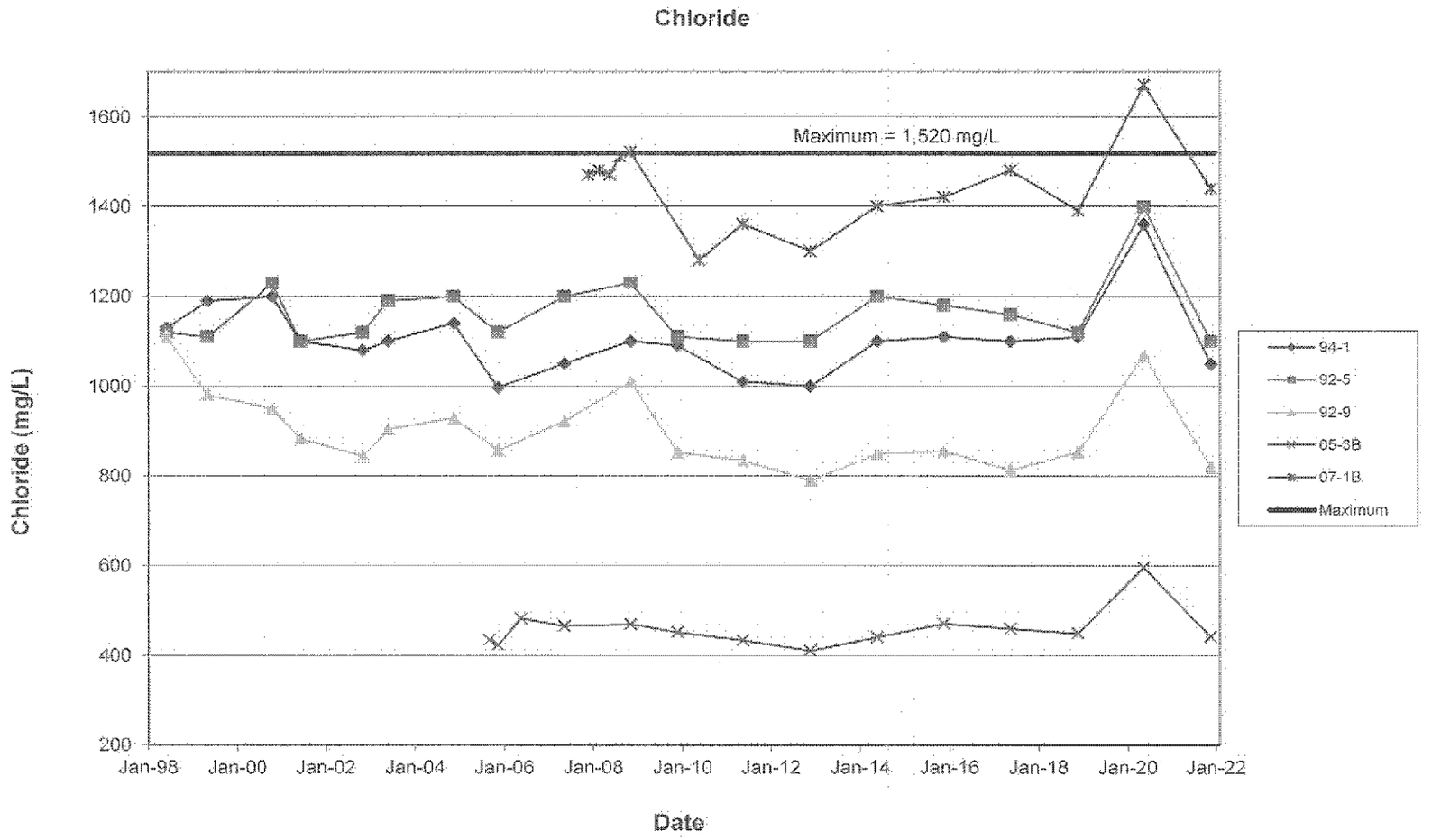

FIGURE FC4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

WSP GOLDER

002618

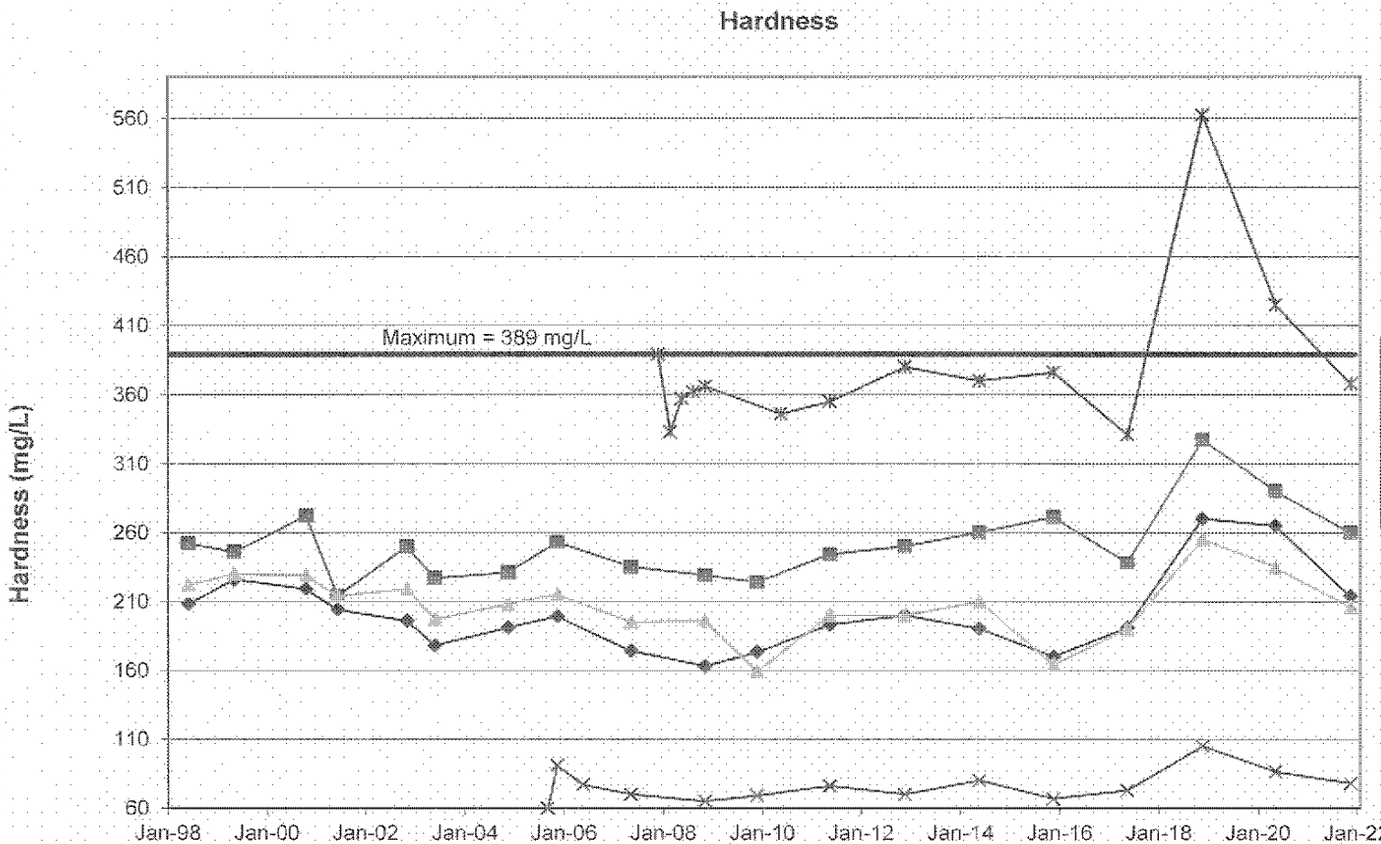

FIGURE FC5

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

INTACT CLAY

GOLDER

002619

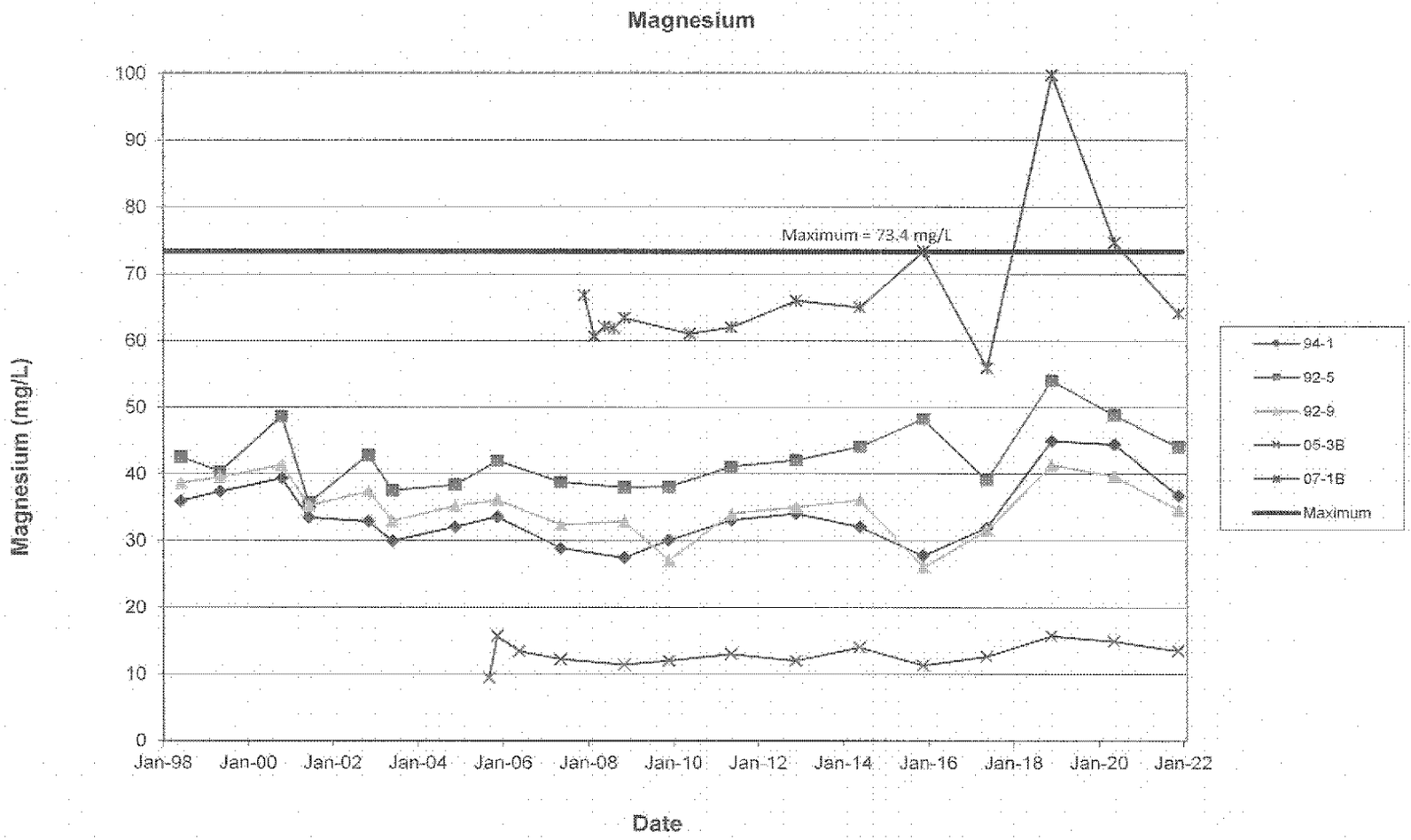

FIGURE FC6

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

WSP GOLDER

002620

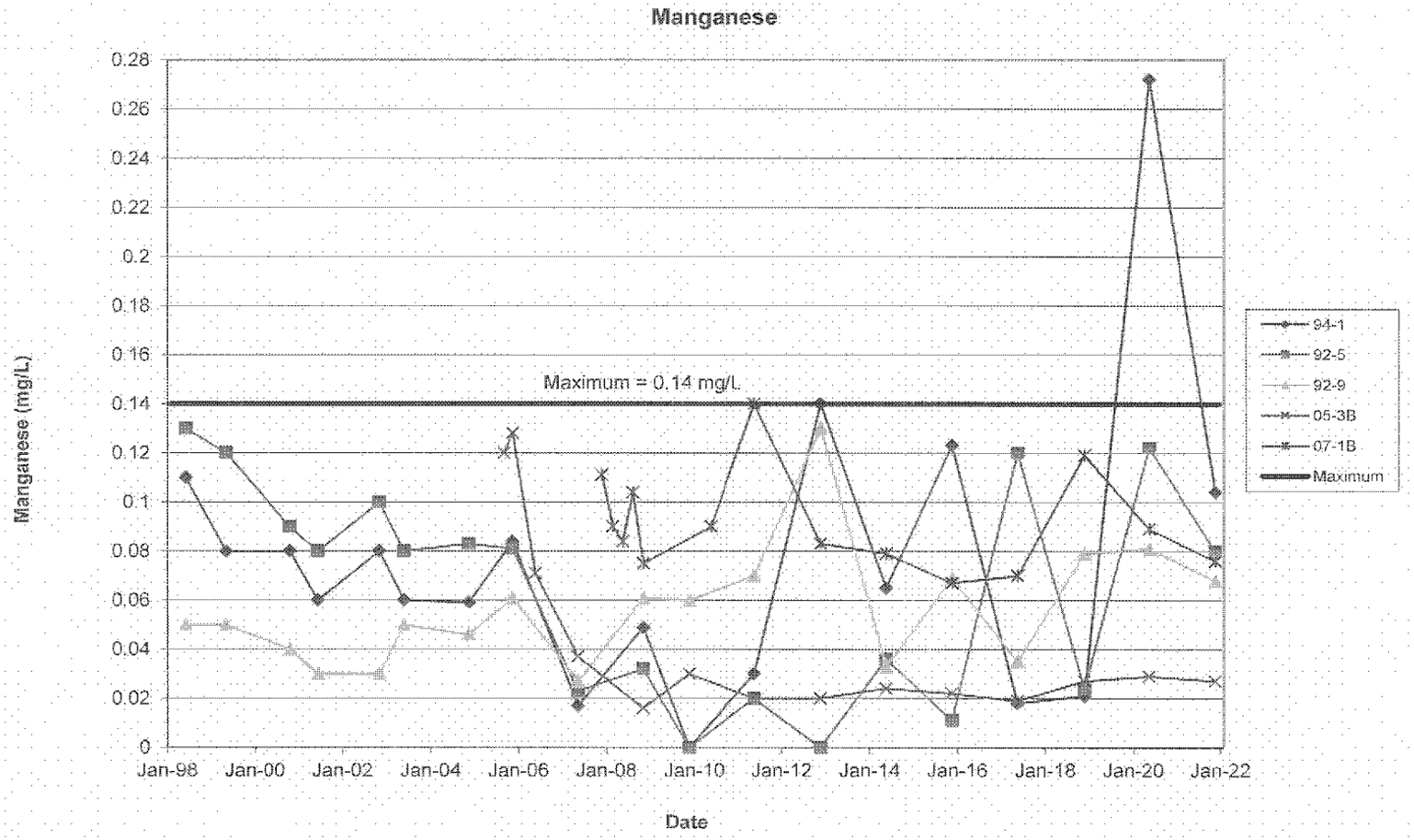

FIGURE FC7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

WSP GOLDER

002621

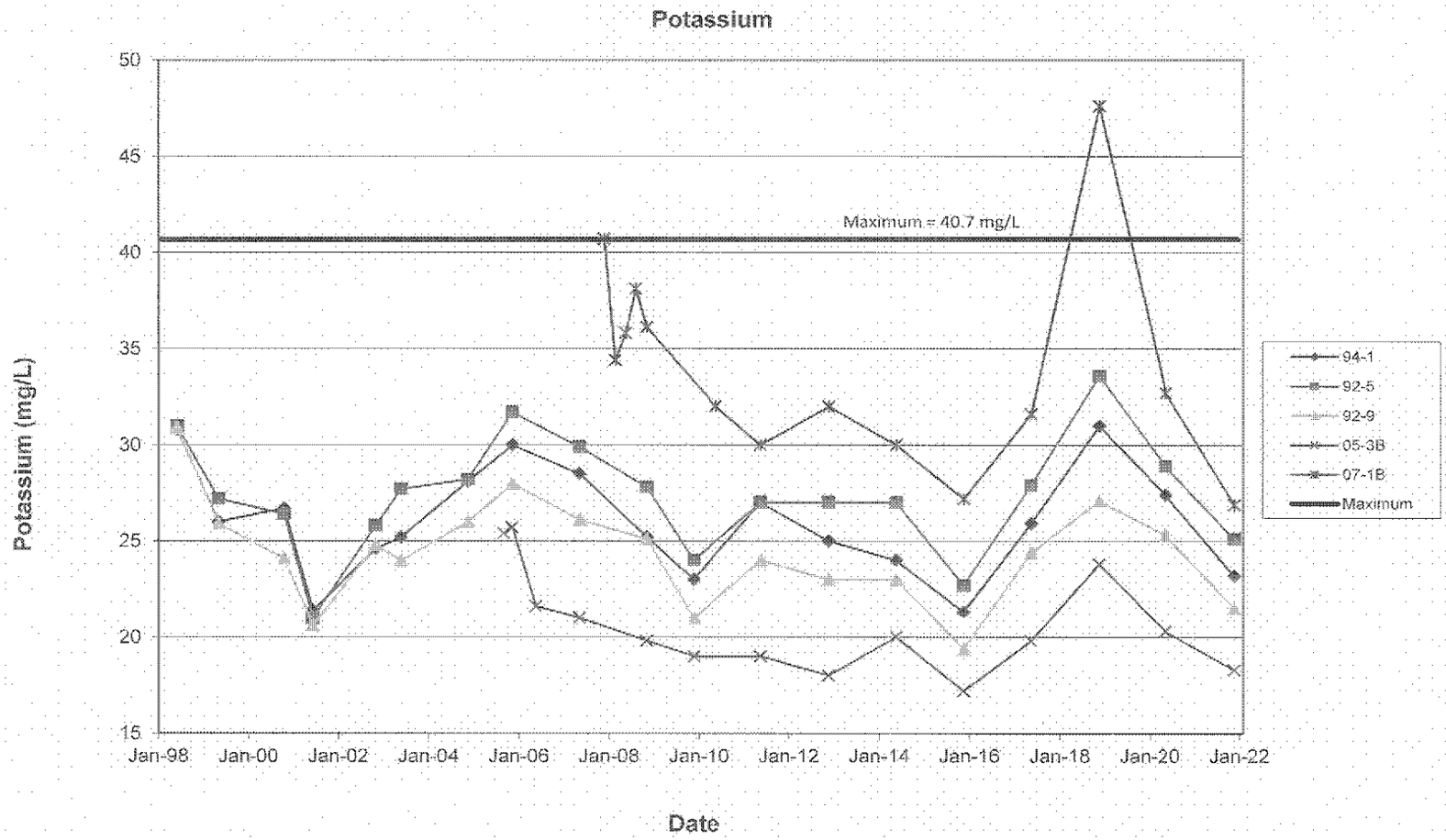

FIGURE FC8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002622

APPENDIX F-D

Glacial Till/Upper Bedrock Zone

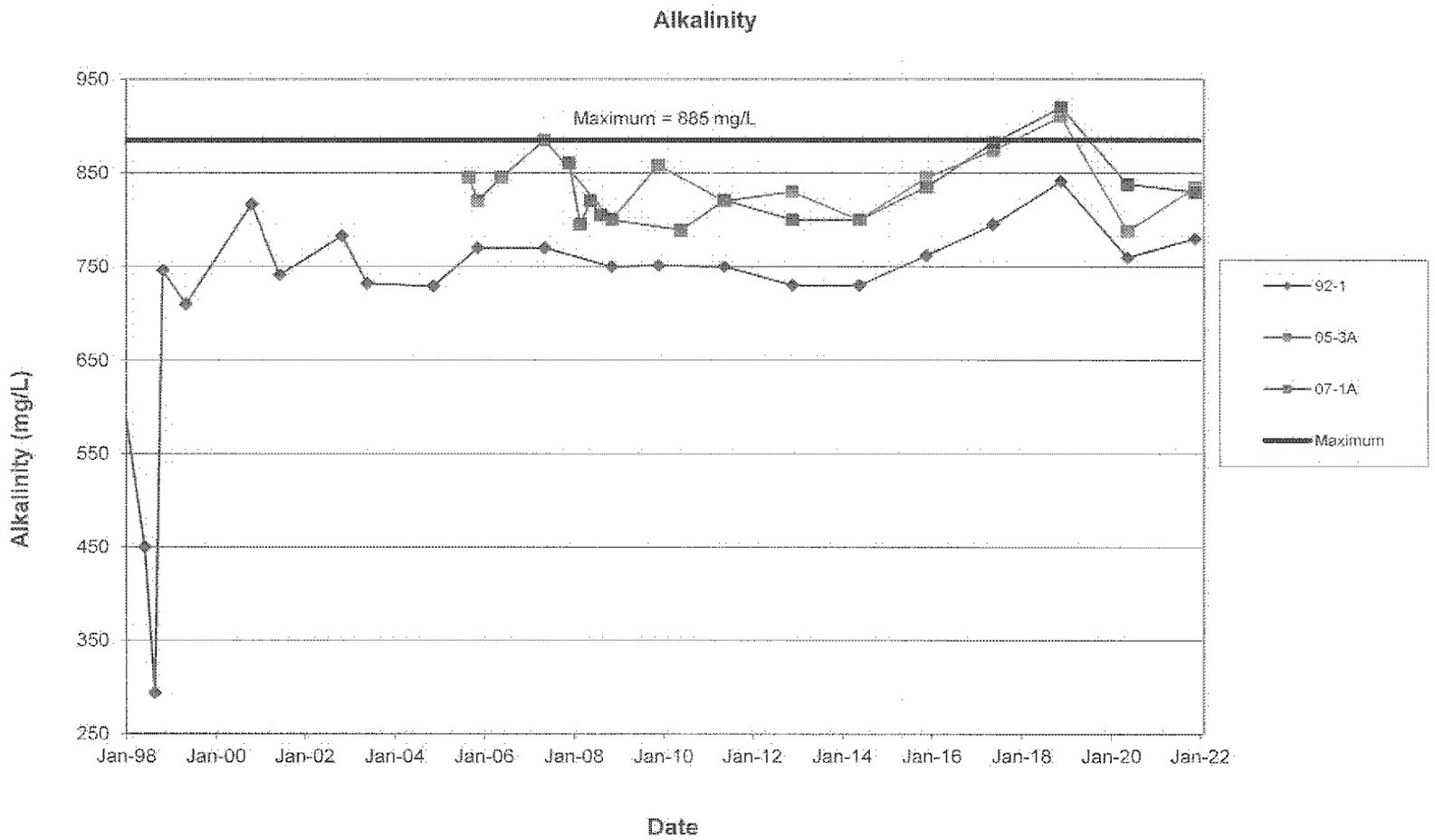

FIGURE FD1

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002624

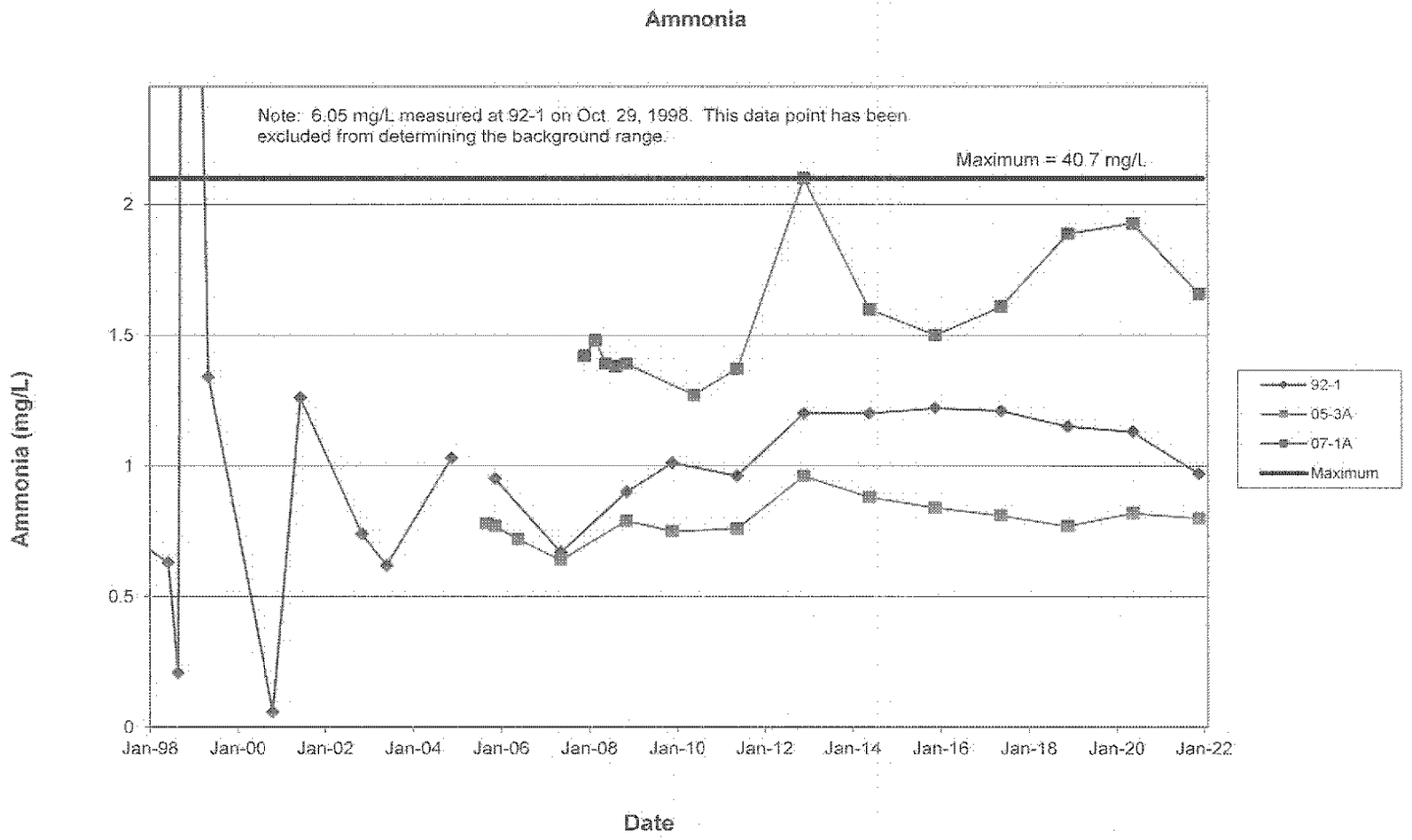

FIGURE FD2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002625

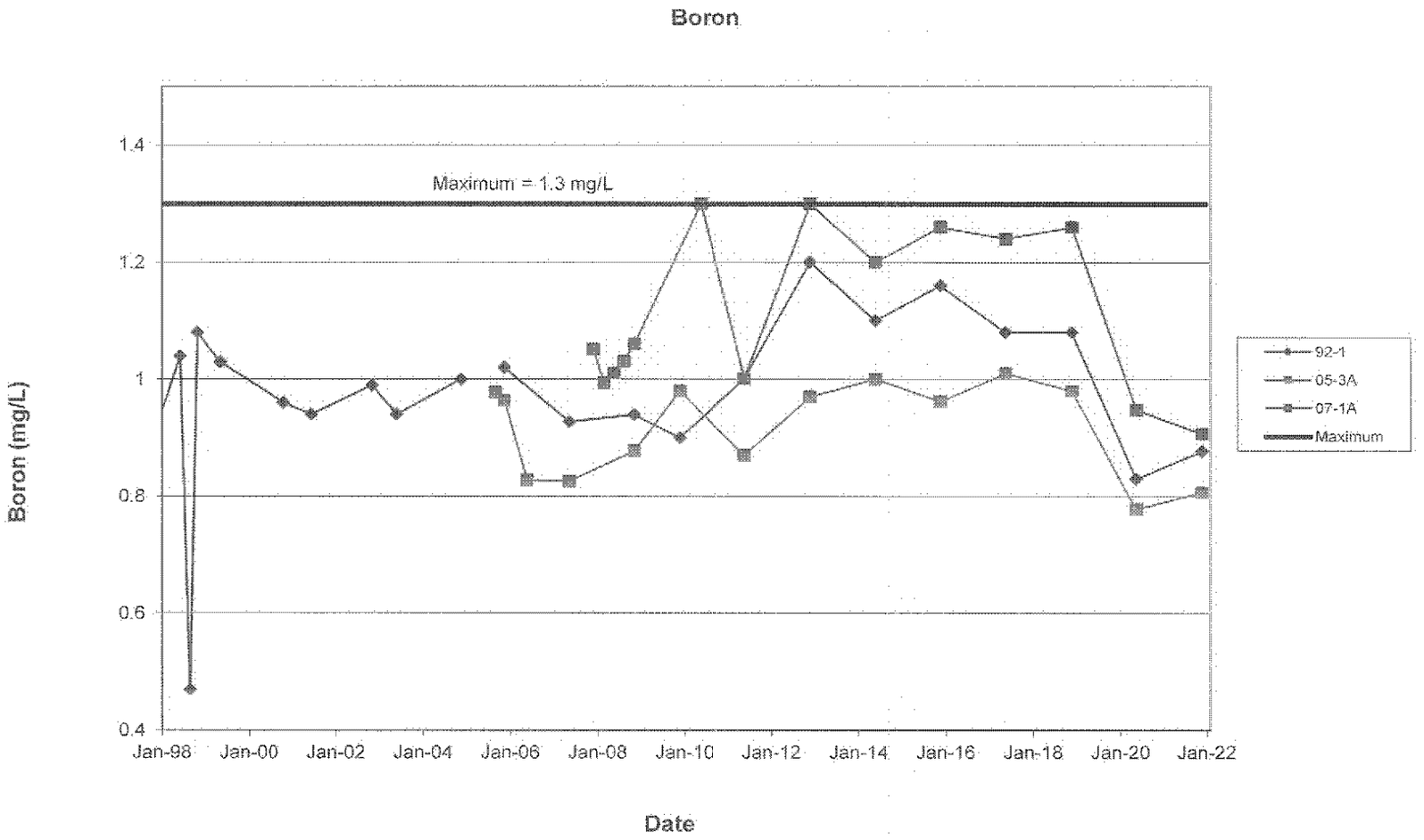

FIGURE FD3

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002626

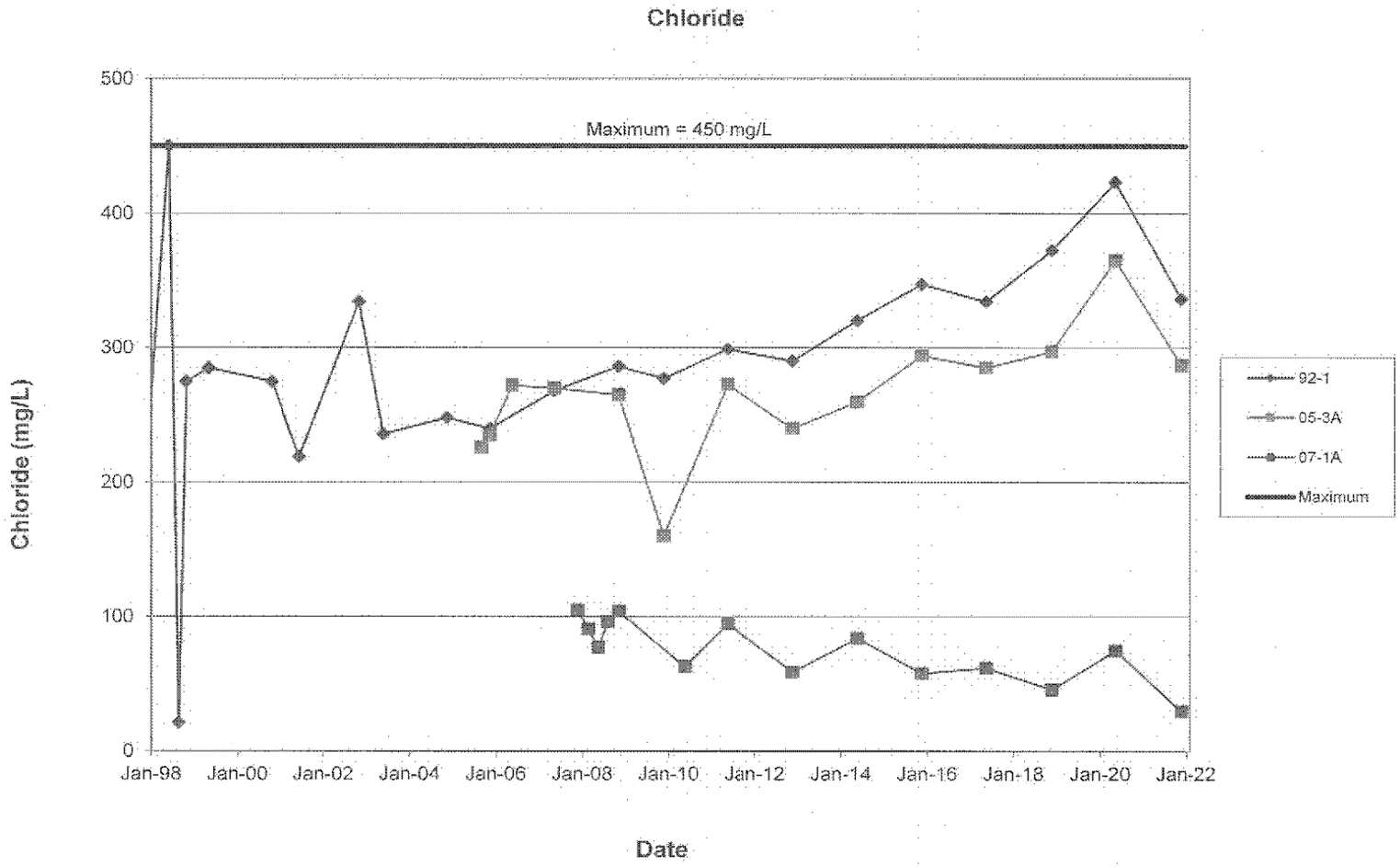

FIGURE FD4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002627

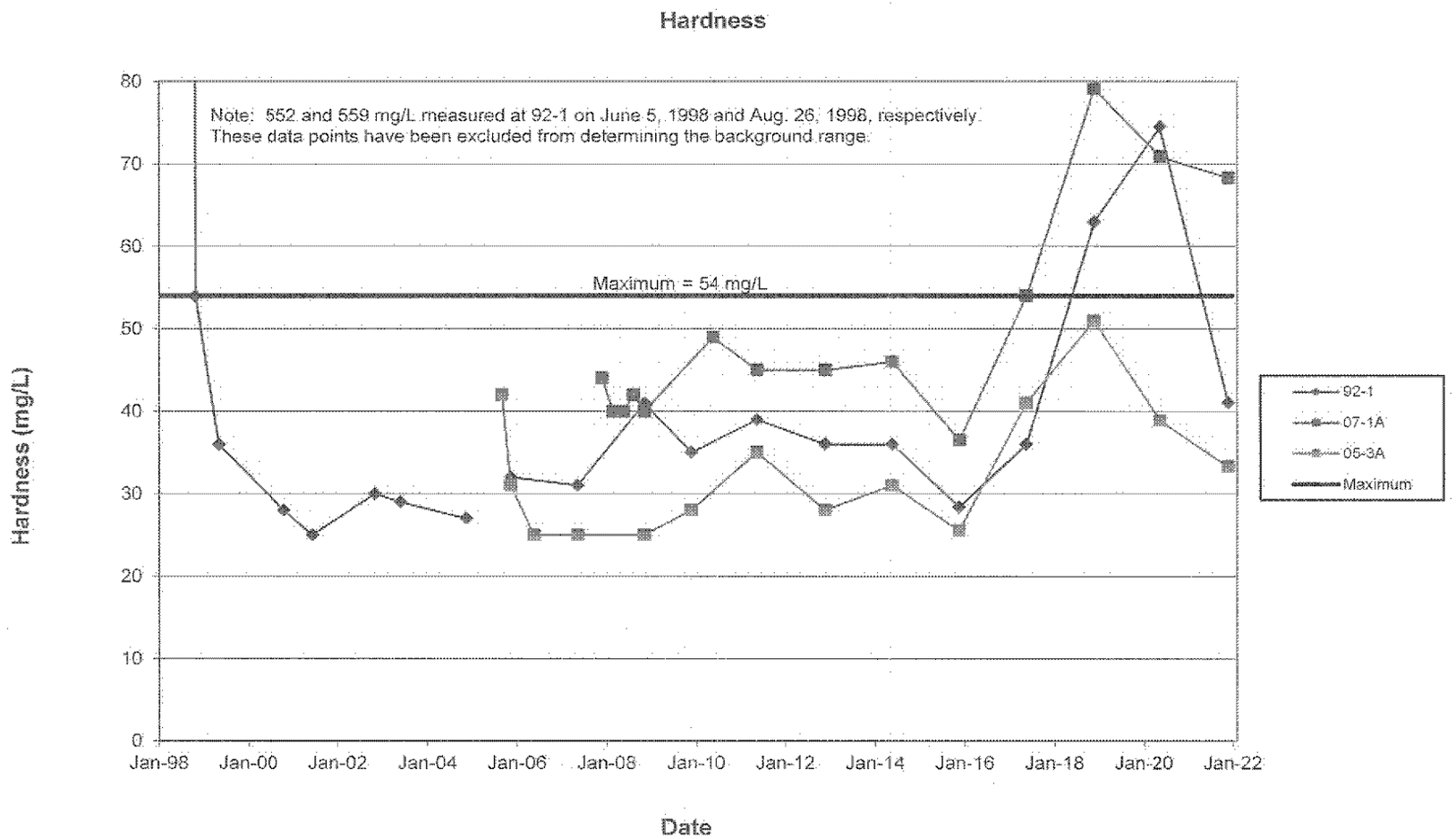

FIGURE FD5

Project No. 21497772

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Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002628

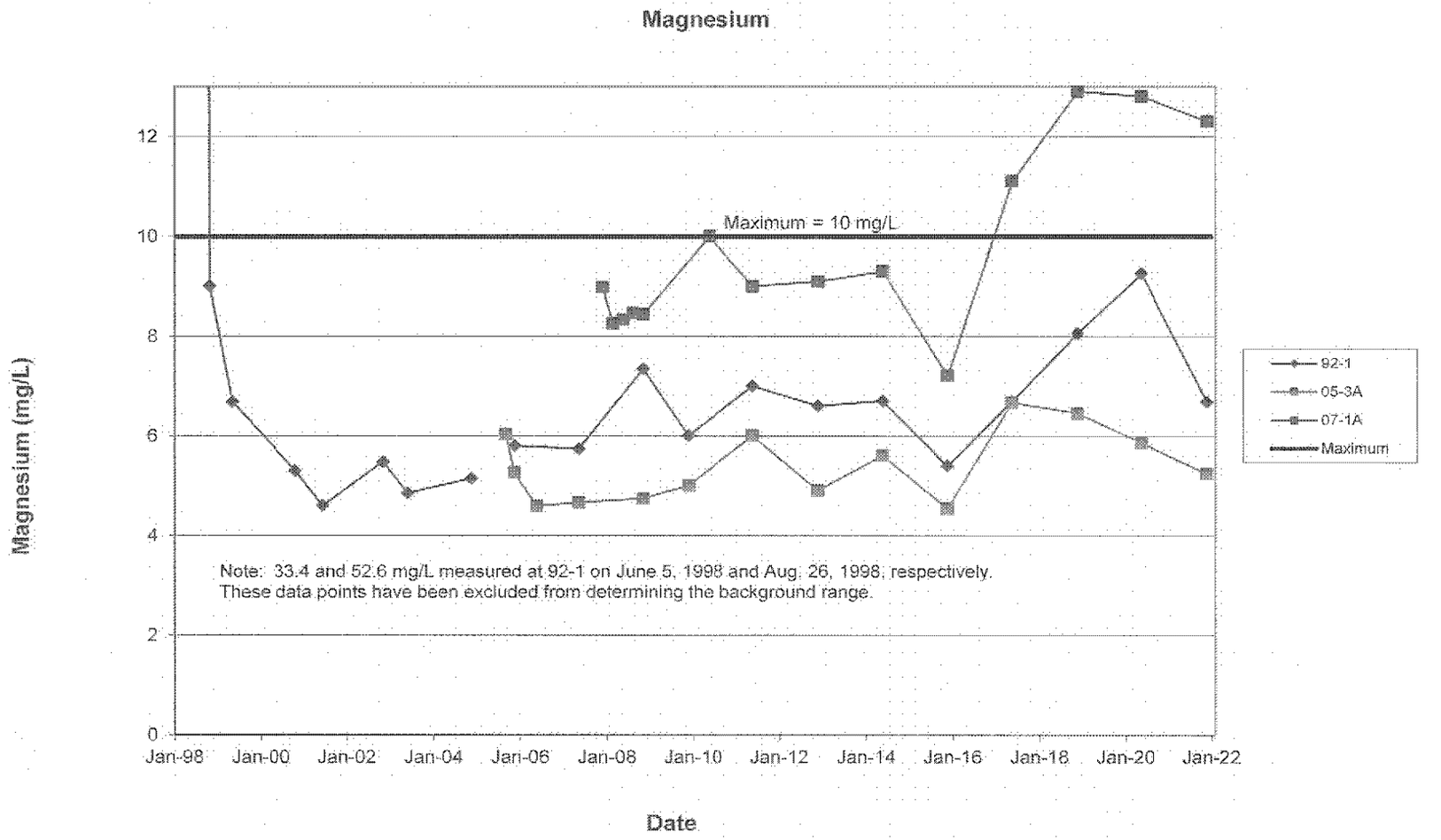

FIGURE FD6

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002629

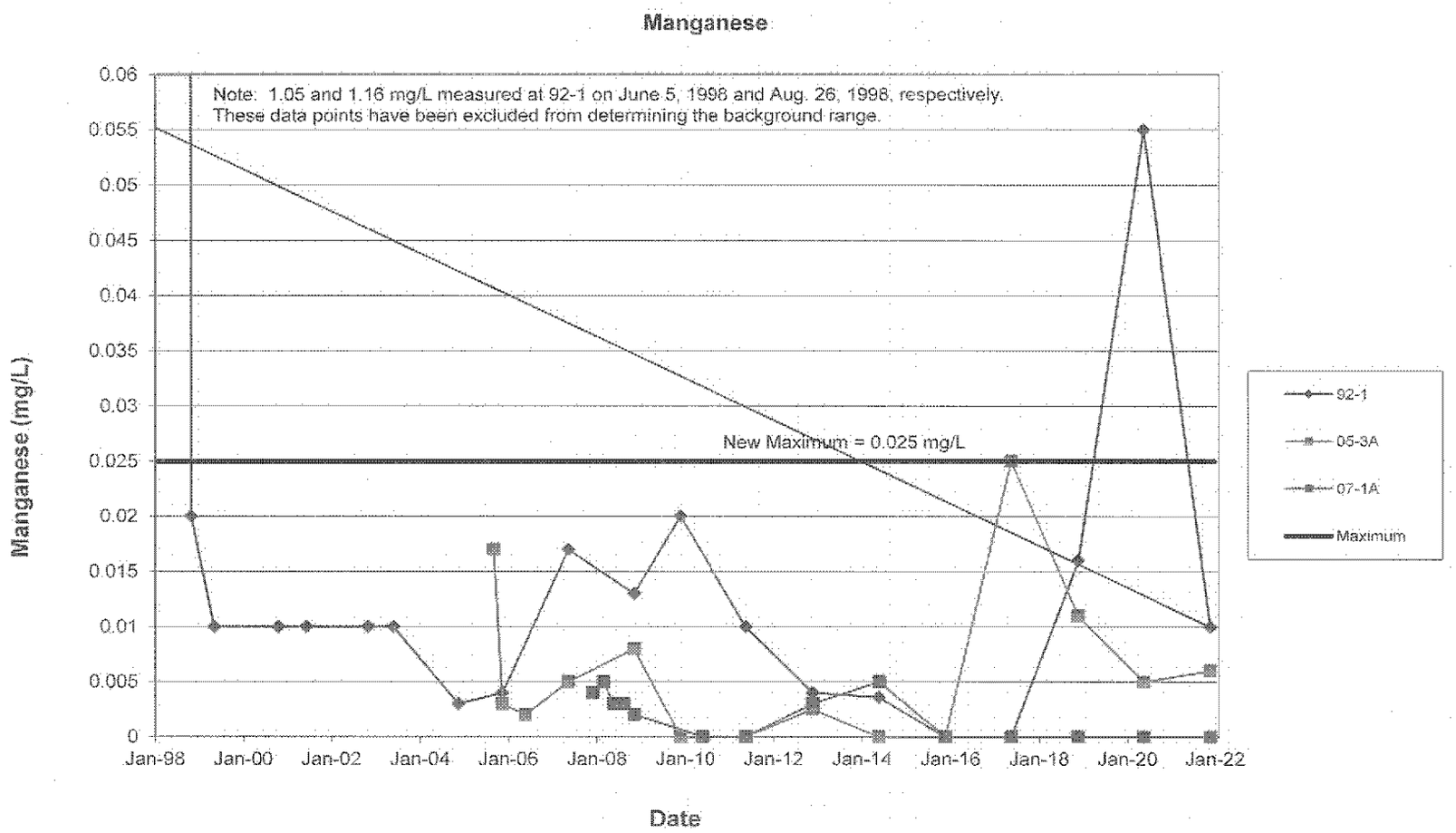

FIGURE FD7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

wsp GOLDER

002630

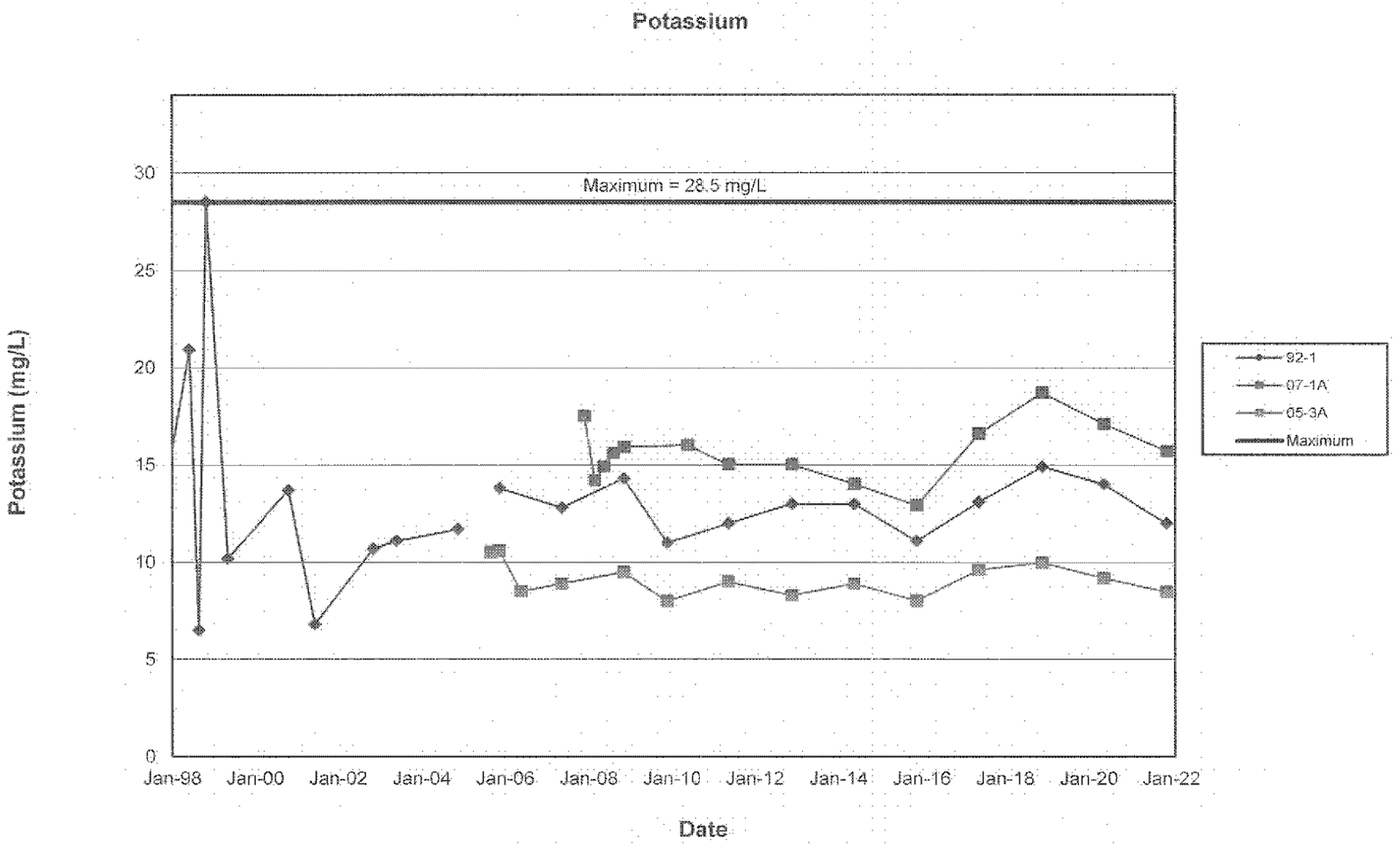

FIGURE FD8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

GOLDER

002631

APPENDIX G

Surface Water Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report

Pages 2634 to / à 2636

are not relevant

sont non pertinentes

Appendix '2'

Golder 2021 Landfill Gas Monitoring Report

WSP GOLDER

REPORT

2021 Landfill Gas Monitoring Report

Waste Connections of Canada
Navan Waste Recycling and Disposal Facility
Ottawa, Ontario

Submitted to:

Waste Connections of Canada
3354 Navan Road
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Submitted by:

Golder Associates Ltd.
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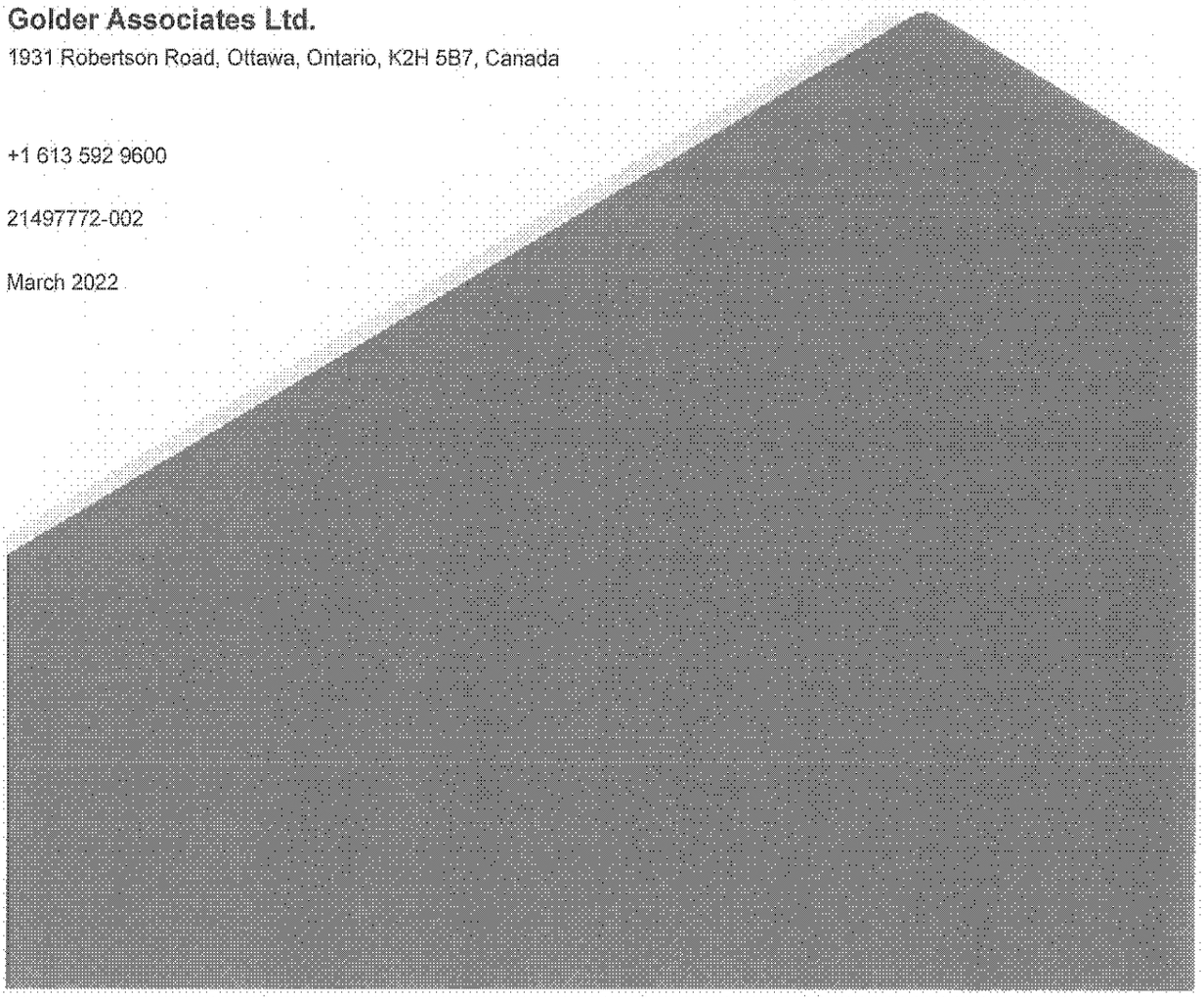
21497772-002

March 2022



Distribution List

10 copies	Waste Connections of Canada
1 e-copy	Golder Associates Ltd.

Executive Summary

This report serves as the landfill gas (LFG) monitoring portion of the 2021 site operations and monitoring report and presents the results of LFG monitoring activities carried out during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility). This report has been prepared to fulfill the reporting requirements outlined in Condition 110 of Environmental Compliance Approval No. A460702 dated April 16, 2009.

The following executive summary highlights key points only; for complete information and findings it is necessary for the reader to examine the complete report.

LFG monitoring was undertaken in May, August and December 2021. At most locations monitored, methane gas was detected at concentrations lower than 1.25% by volume. Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 1.25% by volume at the following locations:

- MH-2 (G18a), MH-3 (G13a), MH-4 (G12a), and MH-5 (G11a) in August 2021
- MH-7 (G5a), MH-9 (G3a), and MH-10 (G2a) in December 2021

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the WCC Navan Facility based on the 2021 monitoring results. Although no monitoring locations are available below surface at the property boundary, it is anticipated that the WCC Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events, with the exception of the following location, which reported a relatively low detection (1 part per million or ppm):

MH-6 (G6a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), all in May 2021.It is noted that an interim LFG odour control system (refer to Section 3.4) was installed in 2011 and commissioned in April 2012. The system was extended in 2016, 2017, 2019, and 2020. The purpose of this system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells.

Construction of the permanent LFG collection and treatment system continued in 2021 and the new flare and extraction plant are expected to be commissioned in 2022.

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APPENDICES

APPENDIX A
2009 Landfill Gas Characterization

1.0 INTRODUCTION

This report serves as the landfill gas (LFG) monitoring portion of the 2021 site operations and monitoring report and presents the results of LFG monitoring activities carried out by Golder Associates Ltd. (Golder) during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility).

The WCC Navan Facility is located at 3354 Navan Road on part of Lots 2, 3, and 4, Concession IV, Ottawa Front, in the City of Ottawa as shown in Figure 1. This site is operated under Environmental Compliance Approval (ECA) No. A460702 (dated April 16, 2009) and ECA (air) No. 6141-59XKF9 (dated May 10, 2002, authorizing the use of a mobile wood grinder to process wood waste), No. 6733-7BYS9A (dated April 16, 2009, authorizing the permanent LFG Collection and Treatment System) and No. 3536-8APNZD (dated November 24, 2010, authorizing the Interim Landfill Gas Odour Control System).

This report has been prepared to fulfill the reporting requirements outlined in Condition 110 of ECA No. A460702.

2.0 CHARACTERISTICS OF LANDFILL GAS AT THE WCC NAVAN FACILITY

The presence of typical LFG is indicated by a reduction in nitrogen (N_2) and oxygen (O_2) and elevated concentrations of carbon dioxide (CO_2), methane (CH_4) and hydrogen sulfide (H_2S) when compared to atmospheric air as described in the table below. The main constituents of typical LFG are CO_2, CH_4 and H_2S. Other parameters such as mercaptans and volatile organic compounds can be present in LFG but at lower concentrations. LFG at the WCC Navan Facility was characterized in 1994, in 2002 and in 2009. The average composition of WCC LFG at the monitored locations is provided in the table below. It is noted that the LFG composition presented herein is not representative of the composition in the LFG collection and flaring system. The raw data from the 1994 and 2002 characterizations is provided in Table 1 and the data from the 2009 characterization is provided in Appendix A.

Select Gases	Sea-Level Composition of Air[1] (15°C and 101 kPa) (% by Volume)	Average WCC LFG Composition November 1994 (% by Volume)	Average WCC LFG Composition June 2002 (% by Volume)	Average WCC LFG Composition 2009* (% by Volume)
Nitrogen, N_2	78.1	77.5	78.4	NM
Oxygen, O_2	20.9	19	20.6	14.6
Carbon Dioxide, CO_2	0.03	2.7	0.5	12.6
Methane, CH_4	0.0002	1.3	0.2	14.1
Trace Elements	<0.01	NM	NM	NM

Notes:
[1] Source: CRC Handbook of Chemistry and Physics by David R. Lide, Editor-in-Chief, 1997 Edition.
* The averages were calculated using data from all Maintenance Holes and cleanouts (both measured with tubing) over the six monitoring sessions.
NM – not monitored

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3.0 ENGINEERING SYSTEMS

From a hydrogeological perspective, the WCC Navan Facility is favourably situated on a thick deposit of low permeability, Champlain Sea clay (Leda Clay). The site is characterized by a shallow groundwater table. This is overlain by a thin sand cover, through which gas migration can occur. The west and south perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends to the water table. This drainage system, combined with the natural subsoil conditions, a perimeter buffer area and constructed low permeability barrier systems are considered to have significantly reduced the potential for off-site migration of LFG. The engineering systems in place at the WCC Navan Facility to safeguard against off-site migration of methane gas are discussed below.

3.1 Buffer Area and Natural Barrier System

The WCC Navan Facility is designed with a buffer area and natural barriers. The site has a favourable hydrogeological setting whereby the site is underlain and surrounded by a thick clay deposit of low permeability. The depth below grade to the water table at the perimeter of the site is shallow. The depth of the landfill between the ground surface and the water table is less than 2.5 metres. The Ministry of the Environment, Conservation and Parks (MECP) *Guideline for Assessing Methane Hazards from Landfill Sites* (Ministry of Environment, 1987) considers that methane gas migration of any significance may extend for a distance of ten times the depth of the landfill between the ground surface and the water table. Based on site conditions, this 10:1 general rule would suggest that methane migration could extend for a distance of 25 metres. The north, west, south and east sides of the landfill footprint are surrounded by buffer zones of 30 to 70 metres, 100 metres, 10 metres and 140 metres, respectively. Note that on the south side of the landfill a 10-metre buffer zone exists between the south limits of the waste mound and the VIA Rail right-of-way (ROW) and an additional buffer strip with a width of 100 metres exists to the south of the VIA Rail ROW. These buffers would therefore provide adequate natural venting. The natural barriers and the provision of adequate buffer area present at the WCC Navan Facility are the preferred method of dealing with potential LFG migration.

3.2 Constructed Barrier System

In addition to natural barriers and buffer area, WCC has constructed low permeability clay cut-off walls, clay berms and intervening drainage trenches at the perimeter of the waste footprint. At the edge of the fill area, native sand and other pervious materials have been removed and replaced with less permeable compacted clay. These clay barriers, designed to minimize and contain the flow of leachate, also act as a barrier against the lateral migration of LFG. Presently, the constructed clay barriers exist along the northeast, northwest, west, southwest and southeast perimeters of the fill area. As development of the landfill progresses, clay barriers will be constructed along the east perimeters. In 2020, WCC continued to construct the east buffer adjacent to the waste limit and WCC constructed the north clay buffer wall. An intervening trench or excavated drainage ditch with its base at an elevation lower than the base of the waste pile and/or water table is also present at the perimeter of the waste footprint and will intercept and force any methane to the atmosphere. Construction of the leachate drainage layer on the north and northeast slope in Phase 6 was completed in 2020 (refer to Section 3.3) and landfilling operations were generally located in the northeast corner of the approved waste footprint in 2021.

3.3 Passive Ventilation System

The leachate collection system constructed along the west, south and east limits of the existing waste area, also serves as a passive ventilation system. A passive ventilation system is a system that prevents the subsurface migration of LFGs beyond the landfill property by altering the path of flow without the use of mechanical components.

It can be used as a general barrier to gas movement or as a protective measure for structures and/or vegetation. Maintenance Holes (MHs), installed at intervals of approximately 100 metres are effective in venting LFG as indicated by the results of the field monitoring (as discussed in Sections 4.4 and 5.0).

3.4 Interim Landfill Gas Odour Control System

As part of their commitment to control potential odorous emissions from the site, WCC has installed an interim LFG odour control system which will operate until the full-scale LFG collection system is installed at the site in the near future.

The interim LFG odour control system, which has been constructed within the existing landfill footprint, includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells, as well as the installation of lateral and header piping, condensate management facilities, an outdoor skid-mounted abstraction plant, and a candlestick flare. During construction, some 15 leachate collection system cleanouts were excavated and the perforated pipe replaced with solid pipe and air tight connections. Tees were installed in the header pipe to allow for expansion of the interim odour control system, if required.

The interim LFG odour control system was installed in 2011 and has been operating since April 2012. Extensions to the LFG odour control system were installed in 2016, 2017, 2019 and 2020. The additional vertical wells installed in 2017 and 2019 are intended to be part of the future permanent LFG collection system. In 2020, one horizontal well was added at the north-west corner of Phase 1.

To date, these systems have performed satisfactorily and have assisted in minimizing potential LFG problems related to the landfill operations. A permanent LFG collection system is being installed as part of the expansion of the WCC Navan Facility as the landfill cells are completed to their final elevation.

4.0 LANDFILL GAS ASSESSMENTS

4.1 Olfactive Assessment

The WCC Navan Facility is a dry waste facility and wet organic waste is not permitted for processing or disposal. Consequently, few odours are emitted from the waste pile at this site. Odours from the waste pile, when detected, are in isolated locations occurring generally from fugitive emissions at ground surface in areas of recent landfilling activity, i.e. three to ten months following waste placement. Clay cover material is regularly placed over areas where the final fill heights have been reached. The waste and daily/interim cover materials in areas where no clay cover has been placed are sufficiently pervious to provide good ventilation at the surface thereby preventing the accumulation of LFG. The leachate collection system constructed at the south and west perimeters of the waste footprint behave as a passive gas ventilation system. Odours resulting from LFG are, on occasion, noticeable at some of the MH openings located along the leachate collection system. These odours dissipate rapidly and are barely noticeable only a short distance from the source of the odours.

It is important to note that in compliance with the amended ECA dated April 16, 2009, the WCC Navan Facility is no longer receiving materials for composting.

Evaluation of odour is based on the subjective interpretations of WCC's on-site personnel and observations by Golder and WCC staff during site visits as well as documentation of odour complaints received from the public nearby. The site practice, when odour complaints are received at the time of the occurrence, is to carry out an investigation of the source of odour regardless of the source of origin and to follow up with the caller with the corrective measures taken or to notify them of the potential source of odour if it is deemed to be originating from an off-site source.

4.2 Visual Assessment

There are no discernible impacts on vegetation at the surface of the landfill resulting from LFG. WCC has undertaken a landscaping program at the site including seeding berms and planting trees and significant efforts have been made at the site to preserve and relocate existing vegetation. The top surface of the waste pile has not been seeded.

In the past, venting of LFG could be observed at ground surface along the west side of the landfill between MHs. The LFG venting was only noticeable once the ground surface was covered with snow. In 2021, venting of LFG at ground surface was not noticeable to Golder technicians.

4.3 Ongoing Gas Monitoring in On-Site Buildings

Gas monitors have been installed in three on-site buildings. The monitors, that are calibrated annually, measure carbon monoxide (CO), nitrogen dioxide (NO_2) and CH_4 in the main site building, H_2S and CH_4 in the scale house, and H_2S and CH_4 in the pump station building. To date, the monitors have not detected any of these gases in the buildings.

4.4 Field Monitoring

Field monitoring with the use of portable field instruments was carried out on May 20, 2021, on August 25, 2021 and on December 16, 2021. The locations where monitoring of LFG and air quality was conducted during the last monitoring session are indicated on Figure 2. Shallow monitoring wells located along the south and north boundaries of the site were included in the monitoring program. Monitoring was also carried out at site facilities such as the leachate pump station, the maintenance garage, the weigh scale station and the leachate collection system. Other on-site locations were selected based on an olfactive and visual inspection of the site, and active landfilling operations. Some locations were selected at random. MHs that are part of the leachate collection system were included.

Monitoring for LFG was also carried out in buildings within close proximity to the landfill. These buildings are the following:

- The on-site maintenance garage
- The on-site pump station
- The on-site scale house
- WCC office at 3354 Navan Road

The ambient air at six addresses along Navan Road and two other off-site locations near the new subdivision adjacent to the site was also included in the LFG monitoring program.

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Weather data was obtained from the Ottawa Airport (OTTAWA INTL A, climate ID 6106001) in Ottawa, Ontario located 17 kilometres southwest of the WCC Navan Facility for the monitoring periods of May 20, 2021; August 22, 2021 and December 16, 2021. This weather data is summarized in the table below:

Date	Temperature (°C)			Relative Humidity (%)		Precipitation* (mm)			Station Pressure (kPa)			Wind During Working Hours	
	Max.	Min.	Mean	Max.	Min.	Rain	Snow	Total Precip.	Max.	Min.	Variability During Working Hours	Max Speed (km/h)	Prevail. Direct.
May 20, 2021	29.1	15.8	22.3	76	34	0.0	0.0	0.0	101.51	101.27	↓	17	NW
Aug. 25, 2021	32.6	18.3	25.3	97	42	0.0	0.0	0.0	100.46	100.2	↓	19	SW
Dec.16, 2021	15.2	-0.3	7.7	99	48	2.1	0.0	2.1	100.16	98.4	↓	41	S/SW

Notes: * Precipitation data obtained from the Experimental Farm in Ottawa (CDA RCS, climate ID 6105978)

Entered by: ETB
Checked by: RPM/YJM

Field observations from the Golder technician are provided in Tables 2 to 4 for hours while he was on-site.

The instrument used to detect and measure LFG concentrations during the various sampling events was a LANDTEC GEM-5000 Infrared Gas Analyzer.

The LANDTEC GEM-5000 is designed for analyzing LFG composition and calculating flow. It is a handheld device which can measure percentages of CH_4, CO_2, CO, H_2S and O_2, relative and atmospheric pressure. Methane and carbon dioxide concentrations are measured by infrared gas analyzer and oxygen is measured by the galvanic cell principle. The LANDTEC GEM-2000 Plus, which has historically been used at the site to measure LFG composition, can measure combustible methane Lower Explosive Limit (LEL, equivalent to 5 percent (%) by volume in air for methane gas). Since the LANDTEC GEM-2000 Plus is being phased out and replaced with the LANDTEC GEM-5000, the LEL for all locations were not reported during this monitoring year (see Tables 2 through 4). Interpretation related to LEL is therefore not possible for the 2021 results. Concentrations of CH_4 greater than 1.25% by volume are instead discussed in the next Section.

5.0 LANDFILL GAS FIELD MONITORING RESULTS

Results of the monitoring program undertaken in 2021 are presented in Table 2 for May, Table 3 for August and Table 4 for December. Non-Methane Organic Compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 1.25% at the following locations:

- MH-3 (G13a), MH-2 (G18a), MH-4 (G12a), and MH-5 (G11a)in August 2021
- MH-7 (G5a), MH-9 (G3a), and MH-10 (G2a) in December 2021.

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met at the WCC Navan Facility based on the 2021 monitoring results. Although no monitoring locations are available below surface at the property boundary, based on the discussion in Section 3.1 of this report it is anticipated that the WCC Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events, with the exception of the following locations, which reported a relatively low concentration (at the detection limit of 1 part per million or ppm):

MH-6 (G6a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), all in May 2021. During the May 2021 monitoring session, faint odours were noted at the site, while no odours were noted during the August and December monitoring sessions by the Golder field technician. As previously mentioned, gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2021, WCC personnel responded to one odour related complaint (received on October 14, 2021 from a resident west of the landfill).

6.0 ODOUR CONTROL

To ensure the WCC Navan Facility is operated in a manner that minimizes the impact from odour on the public and the natural environment, the following program is in place at the WCC Navan Facility to deal with odour issues.

6.1 Odour Monitoring

WCC has a comprehensive program for monitoring odours and for taking remedial action in the event that odours become at all problematic in the operation of the WCC Navan Facility. Any unusual odour events and any measures taken to deal with odour at the site are recorded and filed on-site.

There are no Ontario Government standards for odour. There are no agreed-upon, empirical measurement protocols or odour thresholds that may be used in the operation of a landfill or processing facility. Consequently, the ultimate test of an effective odour-control strategy for any facility can only be that it produces no odour complaints from the surrounding community over an extended period of operation. The operators of the facility need to take preventative and other control measures to ensure that odours never reach a threshold where they can generate complaints. The best odour monitoring program available is to give responsibility to all staff working at the site to use their own senses to constantly monitor for excessive levels of odour on-site. While some level of on-site odour is normal and acceptable, it can become a problem when these same odours register off the property. As well, the character of the odour is significant. Many 'aerobic' odours may be very inoffensive, even at a significant concentration, while even very low levels of the types of odour associated with anaerobic activity may be deeply offensive.

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It is normal practice at the site to monitor odours in the following way. Every morning, when staff first arrives on the site, a general inspection is undertaken of the facility. While the site manager is looking for anything untoward, the presence of any odours likely to extend beyond the perimeter of the site will be of special concern. In addition, whenever any material at the site is being disturbed by the equipment used at the facility, staff on-site periodically stand downwind of the work that is being done and assure themselves that any odours being created are mild, indicative of fully aerobic activity, and are not likely to be carried off the property.

In the event that staff on-site believe any odours may have some potential for off-site impact, they will drive to a location off-site and downwind from the work at the facility to determine at that moment if any off-site impact can be detected. If there is a detectable off-site impact, work on the site will be stopped immediately and remedial measures will be taken (see below). If no off-site impacts are detectable, work at the site will proceed with caution, with further periodic inspections off-site. Remedial measures will again be taken as appropriate.

The key to this approach is that all staff are constantly vigilant for even mild odours produced on-site and will take actions to deal with those odours well before they become evident off-site.

A windsock and flag are installed on the site. This provides a strong visual reminder to site staff of existing wind conditions, such that they can make judgments as to the potential for off-site odours, given that day's planned activities.

No odour monitoring program is of much value unless there is a companion program to control those same odours, once they are detected. What follows is a stepped program, capable of dealing effectively with everything from the mildest odours to the most offensive. It should be noted that all of the measures described below can and are just as likely to be applied to only sections of a site, rather than to the entire site. The source of odour problems can commonly be quite localized.

6.2 Prevention

The best odour control strategy is odour prevention. If experienced staff early in the process makes the correct, preventative decisions, odour will not be an issue. Although mild odours are experienced on-site from time to time, they are mild in nature and should not be noticeable off-site.

A perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends below the water table. This drainage system has significantly reduced, if not eliminated, the potential for off-site migration of LFG.

Monitoring of methane gas at the landfill site is performed on three occasions per year generally during the spring, summer and late fall or winter. Results of the monitoring programs and interpretation of the data are presented in the annual Operations & Monitoring report.

A leachate pumping station has been constructed in the southeast corner of the landfill site and a forcemain connection to the municipal sewage treatment plant commenced in 2007. Presently, the disposal method of choice for leachate generated by the WCC Navan Facility is treatment at the Robert O. Pickard Environmental Centre, a wastewater treatment plant. The use of leachate retention ponds has been discontinued. This eliminates the possibility of odours emanating from on-site treatment and leachate retention ponds.

As discussed in Section 3.4, an interim LFG odour control system was installed in 2011 and commissioned in April 2012. The purpose of the interim LFG odour control system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical

LFG extraction wells. The system was extended in 2016, 2017, and 2019. In 2020, one horizontal well was added at the north-west corner of Phase 1. In 2021, a portion of the header pipe for the permanent landfill gas collection and treatment system was installed and construction of the structural pad and compound area for the new flare and extraction plant were completed. Commissioning of the new flare and extraction plant is expected in 2022.

6.3 Masking the Odour

Principally, these additional measures will consist of using physical, biological and/or chemical methods to mask the odours on the surface of the odour source, so that none of the odours contained within are released to the environment. A number of proven masking techniques are available and can be used at the discretion of the site manager:

- Physically covering the surface of the odour source with a 15 centimetre layer of bulking material is often enough to block the release of most odours for a period of a day or more while remedial work is done;
- A number of biological inoculants are available commercially. These substances, when applied to the surface in a water solution, are felt to effectively reinforce aggressive aerobic activity on the surface by out-competing any anaerobic colonies that may be present in the near surface area. In effect, this creates a bio-filter, and biologically processes anaerobic gases as they are released; and/or,
- A number of chemical/nutrient mixtures are also available commercially. These substances, when applied to the odour source in much the same manner used with the biological inoculants, can have a very similar or even stronger effect. Manufacturers of these products claim that their compounds rapidly stimulate the growth of one desirable family of microorganisms or another, again to create a bio-filter effect.

Whatever the actual mechanism, these products have been proven effective in the field. In all cases, odour control strategies used at this level can be applied within minutes of the decision to use them, and the effects will be largely felt within 10-15 minutes of that application, if not sooner.

6.4 Isolating an Odour Source

The last strategy will consist of using additional measures to isolate and neutralize the offending odour source material. The offensive material may be removed from the problem area, landfilled and covered immediately. This isolation strategy will be used at the discretion of the site manager.

6.5 Complaints Response

In the event that an odour complaint is received, either by the City of Ottawa or the MECP, it is expected that those parties will immediately contact WCC site staff and notify them of the problem. WCC staff will take immediate steps to determine the extent of the problem and whether or not it is caused by the facility. If the source of the odour is deemed to be originating from the WCC Navan Facility, appropriate measures as described above will be taken to mitigate the odour problem and to stop the detection of odours off-site. Again, all such measures taken will be documented and a record kept on-site. If the identity of the complainant is made known to WCC staff, staff will contact the complainant that day, listen to their description of the problem, advise them in detail of the measures taken to rectify the problem, and invite them to visit the facility at some point to see for themselves how the site is operated. WCC will also call them back in a week's time to determine whether or not they have been aware of any other odours at their location.

WCC staff has found in the past that this kind of immediate and personal attention goes a long way to building community support for a facility and builds community confidence in the management of the site.

7.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Waste Connections of Canada. The report, which specifically includes all tables and figures, is based on data and information collected by Golder Associates Ltd. and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder Associates Ltd. as described in this report.

Golder Associates Ltd. has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Air quality conditions may vary from these sampled locations.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

Signature Page

We trust this report satisfies your current requirements. If you have any further questions regarding this report, please contact the undersigned.

Golder Associates Ltd.

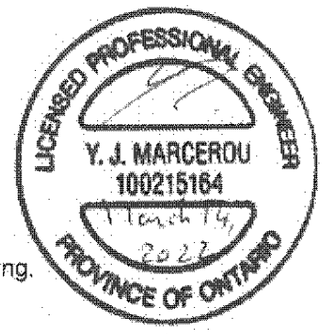

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Table 1: Composition of Landfill Gas at WCC Navan Facility

PARAMETER	November 29, 1994					June 13, 2002				
	MDL	MH-12	G.L. Q-7	MH-7	MH-0	MDL	Ambient (Parking)	Passive Vent F-4	MH-9	Pump Station
		SMP1	SMP2	SMP3	SMP4		SMP1	SMP2	SMP3	SMP4
Nitrogen, N_2 (%)	0.1	77	75	79	79	0.1	77.6	80.1	77.7	78.2
Oxygen, O_2 (%)	0.1	20	15	20	21	0.1	21.6	17.6	21.4	21.7
Carbon Dioxide,CO_2 (%)	0.1	1.8	7.8	1	ND	0.1	ND	1.5	0.3	ND
Methane, CH_4 (%)	0.1	0.7	3.8	0.6	ND	0.1	ND	ND	0.5	ND
Carbon Monoxide, CO (%)	0.1	ND	ND	ND	ND	0.1	ND	ND	ND	ND
Carbon Disulfide (PPM)	0.02	*	ND	-	-	0.04	ND	ND	ND	ND
Dimethyl Disulfide (PPM)	0.03	ND	ND	-	-	0.05	ND	ND	ND	ND
Ethyl Mercaptan / Dimethyl Sulfide (PPM)	0.03	0.4	ND	-	-	0.1	ND	ND	ND	ND
Hydrogen Sulfide / Carbonyl Sulfide (PPM)	0.02	120	0.4	-	-	0.05	ND	ND	ND	-
						2.1	-	-	-	2.2*
Methyl Mercaptan (PPM)	0.03	1	ND	-	-	0.05	ND	ND	ND	ND
Propyl Mercaptan / Ethyl Methyl Sulfide (PPM)	0.03	ND	ND	-	-	0.1	ND	ND	ND	ND
Sulfur Dioxide (PPM)	0.1	ND	ND	-	-	0.4	ND	ND	ND	ND
1,1,1-Trichloroethane (ppb)	0.2	0.1	ND	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene (ppb)	-	-	-	-	-	1	8	ND	9	ND
1,4-Dichlorobenzene	-	-	-	-	-	1	ND	5	6	<1
Benzene (ppb)	0.1	0.1	ND	-	-	1	ND	ND	ND	7
Cyclohexane (ppb)	0.1	0.1	0.1	-	-	-	-	-	-	-
Ethylbenzene (ppb)	-	-	-	-	-	1	ND	3	2	15
Hexane (ppb)	0.1	ND	0.2	-	-	-	-	-	-	-
m,p-Xylene (ppb)	-	-	-	-	-	2	ND	9	2	35
Naphthalene (ppb)	-	-	-	-	-	10	40	ND	48	ND
Other VOC parameters analysed (refer to lab report)	-	-	-	-	-		ND	ND	ND	ND
o-Xylene (ppb)	-	-	-	-	-	1	<1	4	3	11
Styrene (ppb)	-	-	-	-	-	1	11	5	3	6
Toluene (ppb)	0.1	0.7	0.1	-	-	1	15	29	19	170
Total VOCs - EPA 624 (ppb)		4.1	0.4	-	-	-	-	-	-	-
Total Volatile Organics (ppb)	-	-	-	-	-	0.1	0.43	0.24	0.46	0.51
Trichloroethene (ppb)	-	-	-	-	-	1	ND	ND	ND	7
Trichlorofluoromethane (ppb)	0.5	3.1	ND	-	-	-	-	-	-	-

MDL - Method Detection Limit
ND - Not Detected

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Table 2: Field Monitoring Results - May 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Spring Session

	Monitoring Location		Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Atm. Pressure (inHg)	Atm. Pressure (mBar)
WEST AND SOUTH FACES	G1	a	OW-95-6	0.0	0.1	21.7	0	0	30.18	1022
		b	OW-95-8 Ambient Air	0.0	0.1	21.8	0	0	30.17	1022
	G2	a	MH-10	0.0	0.2	21.9	0	0	30.17	1022
		b	MH-10 Ambient Air	0.0	0.1	22.1	0	0	30.15	1021
	G3	a	MH-9	0.0	0.1	22.1	0	0	30.16	1021
		b	MH-9 Ambient Air	0.0	0.1	22.1	0	0	30.16	1021
	G4	a	MH-8	0.0	0.1	22.2	0	0	30.16	1021
		b	MH-8 Ambient Air	0.0	0.1	22.2	0	0	30.16	1021
	G5	a	MH-7	0.0	0.1	22.2	0	0	30.17	1022
		b	MH-7 Ambient Air	0.0	0.1	22.2	0	0	30.16	1021
	G6	a	MH-6	0.2	1.4	19.7	1	1	30.1	1019
		b	MH-6 Ambient Air	0.0	0.1	20.3	1	0	30.1	1019
	G7		OW-94-1	0.0	0.2	20.2	0	0	30.1	1019
	G8		OW-94-2	0.0	0.2	20.1	1	1	30.1	1019
	G9		05-R3	0.0	0.5	20.2	0	0	30.1	1019
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.1	20.2	0	0	30.1	1019
	G11	a	MH-5	0.0	0.7	20.0	8	0	30.1	1019
		b	MH-5 Ambient Air	0.0	0.1	20.0	9	0	30.1	1019
	G12	a	MH-4	0.7	0.8	20.6	0	0	30.19	1022
		b	MH-4 Ambient Air	0.0	0.1	20.9	0	0	30.19	1022
	G13	a	MH-3	0.9	1.8	19.9	0	0	30.2	1023
		b	MH-3 Ambient Air	0.0	0.1	20.9	0	0	30.19	1022
	G14		OW-92-7	0.0	0.1	20.8	0	0	30.2	1023
	G15		OW-92-8	0.0	0.3	20.5	0	1	30.2	1023
	G16		05-8	0.3	0.0	20.7	0	0	30.2	1023
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.1	20.8	0	0	30.2	1023
	G18	a	MH-2	0.0	0.9	20.5	3	0	30.21	1023
		b	MH-2 Ambient Air	0.0	0.1	20.8	4	0	30.14	1021
	G19	a	MH-1	Sealed						
		b	MH-1 Ambient Air	0.0	0.1	20.6	0	0	30.19	1022
	G20		05-11	0.0	0.4	20.3	0	0	30.21	1023
	G21		OW-92-9	0.0	0.1	20.5	1	0	30.21	1023
	G22		OW-92-10	0.0	0.2	20.4	0	0	30.21	1023
	G23		OW-92-11	0.0	0.6	19.6	0	0	30.2	1023
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.1	20.6	0	0	30.19	1022
	G25	a	Pump House Ambient	0.0	0.1	20.5	2	0	30.21	1023
		b	Air Vent Along Pump House	0.0	0.1	21.5	0	0	30.21	1023
		c	pump House (inside)	0.0	0.1	21.4	0	0	30.22	1023
	G26	a	Wet Well MH	0.0	0.1	21.3	0	0	30.21	1023
		b	Blower Shed	0.0	0.1	21.4	0	0	30	1023
		c	Sea can (blue trailer - inside)	0.0	0.1	21.4	0	0	30.21	1023
		d	Primary Tank #1	0.0	1.6	25.0	0	1	30.21	1023
		e	Primary Tank #2	N/A						
		f	Secondary Tank #1	0.0	0.2	22.2	0	0	30.22	1023
		g	Secondary Tank #2	0.0	0.3	22.2	0	0	30.21	1023
		i	Collector MH	0.0	0.8	22.1	0	0	30	1023
	G27		Grid Line (R-19)	0.0	0.1	22.5	0	0	30.19	1022
	G81	a	Pipeline Ambient Air	0.0	0.1	22.0	0	0	30.17	1022
		b	Pipeline Clean Out	0.0	0.1	22.0	0	0	30.17	1022
	G82	a	Pipeline Clean Out	0.0	0.1	22.2	0	0	30.17	1022
		b	Pipeline Ambient Air	0.0	0.1	22.2	0	0	30.15	1021
	G83	a	Pipeline Ambient Air	0.0	0.1	22.2	0	0	30.15	1021
		b	Pipeline Clean Out MH	Sealed						
	G84	a	Tank Truck loading station MH	0.0	0.1	22.1	0	0	30.17	1022
		b	Ambient Air Tank Truck loading station MH	0.0	0.1	22.1	0	0	30.16	1021
	G88	a	MH-0	0.0	0.1	22.2	0	0	30.15	1021
		b	MH-0 - Ambient Air	0.0	0.1	22.2	0	0	20.14	682
OFFICE/BUILDING AREA	G26	a	Garage	0.0	0.1	20.9	1	0	30.1	1019
		b	Garage (outdoors)	0.0	0.2	20.9	1	0	30.1	1019
	G29		Lunch Room	0.0	0.2	21.0	0	0	30.1	1019
	G31	a	Gate Clerk	Removed						
		b	New Scale (outside)	0.0	0.1	20.8	1	0	30.1	1019
		c	New Gate Clerk (Inside)	0.0	0.1	20.8	1	0	30.1	1019
	G32		Henri's Office	0.0	0.2	21.0	0	0	30.1	1019
	G34		OW-92-18	0.1	0.2	21.1	0	0	30.1	1019
	G35		OW-92-19	0.0	0.2	21.0	0	0	30.1	1019
	G36		Ambient Air (OW92-18, 92-19)	0.0	0.1	21.2	1	0	30.1	1019
	G100		Small Vehicle Drop-Off Area	0.0	0.2	20.8	1	0	30.1	1019

Table 2: Field Monitoring Results - May 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Spring Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
AIR VENTS	G49	a	Passive Air Vent	0.0	0.1	21.9	0	0	30.17	1022
		b	Ambient Air	0.0	0.1	21.9	0	0	30.15	1021
	G50	a	New Passive Air Vent	Could not locate - may have been destroyed						
		b	Ambient Air							
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.1	22.1	0	0	30.14	1021
		b	Manhole	Sealed						
	G102	a	Passive Air Vent	0.0	0.1	22.1	0	0	30.16	1021
		b	Passive Air Vent - Ambient Air	0.0	0.1	22.1	0	0	30.17	1022
FORMER COMPOST AREA	G52		Compost Area East Side	0.0	0.1	22.0	0	0	30.16	1021
	G53		Compost Area North Side	0.0	0.1	22.1	0	0	30.15	1021
	G54		Compost Area South Side	0.0	0.1	22.1	0	0	30.15	1021
	G55		Compost Area West Side	0.0	0.1	22.1	0	0	30.15	1021
AMBIENT AIR COLLECTOR PIPES	G59	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.1	0.1	27.3	0	0	30.11	1020
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.1	0.1	23.3	0	0	30.11	1020
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	0.1	0.1	23.3	0	0	30.11	1020
	G62	a	Pipe E-10	Sealed						
		b	Ambient Air Collector Pipe E-10	0.0	0.1	23.2	0	0	30.11	1020
	G63	a	Pipe E-11	Sealed						
		b	Ambient Air Collector Pipe E-11	0.0	0.1	23.1	0	0	30.11	1020
EAST AND NORTH FACES	G95	a	E-12 Ambient Air	0.0	0.1	22.1	0	0	30.11	1020
		b	E-12 Passive Air Vent	Sealed						
	G96	a	E-13 Ambient Air	0.0	0.1	23.1	0	0	30.11	1020
		b	E-13 Passive Air Vent	Sealed						
	G97	a	G-17 Ambient Air	N/A						
		b	G-17 Passive Air Vent	Part of new landfill cell						
	G200	a	D/E-14 Ambient Air	0.0	0.1	23.0	0	0	30.11	1020
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.1	22.9	0	0	30.11	1020
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	0.0	0.1	22.9	0	0	30.11	1020
		b	D-15/16 Passive Air Vent	Sealed						
	G203		Pipe Cleanout	0.0	0.1	20.6	1	0	30.1	1019
	G204		Pipe Cleanout	0.0	0.1	20.6	1	0	30.1	1019
	G205		Pipe Cleanout	0.0	0.1	20.6	0	0	30.1	1019
	G206		Pipe Cleanout	0.0	0.1	20.5	0	0	30.1	1019
	G207		Pipe Cleanout	0.0	0.1	20.5	1	0	30.1	1019
	G208		Pipe Cleanout	0.0	0.1	20.4	1	0	30.1	1019
ENTRANCE / MISCELLANEOUS	G64		New Recycling Area	0.0	0.1	22.1	0	0	30.14	1021
	G65		Cont. Soil @ O-16	0.0	0.1	23.2	0	0	30.13	1020
	G66		Cont. Soil @ M-6	0.0	0.1	22.0	0	0	30.15	1021
	G67	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.1	22.1	0	0	30.13	1020
	G68		Active Face (location=K-17)	0.0	0.1	22.5	0	0	30.10	1019
	G69		Recycling Area (old)	0.0	0.1	22.1	0	0	30.13	1020
	G70		Grid Line Location G-2	0.0	0.1	21.7	0	0	30.15	1021
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.1	23.2	0	0	30.11	1020
	G74		NEAR MONTE BLUE	0.0	0.2	22.7	0	0	30.11	1020
NAVAN ROAD	G75		3516 Navan Road	0.0	0.2	22.5	0	0	30.11	1020
	G76		3546 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G77		Between 3550 and 3588 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G78		3602 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G79		3626 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G80		3650 Navan Road	0.0	0.1	22.7	0	0	30.11	1020
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	30.14	1021
	GW-2		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	30.15	1021
	GW-3		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	30.10	1019
	GW-4		Gas Extraction Well - Ambient Air	0.0	0.1	22.2	0	0	30.10	1019

Notes		
	The day was:	here during the ✓ morning; ✓ afternoon
	Temperatures ranged from:	20 to 29 degrees Celsius
	Winds were from:	✓ North; ___East; ___ West; ___ South and ✓ Mild; ___Moderate; ___Strong
	Odours were:	___ not noticeable; ✓ faint but noticeable; __ moderate but not offensive; _ strong
	Date: May 20, 2021	Prepared by: ETB Checked by: RPM

Table 3: Field Monitoring Results - August 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Summer Session

	Monitoring Location		Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.0	0.2	20.9	1	0	29.77	1008
		b	OW-95-8 Ambient Air	0.0	0.0	21.1	1	0	29.77	1008
	G2	a	MH-10	1.1	1.3	20.2	0	0	29.77	1008
		b	MH-10 Ambient Air	0.0	0.0	21.1	0	0	29.77	1008
	G3	a	MH-9	0.4	0.3	20.9	1	0	29.77	1008
		b	MH-9 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
	G4	a	MH-8	0.4	0.3	21.1	0	0	29.77	1008
		b	MH-8 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
	G5	a	MH-7	0.0	0.1	21.2	1	0	29.77	1008
		b	MH-7 Ambient Air	0.0	0.0	21.3	1	0	29.77	1008
	G6	a	MH-6	0.1	1.8	19.8	0	0	29.77	1008
		b	MH-6 Ambient Air	0.0	0.1	20.9	0	0	29.77	1008
	G7		OW-94-1	0.0	0.5	20.6	1	0	29.77	1008
	G8		OW-94-2	0.0	0.4	20.6	1	0	29.77	1008
	G9		05-R3	0.0	1.2	20.9	1	0	29.77	1008
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.1	20.8	1	0	29.77	1008
	G11	a	MH-5	6.9	9.4	15.7	1	0	29.77	1008
		b	MH-5 Ambient Air	0.0	0.1	20.8	0	0	29.77	1008
	G12	a	MH-4	1.7	1.6	20.2	0	0	29.77	1008
		b	MH-4 Ambient Air	0.0	0.1	20.8	1	0	29.77	1008
	G13	a	MH-3	17.8	10.8	15.8	1	0	29.77	1008
		b	MH-3 Ambient Air	0.0	0.1	20.9	1	0	29.77	1008
	G14		OW-92-7	0.0	0.1	20.9	1	0	29.77	1008
	G15		OW-92-8	0.9	2.2	20.2	0	0	29.77	1008
	G16		05-8	0.1	0.4	20.8	1	0	29.77	1008
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.1	20.9	1	0	29.77	1008
	G18	a	MH-2	9.5	7.2	17.0	1	0	29.77	1008
		b	MH-2 Ambient Air	0.0	0.1	20.9	1	0	29.77	1008
	G19	a	MH-1 (sealed)	Sealed						
		b	MH-1 Ambient Air	0.0	0.1	21.0	0	0	29.77	1008
	G20		05-11	0.0	1.3	20.4	1	0	29.77	1008
	G21		OW-92-9	0.0	0.5	20.4	1	0	29.77	1008
	G22		OW-92-10	0.0	0.3	20.6	1	0	29.77	1008
	G23		OW-92-11	0.0	2.6	20.9	1	0	29.77	1008
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.0	20.9	1	0	29.77	1008
	G25	a	Pump House Ambient	0.0	0.0	20.8	1	0	29.77	1008
		b	Air Vent Along Pump House	0.0	0.0	20.8	1	0	29.77	1008
		c	pump House (inside)	0.0	0.0	20.9	1	0	29.77	1008
	G26	a	Wet Well MH	0.0	0.5	20.8	1	0	29.77	1008
		b	Blower Shed	0.0	0.0	20.8	1	0	29.77	1008
		c	Sea can (blue trailer - inside)	0.0	0.0	20.9	0	0	29.77	1008
		d	Primary Tank #1	0.0	3.0	20.5	1	0	29.77	1008
		e	Primary Tank #2	0.0	2.3	20.6	2	0	29.77	1008
		f	Secondary Tank #1	0.0	0.3	20.8	2	0	29.77	1008
		g	Secondary Tank #2	0.0	0.3	20.8	2	0	29.77	1008
		i	Collector MH	0.1	0.4	20.7	1	0	29.77	1008
	G27		Grid Line (R-19)	0.0	0.0	20.9	1	0	29.77	1008
	G81	a	Pipeline Ambient Air	0.0	0.0	21.1	0	0	29.77	1008
		b	Pipeline Clean Out	0.0	0.0	21.1	0	0	29.77	1008
	G82	a	Pipeline Clean Out	0.0	0.0	21.2	1	0	29.77	1008
		b	Pipeline Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
	G83	a	Pipeline Ambient Air	Not found						
		b	Pipeline Clean Out MH	Not found						
	G84	a	Tank Truck loading station MH	0.0	0.0	21.8	1	0	29.77	1008
		b	Ambient Air Tank Truck loading station MH	0.0	0.0	20.8	1	0	29.77	1008
	G98	a	MH-0	0.0	0.1	21.7	1	0	29.77	1008
		b	MH-0 Ambient Air	0.0	0.0	21.8	1	0	29.77	1008
OFFICE/BUILDING AREA	G28	a	Garage	0.0	0.1	20.9	1	0	29.77	1008
		b	Garage (outdoors)	0.0	0.1	20.7	1	0	29.77	1008
	G29		Lunch Room	0.0	0.1	20.9	1	0	29.77	1008
	G31	a	Gate Clerk	Removed						
		b	New Scale (outside)	0.0	0.1	20.9	0	0	29.77	1008
		c	New Gate Clerk (Inside)	0.0	0.1	20.9	1	0	29.77	1008
	G32		Henri's Office	0.0	0.1	20.9	1	0	29.77	1008
	G34		OW-92-18	0.0	0.1	21.1	1	0	29.77	1008
	G35		OW-92-19	0.0	0.2	21.0	1	0	29.77	1008
	G36		Ambient Air (OW92-18, 92-19)	0.0	0.1	21.2	1	0	29.77	1008
	G100		Small Vehicle Drop-Off Area	0.0	0.1	20.9	1	0	29.77	1008

Table 3: Field Monitoring Results - August 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Summer Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
AIR VENTS	G99	a	Passive Air Vent	0.0	0.0	21.1	1	0	29.77	1008
		b	Ambient Air	0.0	0.0	21.1	1	0	29.77	1008
	G50	a	New Passive Air Vent	0.0	0.0	21.5	1	0	29.77	1008
		b	Ambient Air	0.0	0.0	21.8	0	0	29.77	1008
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.0	21.3	1	0	29.77	1008
		b	Manhole	Sealed						
	G102	a	Passive Air Vent	No passive air vent						
		b	Passive Air Vent - Ambient Air	0.0	0	21.4	1	0	29.77	1008
FORMER COMPOST AREA	G52		Compost Area East Side	0.0	0.0	21.4	0	0	29.77	1008
	G53		Compost Area North Side	0.0	0.0	21.4	1	0	29.77	1008
	G54		Compost Area South Side	0.0	0.0	21.4	1	0	29.77	1008
	G55		Compost Area West Side	0.0	0.0	21.4	1	0	29.77	1008
AMBIENT AIR COLLECTOR PIPES	G59	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.0	0.0	21.3	1	0	29.77	1008
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.0	0.0	21.3	1	0	29.77	1008
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	Not found						
	G62	a	Pipe E-10	Sealed						
		b	Ambient Air Collector Pipe E-10	0.0	0.0	21.3	1	0	29.77	1008
	G63	a	Pipe E-11	Sealed						
		b	Ambient Air Collector Pipe E-11	0.0	0.0	21.3	1	0	29.77	1008
EAST AND NORTH FACES	G83	a	E-12 Ambient Air	Not found						
		b	E-12 Passive Air Vent	Sealed						
	G96	a	E-13 Ambient Air	Not found						
		b	E-13 Passive Air Vent	Sealed						
	G51	a	G-17 Ambient Air	Part of new landfill cell						
		b	G-17 Passive Air Vent							
	G200	a	D/E-14 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	Inadvertently missed during this monitoring session.						
		b	D-15/16 Passive Air Vent	Sealed						
	G203		Pipe Cleanout	No longer present						
	G204		Pipe Cleanout							
	G205		Pipe Cleanout							
	G206		Pipe Cleanout							
	G207		Pipe Cleanout							
	G208		Pipe Cleanout							
CENTRE AREA - MISCELLANEOUS	G64		New Recycling Area	0.0	0.1	21.2	1	0	29.77	1008
	G65		Cont. Soil @ L-16	0.0	0.0	21.4	1	0	29.77	1008
	G66		Cont. Soil @ M-6	0.0	0.0	21.3	1	0	29.77	1008
	G67	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.0	21.4	1	0	29.77	1008
	G68		Active Face (location=JK-20/21)	0.0	0.0	21.6	1	0	29.77	1008
	G69		Recycling Area (old)	0.0	0.0	21.4	0	0	29.77	1008
	G70		Grid Line Location G-2	0.0	0.0	21.0	1	0	29.77	1008
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.0	21.5	1	0	29.76	1008
	G74		NEAR MONTE BLUE	0.0	0.0	21.3	1	0	29.76	1008
NAVAN ROAD	G75		3516 Navan Road	0.0	0.1	21.1	0	0	29.78	1008
	G76		3546 Navan Road	0.0	0.0	21.2	0	0	29.78	1008
	G77		Between 3550 and 3588 Navan Road	0.0	0.0	21.2	1	0	29.78	1008
	G78		3602 Navan Road	0.0	0.0	21.2	0	0	29.78	1008
	G79		3626 Navan Road	0.0	0.0	21.2	1	0	29.78	1008
	G80		3650 Navan Road	0.0	0.1	21.2	1	0	29.78	1008
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.0	21.4	0	0	29.77	1008
	GW-2		Gas Extraction Well - Ambient Air	0.0	0.0	21.4	1	0	29.77	1008
	GW-3		Gas Extraction Well	0.0	0.0	21.5	1	0	29.77	1008
	GW-4		Ambient Air	0.0	0.0	21.5	1	0	29.77	1008

Notes:	The day was:	__overcast; ✓ sunny; ___ cloudy; __ wet; during the ✓morning; ✓afternoon
	Temperatures ranged from:	18 to 32 degrees Celsius
	Winds were from the:	___North; ___ East; ✓ West; ✓ South and: ✓ Mild; __ Moderate; __ Strong
	Odours were:	✓ not noticeable; faint but noticeable; __ moderate but not offensive; ___strong
	Date: August 25, 2021	Prepared by: ETB Checked by: RPM

Table 4: Field Monitoring Results - December 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Winter Session

	Monitoring Location		Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.0	0.2	22.2	0	0	29.47	998
		b	OW-95-8 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G2	a	MH-10	2.1	1.3	21.4	0	0	29.47	998
		b	MH-10 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G3	a	MH-9	3.8	2.2	21.8	0	0	29.47	998
		b	MH-9 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G4	a	MH-8	0.0	0.1	22.3	0	0	29.47	998
		b	MH-8 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G5	a	MH-7	2.1	1.5	21.6	0	0	29.47	998
		b	MH-7 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G6	a	MH-6	0.0	0.6	22.2	0	0	29.47	998
		b	MH-6 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G7		OW-94-1	0.0	0.2	22.2	0	0	29.47	998
	G8		OW-94-2	0.0	0.4	22.2	1	0	29.47	998
	G9		05-R3	0.0	0.7	22.3	0	0	29.47	998
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.1	22.3	0	0	29.47	998
	G11	a	MH-5	0.0	0.2	22.3	0	0	29.47	998
		b	MH-5 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G12	a	MH-4	0.0	0.2	22.3	0	0	29.47	998
		b	MH-4 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G13	a	MH-3	0.1	0.8	22.2	0	0	29.47	998
		b	MH-3 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G14		OW-92-7	0.0	0.2	22.2	0	0	29.47	998
	G15		OW-92-8	0.1	9.7	21.1	0	0	29.47	998
	G16		05-8	0.0	0.2	22.2	0	0	29.47	998
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.1	22.3	0	0	29.47	998
	G18	a	MH-2	0.0	0.2	22.3	0	0	29.47	998
		b	MH-2 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G19	a	MH-1 (sealed)	Sealed						
		b	MH-1 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G20		05-11	0.0	0.5	22.2	0	0	29.47	998
	G21		OW-92-9	0.1	0.4	22.2	0	0	29.47	998
	G22		OW-92-10	0.0	0.8	22.2	0	0	29.47	998
	G23		OW-92-11	0.0	1.3	22.2	0	0	29.47	998
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.1	22.2	0	0	29.47	998
	G25	a	Pump House Ambient	0.0	0.1	22.3	0	0	29.47	998
		b	Air Vent Along Pump House	0.0	0.1	22.2	0	0	29.47	998
		c	pump House (inside)	0.0	0.1	22.3	0	0	29.47	998
	G26	a	Wet Well MH	0.0	0.1	22.3	0	0	29.47	998
		b	Blower Shed	0.0	0.1	22.3	0	0	29.47	998
		c	Sea can (blue trailer - inside)	0.0	0.1	22.3	0	0	29.47	998
		d	Primary Tank #1	0.0	0.2	22.2	1	0	29.47	998
		e	Primary Tank #2	0.0	0.2	22.2	0	0	29.47	998
		f	Secondary Tank #1	0.0	0.2	22.2	0	0	29.47	998
		g	Secondary Tank #2	0.0	0.2	22.2	0	0	29.47	998
		i	Collector MH	0.0	0.1	22.3	0	0	29.47	998
	G27		Grid Line (R-19)	0.0	0.1	22.3	0	0	29.47	998
	G81	a	Pipeline Ambient Air	0.0	0.1	22.2	0	0	29.47	998
		b	Pipeline Clean Out	0.0	0.1	22.2	0	0	29.47	998
	G82	a	Pipeline Clean Out	0.0	0.1	22.2	0	0	29.47	998
		b	Pipeline Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G83	a	Pipeline Ambient Air	0.0	0.1	21.7	0	0	29.47	998
		b	Pipeline Clean Out MH	Sealed						
	G84	a	Tank Truck loading station MH	0.1	0.2	21.7	0	0	29.47	998
		b	Ambient Air Tank Truck loading station MH	0.0	0.1	21.8	0	0	29.47	998
	G98	a	MH-0	Sealed						
		b	MH-0 Ambient Air	0.0	0.1	21.7	0	0	29.47	998
OFFICE/BUILDING AREA	G28	a	Garage	0.0	0.1	22.0	0	0	29.47	998
		b	Garage (outdoors)	0.0	0.1	22.0	0	0	29.47	998
	G29		Lunch Room	0.0	0.2	22.0	0	0	29.47	998
	G31	a	Gate Clerk	Removed						
		b	New Scale (outside)	0.0	0.1	22.0	0	0	29.47	998
		c	New Gate Clerk (Inside)	0.0	0.1	22.0	0	0	29.47	998
	G32		Henri's Office	0.0	0.2	22.0	0	0	29.47	998
	G34		OW-92-18	0.0	0.1	22.0	0	0	29.47	998
	G35		OW-92-19	0.1	3.0	21.8	0	0	29.47	998
	G36		Ambient Air (OW92-18, 92-19)	0.1	0.1	22.0	0	0	29.47	998
	G100		Small Vehicle Drop-Off Area	0.0	0.1	22.0	0	0	29.47	998

Table 4: Field Monitoring Results - December 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Winter Session

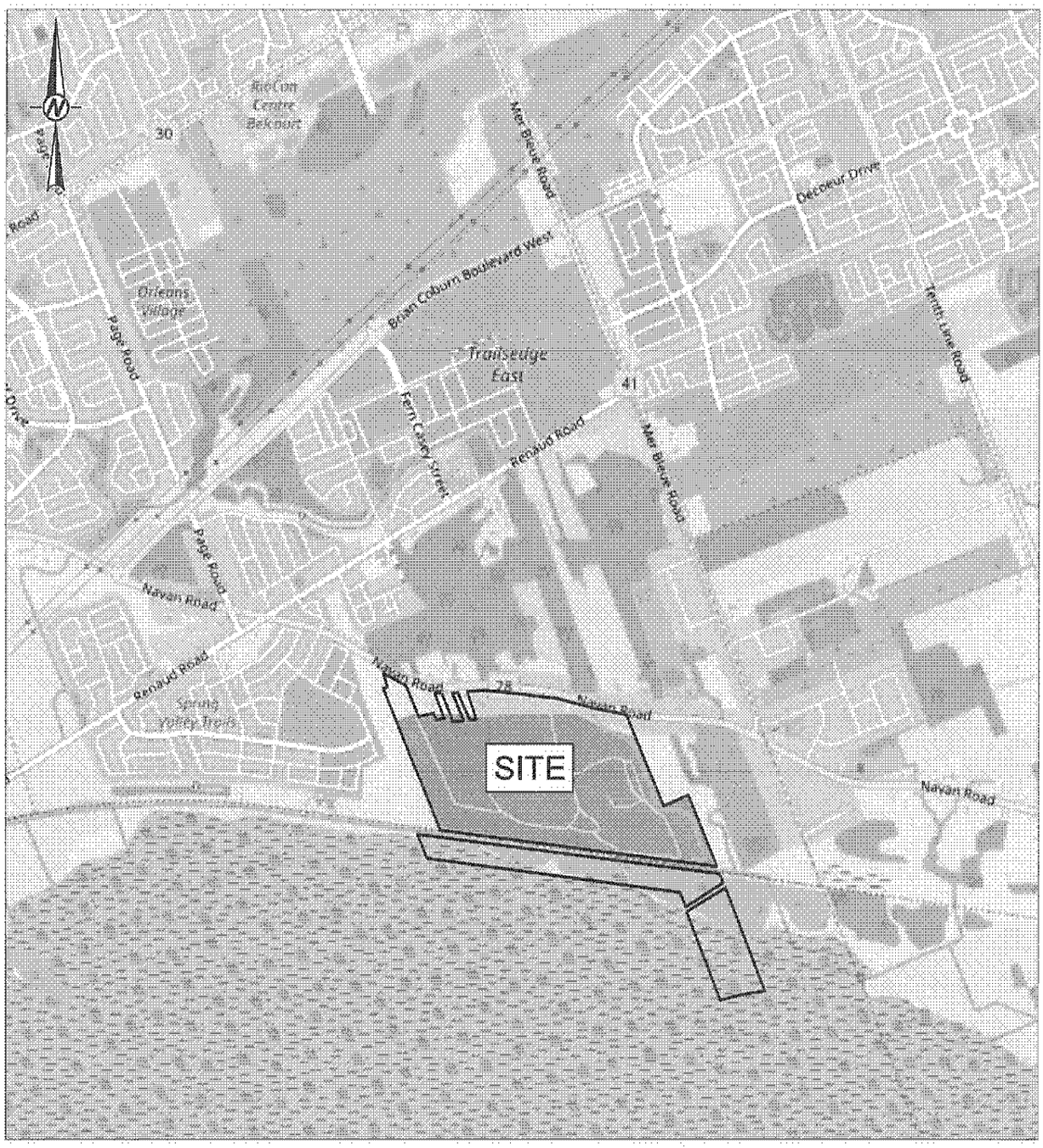
Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
AIR VENTS	G99	a	Passive Air Vent	0.0	0.1	22.1	0	0	29.47	998
		b	Ambient Air	0.0	0.1	22.1	0	0	29.47	998
	G50	a	New Passive Air Vent	0.0	0.1	21.7	0	0	29.47	998
		c	Ambient Air	0.0	0.1	21.7	0	0	29.47	998
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.1	22.9	0	0	29.47	998
		b	Manhole	Sealed						
	G102	a	Passive Air Vent	0.0	0.1	21.8	0	0	29.47	998
		b	Passive Air Vent - Ambient Air	0.0	0.1	21.8	0	0	29.47	998
FORMER COMPOST AREA	G52		Compost Area East Side	0.0	0.1	21.8	0	0	29.47	998
	G53		Compost Area North Side	0.0	0.1	21.8	0	0	29.47	998
	G54		Compost Area South Side	0.0	0.1	21.9	0	0	29.47	998
	G55		Compost Area West Side	0.0	0.1	21.8	0	0	29.47	998
AMBIENT AIR COLLECTOR PIPES	G58	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.0	0.1	21.7	0	0	29.47	998
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.0	0.1	21.7	0	0	29.47	998
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	0.0	0.1	21.6	0	0	29.47	998
	G62	a	Pipe E-10	Sealed						
		b	Ambient Air Collector Pipe E-10	0.0	0.1	21.5	0	0	29.47	998
	G63	a	Pipe E-11	Sealed						
		b	Ambient Air Collector Pipe E-11	0.0	0.1	21.5	0	0	29.47	998
EAST AND NORTH FACES	G86	a	E-12 Ambient Air	0.0	0.1	21.4	0	0	29.47	998
		b	E-12 Passive Air Vent	Sealed						
	G85	a	E-13 Ambient Air	0.0	0.1	21.4	0	0	29.47	998
		b	E-13 Passive Air Vent	Sealed						
	G91	a	G-17 Ambient Air	0.0	0.1	21.3	0	0	29.47	998
		b	G-17 Passive Air Vent	Part of new landfill cell						
	G200	a	D/E-14 Ambient Air	0.0	0.1	21.3	0	0	29.47	998
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.1	21.2	0	0	29.47	998
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	Abandoned Well						
		b	D-15/16 Passive Air Vent							
	G203		Pipe Cleanout	0.0	0.1	22.2	0	0	29.47	998
	G204		Pipe Cleanout	0.0	0.1	22.1	0	0	29.47	998
	G205		Pipe Cleanout	0.0	0.1	22.1	0	0	29.47	998
	G206		Pipe Cleanout	0.0	0.1	22.0	0	0	29.47	998
	G207		Pipe Cleanout	0.0	0.1	22.0	0	0	29.47	998
	G208		Pipe Cleanout	0.0	0.1	22.0	0	0	29.47	998
CENTRE AREA MISCELLANEOUS	G64		New Recycling Area	0.0	0.1	22.1	0	0	29.47	998
	G65		Cont. Soil @ L-16	0.0	0.1	21.8	0	0	29.47	998
	G66		Cont. Soil @ M-6	0.0	0.1	22.0	0	0	29.47	998
	G67	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.1	22.0	0	0	29.47	998
	G68		Active Face (location=G19)	0.0	0.1	22.4	0	0	29.47	998
	G69		Recycling Area (old)	0.0	0.1	22.2	0	0	29.47	998
	G70		Grid Line Location G-2	0.0	0.1	22.1	0	0	29.47	998
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.1	21.6	0	0	29.47	998
	G74		NEAR MONTE BLUE	0.0	0.1	21.8	0	0	29.47	998
NAVAN ROAD	G75		3516 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G76		3546 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G77		Between 3550 and 3568 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G78		3602 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G79		3626 Navan Road	0.0	0.1	21.8	0	0	29.47	998
	G80		3650 Navan Road	0.0	0.1	21.8	0	0	29.47	998
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.1	22.0	0	0	29.47	998
	GW-2		Gas Extraction Well - Ambient Air	Location was inadvertently missed in monitoring session						
	GW-3		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	29.47	998
	GW-4		Ambient Air	0.0	0.1	22.0	0	0	29.47	998

Notes:

The day was: ✓overcast; ✓sunny; __cloudy; __wet; during the ✓morning; ✓afternoon
Temperatures ranged from: 3 to 15 degrees Celsius
Winds were from the: __North; __East; ✓West; ✓South and: __Mild; ✓Moderate; ✓Strong
Odours were: ✓ not noticeable; __faint but noticeable; __ moderate but not offensive; strong

Date: December 15, 2021

Prepared by: ETB
Checked by: RPM



WASTE CONNECTIONS OF CANADA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

CLIENT
WASTE CONNECTIONS OF CANADA

PROJECT
REPORT ON 2021 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

CONSULTANT
WSP GOLDER

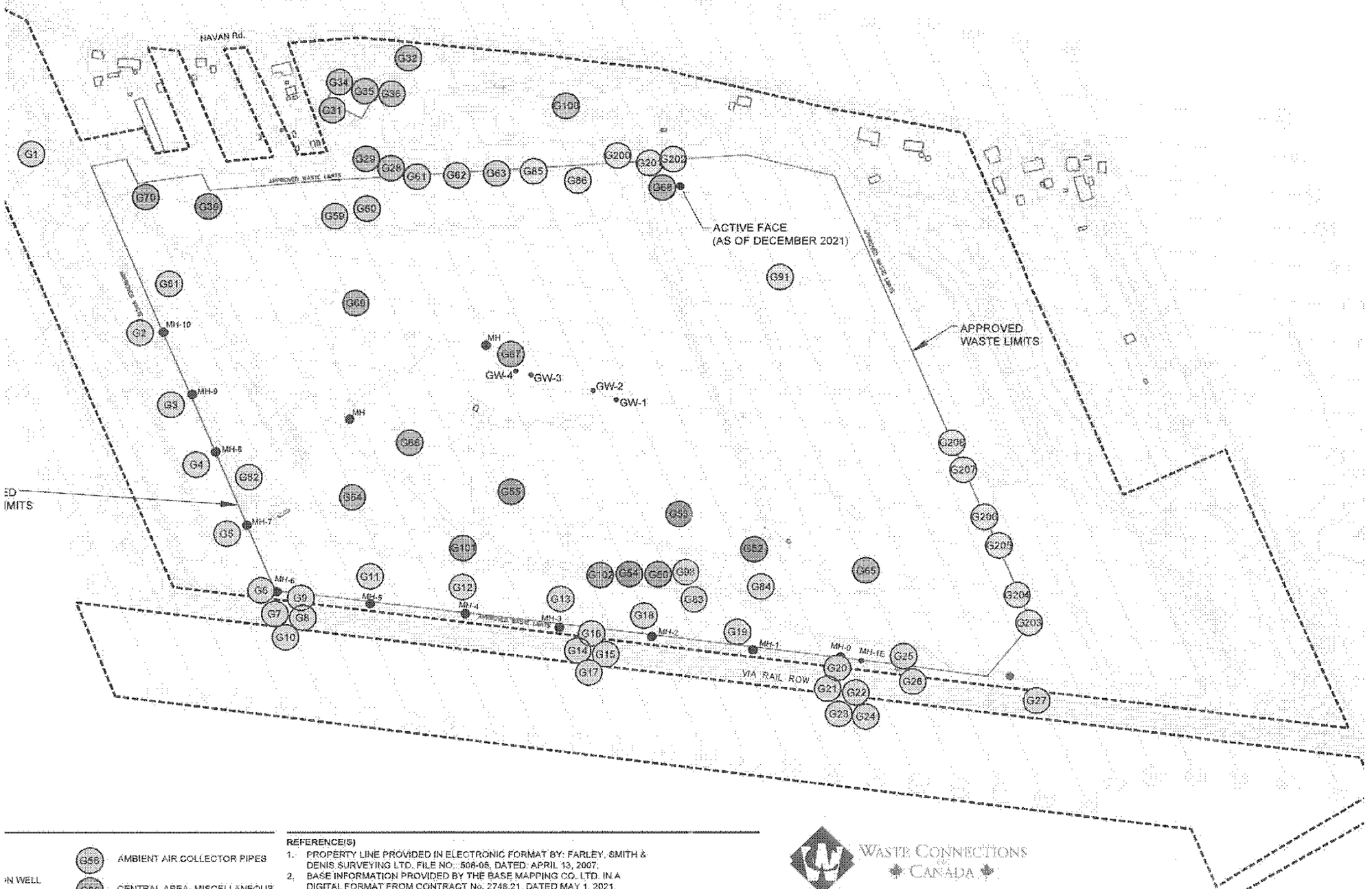
YYYY-MM-DD	2022-01-05
DESIGNED	YJM
PREPARED	ABD
REVIEWED	YJM
APPROVED	PLE

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
21497772	0001	0	1

25 mm

002660



G56 AMBIENT AIR COLLECTOR PIPES

G68 CENTRAL AREA- MISCELLANEOUS

G45 AIR VENTS

G5 WEST AND SOUTH FACES

G30 OFFICE/BUILDING AREA

REFERENCE(S)

1. PROPERTY LINE PROVIDED IN ELECTRONIC FORMAT BY: FARLEY, SMITH & DENIS SURVEYING LTD. FILE NO.: 506-05, DATED: APRIL 13, 2007.
2. BASE INFORMATION PROVIDED BY THE BASE MAPPING CO. LTD. IN A DIGITAL FORMAT FROM CONTRACT No. 2748.21, DATED MAY 1, 2021.
3. COORDINATE SYSTEM NAD 83-UTM, VERTICAL DATUM: GEODETIC

NOTE(S)

1. G73 TO G80 ARE LOCATED OFF-SITE.
2. LOCATION G68 MOVES THROUGHOUT THE YEAR, SEE TABLES 2 TO 4 FOR EXACT LOCATION

WASTE CONNECTIONS OF CANADA

CLIENT
WASTE CONNECTIONS OF CANADA

CONSULTANT

YYYY-MM-DD 2022-01-05

PROJECT
REPORT ON 2021 LAN
NAVAN WASTE RECY(
3354 NAVAN ROAD, O

TITLE

002661

APPENDIX A

2009 Landfill Gas Characterization

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Re- Gas
			QRAE	GEM-2000			QRAE	GEM-2000			
MH-6 (tubing inside manhole)	0.1	1.1	20.5	22.6	2	0	3	1	984	76.2	
hole MH-6 (ambient air)	0.0	0.1	20.9	22.1	0	0	0	0	984	77.8	
MH-5 (tubing inside manhole)	0.1	1.1	20.9	22.1	2	0	3	0	984	76.7	
hole MH-5 (ambient air)	0.0	0.1	20.5	21.6	0	0	0	0	984	78.3	
MH-4 (tubing inside manhole)	0.9	2.3	19.5	20.7	1	0	21	18	985	76.1	
hole MH-4 (ambient air)	0.0	0.1	20.7	22.1	1	0	0	0	984	77.8	
MH-3 (tubing inside manhole)	0.1	0.7	20.5	21.7	0	0	0	2	984	77.5	
hole MH-3 (ambient air)	0.1	0.1	20.9	22.3	0	0	0	0	984	77.5	
MH-2 (tubing inside manhole)	0.7	0.9	20.4	21.9	1	0	30	0	984	76.5	
hole MH-2 (ambient air)	0.0	0.0	20.9	22.2	0	0	0	0	984	77.8	
MH-1 (tubing inside manhole)	10.7	8.2	17.5	18.0	0	0	>100	>60	984	63.1	
hole MH-1 (ambient air)	0.0	0.0	20.9	22.3	0	0	0	0	984	77.7	
anout E-12 (ambient air)	0.1	0.1	20.9	22.3	0	0	2	1	983	77.5	
E-12 (tubing inside cleanout)	53.5	47.3	2.2	0.2	39	169	43	>60	983	-1.0	
anout E-13 (ambient air)	0.0	0.1	20.9	22.4	0	0	0	0	983	77.5	
E-13 (tubing inside cleanout)	55.0	48.2	20.9*	0.5	7	161	>100	>60	983	-3.7	
anout I-17 (ambient air)	0.0	0.1	20.9	22.4	0	0	0	0	984	77.5	
I-17 (tubing inside cleanout)	0.8	3.6	17.8	18.5	0	0	32	16	983	77.1	
anout K-17 (ambient air)	0.0	0.0	20.9	22.4	0	0	0	0	984	77.6	
K-17 (tubing inside cleanout)	48.7	34.3	5.7	2.8	12	15	>100	>60	983	14.2	
anout L-17 (ambient air)	0.0	0.0	20.9	22.4	0	0	0	0	983	77.6	
L-17 (tubing inside cleanout)	20.4	20.1	11.4	11.1	2	0	>100	>60	983	48.4	
inout M-17 (ambient air)	0.0	0.0	20.9	22.5	0	0	0	0	983	77.5	
M-17 (tubing inside cleanout)	0*	0.0	18.0	19.0	0	168	>100	>60	983	81.0	
inout G-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	983	77.4	
G-17 (tubing inside cleanout)	0.2	0.4	20.3	22.1	0	0	5	3	984	77.3	
inout N-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	983	77.4	
N-17 (tubing inside cleanout)	N/A (monitoring location blocked/clogged)										
inout H-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	992	77.4	
H-17 (tubing inside cleanout)	N/A (monitoring location blocked/clogged)										
inout E-16 (ambient air)	0.0	0.1	20.9	22.5	0	0	0	0	1000	77.4	
E-16 (tubing inside cleanout)	51.3	50.8	2.4	0.6	68	169	>100	>60	1000	-2.7	
inout F-16 (ambient air)	0.0	0.3	20.9	22.3	0	0	1	0	1000	77.4	
F-16 (tubing inside cleanout)	8.2	11.1	12.9	13.1	0	0	>100	>60	1000	67.6	
inout F-17 (ambient air)	0.0	0.1	20.9	22.5	0	0	0	0	999	77.4	
F-17 (tubing inside cleanout)	0.0	3.1	18.6	20.1	0	0	0	0	999	76.8	
inout G-16 (ambient air)	0.0	0.1	20.9	22.6	0	0	0	0	999	77.3	
G-16 (tubing inside cleanout)	0.0	1.8	19.5	21.1	0	0	0	0	999	77.1	
al Manhole (tubing inside)	54.6	38.4	2.4	1.8	19	168	>100	>60	983	5.2	
al M ole (ambient air)	0.0	0.0	20.9	22.5	0	0	0	0	983	77.5	

ble ieous reading based on other measurement at this monitoring location

0002663

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	10.5	4.6	17.7	16.9	0	0	>100	>60	997	68.0	4.6
Manhole MH-10 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	997	79.4	2.5
Manhole MH-9 (tubing inside manhole)	15.1	6.6	16.2	15.4	56	0	>100	>60	996	62.9	5.2
Manhole MH-9 (ambient air)	0.0	0.1	20.9	20.3	0	0	0	0	996	79.6	3.5
Manhole MH-8 (tubing inside manhole)	18.6	9.8	14.5	13.5	12	0	>100	>60	997	58.1	7.5
Manhole MH-8 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	997	79.5	3.0
Manhole MH-7 (tubing inside manhole)	0.7	0.5	20.9	20.1	0	0	33	15	997	78.7	3.3
Manhole MH-7 (ambient air)	0.1	0.2	20.9	20.3	0	0	0	1	997	79.4	3.3
Manhole MH-6 (tubing inside manhole)	0.0	0.8	20.3	19.7	22	0	0	1	1001	79.5	5.6
Manhole MH-6 (ambient air)	0.0	0.1	20.9	20.2	0	0	0	0	1001	79.7	4.0
Manhole MH-5 (tubing inside manhole)	1.1	4.0	18.3	17.7	0	0	47	22	1001	77.2	10.8
Manhole MH-5 (ambient air)	0.0	0.1	20.9	20.2	0	0	0	0	1001	79.7	4.0
Manhole MH-4 (tubing inside manhole)	0.0	0.9	20.5	19.9	28	0	7	2	1001	79.2	4.6
Manhole MH-4 (ambient air)	0.0	0.1	20.9	20.3	0	0	0	0	1001	79.6	3.5
Manhole MH-3 (tubing inside manhole)	0.6	1.4	20.2	19.7	0	0	26	13	1001	78.3	4.4
Manhole MH-3 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	1001	79.5	3.0
Manhole MH-2 (tubing inside manhole)	10.3	9.3	16.7	15.7	20	0	>100	>60	1001	64.7	5.8
Manhole MH-2 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	1001	79.4	2.5
Manhole MH-1 (tubing inside manhole)	0.0	0.8	20.5	20.2	0	0	0	1	1001	79.0	3.3
Manhole MH-1 (ambient air)	0.0	0.1	20.9	20.6	0	0	0	0	1001	79.3	2.1
Cleanout E-12 (ambient air)	46.0	3.2	20.9	18.6	0	28	>100	>60	996	32.2	-37.6
Cleanout E-12 (tubing inside cleanout)	N/A (gas odours too strong; measurements not recorded due to safety)										
Cleanout E-13 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	996	79.5	3.0
Cleanout E-13 (tubing inside cleanout)	>60	53.0	2.4	0.4	30	157	>100	>60	996		
Cleanout I-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	999	79.5	3.0
Cleanout I-17 (tubing inside cleanout)	1.1	6.1	13.9	13.6	8	0	54	23	999	79.2	28.2
Cleanout K-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	1	999	79.5	3.0
Cleanout K-17 (tubing inside cleanout)	59.3	39.3	3.4	0.1	9	1	>100	>60	999	1.3	0.9
Cleanout L-17 (ambient air)	0.0	0.1	20.9	20.0	0	0	0	1	999	79.9	4.9
Cleanout L-17 (tubing inside cleanout)	9.6	10.6	14.8	13.6	25	0	>100	>60	999	66.2	15.2
Cleanout M-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	999	79.5	3.0
Cleanout M-17 (tubing inside cleanout)	9.0	6.0	17.2	16.5	1	160	>100	>60	999	68.5	6.6
Cleanout G-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	1	998	79.5	3.0
Cleanout G-17 (tubing inside cleanout)	0.4	1.6	19.0	18.6	0	0	0	9	998	79.4	9.7
Cleanout N-17 (ambient air)	N/A										
Cleanout N-17 (tubing inside cleanout)	N/A										
Cleanout H-17 (ambient air)	N/A										
Cleanout H-17 (tubing inside cleanout)	N/A										
Cleanout E-16 (ambient air)	0.2	0.2	20.9	20.4	0	0	0	1	996	79.2	2.7
Cleanout E-16 (tubing inside cleanout)	> max. limit	52.4	2.4	0.5	51	59	>60	>60	996		
Cleanout F-16 (ambient air)	0.0	0.1	20..9	20.5	0	0	0	1	996	79.4	2.5
Cleanout F-16 (tubing inside cleanout)	0.0	5.6	15.3	14.8	0	0	9	2	996	79.6	24.1
Cleanout F-17 (ambient air)	0.0	0.1	20.9	20.4	4	0	0	0	996	79.5	3.0
Cleanout F-17 (tubing inside cleanout)	18.6	20.7	2.4	3.1	35	0	>100	>60	996	57.6	46.0
Cleanout G-16 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	996	79.4	2.5
eanout G-16 (tubing inside cleanout)	0.0	7.2	3.0	14.5	0	0	14	0	996	78.3	23.9
Central Manhole (tubing inside)	56.2	43.0	2.7	0.3	26	160	>100	>60	999	0.5	-0.6
Central Manhole (ambient air)											

002664

Monitoring Location	Methane CH_4(%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	4.0	2.0	19.9	20.0	13	0	>100	>60	1003	74.0	-1.0
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	12.1	5.3	17.5	17.4	23	0	>100	>60	1003	65.2	0.0
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	2.8	1.5	19.8	20.3	41	0	>100	>60	1003	75.4	-0.7
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.2	0.3	20.9	21.2	57	0	0	4	1003	78.3	-1.2
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.0	0.5	20.9	20.4	0	1	0	0	1005	79.1	2.6
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	0.5	1.8	19.6	19.9	83	0	14	11	1005	77.8	3.2
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	0.0	0.4	20.9	21.2	178	4	0	0	1005	78.4	-1.1
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	1.2	2.1	19.9	20.8	37	70	27	24	1005	75.9	-2.1
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	29.8	22.5	10.4	10.3	78	0	>100	>60	1005	37.4	-1.2
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	0.2	20.1	21.9	23	0	10	1	1005	77.9	-4.2
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	50.5	46.1	1.8	1.8	28	1	>100	>60	1003	1.6	-5.2
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	50.9	42.5	8.1	1.9	7	1	>100	>100	1003	4.7	-2.4
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.2	0.9	20.9	20.8	3	0	6	4	1005	78.1	0.1
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	33.8	24.1	10.8	8.8	65	7	>100	1	1005	33.3	0.3
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	0.7	1.2	19.5	20.7	40	0	41	15	1004	77.4	-0.2
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	1.2	1.3	20.2	20.6	33	3	38	25	1004	76.9	-0.3
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	45.7	50.3	5.9	7.7	45	196	>100	>60	1004	-3.7	-32.6
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	13.8	13.7	3.7	15.6	78	0	>100	>100	1003	56.9	-1.6
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	0.0	0.1	20.9	20.1	0	0	0	0	1003	79.8	4.4
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	8.6	10.8	11.6	13.0	44	0	>100	>100	1003	67.6	18.9
Cleanout G-16 (ambient air)											
leanout G-16 (tubing inside cleanout)	0.0	0.2	20.1	21.1	46	0	0	0	1003	78.7	-0.4
Central Manhole (tubing inside)	59.4	40.1	3.6	0.3	4	208	>100	>60	1002	0.2	-0.9
Central Manhole (ambient air)											

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Monitoring Location	Methane CH_4(%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)											
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	10.2	5.2		12.1						72.5	27.1
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	12.2	6.8		16.1						64.9	4.5
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)											
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)											
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)											
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)											
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)											
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)											
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)											
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)											
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)											
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)											
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)											
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)											
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)											
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)											
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)											
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)											
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)											
Cleanout G-16 (ambient air)											
leanout G-16 (tubing inside cleanout)											
Central Manhole (tubing inside)											
Central Manhole (ambient air)											

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Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	0.4	0.5		21.0				8	1017	78.1	-0.7
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	0.2	1.2		20.9				4		77.7	-0.7
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	1.1	2.5		20.3				21		76.1	0.0
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.0	0.1		21.2				1		78.7	-0.8
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.1	2.4		20.3				2		77.2	1.1
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	2.1	6.5		18.6				42		72.8	3.1
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	0.0	0.0		21.3				0		78.7	-1.2
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	11.2	9.9		15.6				>100		63.3	4.8
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	2.5	3.9		19.6				51		74.0	0.5
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	0.8		21.0				0		78.2	-0.5
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	49.6	45.9		2.4				>100		2.1	-6.9
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	55.5	43.2		1.0				>100		0.3	-3.5
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.2	2.4		18.4				5		79.0	10.0
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	46.5	32.6		2.8				>100		18.1	7.6
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	3.2	1.0		13.1				64		82.7	33.6
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	2.6	2.5		19.6				53		75.3	1.8
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	0.0	0.9		20.0				0		79.1	4.1
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	52.8	46.3		0.9				>100		0.0	-3.4
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	12.5	17.5		4.7				>100		65.3	47.7
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	0.0	4.9		16.3				0		78.8	17.7
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	2.0		19.0				0		79.0	7.8
Central Manhole (tubing inside)	7.8	8.8		16.4				>100		67.0	5.5
Central Manhole (ambient air)											

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Notes: (1) Pressure previously recorded as 30 mmHg. Assumed error and has been corrected to inHg. Received client confirmation March 8, 2019

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	0.7	0.7		21.3					1017	77.3	-2.6
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	0.5	1.8		21.1		0				76.6	-2.5
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	0.3	1.4		21.2		0				77.1	-2.4
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.0	0.2		21.7		0				78.1	-3.3
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.0	1.8		21.1		0				77.1	-2.0
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	2.0	6.6		18.7		0				72.7	2.6
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	12.8	9.7		15.7		0				61.8	2.9
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	24.0	19.3		10.0		0				46.7	9.2
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	2.6	5.0		19.5		0				72.9	-0.2
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	1.3		21.1		0					
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	48.9	45.4		2.8		204		>100		2.9	-7.6
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	54.2	45.5		0.2		204		>100	1024	0.1	-0.7
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.4	3.2		17.8		0				78.6	11.9
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	47.7	33.0		2.9		2				16.4	5.5
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	4.8	11.2		12.0		0				72.0	27.0
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	2.0	2.1		19.9		0				76.0	1.4
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	0.0	0.9		20.0		0				79.1	4.1
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	52.0	46.8		0.5		54		>100		0.7	-1.2
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	10.6	16.5		5.5		5		>100		67.4	46.8
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	0.0	4.5		17.1		0		0		78.4	14.3
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	2.0		19.5		0		0		78.5	5.4
Central Manhole (tubing inside)	6.6	7.6		17.2		0				68.6	4.1
Central Manhole (ambient air)											

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...tes: (1) Pressure previously recorded as 30 mmHg. Assumed error and has been corrected to inHg. Received client confirmation March 8, 2019

Appendix '3'

Golder 2021 Noise Monitoring Memorandum

GOLDER
MEMBER OF WSP

TECHNICAL MEMORANDUM

DATE February 16, 2022 **Project No.** 20412275

TO Henri Huneault, Landfill Site Manager
Waste Connections of Canada

CC joe_tomaselli@golder.com

FROM Yanqing Zeng **EMAIL** yanqing_zeng@Golder.com

WASTE CONNECTIONS OF CANADA NAVAN FACILITY NOISE MONITORING 2021

Dear Mr. Huneault:

Golder Associates Ltd. (Golder) was retained to carry out annual noise monitoring for the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (WCC Navan Facility) in the eastern portion of Ottawa, Ontario. Noise monitoring was carried out to fulfill the requirements as outlined in Section 9.5 of the Design & Operations Report Navan Landfill Site Expansion Approvals (January 2008). This memorandum provides a summary of the noise monitoring results for 2021.

Site Operations

The WCC Navan Facility is a waste management facility that handles solid, non-hazardous industrial and commercial waste (including construction and demolition waste), asbestos waste, dry non-putrescible (i.e., non-organic) domestic waste and impacted soil. The facility operates six days a week, from 7:00 am to 5:00 pm on weekdays and 8:00 am to 1:00 pm on Saturday. The existing operations allow for a maximum of 234,750 tonnes of waste per year to be landfilled with an average daily maximum of 1,500 tonnes. Figure 1 (attached) shows a key plan of the site and surrounding area.

Methodology

An annual noise monitoring program was completed in 2021 using two Larson Davis 820 sound level meters located at the nearest residential receptors (i.e., points of reception (POR(s))) to the WCC Navan Facility. Noise data was logged every hour for the duration of the monitoring period. The monitoring was carried out from November 1 to November 9, 2021. Monitoring locations are shown in Figure 1 (attached). All monitoring data is summarized in Appendix A. Weather data during the monitoring program is provided in Appendix B.

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Results

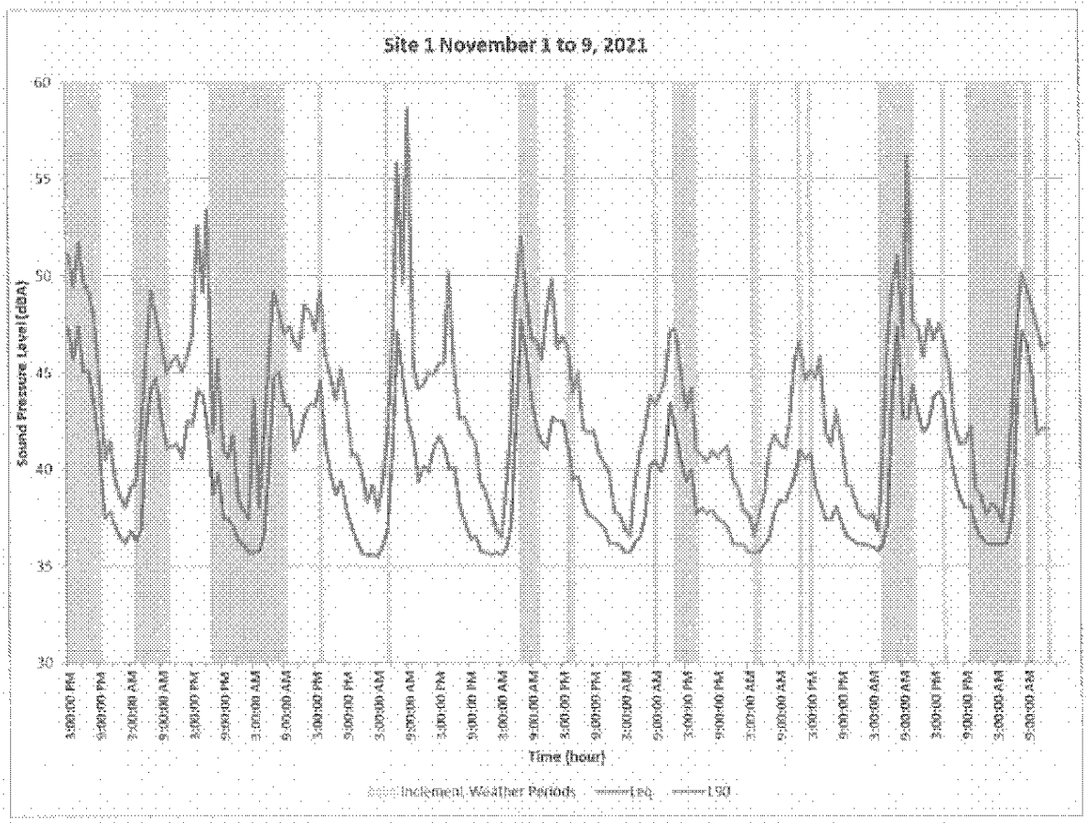
Table 1 summarizes the noise monitoring results for the 2021 monitoring program.

Table 1: Summary of Daytime Noise Levels

Monitoring Site	Minimum Daytime Hourly L_{eq} (dBA)	Minimum Daytime Hourly L_{90} (dBA)	Average Daytime Hourly L_{eq} (dBA)	Average Daytime Hourly L_{90} (dBA)
Monitoring Site 1	41	37	48	42
Monitoring Site 2	48	30	57	49

Notes: Data represents monitored levels over the entire monitoring period

Data collected during periods of inclement weather (i.e., rain and/or high wind speeds, in excess of 18 km/h, the limit described in International Standards Organization (ISO) 1996-2 (2007) Standard *Acoustics – Description, measurement and assessment of environmental Noise – Part 2: Determination of environmental noise levels for favourable sound propagation conditions*) were excluded from the calculated levels provided in Table 1.
The periods of monitoring for which data was excluded from the calculation are shown in Plots 1 and 2 as shaded regions.



Plot 1: November 2021 Noise Monitoring Results – Monitoring Site 1

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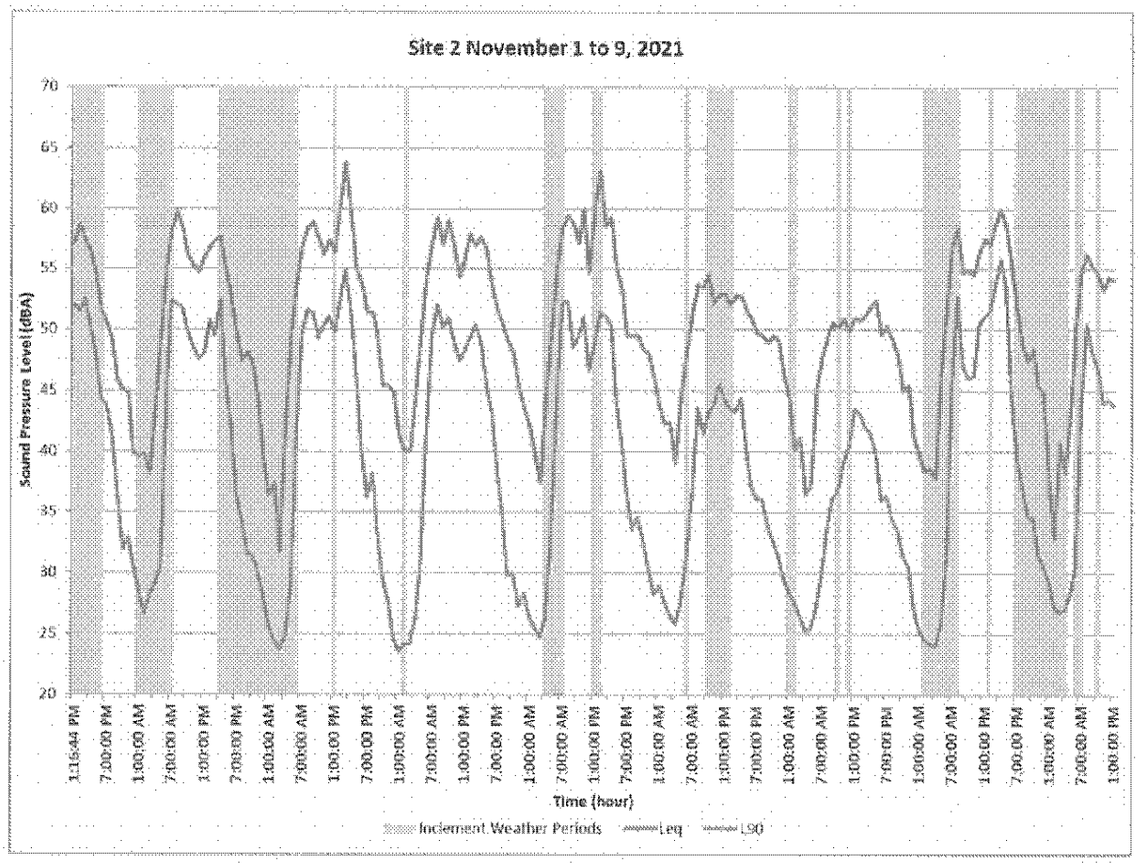

Plot 2: November 2021 Noise Monitoring Results – Monitoring Site 2

Criteria and Guidelines

The WCC Navan Facility and PORs are located on Parts of Lots 2, 3 and 4, Concession 4, Ottawa Front (formerly the City of Gloucester). The noise criteria for the WCC Navan Facility are based on the Ministry of Environment, Conservation and Parks (MECP) (formerly known as the Ministry of the Environment and Climate Change (MOECC)) Noise Guidelines for Landfill Sites (October 1998) and Noise Pollution Control (NPC) publication NPC 300 (August 2013). The Landfill Guideline outlines the sound level limit criteria for evaluating landfill site operations (i.e., landfilling activities) and NPC 300 provides the criteria for on-site stationary noise sources (i.e., non-landfilling activities). Table 2 summarizes the sound level limits at a POR due to landfill site operations.

Table 2: Applicable Noise Limits

	Daytime (07:00 – 19:00)	Night-time (19:00 – 07:00)
Landfilling Operations – 1-Hour Equivalent Sound Level – L_{eq} (dBA)	55	45
Stationary Sources – 1-Hour Equivalent Sound Level – L_{eq} (dBA)	50	45

Discussion

Based on site observations, the noise levels at the two PORs are dominated by road traffic noise along Navan Road and with audible noise from landfilling operations of the WCC Navan Facility, as confirmed during Golder staff visits (i.e., deployment and collection of the monitoring equipment). Golder's January 2008 report predicted a noise impact level for the existing site operations of the WCC Navan Facility on the surrounding PORs to be between 27 and 37 dBA due to site operations. The measured average hourly noise levels were equal to 48 dBA and 57 dBA at Monitoring Location 1 and Monitoring Location 2, respectively. The noise level at Monitoring Location 1 was below the applicable MECP Landfill Guidelines for landfilling operations noise limit, whereas at Monitoring Location 2 the average cumulative (i.e. ambient plus landfill) hourly noise level was 2 dB above the noise limit. During the site visit it was observed that noise levels at Monitoring Location 1 were predominantly influenced by traffic on the adjacent road with lesser contributions from the landfill. The noise level at Monitoring Location 2 was dominated by both; activities at the landfill and contributions from traffic on the adjacent road. In 2021 and into the near future there was and continues to be construction works in the vicinity of the landfill. These activities are expected to include increased traffic from the construction of residential and infrastructure projects in the area.

Monitor Location 2 has historically been used to represent the area due to the ease of gaining access to the property as WCC owns the property. This monitoring site is not actually the nearest point of reception (POR) in the vicinity of the Facility as this residence is located within the Facility property line. The closest POR relevant to the Monitoring Location 2 would be located approximately 100 m northeast of the Monitoring Location 2 site. It is expected that the Facility noise contributions measured at the actual nearest off-site noise POR would be lower due to the increased distance between the Facility noise sources and the POR. Based on the above, it is expected that the noise emissions from the Facility operations could be meeting the applicable noise limit at the noise receptors located north of the Monitoring Location 2 site. Therefore, the Facility is expected to be able to operate within compliance with the relevant noise limits based on the results of 2021 noise monitoring.

It should be noted that it is understood the Facility is not a source of noise complaints from area residents.

Proposed Future Noise Monitoring

As discussed above, the noise levels in the area are dominated by traffic along Navan Road as well as current operations of the Facility (i.e., within the northeast area of the Landfill). Based on the findings from the 2021 and previous monitoring programs, Golder recommends that the noise monitoring at the WCC Navan Facility continue to be conducted on an annual basis with one monitoring session per year. In addition, if a noise complaint is received, it is recommended that additional noise investigations be completed to determine whether noise control (e.g., administrative or engineering) will be required.

Closure

Golder Associates Ltd. was retained to carry out noise monitoring for Waste Connections Canada (WCC) at the WCC Navan Facility in the eastern portion of Ottawa, Ontario. The monitoring results and site observations indicate that the landfilling noise levels, expressed in average 1-hour Leq is observed to be below the noise limit at Monitoring Location 1 and slightly above the noise limit at the Monitoring Location 2. With the understanding that the current Monitoring Location 2 site is located within the property line of the landfill, and the actual nearest offsite POR is located further from the landfill equipment, it is expected that the noise levels from the Facility operations at the nearest off-site PORs would be within the applicable noise limit. Based on these results, the operations of the WCC Navan Facility are expected to be operating in compliance with the MECP Landfill Guideline and NPC 300 limits as summarized in Table 2, where applicable.

If you have any further questions or concerns, please do not hesitate to contact the undersigned at your earliest convenience.

Golder Associates Ltd.

Yanqing Zeng, M.A.E.
Acoustics, Noise and Vibration Specialist

Joe Tomaselli, M.Eng., P.Eng.
Associate/Senior Acoustics, Noise and Vibration Engineer

YZ/TN/JT/sg
https://golderassociates.sharepoint.com/sites/136820/project files/6 deliverables/1200_2021 noise memo/20412275-tm-rev0 waste connections of canada navan_16feb2022.docx

Attachments: Figure1 – Noise Monitoring Locations
Appendix A – Noise Data
Appendix B – Weather Data November 1 to 9, 2021

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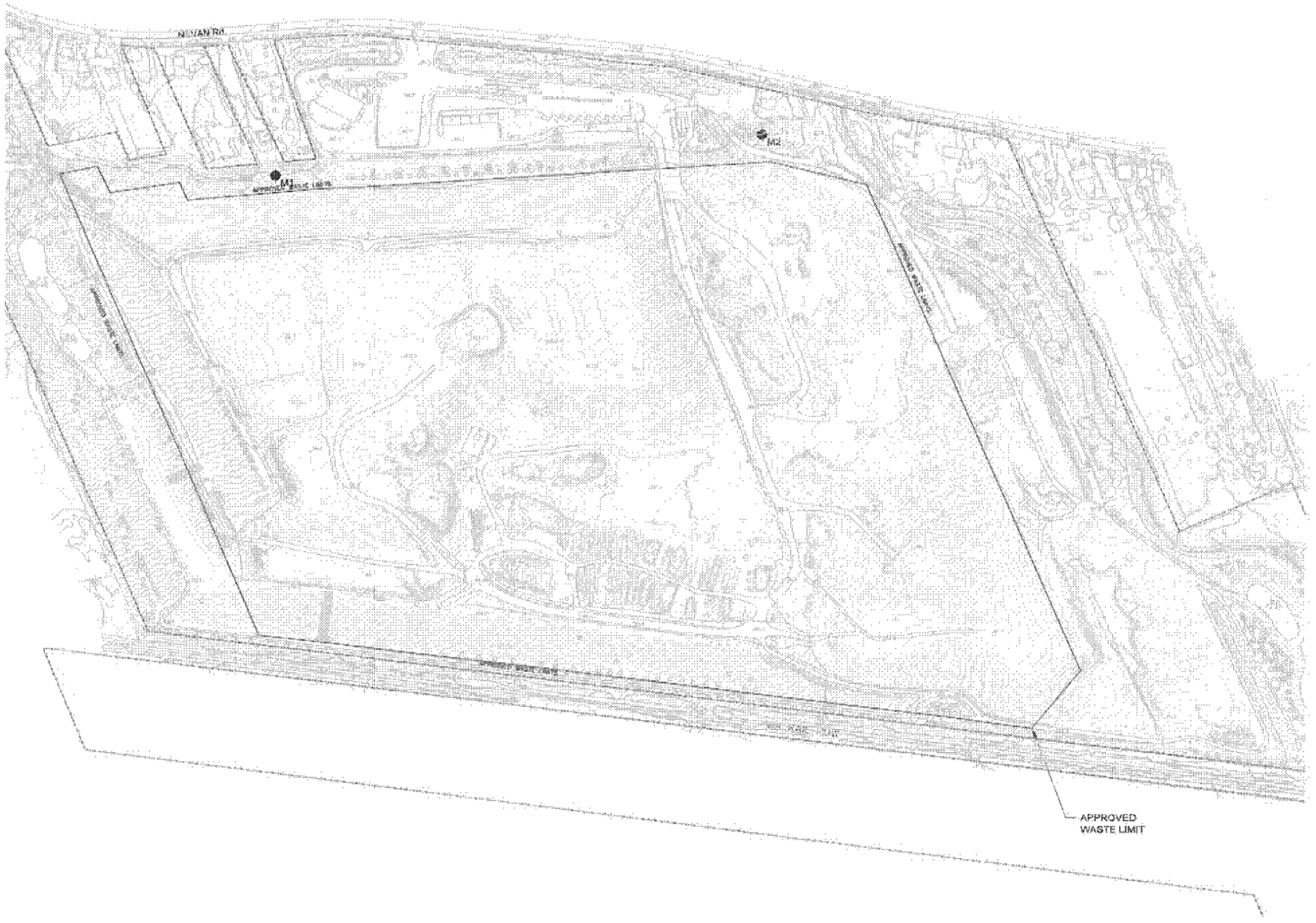
FIGURE



SITE

LEGEND

- MONITORING
- VERTICAL / H
- INDEX / INTEI
- SPOT ELEVA
- HEDGE LINE
- GUARD RAIL
- RETAINING W
- FENCE LINE
- WOODED AR
- SINGLE TREE
- SHORELINE / DITCH / STRE MARCH
- BUILDING
- POST
- AREA OUTLI
- PAVED / LOO
- PROPERTY E

REFERENCE(S)

1. PROPERTY LINE PROVIDED IN DENIS SURVEYING LTD. FILE
2. BASE INFORMATION PROVIDE FORMAT FROM CONTRACT NO
3. COORDINATE SYSTEM NAD 8

0

1:5,000

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CLIENT

WASTE CONNECTIONS OF CANADA

CONSULTANT

YYYY-MM-DD 2021-12-10

PROJECT

NAVAN WASTE RECYC
3354 NAVAN ROAD, OT

TITLE

APPENDIX A

Noise Data

Table A1 summarizes noise levels measured at Monitoring Site 1 and Monitoring Site 2.

Table A1: Measured Noise Levels [dBA]

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-1-21	15:00	51.1	47.3	57.3	52.5
11-1-21	16:00	49.4	45.7	56.5	50.3
11-1-21	17:00	51.7	47.4	54.7	48
11-1-21	18:00	49.7	45.1	51.7	44.4
11-1-21	19:00	49.2	45.1	50.6	43.7
11-1-21	20:00	47.8	43.3	49.2	41.4
11-1-21	21:00	44.6	41	45.8	36.6
11-1-21	22:00	40.5	37.5	45.1	32
11-1-21	23:00	41.5	37.8	44.8	32.9
11-2-21	0:00	39.5	37.1	39.9	30.8
11-2-21	1:00	38.6	36.5	39.6	28.6
11-2-21	2:00	38.1	36.2	39.8	26.7
11-2-21	3:00	39.1	36.8	38.2	28.1
11-2-21	4:00	39.3	36.3	43.6	29.2
11-2-21	5:00	42.2	36.9	49.5	30.5
11-2-21	6:00	45.8	42.2	55.2	45.1
11-2-21	7:00	49.2	44.2	58	52.4
11-2-21	8:00	47.9	44.7	59.8	52.1
11-2-21	9:00	46.5	42.5	58.4	51.8
11-2-21	10:00	45	41.1	56.1	49.8
11-2-21	11:00	45.6	41.2	55.3	48.5
11-2-21	12:00	45.9	41.3	54.7	47.6
11-2-21	13:00	45.1	40.6	55.9	48
11-2-21	14:00	45.9	42.5	56.7	50.7
11-2-21	15:00	46.9	42.3	57.3	49.5
11-2-21	16:00	52.6	44.1	57.6	52.4
11-2-21	17:00	49.2	43.8	55	45.7
11-2-21	18:00	53.4	42.2	52.7	42
11-2-21	19:00	41.9	38.7	49.6	36.3
11-2-21	20:00	45.7	39.8	47.4	34.3
11-2-21	21:00	41	37.5	48.2	31.6
11-2-21	22:00	40.6	37.4	47.1	31.3
11-2-21	23:00	41.9	37.1	44.3	30.1
11-3-21	0:00	38.4	36.3	39.5	28.1

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-3-21	1:00	37.9	36.1	36.4	25.7
11-3-21	2:00	37.4	35.7	37.3	24.4
11-3-21	3:00	43.7	35.7	31.8	23.7
11-3-21	4:00	38	35.8	42.5	24.7
11-3-21	5:00	41.6	36.6	49.8	29.1
11-3-21	6:00	45.5	40.2	53.6	40.9
11-3-21	7:00	49.2	44.8	56.7	49.7
11-3-21	8:00	48.2	45	58.3	51.6
11-3-21	9:00	47	43.3	58.9	51.4
11-3-21	10:00	47.4	43.3	57.6	49.4
11-3-21	11:00	46.6	41	56.2	50.4
11-3-21	12:00	46.2	41.7	57.3	51
11-3-21	13:00	48.5	42.8	56.4	49.8
11-3-21	14:00	48.1	43.4	60	52.2
11-3-21	15:00	47.2	43.3	63.8	54.8
11-3-21	16:00	49.2	44.5	59.6	51.5
11-3-21	17:00	45.9	41.3	55	46.3
11-3-21	18:00	44.8	39.7	53.8	40
11-3-21	19:00	43.6	38.7	51.4	36.3
11-3-21	20:00	45.2	39.4	51.4	38.2
11-3-21	21:00	43.2	37.9	49.4	33.5
11-3-21	22:00	40.7	37	45.4	29.6
11-3-21	23:00	40.8	36.3	45.4	27.8
11-4-21	0:00	39.8	35.7	44.8	24.6
11-4-21	1:00	38.3	35.6	41.2	23.6
11-4-21	2:00	39.2	35.6	40	24.1
11-4-21	3:00	37.9	35.5	40	24.2
11-4-21	4:00	39.6	36.1	44.8	26.3
11-4-21	5:00	41.8	36.8	49.3	30.6
11-4-21	6:00	46.2	40.9	54.2	41.6
11-4-21	7:00	55.8	47.1	57	49.6
11-4-21	8:00	49.6	44.7	59.3	52
11-4-21	9:00	58.7	42.5	56.9	50.2
11-4-21	10:00	45.3	41.4	59	50.9
11-4-21	11:00	44.2	39.4	56.9	49
11-4-21	12:00	44.3	40.2	54.3	47.5
11-4-21	13:00	45	39.9	55.7	48.2

Appendix A Noise Data

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-4-21	14:00	44.9	41.2	57.8	49.3
11-4-21	15:00	45.5	41.7	56.9	50.4
11-4-21	16:00	45.5	41.1	57.6	49
11-4-21	17:00	50.2	40	56.6	45.4
11-4-21	18:00	45.3	40.1	53.5	43.1
11-4-21	19:00	42.6	38.1	51.6	38.4
11-4-21	20:00	42.7	37.2	50.6	35.2
11-4-21	21:00	41.8	36.4	49.1	29.8
11-4-21	22:00	41.4	36.5	48.2	30
11-4-21	23:00	39.4	35.8	45.4	27.3
11-5-21	0:00	38.8	35.7	43.5	28.3
11-5-21	1:00	37.9	35.6	42.2	26.4
11-5-21	2:00	36.9	35.7	39.7	25.5
11-5-21	3:00	36.5	35.6	37.4	24.7
11-5-21	4:00	39.2	36	44.2	26.4
11-5-21	5:00	42.1	37.2	49.5	32.9
11-5-21	6:00	48.9	42.7	55	44.2
11-5-21	7:00	52	47.7	58.5	52.2
11-5-21	8:00	49	45.8	59.4	52.3
11-5-21	9:00	46.7	43.4	58.8	48.6
11-5-21	10:00	46.7	42	57.1	49.5
11-5-21	11:00	45.7	41.4	60	51
11-5-21	12:00	48.1	41.1	54.7	46.7
11-5-21	13:00	49.8	42.7	60.1	48.9
11-5-21	14:00	46.3	42.5	63.1	51.4
11-5-21	15:00	46.8	42.5	58.5	51.1
11-5-21	16:00	46.3	41.1	59.3	50.4
11-5-21	17:00	44	39.5	55	43.9
11-5-21	18:00	45	39.6	53.3	40.6
11-5-21	19:00	42.1	38.3	49.5	36.7
11-5-21	20:00	41.9	37.6	49.5	33.6
11-5-21	21:00	42	37.5	49.6	34.6
11-5-21	22:00	40.7	37.2	48.4	32.7
11-5-21	23:00	40.4	37	48	30.4
11-6-21	0:00	39.8	36.2	46	28.2
11-6-21	1:00	37.8	36.2	43.6	28.9
11-6-21	2:00	37.7	36.1	42.4	27.7

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Appendix A Noise Data

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-6-21	3:00	36.9	35.7	42.4	26.6
11-6-21	4:00	36.6	35.7	39.1	25.8
11-6-21	5:00	39.2	36.2	44.6	27.6
11-6-21	6:00	40.9	36.5	48.2	31.3
11-6-21	7:00	42.1	37.6	51.3	36.4
11-6-21	8:00	43.8	40.2	53.7	43.6
11-6-21	9:00	43.3	40.4	53.5	41.5
11-6-21	10:00	43.9	39.9	54.5	43.2
11-6-21	11:00	44.6	40.7	52.2	43.8
11-6-21	12:00	47.2	43.4	52.9	45.5
11-6-21	13:00	47.2	42	53	44.3
11-6-21	14:00	45.1	40.4	52	43.5
11-6-21	15:00	43.1	39.4	52.8	43.3
11-6-21	16:00	44.2	40	52.8	44.4
11-6-21	17:00	41	37.7	51.6	39.9
11-6-21	18:00	40.7	38	50.9	37.1
11-6-21	19:00	40.4	37.7	49.8	36.1
11-6-21	20:00	40.9	37.9	49.6	36.1
11-6-21	21:00	40.6	37.4	49	33.9
11-6-21	22:00	41	37.3	49.5	32.6
11-6-21	23:00	41.2	37	49.1	31.4
11-7-21	0:00	39.5	36.2	46.1	29.4
11-7-21	1:00	39	36.1	44.6	28.5
11-7-21	2:00	37.9	36.1	40.1	27.6
11-7-21	3:00	37.7	35.7	41.1	26.5
11-7-21	4:00	36.6	35.7	36.5	25.3
11-7-21	5:00	37.6	35.7	37.2	25.5
11-7-21	6:00	38.6	36.1	45.2	27.3
11-7-21	7:00	41	36.5	47.7	30.1
11-7-21	8:00	41.8	37.8	49.5	34
11-7-21	9:00	41.3	38.4	50.6	36.1
11-7-21	10:00	41.1	38.3	50.2	36.7
11-7-21	11:00	42.5	39	51	39.1
11-7-21	12:00	45.6	39.6	50	40.4
11-7-21	13:00	46.6	41	51	43.5
11-7-21	14:00	44.6	40.5	50.8	43.1
11-7-21	15:00	45.1	40.8	51.2	42

Appendix A Noise Data

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-7-21	16:00	44.7	39	51.9	41.6
11-7-21	17:00	45.8	38.3	52.4	39.9
11-7-21	18:00	41.9	37.4	49.6	36
11-7-21	19:00	41.3	37.4	50.3	36.3
11-7-21	20:00	43.1	38.1	49.2	34.4
11-7-21	21:00	41.4	37.2	47.9	33.5
11-7-21	22:00	39.2	36.5	45	31.3
11-7-21	23:00	39.1	36.4	45.4	30.5
11-8-21	0:00	38	36.2	41.3	27.2
11-8-21	1:00	37.6	36.1	39.8	25.4
11-8-21	2:00	37.5	36.1	38.4	24.5
11-8-21	3:00	37.7	36	38.6	24.2
11-8-21	4:00	36.8	35.8	37.7	24
11-8-21	5:00	40.5	36.1	46.6	25.7
11-8-21	6:00	46.5	37.2	51.9	31.1
11-8-21	7:00	49.3	44	56.7	45.3
11-8-21	8:00	51.1	47.4	58.4	52.7
11-8-21	9:00	46.8	42.6	54.7	47.1
11-8-21	10:00	56.2	42.6	54.9	46
11-8-21	11:00	47.6	44.3	54.5	46.2
11-8-21	12:00	47.4	42.9	56.3	50.5
11-8-21	13:00	45.8	41.9	57.5	51.1
11-8-21	14:00	47.7	42.3	57	51.6
11-8-21	15:00	46.7	43.7	58.6	53.6
11-8-21	16:00	47.5	44	60	55.8
11-8-21	17:00	46.7	43.5	58.6	53.4
11-8-21	18:00	45.3	41.1	55.4	44.5
11-8-21	19:00	42.2	39.6	51.8	39.6
11-8-21	20:00	41.3	38.5	48.8	37
11-8-21	21:00	41.4	38	47.4	34.7
11-8-21	22:00	42.2	38.1	48.4	34.5
11-8-21	23:00	39	37.1	45.4	31.6
11-9-21	0:00	38.7	36.5	44.7	30.5
11-9-21	1:00	37.6	36.2	37.6	29.3
11-9-21	2:00	38.2	36.1	32.9	27.2
11-9-21	3:00	38	36.1	40.7	26.8
11-9-21	4:00	37.3	36.1	38.3	27.1

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Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-9-21	5:00	39.5	36.2	43.6	28.4
11-9-21	6:00	42.6	37.5	50.1	30.5
11-9-21	7:00	47	43.1	55	44
11-9-21	8:00	50.1	47.1	56.2	50.5
11-9-21	9:00	49.3	46.5	55.2	48.1
11-9-21	10:00	48.3	44.6	54.6	46.9
11-9-21	11:00	47.4	41.8	53.3	44
11-9-21	12:00	46.2	42.1	54.3	44.2
11-9-21	13:00	46.5	42.1	54.1	43.8

Notes: Rows highlighted in yellow represent data monitored during the Facility daytime period of operations.
[a] Noise data not available for this period of measurement

APPENDIX B

Weather Data November 1 to 9, 2021

Station Name	OTTAWA INT'L
Province	ONTARIO
Latitude	45.32
Longitude	-75.67
Elevation	114
Climate Identifier	6106001
WMO Identifier	71628
TC Identifier	YOW

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Table B1: Weather Data November 1 to November 9, 2021

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-01 13:00	10.6	-2.5	40	25	32	99.98	Mainly Clear
2021-11-01 14:00	11.1	-1.6	41	24	27	100	NA
2021-11-01 15:00	9.6	-2.2	43	24	22	100.02	NA
2021-11-01 16:00	9	-0.6	51	25	29	100.06	Mostly Cloudy
2021-11-01 17:00	6.7	1	67	26	29	100.14	NA
2021-11-01 18:00	5.5	0.7	71	23	21	100.19	NA
2021-11-01 19:00	4.6	0.9	77	23	20	100.25	Clear
2021-11-01 20:00	3.9	0.7	80	23	17	100.29	NA
2021-11-01 21:00	3.3	0.5	82	24	13	100.36	NA
2021-11-01 22:00	2.5	0.4	86	25	8	100.39	Clear
2021-11-01 23:00	1.7	-0.9	83	24	10	100.4	NA
2021-11-02 0:00	1.6	-0.1	89	24	4	100.41	NA
2021-11-02 1:00	1.1	-0.6	89	25	5	100.38	Clear
2021-11-02 2:00	-1	-1.9	94	18	4	100.4	NA
2021-11-02 3:00	0.1	-0.4	96	19	7	100.39	NA
2021-11-02 4:00	0.7	0.2	96	25	8	100.39	Mostly Cloudy
2021-11-02 5:00	0.5	-0.2	95	21	8	100.41	NA
2021-11-02 6:00	-0.1	-0.7	96	19	8	100.41	NA
2021-11-02 7:00	-0.2	-0.9	95	19	8	100.45	Mainly Clear
2021-11-02 8:00	1.1	0	93	20	9	100.48	NA
2021-11-02 9:00	3.4	1.4	86	22	10	100.48	NA
2021-11-02 10:00	4.1	1.5	83	21	11	100.5	Mostly Cloudy
2021-11-02 11:00	5.6	1.6	76	23	10	100.48	NA
2021-11-02 12:00	7.9	1.7	65	22	13	100.41	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-02 13:00	9.2	0.7	55	22	18	100.36	Mostly Cloudy
2021-11-02 14:00	6.8	2.6	74	15	5	100.35	NA
2021-11-02 15:00	7.5	0.9	63	19	10	100.34	NA
2021-11-02 16:00	6.1	2.1	75	32	14	100.38	Mostly Cloudy
2021-11-02 17:00	3.3	2.1	92	32	20	100.43	Rain Showers
2021-11-02 18:00	3.3	2.1	92	24	8	100.5	Rain Showers
2021-11-02 19:00	3.1	2.4	95	26	8	100.55	Rain Showers
2021-11-02 20:00	1.8	1.2	96	23	8	100.55	NA
2021-11-02 21:00	1.2	0.8	97	25	3	100.58	NA
2021-11-02 22:00	1.4	1.2	99	22	7	100.6	Mostly Cloudy
2021-11-02 23:00	0.9	0.8	99	22	8	100.62	NA
2021-11-03 0:00	0.8	0.6	99	25	5	100.63	NA
2021-11-03 1:00	0.9	0.8	99	25	5	100.66	Cloudy
2021-11-03 2:00	1.1	1	99	29	7	100.68	NA
2021-11-03 3:00	1.3	1.2	99	36	8	100.67	NA
2021-11-03 4:00	1	0.7	98	2	7	100.68	Cloudy
2021-11-03 5:00	1	0.3	95	29	4	100.72	NA
2021-11-03 6:00	1.3	0.3	93	33	11	100.78	NA
2021-11-03 7:00	1.1	-0.2	91	32	10	100.82	Mostly Cloudy
2021-11-03 8:00	1.6	-0.3	88	33	13	100.91	NA
2021-11-03 9:00	2.2	-0.8	80	32	10	100.96	NA
2021-11-03 10:00	2.8	-1.6	73	33	9	101	Clear
2021-11-03 11:00	3.2	-3.8	60	33	9	101.05	NA
2021-11-03 12:00	4.1	-4	56	34	14	101.02	NA
2021-11-03 13:00	4.9	-5.6	47	28	15	100.98	Mostly Cloudy
2021-11-03 14:00	5.2	-5.4	46	29	24	101.01	NA
2021-11-03 15:00	4.8	-5.6	47	28	18	101.03	NA
2021-11-03 16:00	4.4	-6.2	46	27	16	101.05	Mostly Cloudy
2021-11-03 17:00	0.7	-6	61	25	12	101.09	NA
2021-11-03 18:00	0.5	-5.7	63	25	9	101.13	NA
2021-11-03 19:00	-0.1	-6.3	63	27	11	101.16	Mainly Clear
2021-11-03 20:00	-0.9	-6.5	66	25	8	101.17	NA
2021-11-03 21:00	-3	-5.4	83	23	4	101.22	NA
2021-11-03 22:00	-1.6	-6.2	71	24	7	101.25	Mainly Clear
2021-11-03 23:00	-2	-5.4	78	24	5	101.27	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-04 0:00	-2.7	-5.1	83	24	3	101.28	NA
2021-11-04 1:00	-3.5	-5.7	85	32	4	101.27	Mainly Clear
2021-11-04 2:00	-2.7	-4.8	86	29	4	101.28	NA
2021-11-04 3:00	-3.1	-4.3	91	36	5	101.28	NA
2021-11-04 4:00	-2.3	-4.3	86	3	6	101.27	Mostly Cloudy
2021-11-04 5:00	-1.3	-4	82	1	6	101.29	NA
2021-11-04 6:00	-3	-5.3	84	1	8	101.27	NA
2021-11-04 7:00	-3	-4.8	87	1	4	101.31	Mostly Cloudy
2021-11-04 8:00	-0.9	-2.6	88	6	4	101.33	NA
2021-11-04 9:00	0.9	-3	75	34	4	101.35	NA
2021-11-04 10:00	2.7	-3	66	10	4	101.34	Mainly Clear
2021-11-04 11:00	4.2	-4.3	54	20	11	101.35	NA
2021-11-04 12:00	3.7	-3.6	59	28	7	101.3	NA
2021-11-04 13:00	4.8	-5.3	48	25	4	101.19	Mostly Cloudy
2021-11-04 14:00	3.9	-4.1	56	30	10	101.17	NA
2021-11-04 15:00	5.2	-5.4	46	27	15	101.15	NA
2021-11-04 16:00	4.3	-5.2	50	25	15	101.14	Mainly Clear
2021-11-04 17:00	2.2	-6.3	53	30	9	101.15	NA
2021-11-04 18:00	2.6	-6.3	52	34	7	101.21	NA
2021-11-04 19:00	-0.9	-6.5	66	18	3	101.21	Clear
2021-11-04 20:00	-2	-6.6	71	13	3	101.17	NA
2021-11-04 21:00	-2.5	-5.8	78	16	7	101.18	NA
2021-11-04 22:00	-1.7	-6.6	69	16	5	101.23	Clear
2021-11-04 23:00	-2.4	-6.1	76	13	7	101.21	NA
2021-11-05 0:00	-2.2	-5.7	77	17	10	101.21	NA
2021-11-05 1:00	-1.5	-4.4	81	15	8	101.18	Mostly Cloudy
2021-11-05 2:00	-1.8	-4.1	84	10	3	101.18	NA
2021-11-05 3:00	-1.9	-4.3	83	16	6	101.18	NA
2021-11-05 4:00	-1.7	-3.7	86	36	1	101.21	Mostly Cloudy
2021-11-05 5:00	-3	-4.2	91	21	4	101.24	NA
2021-11-05 6:00	-2.1	-3.3	92	23	5	101.28	NA
2021-11-05 7:00	-4.2	-4.9	95	23	7	101.35	Clear
2021-11-05 8:00	-1.1	-1.9	95	24	8	101.41	NA
2021-11-05 9:00	1.6	-0.5	86	26	12	101.45	NA
2021-11-05 10:00	3.6	-0.3	76	24	13	101.46	Clear

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-05 11:00	5.8	-2	57	28	10	101.46	NA
2021-11-05 12:00	6.9	-3.1	49	23	9	101.44	NA
2021-11-05 13:00	7.9	-5.9	37	30	17	101.37	Clear
2021-11-05 14:00	8.5	-5.8	36	26	19	101.31	NA
2021-11-05 15:00	8.3	-6.4	35	26	19	101.28	NA
2021-11-05 16:00	6.9	-6.1	39	22	15	101.24	Mainly Clear
2021-11-05 17:00	4.9	-5	49	23	11	101.25	NA
2021-11-05 18:00	6	-4.2	48	23	13	101.3	NA
2021-11-05 19:00	4.3	-2.8	60	23	13	101.31	Mainly Clear
2021-11-05 20:00	3.3	-2.9	64	22	12	101.34	NA
2021-11-05 21:00	2.9	-2.8	66	21	9	101.35	NA
2021-11-05 22:00	2.2	-2.9	69	21	7	101.35	Mainly Clear
2021-11-05 23:00	1.7	-2.9	72	21	6	101.33	NA
2021-11-06 0:00	1.2	-3	74	22	8	101.33	NA
2021-11-06 1:00	0.5	-2.8	79	23	6	101.36	Clear
2021-11-06 2:00	-0.7	-3.6	81	20	9	101.36	NA
2021-11-06 3:00	-0.3	-3.2	81	19	8	101.37	NA
2021-11-06 4:00	-0.5	-3.2	82	19	10	101.38	Mainly Clear
2021-11-06 5:00	-1.2	-3.6	84	19	10	101.41	NA
2021-11-06 6:00	-1.2	-2.9	88	18	10	101.4	NA
2021-11-06 7:00	-1.2	-2.5	91	20	7	101.44	Mainly Clear
2021-11-06 8:00	0.7	-1.1	88	21	9	101.44	NA
2021-11-06 9:00	3.8	0.1	77	18	9	101.4	NA
2021-11-06 10:00	6.7	1.3	68	20	16	101.35	Mainly Clear
2021-11-06 11:00	8.6	1.2	60	21	25	101.32	NA
2021-11-06 12:00	9.5	0.3	52	20	23	101.23	NA
2021-11-06 13:00	9.8	-0.1	50	21	22	101.12	Mostly Cloudy
2021-11-06 14:00	10.2	0.7	52	18	21	101.03	NA
2021-11-06 15:00	9.7	1.2	55	20	21	100.98	NA
2021-11-06 16:00	8.8	0.9	58	19	17	100.93	Mainly Clear
2021-11-06 17:00	6.7	0.8	66	18	10	100.92	NA
2021-11-06 18:00	5.1	0.8	74	16	10	100.95	NA
2021-11-06 19:00	4.9	0	71	19	11	100.93	Mainly Clear
2021-11-06 20:00	3.8	-0.4	74	21	13	100.91	NA
2021-11-06 21:00	2.8	-0.8	77	21	9	100.89	NA

Appendix B Weather Data

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-06 22:00	2.4	-0.4	82	21	13	100.89	Clear
2021-11-06 23:00	2.5	-0.6	80	19	7	100.85	NA
2021-11-07 0:00	1.8	-0.9	82	17	7	100.82	NA
2021-11-07 1:00	0.9	-0.9	88	10	4	100.8	Mostly Cloudy
2021-11-07 2:00	-1	-2	93	10	6	100.78	NA
2021-11-07 3:00	-2.7	-3.7	93	11	8	100.74	NA
2021-11-07 4:00	0.8	-1.5	84	19	8	100.73	Mostly Cloudy
2021-11-07 5:00	1.2	-1.4	83	19	6	100.73	NA
2021-11-07 6:00	0.9	-1.6	84	18	8	100.68	NA
2021-11-07 7:00	-0.4	-2.9	84	14	5	100.67	Mainly Clear
2021-11-07 8:00	2	-0.5	83	18	9	100.69	NA
2021-11-07 9:00	5.4	2.1	80	21	14	100.68	NA
2021-11-07 10:00	8.2	3.7	73	19	16	100.63	Mainly Clear
2021-11-07 11:00	10.9	4	62	22	26	100.6	NA
2021-11-07 12:00	12.4	4.5	58	22	18	100.54	NA
2021-11-07 13:00	13	3.8	54	23	22	100.46	Mainly Clear
2021-11-07 14:00	13.4	4.8	56	18	16	100.42	NA
2021-11-07 15:00	13.6	5.1	56	20	14	100.38	NA
2021-11-07 16:00	12.5	5.2	61	19	14	100.38	Mainly Clear
2021-11-07 17:00	10.6	5	68	16	9	100.4	NA
2021-11-07 18:00	9.7	4.8	72	17	9	100.47	NA
2021-11-07 19:00	8.8	4.8	76	19	11	100.51	Mainly Clear
2021-11-07 20:00	7.4	4.5	81	17	10	100.51	NA
2021-11-07 21:00	7.3	5.1	86	28	10	100.58	NA
2021-11-07 22:00	7.4	5.1	85	19	9	100.56	Mostly Cloudy
2021-11-07 23:00	7.3	5.4	87	20	8	100.54	NA
2021-11-08 0:00	7.4	5.5	88	22	7	100.57	NA
2021-11-08 1:00	6.8	5	88	26	7	100.57	Mostly Cloudy
2021-11-08 2:00	7	5.4	90	26	6	100.59	NA
2021-11-08 3:00	5.6	4.5	93	24	4	100.6	NA
2021-11-08 4:00	5.1	4.5	96	25	6	100.65	Mainly Clear
2021-11-08 5:00	4.5	4.3	98	30	4	100.64	NA
2021-11-08 6:00	2	1.6	97	21	7	100.7	NA
2021-11-08 7:00	1.7	1.6	99	36	2	100.75	Mainly Clear
2021-11-08 8:00	3.8	3.8	100	17	7	100.76	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-08 9:00	7.3	6	92	17	4	100.77	NA
2021-11-08 10:00	10.7	6.4	75	13	8	100.72	Clear
2021-11-08 11:00	12.8	6.6	66	18	13	100.73	NA
2021-11-08 12:00	13.8	6.9	63	19	15	100.67	NA
2021-11-08 13:00	14.3	7.3	62	18	15	100.58	Mainly Clear
2021-11-08 14:00	14	7.5	65	17	13	100.51	NA
2021-11-08 15:00	13.6	7.9	68	16	19	100.41	NA
2021-11-08 16:00	12.7	7.9	73	17	12	100.38	Mainly Clear
2021-11-08 17:00	11.3	7.6	78	18	14	100.3	NA
2021-11-08 18:00	10.1	7.6	84	21	10	100.35	NA
2021-11-08 19:00	9.1	7.5	90	20	13	100.31	Mainly Clear
2021-11-08 20:00	8.4	7.5	94	19	8	100.3	NA
2021-11-08 21:00	7.2	6.3	94	23	6	100.3	NA
2021-11-08 22:00	7.7	7.5	99	20	8	100.27	Fog
2021-11-08 23:00	7	6.7	98	20	9	100.23	Fog
2021-11-09 0:00	6.6	6.3	98	20	12	100.21	Fog
2021-11-09 1:00	6.3	6.1	99	19	10	100.18	Fog
2021-11-09 2:00	5.6	5.5	99	21	8	100.21	Fog
2021-11-09 3:00	6.2	6.1	99	22	11	100.3	Fog
2021-11-09 4:00	6.9	6.7	99	22	8	100.31	Fog
2021-11-09 5:00	7.4	7.1	98	26	10	100.36	Fog
2021-11-09 6:00	8.4	6.8	90	30	15	100.4	NA
2021-11-09 7:00	7.6	6.5	93	29	12	100.4	Mostly Cloudy
2021-11-09 8:00	8.9	7.6	91	31	22	100.54	NA
2021-11-09 9:00	9.3	7.7	90	30	13	100.55	NA
2021-11-09 10:00	11.6	8.3	80	32	13	100.53	Mostly Cloudy
2021-11-09 11:00	13.2	7.8	70	32	19	100.55	NA
2021-11-09 12:00	13.6	6.5	62	29	12	100.51	NA
2021-11-09 13:00	14	4.9	54	31	13	100.49	Mostly Cloudy

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Appendix '4'

Schedule 'A' – 2021 Complaints Summary
Schedule 'B' – 2021 Material Tonnage Summary
Schedule 'C' – Brief Site History
Schedule 'D" – Amendment to Environmental Compliance Approval Number A460702 Notice No. 13

Schedule 'A'

Complaints Summary

Schedule 'A'
2021 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	14/10/2021	1 complaint Received an e-mail complaint from a neighbor (RC) about odours @ 11:30 pm	Odour! It stinks outside (and consequently in my home) quite badly right now. Also, it seems in the last month there has been an increase in stink/smell from the dump. Winds SE, 18 °C, Overcast HH drove to the address and throughout the neighbourhood at 7:00 am the next morning. Winds were from the east. Resident resides west of the landfill. No odours were observed at the time of inspection.

Schedule 'A'
2021 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	14/10/2021	1 complaint Received an e-mail complaint from a neighbor (RC) about odours @ 11:30 pm	Odour! It stinks outside (and consequently in my home) quite badly right now. Also, it seems in the last month there has been an increase in stink/smell from the dump. Winds SE, 18 °C, Overcast HH drove to the address and throughout the neighbourhood at 7:00 am the next morning. Winds were from the east. Resident resides west of the landfill. No odours were observed at the time of inspection.

Schedule 'A'
2021 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	14/10/2021	1 complaint Received an e-mail complaint from a neighbor (RC) about odours @ 11:30 pm	Odour! It stinks outside (and consequently in my home) quite badly right now. Also, it seems in the last month there has been an increase in stink/smell from the dump. Winds SE, 18 °C, Overcast HH drove to the address and throughout the neighbourhood at 7:00 am the next morning. Winds were from the east. Resident resides west of the landfill. No odours were observed at the time of inspection.

Schedule 'B'

2021 Tonnage Summary

SCHEDULE "B"

Month	Total Inbound Monthly Tonnage	2021 Outbound and Re-Used Monthly Tonnage													Total Outbound and Re-Used Monthly Tonnage	Total Tonnage Landfilled
		Cardboard	Tires	Glass	Drywall	E-Waste	Shingles	Wood	Metals&WG	Aggregate	Asphalt	Rock/Concrete	Cont Soil (cover/treated/re-used)	Clean Fill	Wet Waste	
Jan-21	32,535.70	-	-	-	-	-	(54.70)	(236.57)	(96.68)	(523.50)	(18.42)	(75.00)	(19,400.26)	(5.28)	(3.00)	(20,412.41)	12,123.29
Feb-21	24,771.80	-	(1.12)	-	-	-	(14.03)	(281.18)	(51.73)	(683.49)	-	(50.00)	(13,954.44)	(3.99)	(3.00)	(15,042.98)	9,728.82
Mar-21	28,486.50	(0.45)	-	-	-	(2.95)	(101.68)	(569.60)	(41.54)	(957.93)	(54.86)	(5,275.00)	(9,492.00)	(18.57)	(3.00)	(16,517.58)	11,968.92
Q1	85,794.00	(0.45)	(1.12)	-	-	(2.95)	(170.41)	(1,087.35)	(188.95)	(2,164.92)	(73.28)	(5,400.00)	(42,846.70)	(27.84)	(9.00)	(51,972.97)	33,821.03
Apr-21	48,485.90	-	-	-	(5.87)	-	(413.01)	-	(40.20)	(639.11)	(2,729.89)	(3,046.26)	(26,850.51)	(160.81)	(3.00)	(33,890.68)	14,595.22
May-21	45,869.90	-	(1.86)	-	-	(2.70)	(545.86)	(67.10)	(63.48)	(542.30)	(2,185.70)	(1,650.00)	(25,565.59)	(367.91)	(3.00)	(30,995.50)	14,874.40
Jun-21	81,876.00	-	(2.44)	-	-	(2.60)	(531.44)	(86.77)	(60.69)	(1,011.10)	(842.47)	(1,147.78)	(60,871.65)	(313.56)	(3.00)	(64,873.50)	17,002.50
Q2	176,031.80	-	(4.30)	-	(5.87)	(5.30)	(1,490.31)	(153.87)	(164.37)	(2,192.51)	(5,758.06)	(5,846.06)	(113,287.75)	(842.28)	(9.00)	(129,759.68)	46,272.12
Jul-21	54,442.60	-	-	-	-	-	(479.38)	(257.81)	(44.28)	(617.53)	(156.07)	(6,550.00)	(31,795.67)	(330.06)	(3.00)	(40,233.80)	14,208.80
Aug-21	39,536.90	(0.77)	-	-	-	-	(411.38)	(410.94)	(37.61)	(541.40)	(8.48)	(200.00)	(3,812.08)	(268.16)	(3.00)	(5,693.82)	33,843.08
Sep-21	29,099.60	(0.98)	-	(32.27)	-	-	(530.45)	(20.05)	(44.99)	(725.89)	-	(3,080.00)	(20,651.90)	(253.62)	(3.00)	(25,343.15)	3,756.45
Q3	123,079.10	(1.75)	-	(32.27)	-	-	(1,421.21)	(688.80)	(126.88)	(1,884.82)	(164.55)	(9,830.00)	(56,259.65)	(851.84)	(9.00)	(71,270.77)	51,808.33
Oct-21	44,604.50	-	(2.53)	-	-	(2.26)	(552.57)	(675.53)	(34.47)	(804.96)	(2.70)	(2,125.54)	(22,444.38)	(220.18)	(3.00)	(26,868.12)	17,736.38
Nov-21	57,753.80	-	(2.73)	-	-	(0.14)	(510.80)	(1,257.71)	(47.10)	(483.16)	-	(2,395.03)	(32,122.02)	(159.37)	(3.00)	(36,981.06)	20,772.74
Dec-21	25,815.10	(0.30)	(1.58)	-	-	-	(159.82)	(563.48)	(22.18)	(403.20)	-	(2,206.10)	(2,430.87)	(19.74)	(3.00)	(5,810.27)	20,004.83
Q4	128,173.40	(0.30)	(6.84)	-	-	(2.40)	(1,223.19)	(2,496.72)	(103.75)	(1,691.32)	(2.70)	(6,726.67)	(56,997.27)	(399.29)	(9.00)	(69,659.45)	58,513.95
Total:	513,078.30	(2.50)	(12.26)	(32.27)	(5.87)	(10.65)	(4,305.12)	(4,426.74)	(583.95)	(7,933.57)	(5,998.59)	(27,802.73)	(269,391.37)	(2,121.25)	(36.00)	(322,662.87)	190,415.43

Schedule 'C'

Brief Site History

Schedule 'C'
BRIEF SITE HISTORY

Landfilling at the Site started in the early 1960s and served, at the time, as a rural dump operation for local residents. In 1971, the Ministry of Environment and Climate Change (MOECC), formerly the MOE, issued a Provisional Certificate of Approval (CofA No. 460702) to Mr. D. J. Huneault for disposal of industrial waste including construction and demolition waste. Currently the site receives all types of solid, non-hazardous waste for disposal excluding putrescible waste. In 1995, the CofA was amended for the operation of waste processing and composting facilities at the site. Composting operations were suspended with the issuance of the CofA amendments in April 2009. In 2016, the CofA, now an Environmental Compliance Approval (ECA) was amended to permit the treatment of contaminated soils.

Annual monitoring of groundwater and surface water was initiated in 1987 and has evolved into a comprehensive monitoring program that is reported to the MOECC on an annual basis. In 1992, a leachate collection system was constructed along the down-gradient toe of the landfill and surface water diversion ditches were constructed up-gradient within the north buffer zone. Leachate was initially collected in retention ponds and re-circulated onto and into the landfill following treatment through a peat filter and constructed wetland system. Transport of leachate by tanker truck to the municipal wastewater treatment plant was initiated in 1997 and used for 11 years. Construction of the existing leachate pre-treatment/pumping station and forcemain connection to the City of Ottawa sanitary sewer system was completed in 2007 and commissioned in early 2008.

In 2001, a landfill gas collection and flaring system was constructed as an interim odour control system. This system was commissioned in April of 2012 and has remained operational since then.

Construction for the last landfill cell was completed in 2019.

A detailed record of milestones in the site's history is presented as follows:

1960s The site was established to serve the local resident population, operating as a rural dump operation.

1971 The first Ministry of Environment (MOE) Provisional Certificate of Approval (CofA No. A460702) was issued to D.J. Huneault and revised in 1980.

1981 Detailed inspections, surveys and water samplings were undertaken. Monitoring wells were installed. Ownership of the site was transferred to Huneault Waste Management (474299 Ontario Ltd.). An application was submitted to update the CofA.

1983 The CofA was re-issued to 474299 Ontario Ltd. for a 100-acre landfill site limited to construction rubble and inert materials.

1984 Following an Ontario Municipal Board hearing, the site was re-zoned to permit landfilling.

1987 An annual monitoring program for groundwater and surface water was initiated.

1989 Four groundwater-monitoring stations were installed along the south property boundary.

1991 A land use agreement was entered into between the City of Gloucester (now City of Ottawa) and 474299 Ontario Ltd. Monitoring of surface water, groundwater and leachate was increased from annual to semi-annual monitoring events.

1992 A leachate collection system was constructed along the down-gradient toe of the landfill. Surface water diversion ditches were constructed up gradient within the north buffer zone. A leachate retention pond was constructed in the southeast corner of the landfill area. The first of two large cells was excavated in the northwest quadrant.

1993 A second leachate retention pond was constructed in the southeast corner of the landfill area. The CofA was re-issued. Waste types were limited to construction and demolition debris, asbestos; non-hazardous solid industrial waste including impacted soil. The second of two large cells was excavated in the northwest quadrant.

1994 The company changed its name from 474299 Ontario Ltd. to Huneault Waste Management Ltd.

1995 Landfilling continued in the west half of the landfill. Landfill gas monitoring was carried out and passive ventilation trenches were constructed. A large peat filter for leachate treatment was constructed east of the leachate retention ponds. The CofA was amended to permit the processing (recycling) and composting of waste materials (leaf and yard waste).

1996 The CofA was amended to allow for the receipt and composting of wet waste. Constructed wetlands were used for on-site treatment of leachate. A compost pad was constructed within the landfill area with recycled asphalt. In the fall, composting of leaf and yard waste as well as composting of mixed organics began.

1997 Due to complaints from neighbouring residents related to odour issues at the Site during the spring and summer, the use of leachate retention ponds and the composting of wet waste were suspended. Leachate was trucked by tanker to the municipal wastewater treatment plant (ROPEC) in compliance with a field order issued by the MOE. Updates to the 1994 Water Management Systems Report were submitted to the MOE for approval and included a design for a long-term leachate pumping station.

1998 Leachate continued to be trucked by tanker to the municipal wastewater treatment plant (ROPEC). The CofA was amended to insure the company submit a revised compost management plan for approval by the MOE prior to receiving mixed organics at the composting site.

1999 In July of 1999, ownership of the landfill changed. Leachate continued to be trucked by tanker to the municipal wastewater treatment plant (ROPEC). The 1994 Water Management Systems Report (1998 Revisions – Leachate Management) and the Huneault Landfill Leachate/Effluent Pumping Station

Design prepared by Totten Sims Hubicki Associates Ltd., both dated December 1998, were approved by the MOE and the CofA was amended.

2000 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Construction of a new leachate wet well and pump station was completed. The leachate loading station was relocated to the top of the waste pile near Grid Line P-13 following the construction of the pump station. In September 2000 the corporation changed its name from Huneault Waste Management Ltd. to Waste Services Inc. (WSI).

2001 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). A second scale house was added at the entrance to the site to better serve WSI clients and to improve inbound and outbound traffic control. Active landfilling was being carried out in the southeast quadrant of the Site.

2002 Waste Services Inc. (WSI) was acquired by Capital Environmental Services Inc. (CERI), a publicly traded company. An amendment to the CofA was approved to allow foundry sand, wood chips and contaminated soil to be used as alternative daily cover, to allow recycled asphalt and inert granular materials to be used as road base, and to increase the service area to include the Province of Ontario. A CofA (Air) No. 6141-XKF9 was approved to permit the use of a tub grinder on site. A new scale and scale house were constructed at the entrance to the landfill to ease traffic congestion on Navan Road. Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Active landfilling was being carried out in the southeast quadrant of the Site.

2003 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Ainley Graham and Associates, a municipal engineering firm, completed a preliminary design for a leachate forcemain connection to the City of Ottawa sanitary sewer system. A small parcel of land referred to as the Larivière property and running the length of the Site's east property line was acquired in late 2003.

2004 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). A land exchange agreement was completed with the National Capital Commission giving WSI ownership of a 6.91 hectare parcel of land being a 100 metre strip south of the VIA right of way (ROW) in exchange for an 8.43 hectare parcel south of land owned by WSI (Plan 4R-19707). This brings its total land mass in and around the landfill Site to 69.05 hectares.

2005 Leachate continued to be trucked by tanker to ROPEC. A compliance order was received from the City of Ottawa to pre-treat the leachate and reduce the concentrations of hydrogen sulphide discharged at the wastewater treatment plant. The engineering firm Ainley Graham and Associates completed a Stage 1 Detailed Design for the Leachate Pre-Treatment/Pump Station and Forcemain with connection to the City of Ottawa sanitary sewer system. A small parcel of land referred to as the Robert property, running along the landfill Site's east property line, and a residential property located at 3516 Navan Road were acquired. Golder Associates Ltd. was retained to undertake geotechnical and slope stability analysis for the Site as well as monitoring for landfill gas, groundwater, surface water, leachate and sediment. Golder was also retained to undertake a leachate pre-treatment study. In November, WSI announced to the public that it was undertaking

a project to expand the capacity of the landfill and extend its operational life by at least 10 years beyond 2011. The first public Open House was held on December 8, 2005.

2006 In May 2006, the MOE issued an amended CofA No. A460702 consolidating previous Certificates of Approval and associated notices and updating the CofA to the current standards. An updated Design and Operations Report prepared by Gartner Lee Ltd. was adopted. Also in May, a proposed Terms of Reference for the expansion of the landfill in accordance with the Environmental Assessment Act was submitted to the MOE and these were approved in October 2006. Leachate continued to be trucked by tanker to ROPEC. Chemical treatment of leachate to reduce H_2S concentrations began in the spring. An approval for the Leachate Pre-Treatment/Pumping Station and another to install a leachate forcemain within the Navan and Renaud Road allowances were obtained from city council with construction commencing in early December. Additional property to the east of the landfill located at 3326, 3548, 3560 and 3578 Navan Road were acquired by WSI bringing its total land mass in and around the landfill site to 90 ha.

2007 WSI considered and used the results of an environmental assessment (EA) to identify a preferred landfill expansion alternative for the Site thereby extending its operational life. The expansion of the WSI Navan Waste Recycling and Disposal Facility received approval under the Ontario Environmental Assessment Act (EAA) on August 3, 2007. Construction of the leachate forcemain and associated site modifications were completed in August. At the request of the City of Ottawa, modifications to the leachate pre-treatment and sampling system were undertaken with design and construction completed during the later part of 2007.

2008 A revised D&O Report was prepared by Golder Associates Ltd. (January, 2008) to meet the regulatory requirements described in the Landfill Standards (MOE, 1998) and the associated Ontario Regulation 232/98 to address the related Conditions of Approval for the proposed landfill expansion under the EAA. The proposed expansion of the Navan Waste Recycling and Disposal Facility required approval under the Ontario *Environmental Protection Act* (EPA) as well as other legislation. In early 2008, WSI presented submissions to the MOE to satisfy both the conditions of the approved EA and the requirements of the EPA and OWRA. Commissioning of the leachate pre-treatment/pump station was completed in February with leachate being pumped via forcemain to the City of Ottawa sewer system. Construction of new weigh scales, scale house and access roads began in the fall.

2009 Expansion of the Navan Landfill under the Ontario Environmental Protection Act (EPA) received approval with the issuance of the revised CofA No. A460702 (Waste Disposal Site) on April 16, 2009 along with CofA No. 4816-7C7M6C (Industrial Sewage Works) and CofA No. 6733-7BYS9A (Air). CofA No. A460702 was subsequently amended by Notice 1 on October 9th 2009. Significant facility improvements were completed at the entrance to the Site consisting of new scales and scale house, new Site entrance, new office/maintenance facilities, a new small vehicle unloading area and a new wheel wash station. An east diversion ditch c/w fish habitat features was constructed along the east edge of the property and commissioned in the fall following South Nation Conservation Authority approval. A 963 m^2 segment of property bordering Navan Road and west of the new site entrance was severed and transferred to the City of Ottawa for the future

widening of Navan Road. Leachate continued to be pre-treated and discharged via forcemain to the City of Ottawa sewer system.

2010 In July, Waste Services Inc (WSI) merged with BFI Canada Inc., a Progressive Waste Solutions company, to become the third largest provider of waste services in North America. This merger had no impacts on the operations of the Navan Waste Recycling and Disposal Facility. Facility improvements continued to be made throughout 2010 and included completing the pavement structure for the main entrance and access to the site, the small vehicle unloading area and office/maintenance facility parking area and fire route. Berm construction and landscaping east of the wheel wash station and west of the site entrance were also completed. The design for modifications to the leachate pre-treatment/pumping station was approved by the MOE and, the Certificate of Approval (Industrial Sewage Works) was amended (CofA # 5616-86NKNW). The design for an interim odour control system at the site was approved by the MOE and the Certificate of Approval (Air) was amended (CofA # 3536-8APNZD). Construction of the landfill gas forcemain and flaring system was started in November. Cell development continued in the Phase 2 area of the site with active landfilling being carried out in Phases 3 and 4.

2011 Construction of the landfill gas forcemain and flaring system was completed and awaiting approval by the Technical Standards and Safety Authority (TSSA). Construction of the leachate pre-treatment and pumping station improvements were completed. Monitoring well MW11-1 was installed to replace monitoring well OW92-8. E-waste recycling services were introduced for the benefit of the local community. The east storm water management pond was completed in the fall. Cell development was completed in the area of Phase 2. Landfill was carried out in Phases 2, 3, and 4.

2012 An interim odour control system comprising of a landfill gas collection and flaring system was commissioned and approval by the Technical Standards and Safety Authority (TSSA) was received in April. The west stormwater management pond and east diversion ditch were completed in the fall. A new access road to the recycling facility and active landfill areas was constructed along the top of the existing waste mound just west of the East Cell expansion area. Landfilling was carried out in the area of Phases 3 and 4.

2013 An interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation. Leachate collection and pre-treatment was continued throughout 2013. A forcemain obstruction causing a cleanout flange failure resulting in a spill along Navan Road was experienced in December. The event was reported to the MOE and the City. The spill was cleaned up and the system repaired and returned to regular operations. Efforts were concentrated in completing the north facing waste slope west of the site access and the west facing waste slope. Landfilling was carried out in the area of Phases 3 and 4. In 2013, BFI collaborated with a third party to develop a market for recycled drywall. Other materials recycled and re-used consist of glass, tires, cardboard, e-waste, shingles, wood, metals and white goods, aggregate, asphalt, rock and concrete, clean fill and impacted soils for re-use as cover material.

2014 An interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells. Leachate collection and pre-treatment was continued throughout 2014. Construction of the east expansion cell (Phase 1) drainage system was started in 2014 with completion anticipated in early 2015. Waste placement efforts were concentrated in completing the west-facing slope (Phase 3). In 2014 BFI continued to recycle and re-use materials such as glass, tires, cardboard, e-waste, shingles, wood, metals and white goods, aggregate, asphalt, rock and concrete, clean fill as well as impacted soils re-used as cover material.

2015 In 2015, the company changed its operating name from BFI Canada Inc. to Progressive Waste Solutions Canada Inc. Leachate collection and pre-treatment was continued throughout 2015. Construction of the east expansion cell (Phase 1), drainage system started in 2014 was completed in 2015, and landfilling within the cell began in mid December. Waste placement efforts focused on completing the Phase 3 fill area and the west end of Phases 4 and 5 prior to starting waste placement in the new east cell. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells. In addition to recycling various waste materials, PWS in 2015 received MOECC approval for the treatment of contaminated soils.

2016 Leachate collection and pre-treatment was continued throughout 2016. Waste placement efforts continued in the new east cell (Phase 1). Contaminated soil placement to raise the grades to final elevations continued in the Phase 3 fill area and the west end of Phases 4 and 5. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells at the west end of Phase 5. Recycling and treatment of hydrocarbon impacted soils were on-going operations throughout 2016. Treated soils were used as final cover and to raise the grades in the east buffer adjacent the waste column. Cell construction continued in the north half of the east cell (Phase 6) and consisted of excavation work. A screening plant was added to the processing operations for the screening of oversize materials and rock. Amended Environmental Compliance Approval number 2427-AETKQ5 issued by the MOECC dated November 2016 was received for the construction and operation of an enclosed flare.

2017 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2017. In 2017, two Notices of Violation were issued by the City. One for over strength parameters in the leachate that were later addressed and the second for elevated volatile organic readings in a sampling manhole, that was also addressed. Waste placement efforts continued in the east cell (Phase 1). The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of a horizontal collection well in the active fill area and seven permanent vertical wells. Recycling and treatment of hydrocarbon-impacted soils were on-going operations throughout 2017. Treated soils were used as final cover and to raise the grades in the east buffer adjacent the waste column. Cell construction continued in the north half of the east cell (Phase 6) and consisted of excavation work. Design of the final and permanent landfill gas flaring system was completed and submitted in December by Golder Associates Ltd. to the Technical Standards and Safety Authority (TSSA) for review and approval. In the spring of 2017, the company changed its name to Waste Connections of Canada Inc.

2018 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2018. In 2018, one Notice of Violation was issued by the City for a leachate spill along Renaud Road. An obstruction to the discharge pipe inside the sampling manhole located on Renaud Road caused the manhole to fill and overflow onto Renaud Road. The event was reported to the MOE and the City. The spill was cleaned up and the system cleaned out and returned to regular operations. Waste placement efforts continued in the east cell (Phase 1) and in October resumed in the Phase 4 area of the landfill. Excavation of the northeast cell in Phase 6 was continued and construction of the leachate collection and drainage system was substantially completed. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the connection of three vertical wells installed in late 2017. Recycling and treatment of hydrocarbon-impacted soils were on-going operations throughout 2018. Treated soils were used as fill to raise the grades in the east buffer adjacent the waste column in the Phase 6 area..

2019 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2019. Construction of a new cell in Phase 6 was completed and an as-built report prepared by Golder Associates Ltd. was submitted to the Ministry of the Environment, Conservation and Parks. Waste placement efforts continued in Phase 1, in the area of Phase 4 and then in the new cell (Phase 6) for the last quarter of the year. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of four permanent vertical wells in the area of Phase 4. Recycling and treatment of hydrocarbon-impacted soils were on-going operations throughout 2019. Treated soils were used to raise the grades in the east buffer adjacent the waste column. An existing stormwater ditch along the north edge and the northwest edge of the new cell in Phase 6 was replaced by a large diameter culvert complete with concrete headwalls.

2020 WCC continued discharging pre-treated leachate to the City of Ottawa sewer system via a forcemain located on the south shoulder of Navan Road and the east shoulder of Renaud Road connecting at the intersection of Page Road and Renaud Road. The interim landfill gas flaring system continued to be operational and effective in reducing odour causing fugitive gas emissions. In 2020, waste placement was concentrated on the east side of the waste footprint in the Phase 6 cell area. A ditch diversion culvert constructed along the north and east perimeter of the waste cell was located in the Phase 6 area by S.W. Farrell and Sons (1979) Ltd. The drainage layer on the sloped north and east walls of the waste cell in the Phase 6 area was also completed. Recycling, re-use and treatment of hydrocarbon-impacted soils were on-going operations throughout 2020.

2021 WCC continued discharging pre-treated leachate to the City of Ottawa sewer system via a forcemain. The interim landfill gas flaring system continued to be operational and effective in reducing odour causing fugitive gas emissions. In 2021, waste placement was concentrated on the east side of the waste footprint in the Phase 6 cell area. A 300 mm diameter HDPE landfill gas header pipe was installed along the north, west and south edges of the waste footprint by Les Entreprises Forlam Inc. to accommodate the long-term gas collection system. A concrete flare pad and gas extraction plant pad was constructed at the southeast corner of the landfill by S.W. Farrell and Sons (1979) Ltd. A new access road running along the east edge of the waste footprint was 90% completed in 2021. Recycling, rock screening, re-use and treatment of hydrocarbon-impacted soils were on-going

operations throughout 2021. An ECA amendment was issued by the Ministry of the Environment, Conservation and Park, permitting a temporary tonnage exemption for contaminated soils.

Schedule 'D'

Amendment to Environmental Compliance Approval Number A460702 Notice No. 13

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A460702
Notice No. 13
Issue Date: September 29, 2021

Waste Connections of Canada Inc.
6220 Highway 7, No. 600
Vaughan, Ontario
L4G 4H3

Site Location: 3354 Navan Road
Lot Part of Lots 2,3,4, Concession 4
Ottawa City,
K4B 1H9

You are hereby notified that I have amended Approval No. A460702 issued on April 16, 2009, and subsequently amended for a 40 hectare landfill and processing site within a total site area of 92.85 hectares, , as follows:

I. The following conditions are hereby added to this ECA:

Temporary Tonnage Exemption for Contaminated Soil

50.1 Notwithstanding Condition 48, up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021.

50.2 Notwithstanding Condition 50, contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1.

50.3 Conditions 50.1 and 50.2 expire on January 1, 2022.

II. The following items are hereby added to Schedule "A"

63. Letter dated August 19, 2021 to Mohsen Keyvani from Waste Connections Canada and the enclosed Environmental Compliance Approval Application for an emergency amendment to the ECA to temporary increase the annual tonnage limit for contaminated soil.

64. Email dated September 22, 2021 from Brian Forrestal, Waste Connections of Canada to Mohsen Keyvani, MECP regarding the revised additional tonnage for contaminated soil.

The reason for this amendment to the Approval is to allow the Site to temporarily accept additional contaminated soil in 2021 for waste cover to accommodate the extra soil generated from construction sites.

This Notice shall constitute part of the approval issued under Approval No. A460702 dated November 17, 1993

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

* **Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 29th day of September, 2021

Mohsen Keyvani, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

RL/
c: District Manager, MECP Ottawa
Brian Forrestal, P.Eng., Waste Connections of Canada Inc.

APPENDIX 5

EACMR

1.0 INTRODUCTION

1.1 Background

In August 2007, Waste Services (Canada) Inc. (WSI) now Waste Connections of Canada Inc. (WCC) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Condition 4 of that approval required that WSI (WCC) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WSI's (WCC's) compliance monitoring program. In accordance with Condition 3 of the EA approval, WSI previously submitted a separate document proposing an EA Compliance Monitoring Program.

In October 2008 WSI (WCC) submitted the first Environmental Assessment Compliance Monitoring Report (EACMR), which was intended to fulfill condition 4 of the EA approval conditions. The report addressed the period August 3, 2007 to August 2, 2008. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of the EACMR with submission of the Annual Operations and Monitoring Report, which is submitted annually by March 31st. Accordingly, this EACMR is submitted as an Appendix to the Annual Report and covers the period January 1st to Dec. 31st, 2021.

The Ministry's EAAB File # is EA 02 08 02.

1.2 Report Organization

- The EACMR comprises six sections as follows:
- Introduction – provides an overview of the purpose, context of submission and structure of the report as well as the proponent's contact information and an overview of significant activities at the Navan Landfill during the reporting period;
- Physical Works/Mitigation Measures – are presented in Table A, which lists WCC's commitments to make physical improvements to the site and in-design mitigation measures made during the EA and subsequent review, and provides a discussion on WCC's progress in meeting the commitments;
- Studies and Other Commitments – during the EA and review of the EA, WCC made commitments to other studies or activities, such as developing an end use plan and property value protection plan. These and other commitments are listed in Table B and WCC's progress in meeting these requirements is assessed;

- Public Consultation – is presented in Table C, which lists commitments and conditions of approval involving public consultation. A discussion is provided summarizing consultation activities during the reporting period and assessing WCC's fulfillment of these requirements;
- EA Conditions of Approval – the conditions of EA approval contained in the Minister's letter are listed in Table D and WCC's progress in meeting these conditions is described.
- Compliance Status – the final section of the report summarizes the findings in Tables A – D and provides concluding remarks on the overall status of compliance with the EA. Potential non-compliance issues, if any, are discussed in this section.

1.3 Proponent Contact Information

Waste Connections of Canada Inc. (WCC) is a multi-regional, integrated solid waste services company providing collection, transfer, recycling, composting, and disposal services to its customers. WCC is committed to excellence in environmental management and to conducting its business in a manner that protects the environment, health and safety of its employees, customers and communities in which it operates. Waste Connections of Canada Inc. is the owner and operator of the Navan Waste Recycling and Disposal Facility. WCC's contact information is as follows:

Waste Connections of Canada Inc.

3354 Navan Road

Ottawa, ON

K4B 1M9

Attn: Mr. Henri Huneault, Landfill Manager

2.0 PHYSICAL WORKS/MITIGATION MEASURES

There were thirteen (13) commitments made by WSI (WCC) during the EA and subsequent review process. These commitments relate to installation of physical works and/or implementation of mitigation measures. WSI (WCC) made the majority of the commitments during the EA as documented in the EA Study Report (EASR). Table A provides a listing of the outstanding commitments during the current reporting period. For each commitment a reference is provided regarding the documented source of the commitment, the time frame in which it is expected to be implemented and comments on WCC's progress in fulfilling the commitment such as 'completed', 'in progress', 'ongoing' etc.

WCC has now completed nine (9) of the original thirteen (13) commitments in Table A and the remaining four (4) are ongoing. There are no non-compliance issues.

Table A: EA Compliance Status for Physical Works and Mitigation Measures

Commitments	Where Commitment Made	Implementation Schedule	Status
A-5: WCC will install an active gas management system consistent with the requirements of Ontario Regulation 232/98.	▪ Section 8.3 of the EASR.	Landfill gas/odour control system will begin construction in 2010 and the remainder phased in as the landfill is developed.	**Ongoing** Studies for landfill gas completed in 2009. Approved interim LFG odour control system header pipe and connections abstraction plant and candlestick flare equipment was completed in 2011 and commissioned in early 2012. The operation and expansion of the system as required is on-going. Final Design of the permanent enclosed flaring system was completed by Golder Associates Ltd. in 2017 and modified in 2020. In 2020 WCC retained Perennial Energy Inc. to fabricate the enclosed flare and extraction plant for the permanent system to be installed at the site. In 2021, Forlam Construction installed the permanent header pipe on the north, west and south sides of the landfill and are awaiting the flare and extraction plant delivery from Perennial for connection.
A-6: WSI will undertake best management practices (BMP) for dust control.	▪ Section 8.3 of the EASR.	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and ongoing during operations.	**Ongoing** Best management practices for dust control were implemented in 2009 and will continue over the operating life of the landfill. A wheel wash system was constructed and commissioned in late 2009 and operated from April to November 2020 to reduce dirt and mud drag out onto paved roads (internal roads and Navan Road). A Best Management Practices Plan for Fugitive Dust Control was completed by

Table A: EA Compliance Status for Physical Works and Mitigation Measures

Commitments	Where Commitment Made	Implementation Schedule	Status
			Dillon Consulting dated October 2015 and submitted to the MECP in accordance with the requirement of an amendment for the treatment of contaminated soils.
A-7: WSI will vegetate side slopes and berms in order for the landfill to blend in as much as possible with the environment. Species native to Site area will be used wherever possible.	▪ Section 9.1 of the EASR	Following receipt of all necessary approvals to allow expansion of the Navan Landfill. Vegetation planting will be ongoing during operations. Details of vegetation planting will be refined during the EPA approval process.	**Ongoing** Approvals have been received. In 2021 vegetation was maintained and preserved where possible. The south, north and west facing waste slopes have been covered with final cover and seeded. As closure progresses, additional tree planting at the top of the landfill is on-going.

Commitments	Where Commitment Made	Implementation Schedule	Status
A-12: Best management practices (BMP) will be used to mitigate dust from activities at the Navan landfill.	▪ Response to MOE GRT Comments, p. 24 ▪ MOE EA Approval Condition # 10.5	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and ongoing during operations.	**Ongoing** Approvals received.

3.0 STUDIES AND OTHER COMMITMENTS

WSI (WCC) agreed to undertake a total of thirty one (31) studies and additional tasks/commitments during the course of the EA and subsequent review. Table B lists the outstanding commitments during the reporting period along with a brief description of their status. Of the thirty one (31) original commitments listed in Table B, WCC has completed all but three (3) with one (1) not yet started, one (1) ongoing and one (1) in progress. Most of the completed commitments relate to providing additional information and detail during the EPA approval process.

There are no issues with non-compliance associated with any of the Table B commitments.

Table B: EA Compliance Status for Studies and Other Communication

Commitments	Where Commitment Made	Implementation Schedule	Status
B-1: WSI will undertake an evaluation of end-use alternatives.	▪ EASR Table 8.3-1, p. 120d	Three years prior to the landfill closure.	**Not yet started** The evaluation of end use alternatives will be undertaken and documented as part of a closure plan to the MECP as required by Regulation 232/98. Status of the development of the end use plan will be reported in the EACMR section of the annual O&M Report to the MECP starting three years prior to site closure.
B-3: WSI will continue to pursue further waste diversion programs as appropriate.	▪ EASR p.120e	Schedule is based on economic and technical viability and approvals.	**Ongoing** Treatment of hydrocarbon contaminated soils along with the recycling and re-use of other landfill materials such as glass, wood, metals, roofing shingles, aggregates, tires and other materials was on-going throughout 2021.
B-11: WSI will maintain sufficient financial assurance for proper decommissioning of the site in keeping with MOE requirements, community plans and input from the PAC.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**In Progress** Financial assurance plan is in place and will be maintained throughout the life of the landfill site.

4.0 PUBLIC CONSULTATION

WSI (WCC) agreed to seven (7) commitments regarding public consultation during the EA, including the formation of a Public Advisory Committee (PAC). The status of these commitments is provided in Table C. All four (4) of the commitments remaining are ongoing.

Table C: EA Compliance Status for Public Consultations

Commitments	Where Commitment Made	Implementation Schedule	Status
C-3: WSI will work with the PAC on an ongoing basis to consider enhanced opportunities to improve re-cycling and diversion at the Navan Road Landfill to work towards the diversion goals articulated by the City of Ottawa and the province.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and completion of the City's study.	**Ongoing** Treatment of hydrocarbon contaminated soils along with the recycling and re-use of other landfill materials such as glass, wood, metals, roofing shingles, aggregates, tires and other materials was on-going throughout 2021. WCC continues to add marketable materials to its recycling efforts.
C-4: WSI will work with the PAC on an ongoing basis to consider other opportunities to reduce odour, dust and road dirt.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**Ongoing** A wheel wash station was constructed and commissioned at the end of 2009. Construction of an interim odour control system was completed in 2011 and commissioned in early 2012. Final design of a permanent landfill gas system was completed in 2017 and modified in 2020. WCC, in 2020, retained Perennial Energy Inc. to fabricate the flare and extraction plant. In 2021, Forlam Construction installed the permanent header pipe on the north, west and south sides of the landfill and are awaiting delivery of the flare and abstraction plant from Perennial for connection.

Table C: EA Compliance Status for Public Consultations

Commitments	Where Commitment Made	Implementation Schedule	Status
C-5: WSI is prepared to address new issues arising from the EA or detailed EPA assessment work and will work with the PAC on these issues.	▪ WSI – Friends of Mer Bleue Agreement	As these issues become known.	**Ongoing**
C-7: WSI will work with the City of Ottawa, the Friends of the Mer Bleue and the PAC to identify and develop community projects to enhance and improve the community and its public spaces.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**Ongoing** An agreement for a funding mechanism by WCC for community projects was included in the Terms of Reference for the PAC. A number of community projects were funded in 2021 by the WCC-PAC fund.

5.0 EA CONDITIONS OF APPROVAL

In the Notice of Approval to Proceed with the Undertaking, the Minister of the Environment listed forty three (43) conditions grouped into ten (10) categories of which sixteen (16) remain, as listed in Table D. Many of these conditions result from commitments made by WSI (WCC) during the EA review and are listed in Tables A, B or C. For convenience to the reader, cross-references have been provided to the corresponding WSI (WCC) commitment listed in Tables A, B or C. Where no cross-reference is available (i.e., this is a new condition), "not applicable" (n/a) is recorded in Table D. It should be noted that many of the conditions are the same as WSI (WCC) commitments contained in Tables A, B and C.

No non-compliance issues have been identified.

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
1. General Requirements			
1.1 The proponent shall comply with the provisions in the EA which are hereby incorporated in this approval by reference except as provided in these conditions and as provided in any other approval or permit that may be issued for the site.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
1.2 The proponent shall implement any additional commitments made by them and recorded in their response and attachments as noted above, except as provided for in these conditions or as provided for under other approvals, authorizations or permits required for the undertaking.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
1.3 These conditions do not prevent more restrictive conditions being imposed under other statutes.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
2. Public Record			
2.1 Where a document is required for the public record, the proponent shall provide two copies of the document to the Director, one copy for filing within the specific public record file maintained for the undertaking and one copy for staff use.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.2 The proponent shall provide additional copies of such documents at the request of the: • Regional Director; • Clerk of the City of Ottawa; and, • PAC.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.3 The proponent shall quote EAAB file number EA 02 08 02 on the documents.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.4 The proponent may also provide these documents through other means as it considers appropriate.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
3. Compliance Monitoring Program			
3.6 The proponent shall carry out the monitoring program as amended by the Director.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing**
3.7 The proponent shall make the documentation available to the ministry or it's designate upon request in a timely manner when so requested by the ministry during an on-site inspection, audit, or response to a pollution incident report or when information concerning compliance is requested by the ministry.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing**
4. Compliance Reporting			
4.1 The proponent shall prepare an annual compliance report which describes compliance with the conditions of approval set out in this notice and which describes the results of the proponent's EA compliance monitoring program.	n/a	The EACMR is required annually, until all conditions have been met.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
4.2 The proponent shall issue the first compliance report no later than one year following the date of this approval, and in each subsequent year shall issue a compliance report covering the previous year, on the date that is the anniversary of this approval or the proponent can coordinate the timing of its reporting with its annual Design and Operations report required under the EPA.	n/a	MOE has agreed for the EACMR to be submitted annually April 1 with the Annual O & M Report	**Ongoing**
4.3 The proponent shall submit the annual compliance report to the Director for placement on the public record.			**Ongoing**
4.4 The proponent shall submit annual compliance reports until all conditions of this approval are satisfied.	n/a	Beginning in 2008 and annually during the operation of the landfill until all conditions have been satisfied.	**Ongoing** The first annual EACMR was submitted in 2008 and are provided annually attached to the Operations and Monitoring Report.
4.5 When all conditions have been satisfied, the proponent shall indicate in the annual compliance report that this is its final submission.	n/a		**Ongoing**
4.6 The proponent shall retain, either on site or in another location approved by the Director, copies of the annual compliance reports for each reporting year and any associated documentation of compliance monitoring activities.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing** In 2008, WSI established a library on site where EACMR and associated documentation is available for viewing by the public.

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
4.7 The proponent shall make the documentation available to the ministry or it's designate upon request in a timely manner when so requested by the ministry during an on-site inspection, audit, or in response to a pollution incident report or when information concerning compliance is requested by the ministry.	n/a		**Ongoing**
5. Public Advisory Committee			
5.4 The proponent may dispense with the PAC if, after a period of time and after giving sufficient notice, there is no interest from the public in continuing with it. The proponent shall review the need for such a PAC yearly.	n/a	Ongoing throughout operational life of landfill expansion	**Ongoing**
6. Planting Plan			
6.3 The proponent shall make best efforts to protect existing mature trees and vegetation on site that could be used to screen the construction of the landfill berms, where appropriate.			**Ongoing** On-going throughout life of the landfill.

6.0 COMPLIANCE STATUS

WSI (WCC) made a total of 51 commitments during the EA and subsequent review as listed in Tables A, B and C. Eleven (11) commitments remain "ongoing" or "in progress". In other words, about 78% of the original commitments have now been fulfilled and some will remain in ongoing throughout the operating life of the Site.

The Minister listed fourty three (43) conditions in her Notice of Approval to Proceed with the undertaking, which are listed in Table D. Several conditions (13) were derived from WSI (WCC) commitments made during the EA and subsequent review. Eighteen (18) conditions remain at the end of the reporting period and will remain ongoing throughout the operating life of the landfill. WCC continues to make progress in all of the remaining conditions.

No non-compliance issues were identified during the report period.

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LIST OF ABBREVIATIONS

The abbreviations commonly employed on Records of Boreholes, on figures, and in the text of the report are as follows:

I. SAMPLE TYPE

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO or DP	Seamless open-ended, driven or pushed tube samplers
DS	Denison type sample
FS	Foil sample
RC	Rock core
SC	Soil core
SS	Split spoon sampler
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample
DT	Dual tube sample
DD	Diamond drilling

II. PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg. (140 lb.) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split spoon sampler for a distance of 300 mm (12 in.).

Dynamic Cone Penetration Resistance (DCPT); N_d:

The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) to drive an uncased 50 mm (2 in.) diameter, 60^0 cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH:	Sampler advanced by hydraulic pressure
PM:	Sampler advanced by manual pressure
WH:	Sampler advanced by static weight of hammer
WR:	Sampler advanced by weight of sampler and rod

Cone Penetration Test (CPT):

An electronic cone penetrometer with a 60^0 conical tip and a projected end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and friction along a sleeve are recorded electronically at 25 mm penetration intervals.

III. SOIL DESCRIPTION

(a) Cohesionless Soils

Density Index (Relative Density)	**N** Blows/300 mm Or Blows/ft.
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very dense	over 50

(b) Cohesive Soils

C_u or S_u

Consistency	kPa	Psf
Very soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1,000
Stiff	50 to 100	1,000 to 2,000
Very stiff	100 to 200	2,000 to 4,000
Hard	Over 200	Over 4,000

IV. SOIL TESTS

w	Water content
w_p or PL	Plastic limited
w_l or LL	Liquid limit
C	Consolidaiton (oedometer) test
CHEM	Chemical analysis (refer to text)
CID	Consolidated isotropically drained triaxial test[1]
CIU	Consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	Relative density
DS	Direct shear test
Gs	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	Organic content test
SO_4	Concentration of water-soluble sulphates
UC	Unconfined compression test
UU	Unconsolidated undrained triaxial test
V	Field vane test (LV-laboratory vane test)
γ	Unit weight

Note: [1] Tests which are anisotropically consolidated prior shear are shown as CAD, CAU.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$ x or log x	logarithm of x to base 10
g	acceleration due to gravity
t	time
FOS	factor of safety
V	volume
W	weight

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta \sigma'$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
ν	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial vertical effective overburden stress
$\sigma_1\sigma_2\sigma_3$	principal stresses (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3) / 3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) formerly (G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_1 or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity Index = $(w_1 - w_p)$
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_c	consistency index = $(w_1 - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (overconsolidated range)
C_s	swelling index
C_α	coefficient of secondary consolidation
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	overconsolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p or τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c'	effective cohesion
c_u or s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3) / 2$
p'	mean effective stress $(\sigma'_1 + \sigma'_3) / 2$
q	$(\sigma_1 - \sigma_3) / 2$ or $(\sigma'_1 - \sigma'_3) / 2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes: [1] $\tau = c' + \sigma' \tan \phi'$

[2] shear strength = (compressive strength) / 2

PROJECT: 11-1125-0017

RECORD OF BOREHOLE: BH11-1

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 30, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE											
0	Power Auger 200 mm Diam. (Hollow Stem)	Very loose to loose grey brown silty fine sand and silty clay (FILL)		0.00	1	SS	1						Bentonite Seal
1					2	SS	WH						Native Backfill
2					3	SS	4						
3					4	SS	5						
		Grey brown silty clay, some sand (FILL)		3.54									
4		Loose brown SILTY fine SAND, trace gravel, clay and organic matter		3.66	5	SS	7						
5					6	SS	7						
		Stiff red brown SILTY CLAY, trace sand (Weathered Crust)		5.18	7	SS	5						Bentonite Seal
6		Very soft grey SILTY CLAY		5.94	8	SS	1						
7					9	SS	PM						
8					10	SS	PM						
9													Silica Sand
10					11	SS	PM						50 mm Diam. PVC #10 Slot Screen
					12	SS	PM						
		End of Borehole		10.67									
11													
12													
13													
14													
15													

DEPTH SCALE

1 : 75

LOGGED: DG

CHECKED: LEB

Golder Associates

002732

MIS-BHS 001 1111250017-01.GPJ GAL-MIS.GDT 12/23/11 P.G

PROJECT: 09-1125-0006

RECORD OF BOREHOLE: 09-1A

SHEET 1 OF 2

LOCATION: N ;E

BORING DATE: 02/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 203mm Diam. (Hollow Stem)	GROUND SURFACE		68.76									
		Black SANDY SILT with organic matter		0.00									Protective casing
		Loose brown fine SANDY SILT		68.23 0.53	1	SS DO	6						Bentonite Seal
1		Stiff grey brown SILTY CLAY (Weathered Crust)		67.77 0.99	2	SS DO	4						
2					3	SS DO	WH						
		Grey SILTY CLAY		66.17 2.59	4	SS DO	WH						
3													
4					5	SS DO	PM						
		Grey SILTY CLAY, trace of black organic matter		63.88 4.88									
5					6	SS DO	PM						
6					7	SS DO	PM						
		Grey SILTY CLAY, occasional red brown layers, trace black organic matter		60.84 7.92									Native Backfill
8					8	SS DO	PM						
9													
		Grey SILTY CLAY, trace black organic matter		58.46 10.30	9	SS DO	PM						
10					10	SS DO	PM						
11													
12					11	SS DO	PM						
13													
14													
15		CONTINUED NEXT PAGE											

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.G.
CHECKED: MKF

002733

MIS-BHS 001 09112500S-1000.GPJ GAL-MIS.GDT 3/9/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1A

SHEET 2 OF 2

LOCATION: N ;E

BORING DATE: 02/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV/ DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. Φ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp ○ W Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
15	Power Auger 200mm Diam. (Hollow Stem)	— CONTINUED FROM PREVIOUS PAGE —											
		Grey SILTY CLAY, trace black organic matter			12	50 DO	PM						
16													
					13	50 DO	PM						Native Backfill
17													
				50.78									
18		Grey SILTY CLAY		17.98	14	50 DO	WH						
19													Bentonite Seal
				49.00	15	50 DO	>50						Silica Sand
20		Very dense grey SANDY SILT, some gravel and clay (GLACIAL TILL)		19.76									32mm diam. PVC #10 slot screen
21				47.65		50 DO	>50						
		End of Borehole		21.11									
22													Well Screen frozen to Elev. 68.67 m on Feb 8, 2010
23													
24													
25													
26													
27													
28													
29													
30													

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.G.
CHECKED: MKF

002734

ARS-BHS 001 091125008A-2003.GPJ GAL-MIS.GDT 3/6/12

PROJECT: 09-1125-0009

RECORD OF BOREHOLE: 09-1B&C

SHEET 1 OF 1

LOCATION: N ;E

BORING DATE: 04/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		68.73									
		For subsurface stratigraphy refer to record of borehole 09-B2A		0.000									Protective Casing
1													Bentonite Seal
2													Native Backfill
													Silica Sand
3													32mm diam. PVC #10 slot screen C
4													Silica Sand Bentonite Seal
5		Power Auger 200mm Diam. (Approx.)											Native Backfill and Bentonite
6													Bentonite Seal
7													Silica Sand
8													32mm diam. PVC #10 slot screen B
9													
10		End of Borehole		58.67 10.06									
11													W.L. in Screen B at Elev. 67.43 m W.L. in Screen C at Elev. 67.57 m on Feb. 8, 2010
12													
13													
14													
15													

DEPTH SCALE

1 : 75

Golder Associates

LOGGED: D.G.

CHECKED: MKF

002735

MIS-BHS 001 091125009-2009 GPJ 4SAL-MIS.GDT 3/9/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1D

SHEET 1 OF 1

LOCATION: N ;E

BORING DATE: 08/02/2010

DATUM: Geodetic

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - O) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp W Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		69.58									
0	Hand Auger / Open Hole	PEAT		0.00	1	50 DO	WH						Bentonite Seal
1					2	50 DO	1						Silica Sand Backfill
					3	50 DO	WH						32mm Dia. PVC # 10 Slot Screen
2				67.60									
		End of Borehole		1.98									Well in Screen at Elev. 68.40 m Feb. 8, 2010
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: J.D.

CHECKED: MKF

002736

MIS-BHS 001 09112500028-2010.GPJ GAL-MIS.GDT 3/8/10

PROJECT: 07-1122-0203-200

RECORD OF BOREHOLE: BH07-1

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: August 27, 2007

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80); SHEAR STRENGTH Cu, kPa (nat V. + Q - ⊗; rem V. ⊕ U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s (10⁻⁴ 10⁻⁵ 10⁻⁶ 10⁻⁷); WATER CONTENT PERCENT (Wp W Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		72.24							
		TOPSOIL (FILL)		72.15							Protective Casing
		Brown SANDY SILT some gravel trace brick (FILL)		71.45							Bentonite Seal
		Brown SILTY SAND, trace topsoil (FILL)		0.79	1	50 DO	8				Silica Sand
		Dark grey brown SILTY SAND, trace topsoil (FILL)		70.45 1.83	2	50 DO	3				38mm Diam. PVC #10 Slot Screen D
		Stiff grey brown SILTY CLAY (Weathered Crust)		68.61 2.50	3	50 DO	WH				
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter			4	50 DO	WH				Bentonite Seal
					5	50 DO	PH				38mm Diam. PVC #10 Slot Screen C
					6	50 DO	PH				Native Backfill
					7	50 DO	PH				Bentonite Seal
											Silica Sand
		Grey SILTY CLAY, trace black organic matter		63.61 8.53	8	50 DO	PH				38mm Diam. PVC #10 Slot Screen B
					9	50 DO	PH				
		Grey SILTY CLAY, trace to some black organic matter		60.86 11.58	10	50 DO	PH				
					11	50 DO	PH				Native Backfill
					12	50 DO	PH				
					13	50 DO	PH				
					14	50 DO	PH				
					15		PH				

Power Auger 150mm diam. (Refusal 3.5m)

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 100

LOGGED: D.J.S

CHECKED: P.L.E

Golder Associates

002737

M:\Envs\GDT\07-1122-0203-200 GP1 GLDPL CAN.GDT 9/19/07

PROJECT: 07-1122-0203-200

RECORD OF BOREHOLE: BH07-1

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: August 27, 2007

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7})	ADDITIONAL LAB TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20		— CONTINUED FROM PREVIOUS PAGE —						SHEAR STRENGTH Cu, kPa (20 40 60 80); nat V. + Q - ●; rem V. ⊕ U - ○	WATER CONTENT PERCENT (Wp 10 20 30 40 W Wl)		
	Power Auger 255mm diam. (Hollow Stem)	Grey SILTY CLAY, trace to some black organic matter		51.44	15	50 DO	PM				Native Backfill
		Grey SILTY CLAY, occasional clayey silt seam		20.70							Bentonite Seal
22		Compact dark grey SANDY SILT, some gravel and clay, occasional cobbles (GLACIAL TILL)		50.41 / 21.73	16	50 DO	WH				Silica Sand
					17	50 DO	10				38mm Diam. PVC RISER PIPE Screen A
24		End of Borehole Auger Refusal		49.24 / 23.90							

Note: monitoring well screens A and B are each installed in their own boreholes and monitoring well screens C and D are installed in one borehole.

DEPTH SCALE 1 : 100

Golder Associates

LOGGED: O.J.S.

CHECKED: P.L.E.

002738

K:\Active\5 001 07-1122-0203-200.GPJ GLDR_CAN.GDT 9/19/07

PROJECT: 05-1120-732-303

RECORD OF BOREHOLE: 05-11

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Aug. 17, 2005

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7})	WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		72.41									
		Stone dust (FILL)		0.00 / 72.04									Protective steel casing set in bentonite
		Grey brown silty clay, trace sand and organic matter (FILL)		0.37	1	SS	7						
1	Power Auger 200mm Diam. (Hollow Stem)				2	SS	5						Native Backfill
		Dark grey TOPSOIL		70.81 / 2.30									
2		Compact brown fine SAND, trace to some silt		3.80	3	SS	10						Bentonite Seal
					4	SS	17						Silica Sand
3		Grey SILTY CLAY		68.91 / 3.90									38mm Diam. PVC #10 Slot Screen
					5	SS	WH						
4		End of Borehole		64.93 / 4.88									
5													
6													
7													
8													
9													
10													

DEPTH SCALE
1:50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/2/06

002739

PROJECT: 05-1120-732-303

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-8

BORING DATE: Aug. 17, 2005

SHEET 1 OF 1

DATUM:

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Flight Auger 200mm Diam. (Hollow Stem)	GROUND SURFACE		73.16							
		Stone dust (FILL)		72.86 / 0.30							Protective steel casing set in bentonite
1		Asphalt and gravel (FILL)		71.84 / 1.22							
		Dark brown and grey brown silty clay and sandy silt, trace organic matter (FILL)			1	DO	7				
2		Brown sand with plastic and metal (FILL)		71.00 / 2.07	2	DO	27				Native Backfill
		TOPSOIL		69.96 / 3.20	3	DO	12				Bentonite Seal
		Compact brown fine SAND, trace to some silt		3.35							Silica Sand
4					4	DO	19				
		Grey SILTY CLAY		68.63 / 4.33							38mm Diam. PVC #10 Slot Screen
					5	DO	1				
		End of Borehole		68.13 / 5.03							
6											
8											
10											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

002740

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/3/09

PROJECT: 05-1120-732-303

RECORD OF BOREHOLE: 05-R3

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Aug. 18, 2005

DATUM:

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7}) / WATER CONTENT PERCENT Wp — W — Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam. (Hollow Stem)	GROUND SURFACE		72.93							
		Grey stone dust (FILL)		0.00							
		Brown sandy silt, some gravel (FILL)		72.50 / 0.43							
1		Grey brown silty clay, trace sand, organic matter and gravel (FILL)		72.08 / 0.85	1	SS	6				Protective steel casing set in bentonite
2					2	SS	4				Native Backfill
3		Grey brown and red brown SILTY CLAY (Weathered Crust)		69.88 / 3.05	3	SS	6				Bentonite Seal
4					4	SS	7				Silica Sand
		Grey SILTY CLAY		68.60 / 4.33							38mm Diam. PVC #10 Slot Screen
5					5	SS	WH				
		End of Borehole		67.75 / 5.18							

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

BOREHOLE 05-1120-732-303.GPJ GLGR_CAN.GDT 2/5/06

002741

PROJECT: 04-1120-143-3000

RECORD OF BOREHOLE: 05-4

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 16, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam. (Hollow Stem)	GROUND SURFACE		65.00				SHEAR STRENGTH Cu, kPa (20 40 60 80); nat V. + Q - ●; rem V. ⊕ U - ○	WATER CONTENT PERCENT (20 40 60 80); Wp W Wl		
		Brown stratified fine SAND, some silt		0.00							
				64.45							
		Grey brown SILTY CLAY (Weathered Crust)		0.55							
1				63.93	1	50 DO	WH				
		Soft to stiff grey SILTY CLAY		1.07							
					2	50 DO	WH				
2				62.87							
		End of Borehole		2.13							
3	Nilcon Vane										
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15		CONTINUED NEXT PAGE									

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 06-1122-273.GPJ GLDR_CAN.GDT 1/17/07

002742

PROJECT: 04-1120-143-3000

RECORD OF BOREHOLE: 05-4

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 16, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (20 40 60 80) nat V. + Q - ● rem V. ⊕ U - ○	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT Wp — W — Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
15		— CONTINUED FROM PREVIOUS PAGE —											
16									+				
17									+				
18	Nilcon Vane								+				
19									+				
20									+				
21									+				
22									+				
23													
24													
25													
26													
27													
28													
29													
30													

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 06-1122-273.GPJ GLDR_CAN.GDT 1/17/07

002743

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-3

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 8, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		69.85							
0	Power Auger 200mm Diam. (Hollow Stem)	Grey and grey brown silty clay (FILL)		0.00 / 69.39							Bentonite Seal
		Firm to stiff grey brown SILTY CLAY (Weathered Crust)		0.46 / 68.78							Silica Sand
		Grey SILTY CLAY, occasional red brown layer, trace organic matter		1.07	1	50 DO	2				38mm Diam. PVC #10 Slot Screen D
2					2	50 DO	WH				
					3	50 DO	PH				Bentonite Seal
					4	50 DO	WH				Silica Sand
4					5	50 DO	WH				38mm Diam. PVC #10 Slot Screen C
6					6	50 DO	PH				Native Backfill
8					7	50 DO	PM				Bentonite Seal
					8	50 DO	PM				Silica Sand
10					9	50 DO	PM				38mm Diam. PVC #10 Slot Screen B
											Silica Sand
		Grey SILTY CLAY, trace black organic matter		58.27 / 11.58							
12					10	50 DO	PH				
14					11	50 DO	PM				Native Backfill
					12	50 DO	PM				
16					13	50 DO	PM				
18		Grey SILTY CLAY		51.87 / 17.98							
					14	50 DO	PM				
		Grey layered SILTY CLAY and CLAYEY SILT		50.65 / 19.20							Bentonite Seal
20					15		26				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-3

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 8, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---											
20	Power Auger 200mm Diam. (Hollow Stem)	Very loose to compact grey to dark grey SANDY SILT, some gravel, trace clay (GLACIAL TILL)		28.12	15	50 DO	26						Silica Sand
22				47.39	16	50 DO	3						38mm Diam. PVC #10 Slot Screen A
		End of Borehole Auger Refusal		22.46									
24													
26													
28													
30													
32													
34													
36													
38													
40													

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-2

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 10, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam. (Hollow Stem)	GROUND SURFACE		80.08							
		Brown fine SAND, some silt		0.00							
				79.50							
		Very stiff to stiff grey brown SILTY CLAY, occasional red brown layer, fine sand and silt seam (Weathered Crust)		0.58	1	50 DO	12				Protective casing set in bentonite
2					2	50 DO	8				Bentonite Seal
					3	50 DO	6				Native Backfill
					4	50 DO	5				Bentonite Seal
4					5	50 DO	5				Silica Sand
					6	50 DO	2				38mm Diam. PVC #10 Slot Screen D
				74.84							
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter		5.24	7	50 DO	WH				Bentonite Seal
6					8	50 DO	PH				Native Backfill
8					9	50 DO	WH				Bentonite Seal
					10	50 DO	PH				Silica Sand
10					11	50 DO	PM				38mm Diam. PVC #10 Slot Screen C
12					12	50 DO	PM				
14					13	50 DO	PM				Native Backfill
16					14	50 DO	WR				
					15	50 DO	WR				Bentonite Seal
18					16	50 DO	PH				Silica Sand
											38mm Diam. PVC #10 Slot Screen B
20					17		WR				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

002746

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-2

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 10, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp W Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Power Auger 200mm Diam. (Hollow Stem)	--- CONTINUED FROM PREVIOUS PAGE ---									
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter			17	50 DO	WR				
22					18	50 DO	WR				
				57.52							
		Grey SILTY CLAY, slight trace black organic matter		22.58	19	50 DO	WR				Native Backfill
24											
					20	50 DO	WR				
26					21	50 DO	WR				
				52.60							Bentonite Seal
		Grey layered SILTY CLAY and CLAYEY SILT		27.58	22	50 DO	WR				Silica Sand
28		Compact to dense grey to dark grey SANDY SILT, some gravel and clay with cobbles (GLACIAL TILL)		27.89							38mm Diam. PVC #10 Slot Screen A
					23	50 DO	41				
		Probably weathered SHALE BEDROCK		50.58 29.50							
30		End of Borehole Auger Refusal		29.72							
32											
34											
36											
38											
40											

DEPTH SCALE 1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

002747

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-1

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 2, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		85.53							
		Grey crushed stone (FILL)		0.12							Protective casing
		Compact brown stratified fine SAND, trace silt			1	50 DO	15				Silica Sand
				84.01							38mm Diam. PVC #10 Slot Screen D
2		Grey SILTY CLAY, occasional red brown layer with depth		1.52	2	50 DO	WH				Native Backfill
											Bentonite Seal
					3	50 DO	PM				Silica Sand
4											38mm Diam. PVC #10 Slot Screen C
					4	50 DO	PH				
6					5	50 DO	PM				Native Backfill
					6	50 DO	PM				Bentonite Seal
											Silica Sand
					7	50 DO	PM				38mm Diam. PVC #10 Slot Screen B
10		Power Auger 200mm Diam. (Hollow Stem)			8	50 DO	PH				
		Grey SILTY CLAY, occasional red brown layer, scattered trace black organic matter		73.95 11.58							
12					9	50 DO	PM				Native Backfill
					10	50 DO	PM				
14											
					11	50 DO	PM				Bentonite Seal
16					12	50 DO	WR				
											Native Backfill
18					13	50 DO	PM				
20		CONTINUED NEXT PAGE			14		WR				

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 10/19/06

002748

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-1

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 2, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---						SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○) (20 40 60 80)	WATER CONTENT PERCENT Wp W Wl (10 20 30 40)		
20	Power Auger 200mm Diam. (Hollow Stem)	Grey SILTY CLAY, occasional red brown layer, scattered trace black organic matter			14	50 DO	WR				
22					15	50 DO	WR				
				62.97							
		Grey SILTY CLAY, occasional red brown layer, trace to some black organic matter		22.56	16	50 DO	WR				
24					17	50 DO	PM				
26					18	50 DO	WR				Native Backfill
28					19	50 DO	WR				
					20	50 DO	WR				
30					21	50 DO	WR				
32					22	50 DO	WR				
		Layered SILTY CLAY and CLAYEY SILT		52.29 33.24							Bentonite Seal
34					23	50 DO	WR				Silica Sand
		Grey CLAYEY SILT, some gravel		51.53							
		Compact to dense dark grey SANDY SILT, some gravel and clay (GLACIAL TILL)		34.14							38mm Diam. PVC #10 Slot Screen A
				50.33	24	50 DD	>100				
		End of Borehole Auger Refusal		35.20							
36											
38											
40											

DEPTH SCALE
1 : 100

Golder Associates

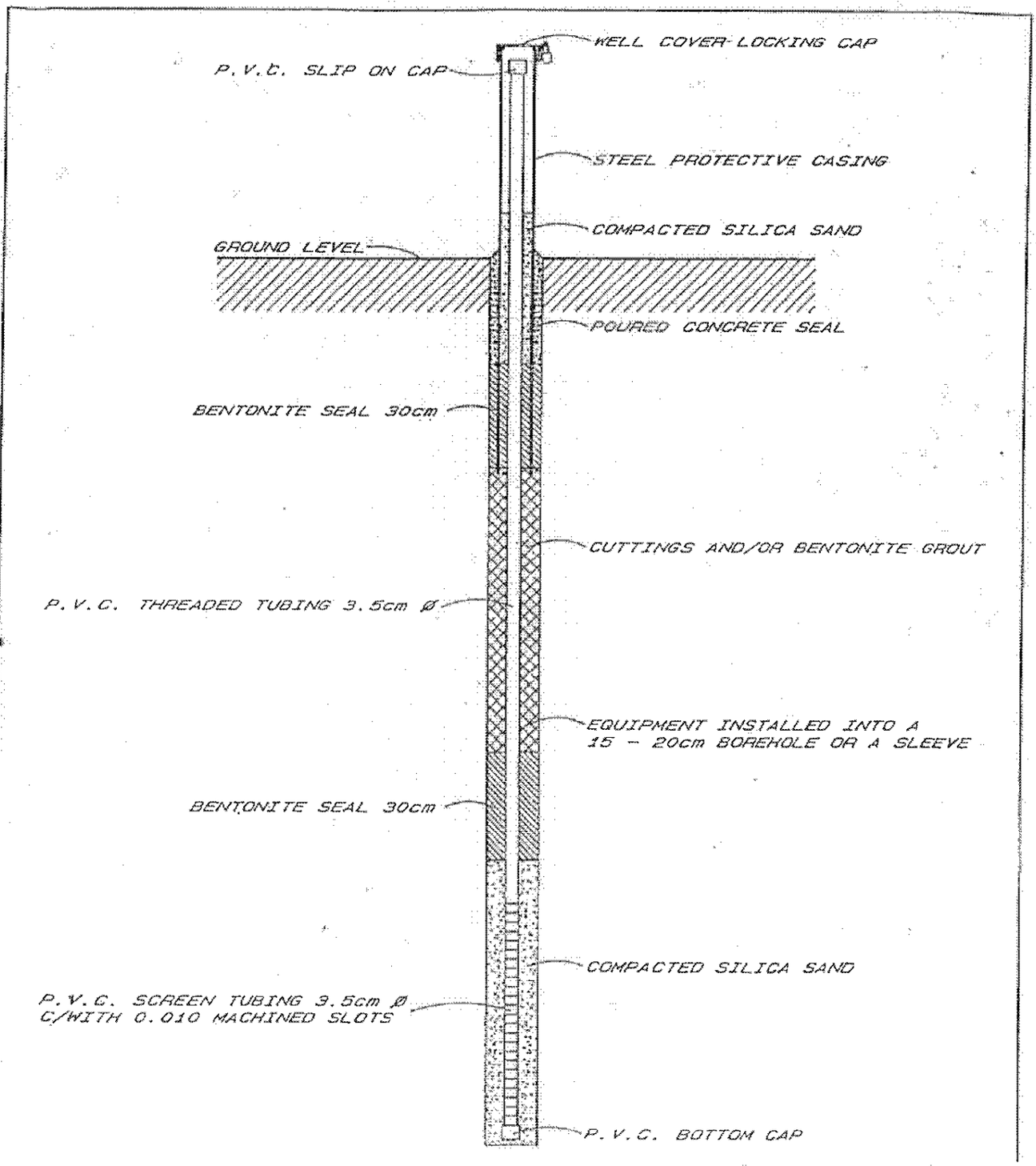
LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 10/19/05

002749

TYPICAL MONITORING WELL INSTALLATION

INSTALLATION TYPIQUE D'UN PUIT D'OBSERVATION



002750

PROJECT NO. WSI006

BOREHOLE NO. MW-4 (MW-C)

PROJECT HUNEAULT LANDFILL

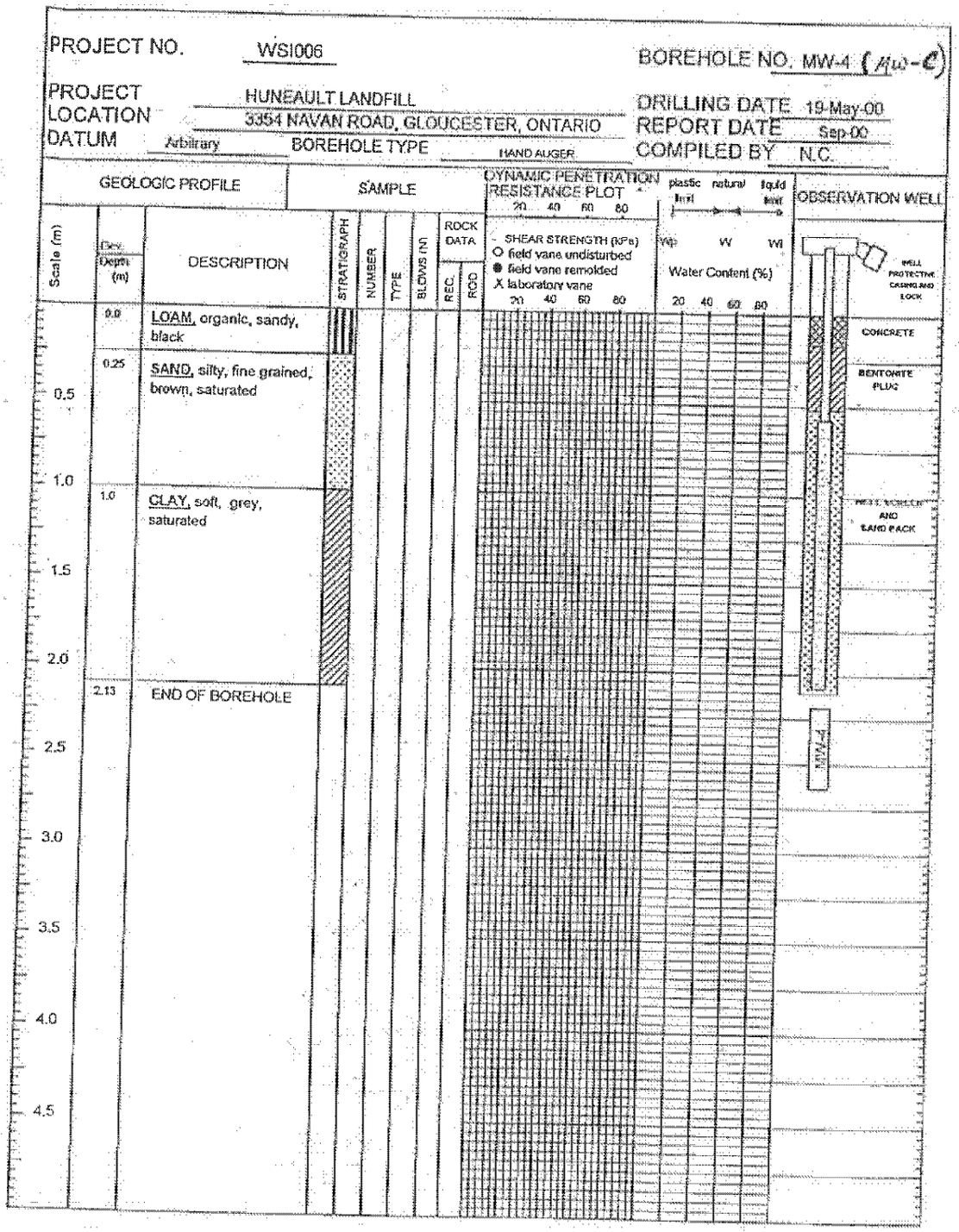
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM Arbitrary BOREHOLE TYPE HAND AUGER

DRILLING DATE 19-May-00

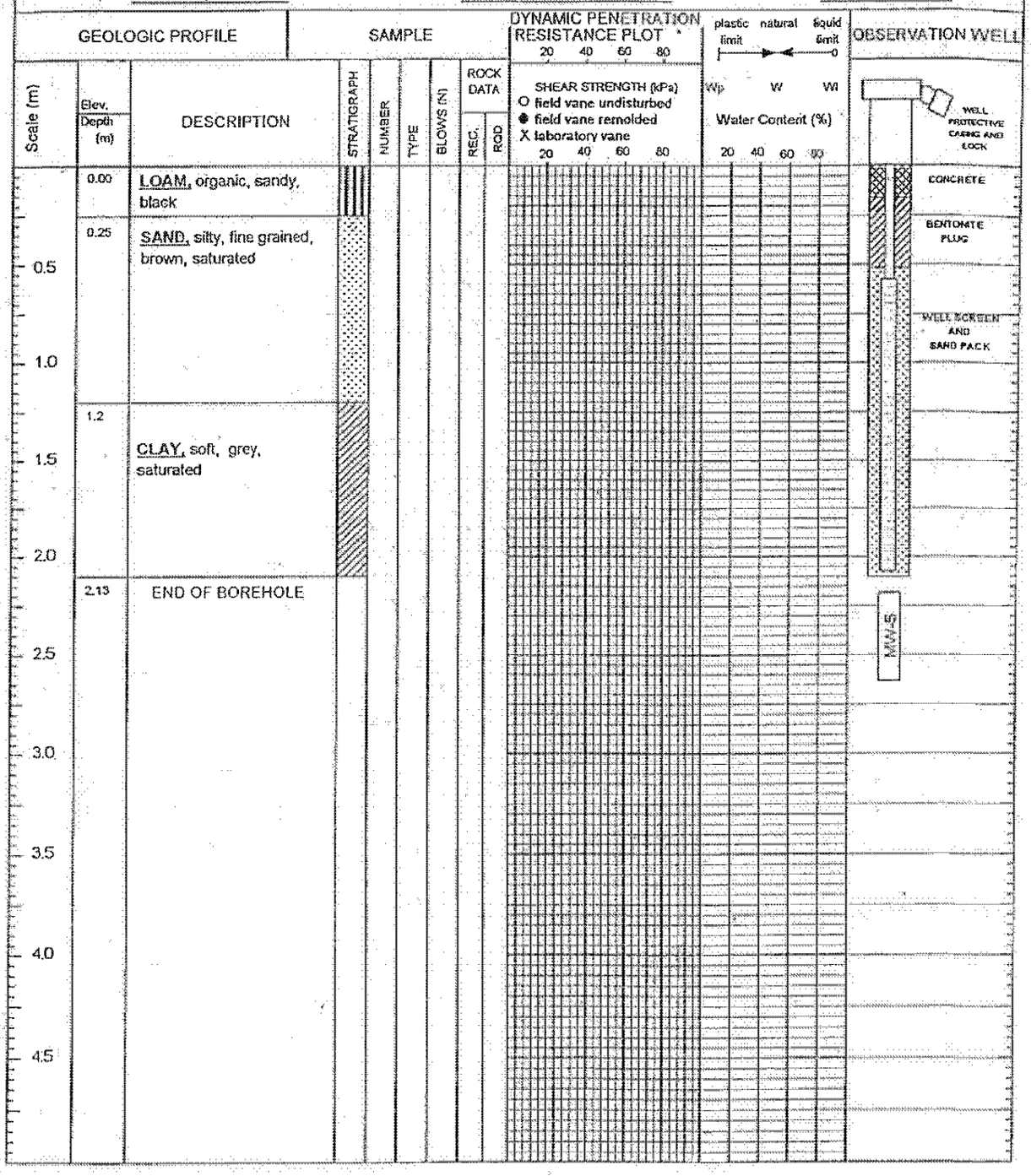
REPORT DATE Sep-00

COMPILED BY N.C.



PROJECT NO. WSI006 BOREHOLE NO. MW-5 (MW-E)

PROJECT HUNEAULT LANDFILL DRILLING DATE 19-May-00
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Sep-00
DATUM Arbitrary BOREHOLE TYPE HAND AUGER COMPILED BY N.C.



PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

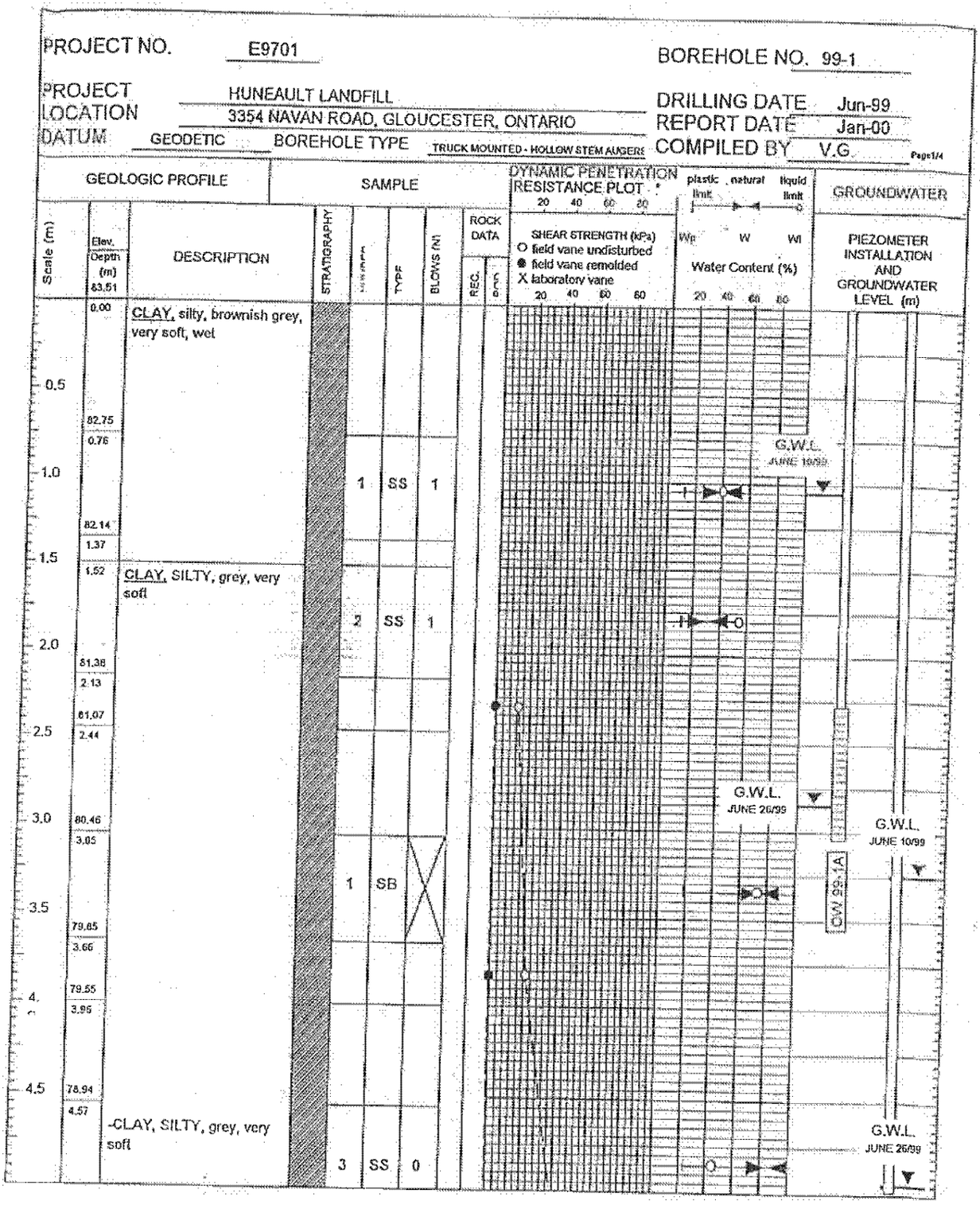
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

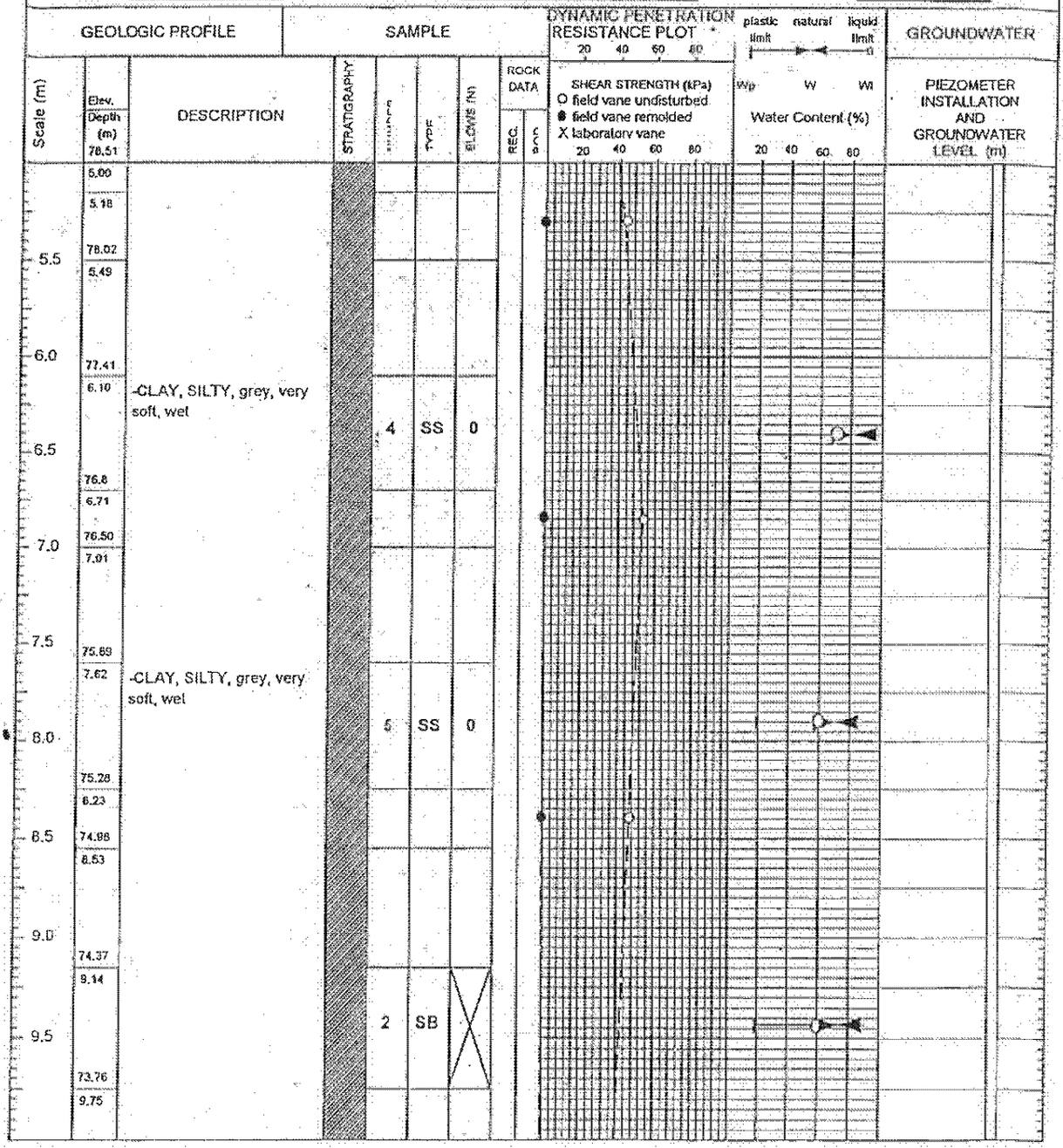
COMPILED BY V.G.

Page1/4



PROJECT NO. E9701 BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL DRILLING DATE Jun-99
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Jan-00
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS COMPILED BY V.G.



PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

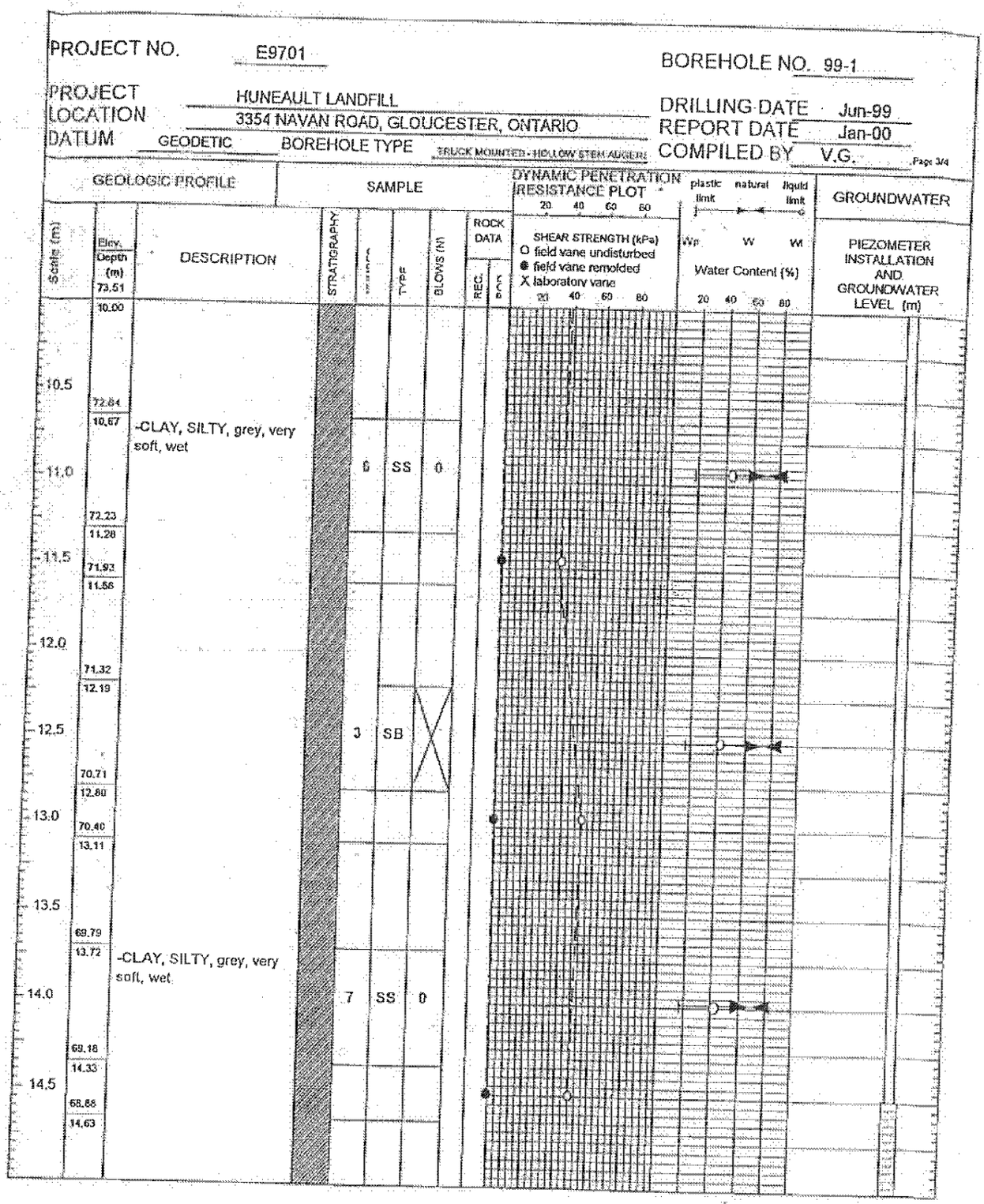
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

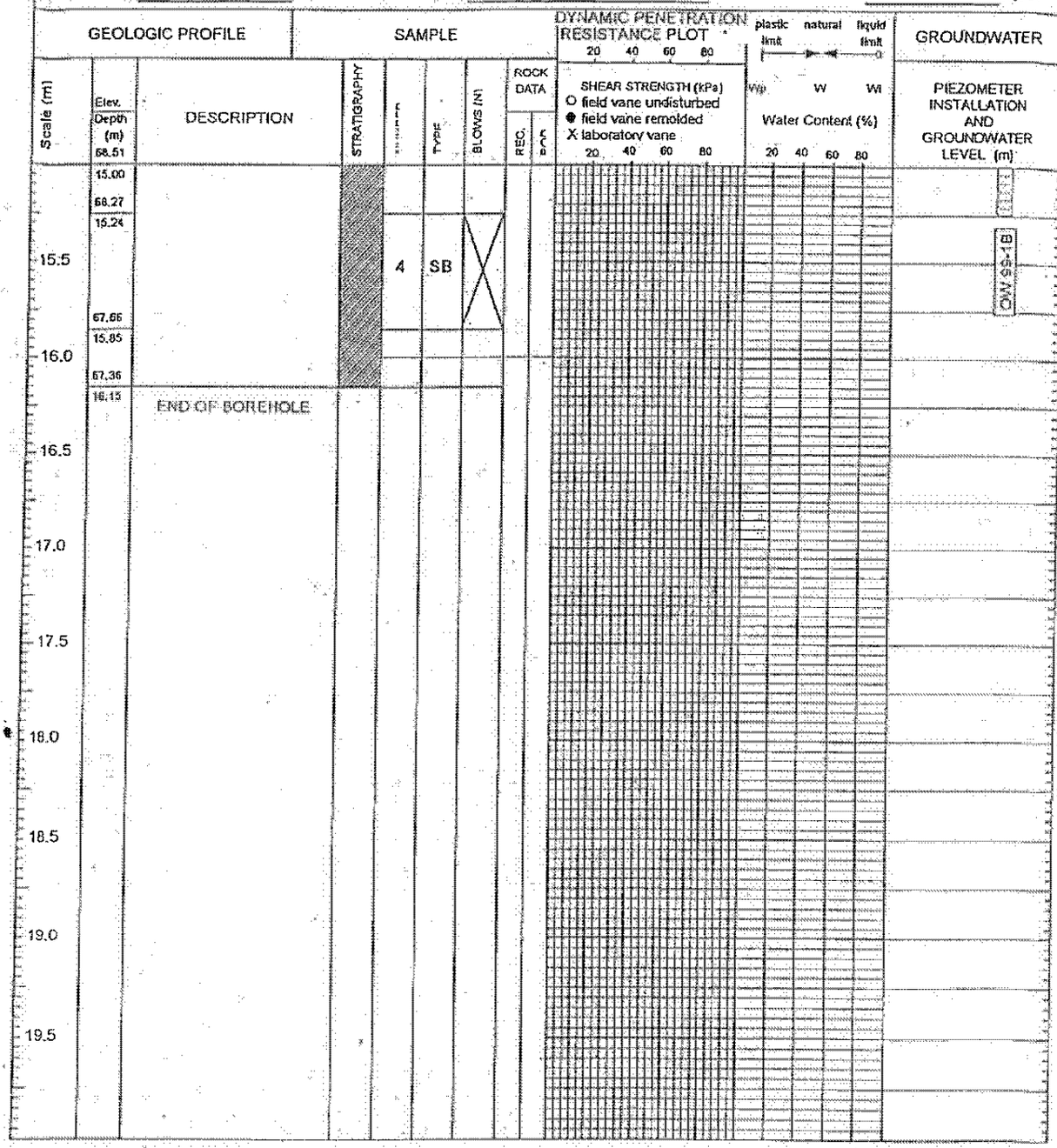
REPORT DATE Jan-00

COMPILED BY V.G.



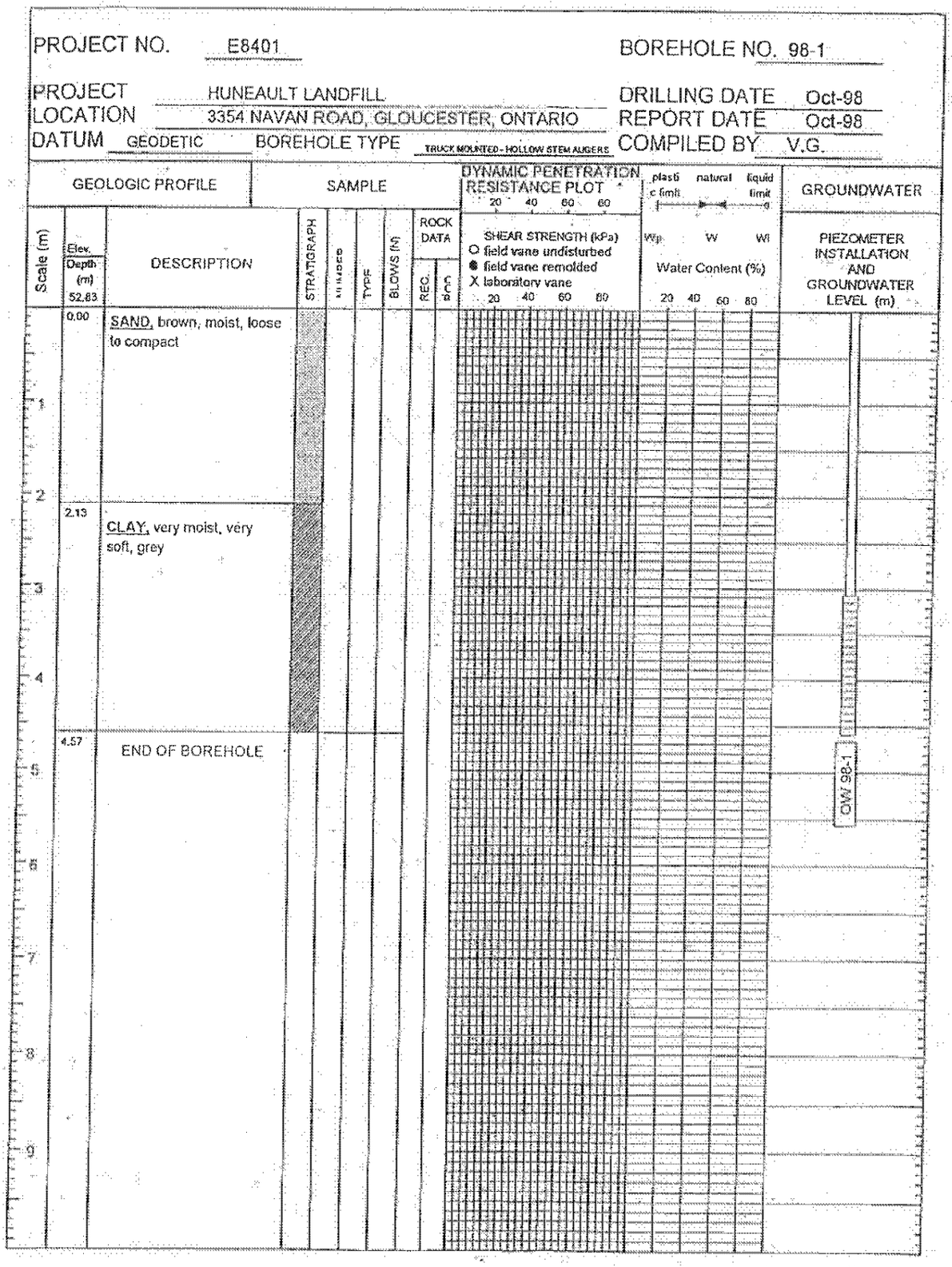
PROJECT NO. E9701 BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL DRILLING DATE Jun-99
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Jan-00
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS COMPILED BY V.G.



PROJECT NO. E8401 BOREHOLE NO. 98-1

PROJECT HUNEAULT LANDFILL DRILLING DATE Oct-98
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-98
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS COMPILED BY V.G.



002757

PROJECT NO. E8401 BOREHOLE NO. 98-2

PROJECT HUNEAULT LANDFILL DRILLING DATE Oct-98
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-98
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE				ROCK DATA		DYNAMIC PENETRATION RESISTANCE PLOT	plasti c limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPH	number	TYPE	BLOWS (N)	REC.	RQD	SHEAR STRENGTH (kPa) O field vane undisturbed ● field vane remolded X laboratory vane	Water Content (%) Wp W Wl	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	0.00	SAND, brown, moist, loose to compact		1	S	1					
	1.37			2	S	0					
	2.13	CLAY, very moist, very soft, grey		3	S	0					
	2.90			4	S	0					
	3.66			5	S	0					
	4.42			6	S	0					
	6.71			7	S	0					
	7.62										
	8.23	END OF BOREHOLE									OW 98-2

002758

PROJECT NO. E8401

BOREHOLE NO. 98-3

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

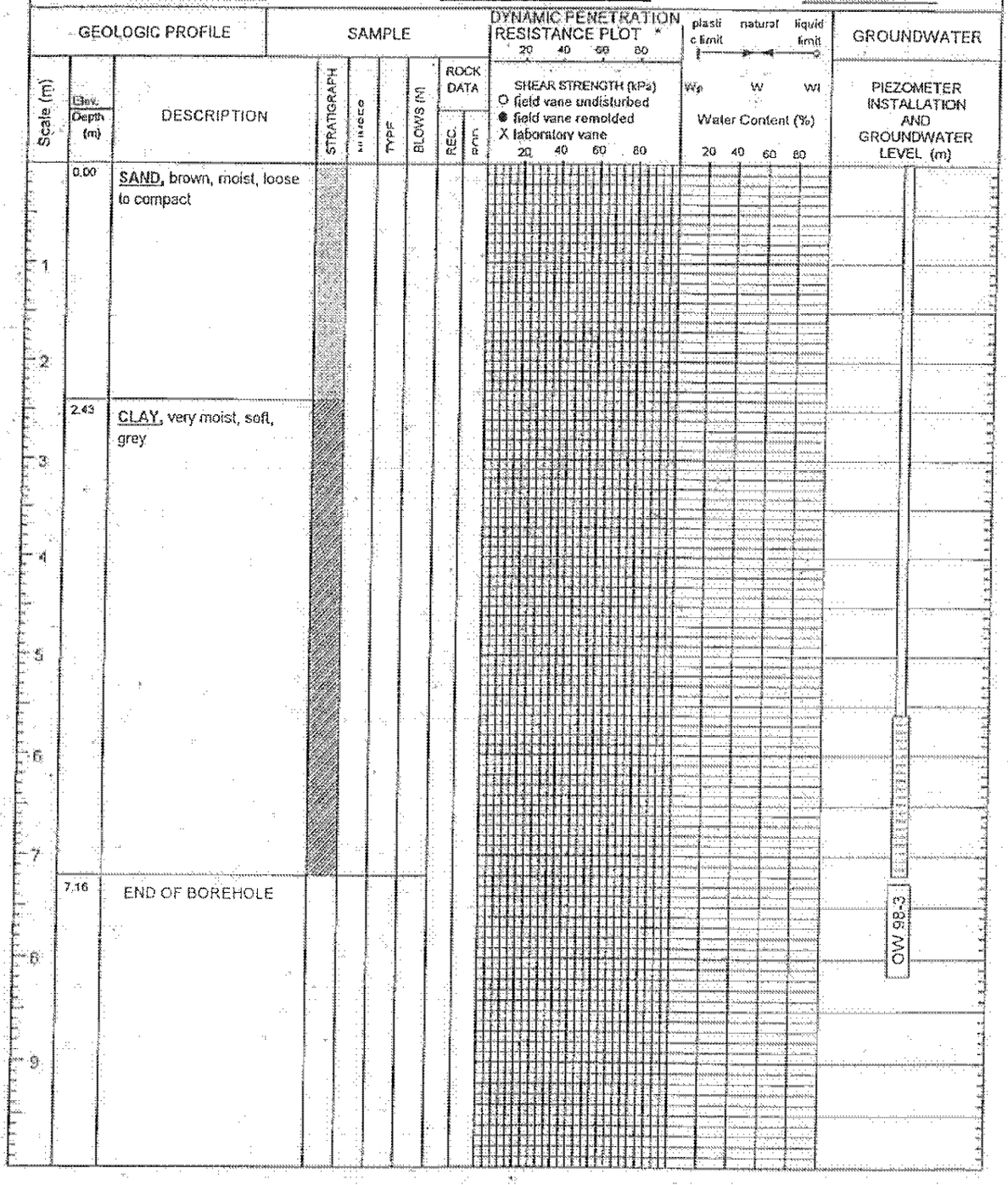
DATUM GEODETIC

BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Oct-98

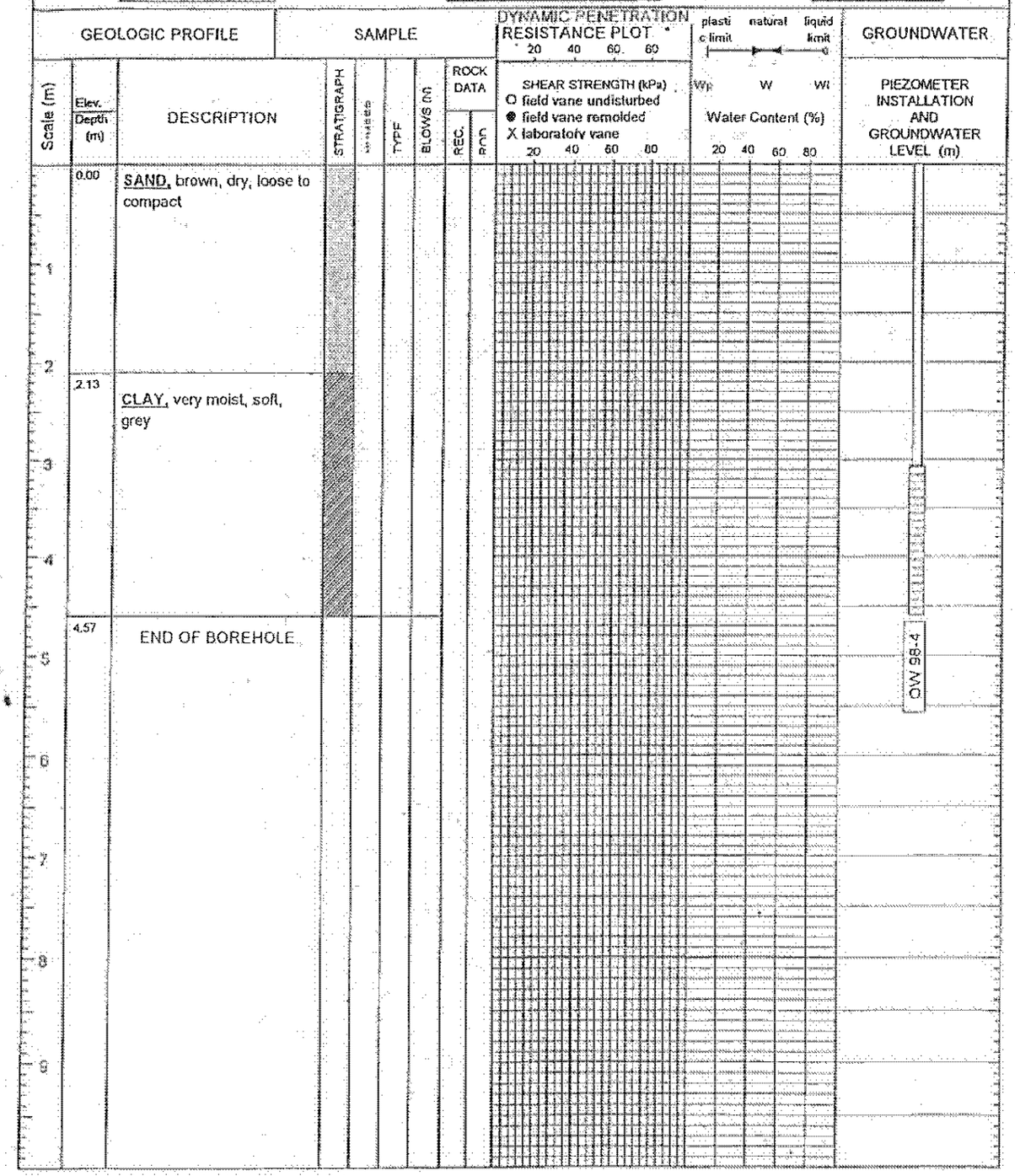
REPORT DATE Oct-98

COMPILED BY V.G.



PROJECT NO. E8401 BOREHOLE NO. 98-4

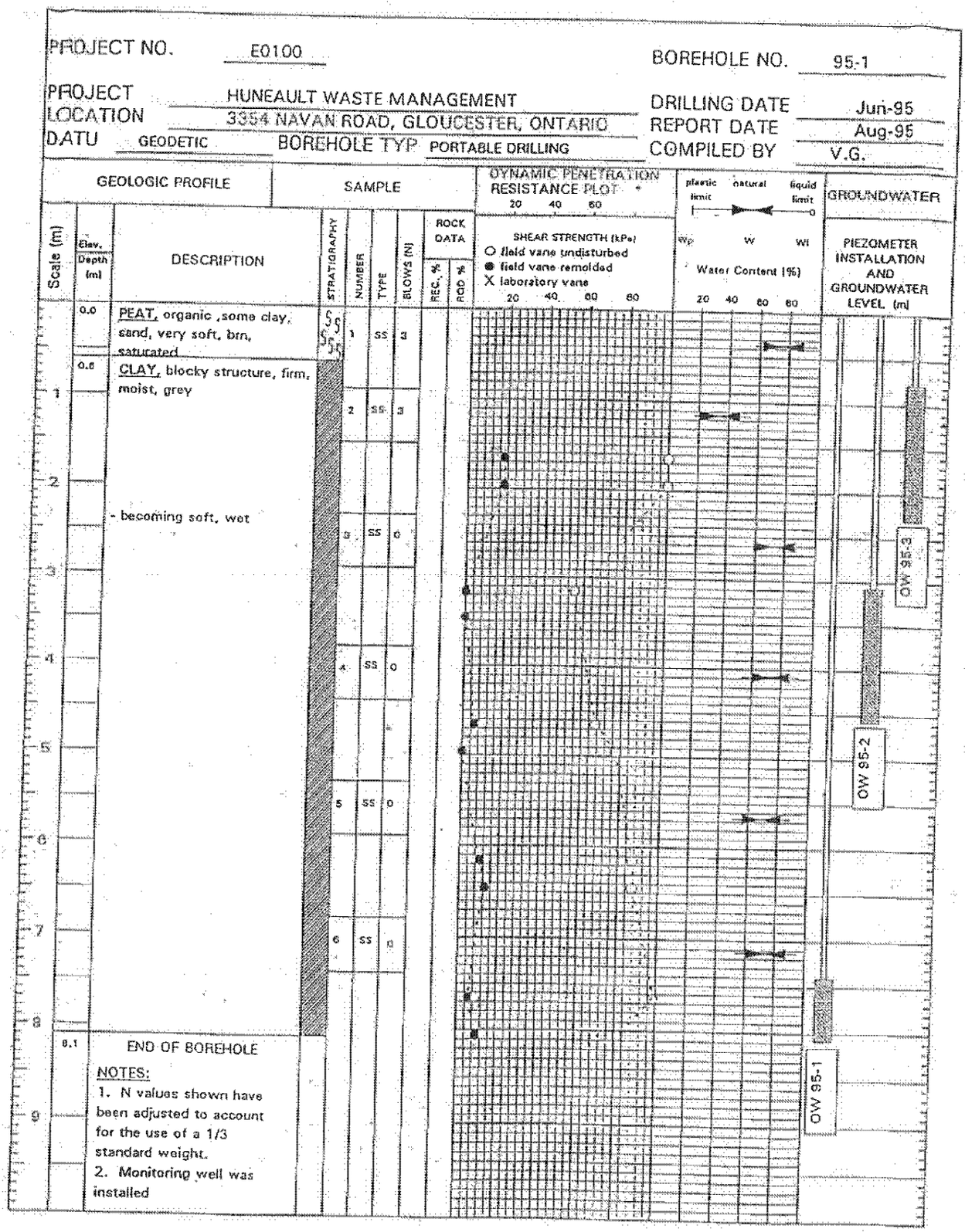
PROJECT HUNEAULT LANDFILL DRILLING DATE Oct-98
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-98
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS COMPILED BY V.G.



002760

PROJECT NO. E0100 BOREHOLE NO. 95-1

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



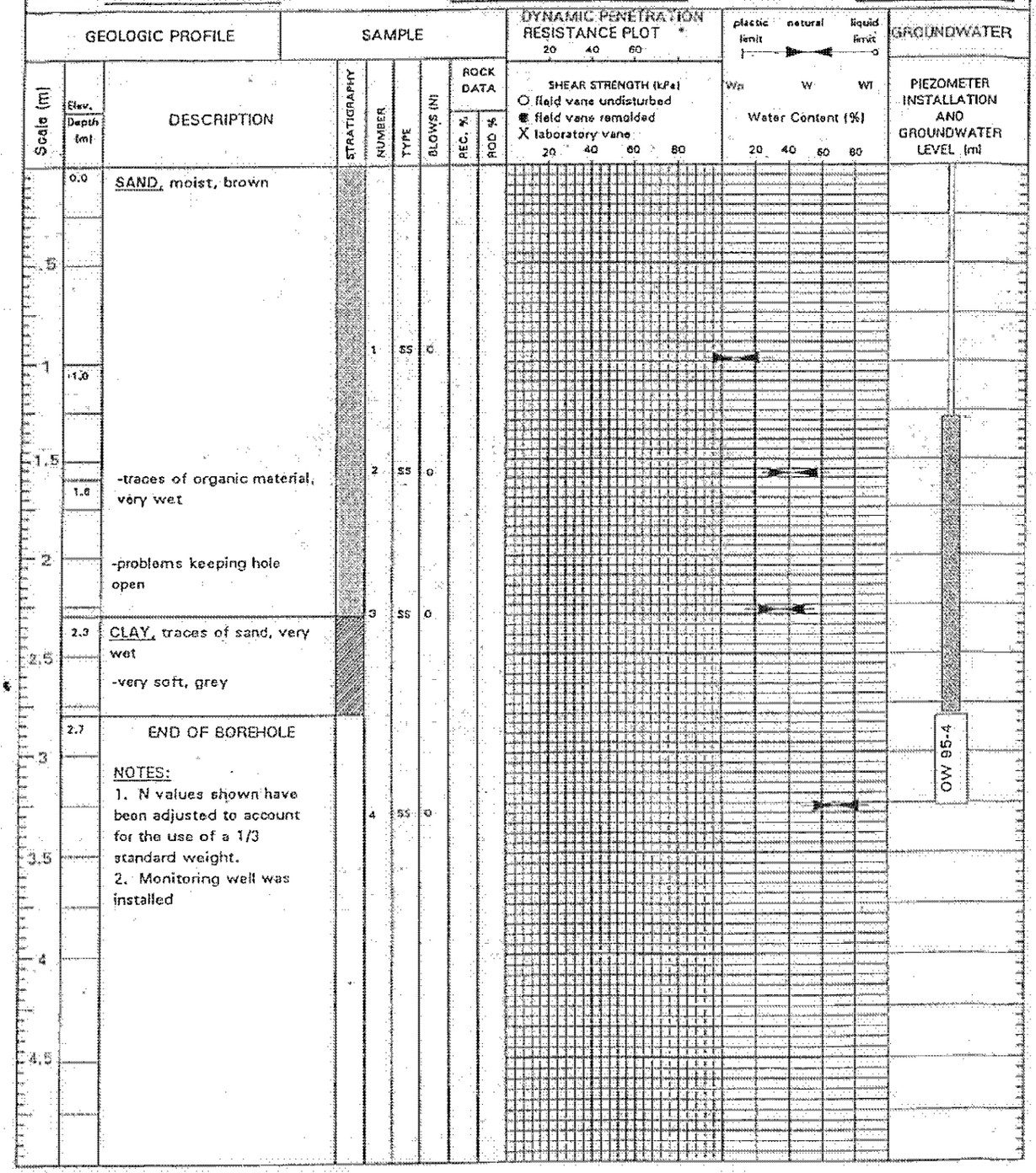
002761

PROJECT NO. E0100 BOREHOLE NO. 95-4

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95

DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



002762

PROJECT NO. E0100 BOREHOLE NO. 95-5

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA ROD %	DYNAMIC PENETRATION RESISTANCE PLOT 20 40 60	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	plastic limit / natural / liquid limit Wp W Wl Water Content (%) 20 40 60 80	GROUNDWATER PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
0	0.0	PEAT, organic, soft, wet, brn		1	SS	0						
	0.3			2	SS	0						
	0.6	SAND, moist, brown										
1		CLAY, moist, brown		3	SS	7						
		-grey, moist										
2				4	SS	5						
												OW 95-7
3		-soft, moist		5	SS	0						
4												
												OW 96-8
5		-becoming stiff, grey, traces of brown and black color		6	SS	0						
6												
		-stiff, grey, traces of brown and black color		7	SS	0						
7												
				8	SS	0						
8												
												OW 95-6
9	8.25	END OF BOREHOLE										

NOTES:
1. N values shown have been adjusted to account for the use of a 1/3 standard weight.
2. Monitoring well was installed

002763

PROJECT NO. E0100

BOREHOLE NO. 95-8

PROJECT HUNEAULT WASTE MANAGEMENT

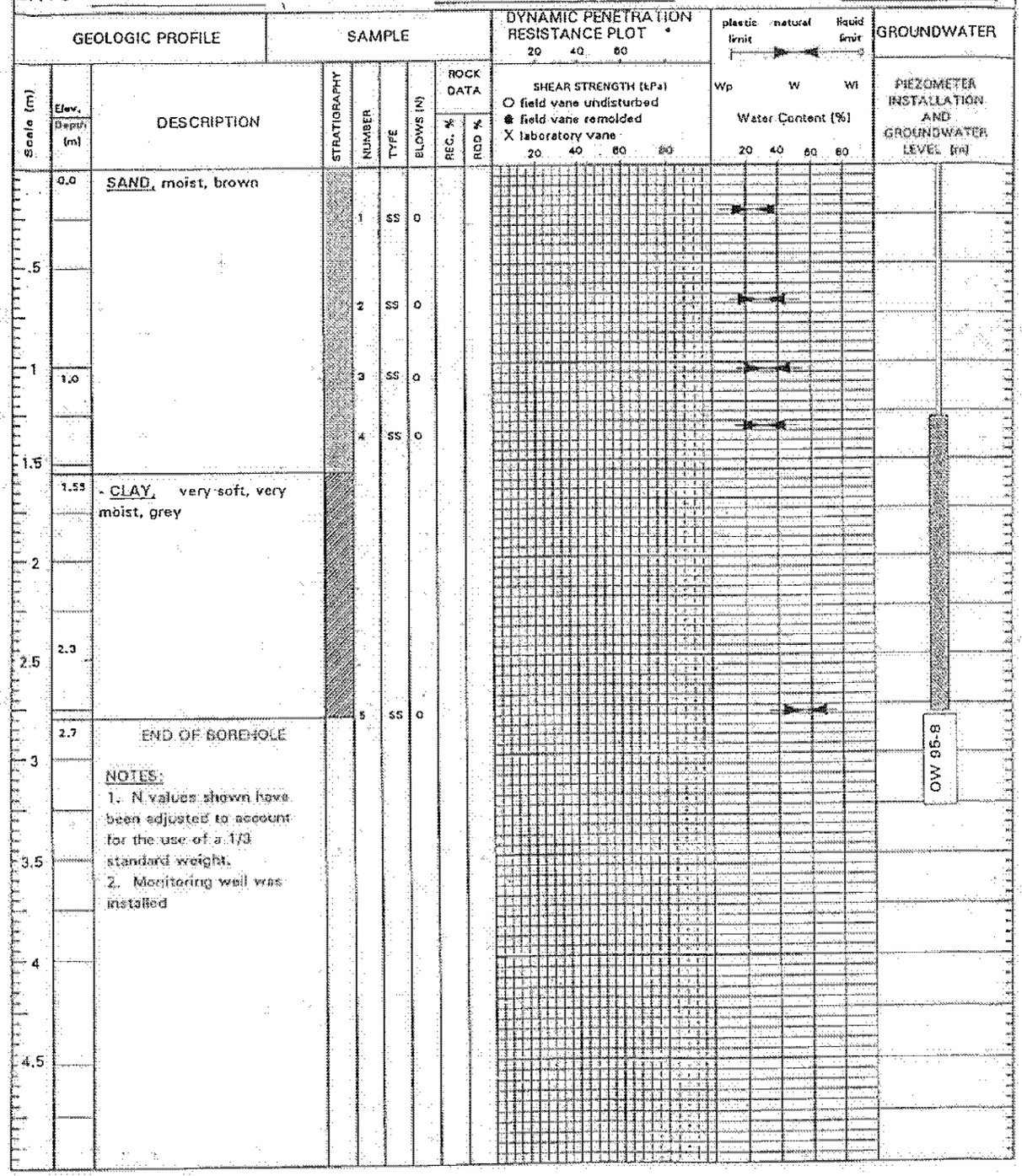
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING

DRILLING DATE Jun-95

REPORT DATE Aug-95

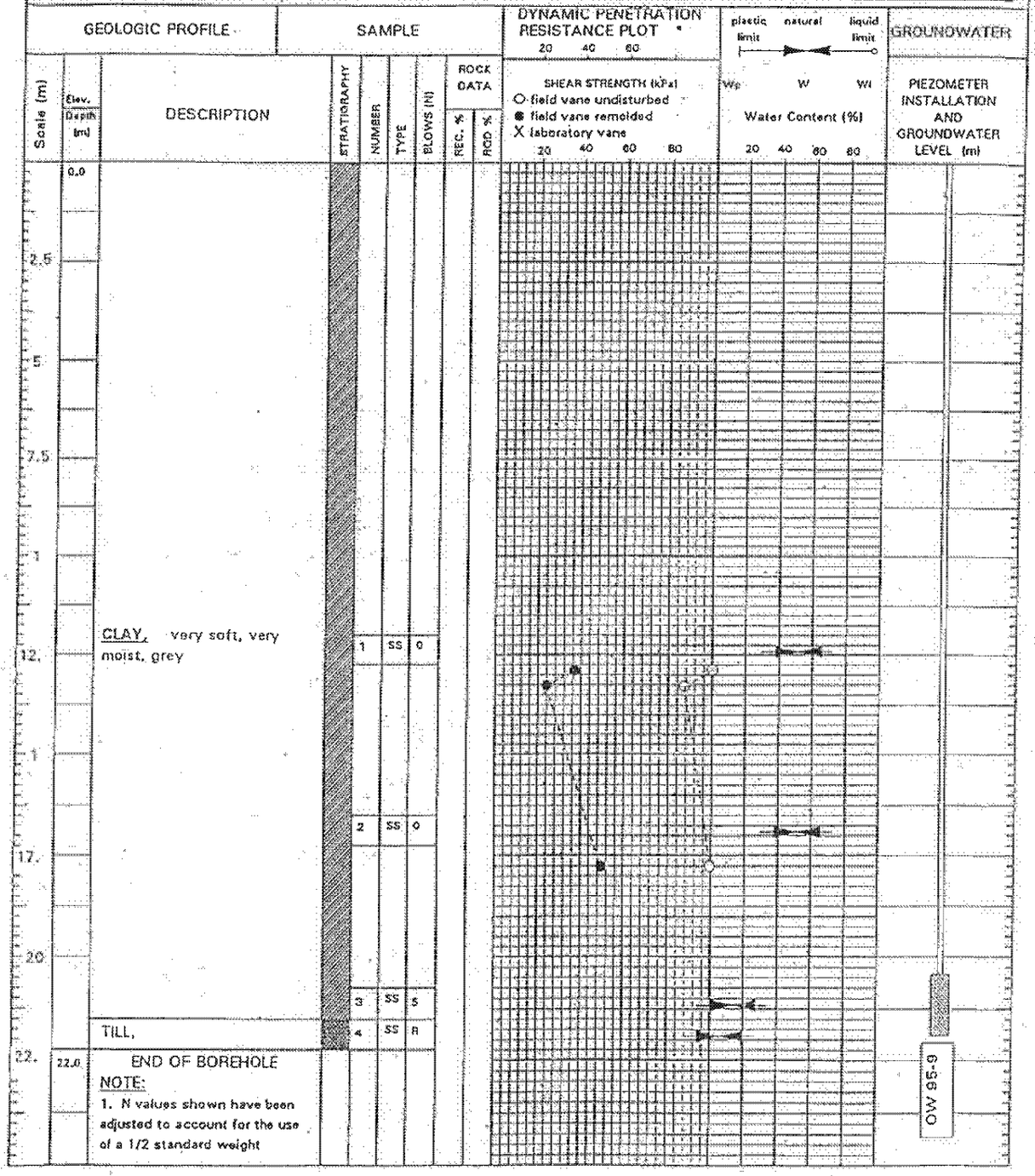
COMPILED BY V.G.



002764

PROJECT NO. E0100 BOREHOLE NO. 95-9

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.

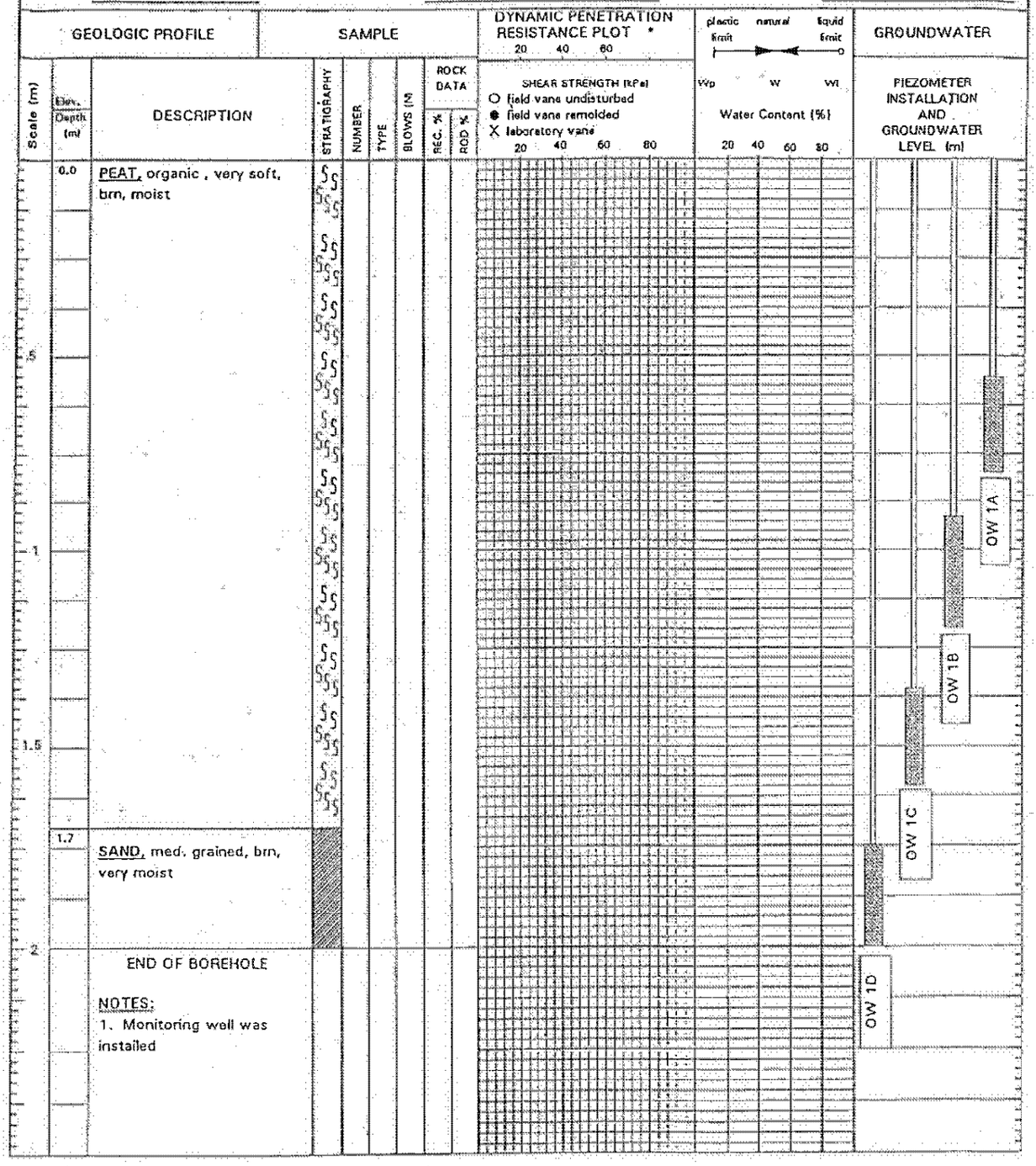


PROJECT NO. E0100 BOREHOLE NO. OW-1A-D

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jul-95

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE

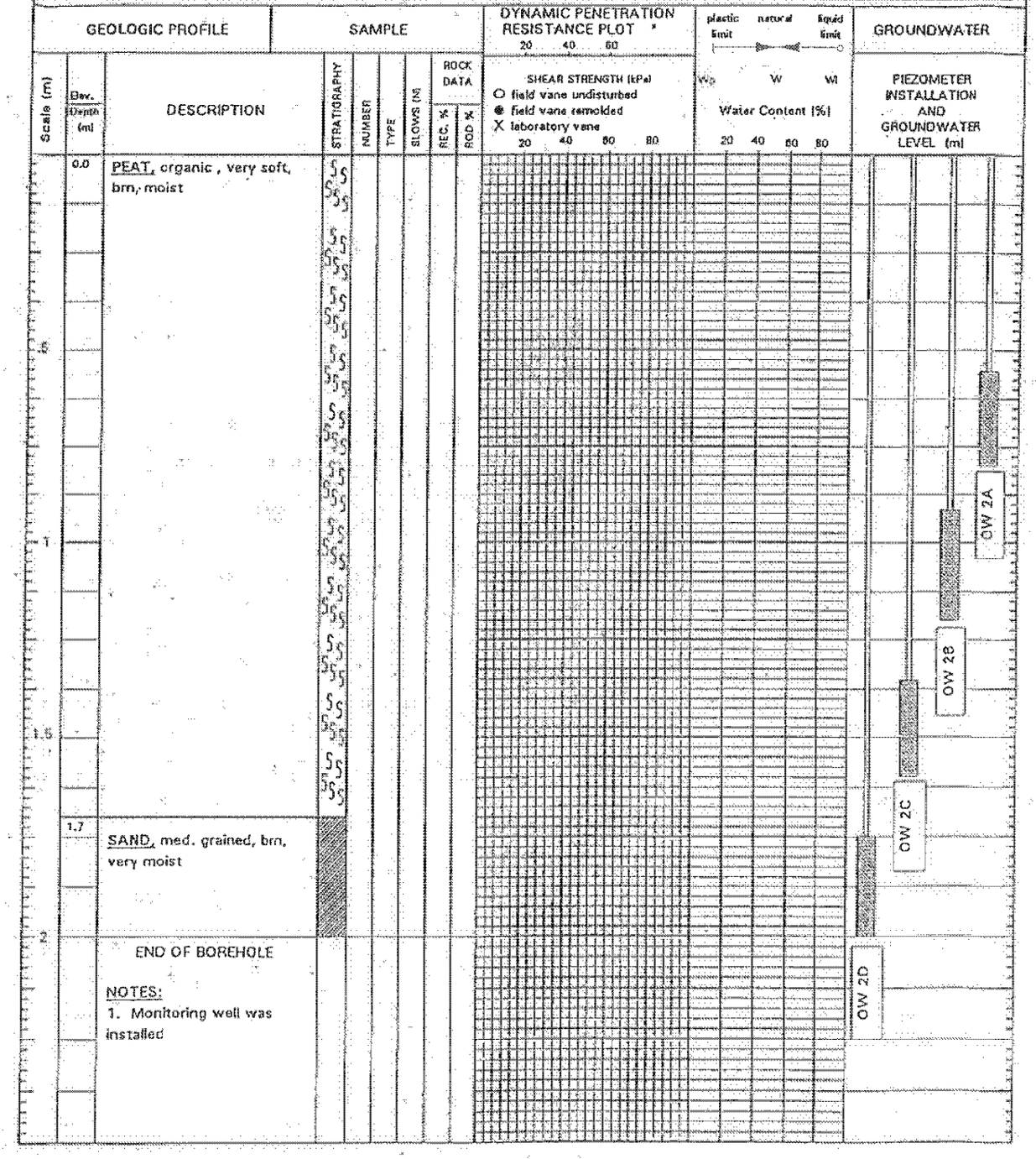
DATU GEODETIC BOREHOLE TYP AUGER TYPE COMPILED BY V.G.



002766

PROJECT NO. E0100 BOREHOLE NO. OW-2A-D

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jul-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE
DATU GEODETIC BOREHOLE TYP AUGER TYPE COMPILED BY V.G.



002767

CASTONGUAY Technologies Inc.
Environmental and Geotechnical Engineering

PROJECT NO. E0100 BOREHOLE NO. 94-1

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE May 19/94
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-94
DATU GEODETIC BOREHOLE TYP BOA DRILL - HOLLOW STEM COMPILED BY N.G.C.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA RQD %	DYNAMIC PENETRATION RESISTANCE PLOT (20 40 60) / SHEAR STRENGTH (kPa) O field vane undisturbed, ● field vane remolded, X laboratory vane (20 40 60 80)	plastic limit / natural / liquid limit; Wp W Wl; Water Content (%) (20 40 60 80)	GROUNDWATER: PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
1	0.0	FILL, mixture: sand, gravel, silt, clay , loose to compact, moist, med. brn									
	0.8	SAND, med. grained, tr. silt, very moist, reddish brn, loose, wet @ 1.1m		1	SS	14					
2	1.5	CLAY, blocky structure, firm, moist, brown to 1.8m becoming grey		2	SS	3					
3		- becoming soft, grey, saturated		3	SS	1					
4				4	SS	1					
5				5	SS	0					
6											
7											
8				6	SS	0					
9	8.5	END OF BOREHOLE									

OW 94-3
OW 94-2
OW 94-1

002768

CASTONGUAY Technologies Inc.
Environmental and Geotechnical Engineering

PROJECT NO. E0100 BOREHOLE NO. 94-4

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE May 19/94
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-94
DATU GEODETIC BOREHOLE TYP BOA DRILL - HOLLOW STEM COMPILED BY N.G.C.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA ROD %
1	0.0	PEAT, non-fibrous, v. soft						
	0.3	SAND, silty, very loose, saturated, brn, loose		1	AS			
	1.1	CLAY, blocky structure, occasional sand seam, v. stiff, moist, brown with oxidation stains		2	SS	11		
2				3	SS	7		
3		- becoming soft, grey,		4	SS	0		
4								
		- occasional black staining		5	SS	0		
5								
6				6	SS	0		
7								
				7	SS	0		
8								
	8.5	END OF BOREHOLE						
9								

DYNAMIC PENETRATION RESISTANCE PLOT * (20 40 60 80)

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
(20 40 60 80)

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
(20 40 60 80)

GROUNDWATER

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 94-6
OW 94-5
OW 94-4

002769

O-8550E

FONDEX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM — DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO — REPORT DATE APRIL 92

DATUM GEODETIC — BOREHOLE TYPE CME 55 — COMPILED BY B.G.S.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Dynamic Cone Penetration Resistance Plot 20 40 60 80 / Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	plastic limit / natural / liquid limit Wp W Wl / Water Content (%) 20 40 60 80	GROUNDWATER PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
1	71.10										
	0.00	SILTY CLAY (FILL) : SOFT, BLACK, MOIST, ORGANIC ODOUR, PIECES OF ASPHALT.									OW-92-1
	69.70										
2	1.40	SAND : LOOSE, BROWN CHANGING TO GREY AND MOIST.									
	68.10										
3	3.00	CLAY : SOFT, GREY, MOIST, BLOCKY STRUCTURE.									
				1	ST						
4		- BECOMING LAYERED.									
5				2	ST						
6											
7				3	ST						
8		- WITH ALTERNATING BROWN LAYERS.									
		- SEA SHELLS VISIBLE AT A DEPTH OF 8.60m.									
		- ALTERNATING GREY AND BLACK LAYERS.									

002770

O-8550E

FOND EX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot 20 40 60 80	plastic limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Shear Strength (kPa) * field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	61.10 10.00	CLAY: SOFT, WITH ALTERNATING GREY AND BROWN LAYERS.		4	ST						OW-92-1
11											
12											
13											
14		- BECOMING WET.									
15		- BECOMING DARK GREY, VARVED STRUCTURE.									
16											
17											
18											
19											

002771

O-8550E

FONDEX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE					Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. % / ROD %	Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	51.10									
	20.00	CLAY : DARK GREY, WET, VARVED STRUCTURE.								OW-92-1
21	49.90 21.20	- BECOMING VERY SOFT, TRACE OF SILT AND GRAVEL AT A DEPTH OF 21.80m.								
22										
23		- BECOMING TILL-LIKE ACCORDING TO SOUND AND DIFFICULTY OF DRILLING.								
	47.15									
24	23.95	SAND AND GRAVEL TILL : ACCORDING TO SOUND AND DIFFICULTY OF DRILLING.								
25	45.80	PRACTICAL AUGER REFUSAL								
	25.30	END OF BOREHOLE								

NOTE :
THE SOIL PROFILE PRESENTED IS REPRESENTATIVE OF THE PIEZOMETER NEST. CONTINUOUS SAMPLING WAS CARRIED OUT AT OW-92-01 TO A DEPTH OF APPROXIMATELY 21.0m. SHELBY TUBE SAMPLES WERE OBTAINED AT VARIOUS ELEVATIONS AT OTHER BOREHOLES WITHIN THE PIEZOMETER NEST.

O-8550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE					Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. % ROD %	Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	76.03									
	10.00	CLAY : TRACE OF SILT. SOFT, GREY, WET.		4	ST					OW-92-12
	75.03									
11	11.00	SILTY CLAY : SOFT, GREY, WET.								
12										
13										
14										
15										
16										
17										
18		- BECOMING SATURATED, ORGANIC ODOUR DETECTED.								

002773

O-B550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot	plastic limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	20 40 60 80 Shear Strength (kPa) • field vane undisturbed × field vane remolded ▪ laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	0.00	200mm OF GRAVEL OVER SAND : FINE GRAINED, LOOSE, BROWN, WET.									OW-92-12
		- BECOMING GREY.		1	ST						
	81.43 4.60	CLAY : TRACE OF SILT, SOFT, GREY, WET.		2	ST						
				3	ST						

002774

0-8530E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM — DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO — REPORT DATE APRIL 92

DATUM GEODETIC — BOREHOLE TYPE CME — COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Shear Strength (kPa) • field vane undisturbed × field vane remolded ◦ laboratory vane 20 40 60 80	Wp W Wl — Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	20.00	SILTY CLAY : SOFT, GREY, SATURATED.									OW92-12
21											
22											
23											
24		- ASSUMED SILTY CLAY BASED ON SOUND AND EASE OF DRILLING									
25											
26											
27											
28											

002775

O-8550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Dynamic Cone Penetration Resistance Plot (20 40 60 80) / Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane (20 40 60 80)	plastic limit / natural / liquid limit — Wp W Wl — Water Content (%) (20 40 60 80)	GROUNDWATER — PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	30.00	SILTY CLAY : (ASSUMED)									OW92-12
31											
32											
33	32.53										
	33.50	SAND AND GRAVEL TILL :									
34		- ENCOUNTERED COBBLES AND BOULDERS.									
35											
36											
37	46.83										
	37.20	PRACTICAL TRICONE REFUSAL									
		END OF BOREHOLE									

NOTE :
THE SOIL PROFILE PRESENTED IS REPRESENTATIVE OF THE PIEZOMETER NEST. CONTINUOUS SAMPLING WAS CARRIED OUT AT OW-92-12 TO A DEPTH OF APPROXIMATELY 22,0m. SHELBY TUBE SAMPLES WERE OBTAINED AT VARIOUS ELEVATIONS AT OTHER BOREHOLES WITHIN THE PIEZOMETER NEST.

002776

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consulting engineers and hydrogeologists

OW2-5

CLIENT HUNEAULT LANDFILL
FILE NO. 245-891
PROJECT GROUNDWATER MONITORING
LOCATION GLOUCESTER, ONTARIO
GEOLOGIST/ENGINEER KEW
DATE COMPLETED November 15, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT
						lockable steel protective casing.	10 20 30 40 50 60 70 80 90
TOPSOIL fine to medium grained, dark brown, wet, come organic material (FILL).						stick-up 0.90m.	
		1				bentonite grout.	
		5				50mm Ø sch 40 threaded PVC riser pipe.	
SAND fine to medium grained, reddish brown, wet, compact, some red and black staining.		2					
		3			10	bentonite seal.	
CLAY grey, wet, cohesive, plastic, laminated compact, weathered							
		4				silica sand filter pack.	
CLAY grey, wet, very cohesive, plastic, soft, laminated. Frequent black vertical staining (0.5cm thick) from 5m to depth. Red banding (1cm thick) 10-15cm apart from 3.6m to depth.		15					
		5				50mm Ø continuously wound PVC #8 slot well screen.	
		6			20		
END OF HOLE 5.26m bgl.						end cap.	
		7					
		25					
		8					
		9					

002777

morrison beatty limited
consulting engineers and hydrogeologists
4800 dixie road, unit 4, mississauga, ontario (416) 624-8500

OW2-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED Noverber 15, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
						lockable steel protective casing. stick-up 0.91m	
TOPSOIL fine to medium grained sand, dark brown, wet, some organic material (FILL).	1	5				50mm Ø sch 40 threaded PVC riser pipe.	
SAND fine to medium grained, reddish brown, wet, compact, some red and black staining.	2						
CLAY grey, wet, cohesive plastic, laminated, compact, weathered.	3	10				bentonite grout.	
CLAY grey, wet, very cohesive, plastic, soft, laminated. Frequent black vertical staining (0.5cm thick) from 5m to depth. Red banding (1cm thick) 10-15cm apart from 3.6m to depth.	4	15					
	5					bentonite seal.	
	6	20				silica sand filter pack.	
	7					50mm Ø continuously wound PVC #8 slot well screen.	
		25					
END OF HOLE 7.92m bgl.	8					end cap.	
	9	30					

002778

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consulting engineers and hydrogeologists
4800 dixie road, Mississauga, ontario (416) 624-5106

OW3-5

CLIENT HUNEAULT LANDFILL
PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO FILE NO. 245-891
GEOLOGIST/ENGINEER KEW DATE COMPLETED November 16, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT
							10 20 30 40 50 60 70 80 90
TOPSOIL fine to medium sand with some very fine gravel, brown to dark brown with some organic material wet, compact, becoming black (FILL).							lockable steel protective casing. stick-up 1.08m
SAND fine to medium grained, orangish brown becoming dark brown, saturated, loose	1	5					50mmØ sch 40 threaded PVC riser pipe.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, weathered.	2						bentonite grout.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, some black vertical staining (1cm thick) from 3.5m. Red banding (1-2cm thick) from 5.0m.	3	10					bentonite seal.
END OF HOLE 5.15m bgl.	4						silica sand filter pack.
		15					50mm Ø continuously wound PVC #8 slot well screen.
	5						
	6	20					end cap.
	7						
		25					
	8						
	9						

002779

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consulting engineers and hydrogeologists

OW3-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 16, 1989

DESCRIPTION	DEPTH metres / feet	SAMPLE no. / type / "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
			lockable steel protective casing, stick-up 0.75m	
TOPSOIL fine to medium sand with some very fine gravel, brown to dark brown with some organic material, wet, compact, becoming black (FILL).	1 / 5			
SAND fine to medium grained, orangish brown becoming dark brown, saturated, loose.	2		50mm Ø sch 40 threaded PVC riser pipe.	
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, weathered.	3 / 10		bentonite grout.	
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, some black vertical staining (1cm thick) from 3.5m. Red banding (1-2cm thick) from 5.0m.	4 / 15			
	5		bentonite seal.	
	6 / 20		silica sand filter pack.	
	7		50mm Ø continuously wound PVC #8 slot well screen.	
	25			
END OF HOLE 7.92m bgl.	8		end cap.	
	9 / 30			

002780

morrison beatty limited
consulting engineers and hydrogeologists
4600 dixie road, R.R.#, mississauga, ontario (416) 624-9200

OW4-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 17, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing.
TOPSOIL fine to medium grained sand, brown, moist, loose (FILL).	1	5					50mmØ sch40 threaded PVC riser pipe.
SAND fine to medium grained, orangish to greenish brown, wet, loose.	2						bentonite grout.
CLAY grey, moist, compact, cohesive, plastic, laminated, weathered.	3	10					bentonite seal.
	4						50mmØ continuously wound PVC #8 slot well screen.
CLAY grey, moist, very cohesive, soft (moldable) Black vertical staining (1cm thick) every 4 to 5cm from 5m. Red banding (1cm thick) every 4 to 5cm from 5m.		15					silica sand filter pack.
	5						end cap.
END OF HOLE 5.27m bgl.	6	20					
	7						
		25					
	8						
	9						

002781

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consulting engineers and hydrogeologists

OW4-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 17, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
						lockable steel protective casing. stick-up 0.82m.	
TOPSOIL fine to medium grained sand, brown, moist, loose (FILL).							
			1		5	50mm Ø sch 40 threaded PVC riser pipe.	
SAND fine to medium grained, orangish to greenish brown, wet, loose.			2				
CLAY grey, moist, compact, cohesive, plastic, laminated, weathered.			3		10	bentointe grout.	
			4		15		
CLAY grey, moist, very cohesive, soft, (moldable) Black vertical staining (1cm thick) every 4 to 5 cm from 5m. Red banding (1cm thick) every 4 to 5cm from 5m.			5			bentonite seal.	
			6		20	silica sand filter pack.	
			7		25	50mm Ø continuously wound PVC #8 slot well screen.	
END OF HOLE 7.92m bgl.			8			end cap.	
			9		30		

002782

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 10-Mar-2022
Order Date: 25-Aug-2021

Revised Report

Order #: 2135394

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2135394-01	L-5

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-21-00015

Report Date: 10-Mar-2022
Order Date: 25-Aug-2021
Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	26-Aug-21	26-Aug-21
Ammonia, as N	EPA 351.2 - Auto Colour	26-Aug-21	27-Aug-21
Anions	EPA 300.1 - IC	26-Aug-21	27-Aug-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	26-Aug-21	26-Aug-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	26-Aug-21	26-Aug-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	26-Aug-21	26-Aug-21
Hardness	Hardness as CaCO3	26-Aug-21	26-Aug-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	26-Aug-21	26-Aug-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	2-Sep-21	2-Sep-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	26-Aug-21	30-Aug-21
Total Dissolved Carbon	MOE 3247B - Combustion IR	26-Aug-21	26-Aug-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	25-Aug-21	26-Aug-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	26-Aug-21	31-Aug-21
Total Suspended Solids	SM 2540D - Gravimetric	25-Aug-21	26-Aug-21
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	27-Aug-21	27-Aug-21

PARACEL LABORATORIES LTD.

Order #: 2135394

Certificate of Analysis

Report Date: 10-Mar-2022

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 25-Aug-2021

Client PO: **7145-21-00015**

Project Description: **20412275**

	Client ID:	L-5	-	-	-
	Sample Date:	24-Aug-21 15:05	-	-	-
	Sample ID:	2135394-01	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	1980	-	-	-
Ammonia as N	0.01 mg/L	91.6 [3]	-	-	-
BOD	2 mg/L	<60 [1]	-	-	-
Chemical Oxygen Demand	10 mg/L	392	-	-	-
Dissolved Inorganic Carbon	5.00 mg/L	468	-	-	-
Dissolved Organic Carbon	0.5 mg/L	103	-	-	-
Total Dissolved Carbon	0.5 mg/L	570	-	-	-
Hardness	mg/L	1110	-	-	-
Phenolics	0.001 mg/L	<0.010 [2]	-	-	-
Phosphorus, total	0.01 mg/L	0.23	-	-	-
Total Dissolved Solids	10 mg/L	2880	-	-	-
Total Suspended Solids	2 mg/L	75	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	86.7	-	-	-
Anions					
Chloride	1 mg/L	542	-	-	-
Nitrate as N	0.1 mg/L	<0.5 [2]	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-
Sulphate	1 mg/L	28	-	-	-
Metals					
Arsenic	1 ug/L	2	-	-	-
Boron	10 ug/L	16400	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	161000	-	-	-
Chromium	1 ug/L	12	-	-	-
Cobalt	0.5 ug/L	4.8	-	-	-
Copper	0.5 ug/L	<0.5	-	-	-
Iron	100 ug/L	3820	-	-	-
Lead	0.1 ug/L	<0.1	-	-	-
Magnesium	200 ug/L	172000	-	-	-
Manganese	5 ug/L	278	-	-	-
Potassium	100 ug/L	115000	-	-	-
Sodium	200 ug/L	645000	-	-	-
Zinc	5 ug/L	<5	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 10-Mar-2022

Order Date: 25-Aug-2021

Project Description: 20412275

	Client ID:	L-5	-	-	-
	Sample Date:	24-Aug-21 15:05	-	-	-
	Sample ID:	2135394-01	-	-	-
	MDL/Units	Water	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	400	5	mg/L	393			1.8	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	ND	1	mg/L	ND			NC	10	
General Inorganics									
Alkalinity, total	854	5	mg/L	867			1.5	14	
Ammonia as N	ND	0.01	mg/L	ND			NC	18	
BOD	ND	150	mg/L	ND			NC	20	BOD01
Chemical Oxygen Demand	37	10	mg/L	37			0.0	12	
Dissolved Organic Carbon	2.6	0.5	mg/L	3.1			17.0	37	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.117	0.01	mg/L	0.115			1.8	15	
Total Dissolved Solids	702	10	mg/L	746			6.1	10	
Total Suspended Solids	13.0	2	mg/L	12.0			8.0	10	
Total Kjeldahl Nitrogen	0.49	0.1	mg/L	0.48			3.2	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	ND	10	ug/L	ND			NC	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	ND	0.5	ug/L	ND			NC	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	ND	200	ug/L	ND			NC	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	ND	100	ug/L	ND			NC	20	
Sodium	ND	200	ug/L	ND			NC	20	
Zinc	ND	5	ug/L	ND			NC	20	
Volatiles									
Benzene	ND	0.5	ug/L				NC	30	
1,1-Dichloroethane	ND	0.5	ug/L				NC	30	
Ethylbenzene	ND	0.5	ug/L				NC	30	
Methylene Chloride	ND	5.0	ug/L				NC	30	
Toluene	ND	0.5	ug/L				NC	30	
Vinyl chloride	ND	0.5	ug/L				NC	30	
m,p-Xylenes	ND	0.5	ug/L				NC	30	
o-Xylene	ND	0.5	ug/L				NC	30	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	8.58	1	mg/L	ND	85.8	85-115			
Nitrate as N	1.04	0.1	mg/L	ND	104	79-120			
Nitrite as N	1.02	0.05	mg/L	ND	102	84-117			
Sulphate	8.74	1	mg/L	ND	87.4	74-126			
General Inorganics									
Ammonia as N	0.260	0.01	mg/L	ND	104	81-124			
BOD	222	2	mg/L	ND	111	71-121			
Chemical Oxygen Demand	243	10	mg/L	37	103	85-111			
Dissolved Organic Carbon	13.8	0.5	mg/L	3.1	107	60-133			
Phenolics	0.022	0.001	mg/L	ND	89.3	69-132			
Phosphorus, total	0.629	0.01	mg/L	0.115	103	80-120			
Total Dissolved Solids	102	10	mg/L	ND	102	75-125			
Total Suspended Solids	20.0	2	mg/L	ND	100	75-125			
Total Kjeldahl Nitrogen	2.56	0.1	mg/L	0.48	104	81-126			
Metals									
Arsenic	53.3	1	ug/L	ND	107	80-120			
Boron	48	10	ug/L	ND	95.8	80-120			
Cadmium	51.0	0.1	ug/L	ND	102	80-120			
Chromium	52.9	1	ug/L	ND	105	80-120			
Cobalt	51.5	0.5	ug/L	ND	103	80-120			
Copper	51.1	0.5	ug/L	ND	102	80-120			
Iron	2430	100	ug/L	ND	97.0	80-120			
Lead	52.0	0.1	ug/L	ND	104	80-120			
Magnesium	9620	200	ug/L	ND	96.1	80-120			
Manganese	51.5	5	ug/L	ND	103	80-120			
Potassium	9800	100	ug/L	ND	97.9	80-120			
Sodium	9730	200	ug/L	ND	97.2	80-120			
Zinc	54	5	ug/L	ND	106	80-120			
Volatiles									
Benzene	31.6	0.5	ug/L	ND	79.1	60-130			
1,1-Dichloroethane	33.5	0.5	ug/L	ND	83.6	60-130			
Ethylbenzene	29.4	0.5	ug/L	ND	73.6	60-130			
Methylene Chloride	28.9	5.0	ug/L	ND	72.3	60-130			
Toluene	32.7	0.5	ug/L	ND	81.8	60-130			
Vinyl chloride	31.0	0.5	ug/L	ND	77.6	50-140			
m,p-Xylenes	61.5	0.5	ug/L	ND	76.9	60-130			
o-Xylene	30.3	0.5	ug/L	ND	75.8	60-130			

Qualifier Notes:

Login Qualifiers :

Container and COC sample IDs don't match - 1 Voc vial reads: "QC"

Applies to samples: L-5

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.

Applies to samples: L-5

Sample Qualifiers :

1 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

2 : Elevated Reporting Limit due to matrix interference.

3 : Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions.

QC Qualifiers :

BOD01 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision-1: This report now includes data for calcium, and an updated calculation for hardness.

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

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Paracel ID: 2135394

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name:	Golder Associates	Project Reference:	20412275
Contact Name:	Yannick Marcoux	Quote #:	10- 799 Leachate
Address:	1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	7145-21-00015
Telephone:	613-592-9600	Email Address:	yannick_marcoux@golder.com, emily_bacon@golder.com henri.hurteau@wasteconnections.com

TAT: ☑ Regular ☐ 1 Day ☐ 2 Day ☐ 3 Day

Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ S.U. (Sanitary) Municipality ☑ Other ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2135394

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote										
1	L-5	WL		9	08/24/21	3:05pm	✓										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-00015 to be sent along with the results
RCut S facility code 6263

Method of Delivery: Swift

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Summerstown Dismal	Verified By:
Relinquished By (Print): M. ARMITAGE	Date/Time:	Date/Time: AUG 25, 2021 11:30	Date/Time: Aug 25 2021 11:15
Date/Time: 08/24/21	Temperature: °C	Temperature: 5.0 °C	pH Verified: ☑ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 20412275
Custody:

Report Date: 3-Jun-2021
Order Date: 27-May-2021

Revised Report

Order #: 2122411

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2122411-01	SED-W
2122411-02	SED-C
2122411-03	SED-E

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 03-Jun-2021
Order Date: 27-May-2021
Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	31-May-21	31-May-21
Mercury by CVAA	EPA 7471B - CVAA, digestion	2-Jun-21	2-Jun-21
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	2-Jun-21	2-Jun-21
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	31-May-21	1-Jun-21
Solids, %	Gravimetric, calculation	2-Jun-21	2-Jun-21

PARACEL LABORATORIES LTD.

Order #: 2122411

Certificate of Analysis

Client: **Golder Associates Ltd. (Ottawa)**

Client PO:

Report Date: 03-Jun-2021

Order Date: 27-May-2021

Project Description: 20412275

	Client ID:	SED-W	SED-C	SED-E	-
	Sample Date:	27-May-21 09:20	27-May-21 09:55	27-May-21 10:55	-
	Sample ID:	2122411-01	2122411-02	2122411-03	-
	MDL/Units	Sediment	Sediment	Sediment	-
Physical Characteristics					
% Solids	0.1 % by Wt.	11.0	51.2	13.1	-
Metals					
Arsenic	1.0 ug/g dry	3.4	1.1	9.1	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Boron	5.0 ug/g dry	28.7	<5.0	15.8	-
Boron, available	0.5 ug/g dry	10.6	1.9	4.2	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	30.5	13.3	35.8	-
Cobalt	1.0 ug/g dry	5.4	2.0	7.9	-
Copper	5.0 ug/g dry	23.7	<5.0	17.1	-
Iron	200 ug/g dry	13100	4950	82800	-
Lead	1.0 ug/g dry	10.6	4.2	10.0	-
Manganese	5 ug/g dry	322	88	1260	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	3.9	<1.0	1.3	-
Nickel	5.0 ug/g dry	19.2	6.2	22.5	-
Selenium	1.0 ug/g dry	1.4	<1.0	1.2	-
Zinc	20.0 ug/g dry	72.8	<20.0	76.5	-

Certificate of Analysis

Report Date: 03-Jun-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Iron	ND	200	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Manganese	ND	5	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Zinc	ND	20.0	ug/g						

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	2.6	1.0	ug/g dry	2.7			5.0	30	
Beryllium	ND	0.5	ug/g dry	ND			NC	30	
Boron, available	ND	0.5	ug/g dry	ND			NC	35	
Boron	7.3	5.0	ug/g dry	6.2			15.7	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium	13.6	5.0	ug/g dry	13.0			4.1	30	
Cobalt	5.3	1.0	ug/g dry	4.9			8.5	30	
Copper	10.3	5.0	ug/g dry	9.9			3.7	30	
Iron	6350	200	ug/g dry	7350			14.6	30	
Lead	7.8	1.0	ug/g dry	8.1			3.4	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Manganese	182	5	ug/g dry	201			10.1	30	
Molybdenum	ND	1.0	ug/g dry	ND			NC	30	
Nickel	11.4	5.0	ug/g dry	10.6			7.2	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Zinc	61.4	20.0	ug/g dry	54.6			11.7	30	
Physical Characteristics									
% Solids	98.6	0.1	% by Wt.	99.6			1.0	25	

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	50.2	1.0	ug/g	1.1	98.3	70-130			
Beryllium	46.0	0.5	ug/g	ND	91.8	70-130			
Boron, available	4.59	0.5	ug/g	ND	91.8	70-122			
Boron	43.5	5.0	ug/g	ND	82.0	70-130			
Cadmium	46.1	0.5	ug/g	ND	92.1	70-130			
Chromium	54.0	5.0	ug/g	5.2	97.6	70-130			
Cobalt	50.5	1.0	ug/g	2.0	97.0	70-130			
Copper	50.4	5.0	ug/g	ND	92.8	70-130			
Iron	5400	200	ug/g	2940	98.5	70-130			
Lead	46.9	1.0	ug/g	3.2	87.3	70-130			
Mercury	1.64	0.1	ug/g	ND	109	70-130			
Manganese	139	5	ug/g	80.6	117	70-130			
Molybdenum	47.1	1.0	ug/g	ND	93.8	70-130			
Nickel	51.3	5.0	ug/g	ND	94.1	70-130			
Selenium	44.9	1.0	ug/g	ND	89.7	70-130			
Zinc	67.6	20.0	ug/g	21.8	91.5	70-130			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 03-Jun-2021
Order Date: 27-May-2021
Project Description: 20412275

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1 - This report includes an updated parameter list.

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Paracel ID: 2122411

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Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412275
Contact Name: Yannick Marceau	Quote #: 19-801
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_bacon@golder.com henri.honeault@wasteconnections.com

TAT: ☑ Regular ☐ 4 Day ☐ 3 Day ☐ 2 Day ☐ 1 Day

Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table _ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☑ Other: CDWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2122411

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	SED-W	SED		1	05/27/21	9:20AM	✓
2	SED-C	SED		1		9:55AM	✓
3	SED-E	SED		1	↓	10:55AM	✓
4							
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada, with POR to be sent along with the results

EQuIS facility code 6553

Method of Delivery: Drop Off

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished by (Print):	Date/Time:	Date/Time: 27-05-21 16:20	Date/Time: 27-05-21 17:16
Date/Time:	Temperature: °C	Temperature: 10.2 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Emily Bacon

Client PO: 7145-21-00015
Project: NAVAN 20412275
Custody: 61596,61595,61594

Report Date: 3-Jun-2021
Order Date: 26-May-2021

Order #: 2122249

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2122249-01	92-19
2122249-02	92-18
2122249-03	05-1C
2122249-04	05-1D
2122249-05	05-3C
2122249-06	05-3D
2122249-07	07-1C
2122249-08	07-1D
2122249-09	92-1D
2122249-10	05-11
2122249-11	Dupe-2
2122249-12	05-8
2122249-13	92-7
2122249-14	05-R3
2122249-15	95-8
2122249-16	98-1
2122249-17	Dupe-3
2122249-18	94-2
2122249-19	95-3
2122249-20	95-2
2122249-21	MW-C
2122249-22	MW-E
2122249-23	95-7
2122249-24	95-6
2122249-25	94-6
2122249-26	94-5

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-21-00015

Report Date: 03-Jun-2021
Order Date: 26-May-2021
Project Description: NAVAN 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, bicarbonate	calculated from EPA 310.1 - Titration to pH 4.5	27-May-21	27-May-21
Alkalinity, carbonate	calculated from EPA 310.1 - Titration to pH 4.5	27-May-21	27-May-21
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	27-May-21	27-May-21
Ammonia, as N	EPA 351.2 - Auto Colour	31-May-21	1-Jun-21
Anions	EPA 300.1 - IC	27-May-21	27-May-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	27-May-21	27-May-21
Hardness	Hardness as CaCO3	27-May-21	28-May-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	27-May-21	28-May-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	28-May-21	28-May-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	27-May-21	28-May-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	27-May-21	28-May-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	27-May-21	28-May-21
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	28-May-21	27-May-21

PARACEL LABORATORIES LTD.

Order #: 2122249

Certificate of Analysis

Report Date: 03-Jun-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 26-May-2021

Client PO: **7145-21-00015**

Project Description: NAVAN 20412275

	Client ID:	92-19	92-18	05-1C	05-1D
	Sample Date:	26-May-21 08:20	26-May-21 08:30	26-May-21 08:40	26-May-21 09:45
	Sample ID:	2122249-01	2122249-02	2122249-03	2122249-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	312	200	173	297
Alkalinity, bicarbonate	5 mg/L	312	199	172	296
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<5
Ammonia as N	0.01 mg/L	0.06	0.07	0.28	0.03
Chemical Oxygen Demand	10 mg/L	20	20	<10	13
Hardness	mg/L	500	522	161	486
Phenolics	0.001 mg/L	0.002	<0.001	<0.001	0.002
Phosphorus, total	0.01 mg/L	0.08	0.35	0.46	0.03
Total Dissolved Solids	10 mg/L	1030	954	342	1060
Total Kjeldahl Nitrogen	0.1 mg/L	0.4	0.1	0.4	0.2
Anions					
Chloride	1 mg/L	222	353	50	370
Nitrate as N	0.1 mg/L	<0.1	0.2	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	210	36	44	86
Metals					
Arsenic	1 ug/L	<1	4	2	<1
Boron	10 ug/L	50	23	63	24
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	160000	137000	38200	136000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Copper	0.5 ug/L	2.1	1.6	1.1	5.6
Iron	100 ug/L	<100	<100	252	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	24200	44000	15900	35700
Manganese	5 ug/L	472	<5	54	14
Potassium	100 ug/L	18200	7200	4920	11600
Sodium	200 ug/L	64700	98200	51100	187000
Zinc	5 ug/L	7	5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: **Golder Associates Ltd. (Ottawa)**

Client PO: **7145-21-00015**

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

	Client ID:	92-19	92-18	05-1C	05-1D
	Sample Date:	26-May-21 08:20	26-May-21 08:30	26-May-21 08:40	26-May-21 09:45
	Sample ID:	2122249-01	2122249-02	2122249-03	2122249-04
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	118%	120%	120%	119%

PARACEL LABORATORIES LTD.

Order #: 2122249

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	05-3C	05-3D	07-1C	07-1D
	Sample Date:	26-May-21 09:05	26-May-21 09:15	26-May-21 09:25	26-May-21 09:30
	Sample ID:	2122249-05	2122249-06	2122249-07	2122249-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	962	742	670	402
Alkalinity, bicarbonate	5 mg/L	954	738	667	401
Alkalinity, carbonate	5 mg/L	8	<5	<5	<5
Ammonia as N	0.01 mg/L	1.20	0.05	0.58	0.38
Chemical Oxygen Demand	10 mg/L	71	<10	38	251
Hardness	mg/L	105	388	241	483
Phenolics	0.001 mg/L	<0.004 [1]	<0.001	<0.004 [1]	<0.001
Phosphorus, total	0.01 mg/L	1.89	0.10	0.58	3.23
Total Dissolved Solids	10 mg/L	1560	1040	1550	670
Total Kjeldahl Nitrogen	0.1 mg/L	2.9	0.2	0.9	5.7
Anions					
Chloride	1 mg/L	276	110	412	18
Nitrate as N	0.1 mg/L	0.1	<0.1	<0.1	0.7
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	12	96	97	186
Metals					
Arsenic	1 ug/L	4	<1	3	<1
Boron	10 ug/L	1540	441	409	173
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	11300	65600	31400	123000
Chromium	1 ug/L	1	<1	<1	<1
Cobalt	0.5 ug/L	0.6	<0.5	0.8	<0.5
Copper	0.5 ug/L	6.2	4.4	0.9	2.6
Iron	100 ug/L	194	<100	287	184
Lead	0.1 ug/L	0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	18600	54500	39400	42300
Manganese	5 ug/L	6	494	348	144
Potassium	100 ug/L	15300	13700	14700	5470
Sodium	200 ug/L	553000	244000	501000	43800
Zinc	5 ug/L	7	13	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: **Golder Associates Ltd. (Ottawa)**

Client PO: **7145-21-00015**

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

	Client ID:	05-3C	05-3D	07-1C	07-1D
	Sample Date:	26-May-21 09:05	26-May-21 09:15	26-May-21 09:25	26-May-21 09:30
	Sample ID:	2122249-05	2122249-06	2122249-07	2122249-08
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	118%	120%	118%	113%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

	Client ID:	92-1D	05-11	Dupe-2	05-8
	Sample Date:	26-May-21 09:40	26-May-21 09:50	26-May-21 00:00	26-May-21 10:15
	Sample ID:	2122249-09	2122249-10	2122249-11	2122249-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	806	614	814	1020
Alkalinity, bicarbonate	5 mg/L	803	613	810	1010
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<25
Ammonia as N	0.01 mg/L	0.60	0.48	0.62	1.33
Chemical Oxygen Demand	10 mg/L	79	25	67	72
Hardness	mg/L	550	621	543	758
Phenolics	0.001 mg/L	<0.004 [1]	0.003	0.014	0.006
Phosphorus, total	0.01 mg/L	0.25	0.06	0.28	0.14
Total Dissolved Solids	10 mg/L	1210	744	1250	1090
Total Kjeldahl Nitrogen	0.1 mg/L	1.3	0.8	1.2	2.9
Anions					
Chloride	1 mg/L	223	30	220	38
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	39	126	40	<1
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	904	1010	893	640
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	90300	146000	89300	163000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Copper	0.5 ug/L	2.9	1.9	4.0	1.9
Iron	100 ug/L	<100	388	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	78700	62100	77700	85300
Manganese	5 ug/L	1330	310	1110	8690
Potassium	100 ug/L	16900	7080	16900	5250
Sodium	200 ug/L	281000	61700	285000	72500
Zinc	5 ug/L	<5	5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

	Client ID:	92-1D	05-11	Dupe-2	05-8
	Sample Date:	26-May-21 09:40	26-May-21 09:50	26-May-21 00:00	26-May-21 10:15
	Sample ID:	2122249-09	2122249-10	2122249-11	2122249-12
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	100%	120%	106%	119%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

	Client ID:	92-7	05-R3	95-8	98-1
	Sample Date:	26-May-21 10:05	26-May-21 10:25	26-May-21 10:50	26-May-21 10:55
	Sample ID:	2122249-13	2122249-14	2122249-15	2122249-16
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	658	774	935	417
Alkalinity, bicarbonate	5 mg/L	652	772	934	412
Alkalinity, carbonate	5 mg/L	6	<5	<5	<5
Ammonia as N	0.01 mg/L	0.21	0.04	2.51	0.69
Chemical Oxygen Demand	10 mg/L	25	<10	107	<10
Hardness	mg/L	259	688	833	302
Phenolics	0.001 mg/L	<0.004 [1]	<0.001	0.004	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.23	0.03	0.03	0.19
Total Dissolved Solids	10 mg/L	1380	1020	1250	1250
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	0.2	2.3	1.0
Anions					
Chloride	1 mg/L	423	15	174	503
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	222	11	<1
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	442	373	53	161
Cadmium	0.1 ug/L	<0.1	<0.1	0.3	<0.1
Calcium	100 ug/L	35200	160000	206000	61800
Chromium	1 ug/L	<1	2	11	<1
Cobalt	0.5 ug/L	<0.5	<0.5	2.1	<0.5
Copper	0.5 ug/L	2.6	2.0	91.9	1.2
Iron	100 ug/L	<100	<100	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	41500	70200	77500	35800
Manganese	5 ug/L	<5	<5	9670	47
Potassium	100 ug/L	16400	7780	17000	14100
Sodium	200 ug/L	454000	135000	122000	352000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

	Client ID:	92-7	05-R3	95-8	98-1
	Sample Date:	26-May-21 10:05	26-May-21 10:25	26-May-21 10:50	26-May-21 10:55
	Sample ID:	2122249-13	2122249-14	2122249-15	2122249-16
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	119%	120%	118%	116%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

	Client ID:	Dupe-3	94-2	95-3	95-2
	Sample Date:	26-May-21 00:00	26-May-21 12:10	26-May-21 12:35	26-May-21 12:25
	Sample ID:	2122249-17	2122249-18	2122249-19	2122249-20
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	915	912	699	1160
Alkalinity, bicarbonate	5 mg/L	913	900	696	1140
Alkalinity, carbonate	5 mg/L	<5	11	<5	<25
Ammonia as N	0.01 mg/L	2.57	0.11	0.17	1.67
Chemical Oxygen Demand	10 mg/L	113	36	137	70
Hardness	mg/L	846	292	176	259
Phenolics	0.001 mg/L	<0.004 [1]	<0.004 [1]	<0.004 [1]	<0.010 [1]
Phosphorus, total	0.01 mg/L	0.03	0.46	1.70	1.05
Total Dissolved Solids	10 mg/L	1190	1770	1090	2240
Total Kjeldahl Nitrogen	0.1 mg/L	3.2	0.6	1.5	2.1
Anions					
Chloride	1 mg/L	172	485	158	574
Nitrate as N	0.1 mg/L	<0.5 [1]	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	9	5	81	2
Metals					
Arsenic	1 ug/L	<1	2	<1	2
Boron	10 ug/L	54	494	705	851
Cadmium	0.1 ug/L	0.2	<0.1	<0.1	<0.1
Calcium	100 ug/L	211000	37100	26700	30200
Chromium	1 ug/L	11	<1	<1	<1
Cobalt	0.5 ug/L	1.6	0.6	0.5	<0.5
Copper	0.5 ug/L	97.9	1.1	1.1	1.6
Iron	100 ug/L	<100	113	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Magnesium	200 ug/L	77500	48400	26400	44700
Manganese	5 ug/L	9820	605	639	89
Potassium	100 ug/L	17200	14700	5790	17200
Sodium	200 ug/L	123000	515000	281000	731000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

	Client ID:	Dupe-3	94-2	95-3	95-2
	Sample Date:	26-May-21 00:00	26-May-21 12:10	26-May-21 12:35	26-May-21 12:25
	Sample ID:	2122249-17	2122249-18	2122249-19	2122249-20
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	119%	119%	119%	120%

PARACEL LABORATORIES LTD.

Order #: 2122249

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	MW-C	MW-E	95-7	95-6
	Sample Date:	26-May-21 12:45	26-May-21 13:00	26-May-21 13:20	26-May-21 13:15
	Sample ID:	2122249-21	2122249-22	2122249-23	2122249-24
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	520	377	629	955
Alkalinity, bicarbonate	5 mg/L	516	375	623	942
Alkalinity, carbonate	5 mg/L	<5	<5	6	13
Ammonia as N	0.01 mg/L	0.16	0.08	0.42	1.98
Chemical Oxygen Demand	10 mg/L	61	23	43	46
Hardness	mg/L	431	284	234	405
Phenolics	0.001 mg/L	0.002	0.002	<0.004 [1]	<0.010 [1]
Phosphorus, total	0.01 mg/L	0.86	0.19	0.24	0.67
Total Dissolved Solids	10 mg/L	1310	868	1350	2190
Total Kjeldahl Nitrogen	0.1 mg/L	1.2	0.7	1.0	2.2
Anions					
Chloride	1 mg/L	217	94	416	763
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.25 [2]
Sulphate	1 mg/L	315	300	13	<1
Metals					
Arsenic	1 ug/L	2	<1	2	1
Boron	10 ug/L	363	245	353	684
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	91400	77700	34100	48300
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	0.7	0.7
Copper	0.5 ug/L	2.0	2.4	2.2	1.3
Iron	100 ug/L	455	<100	460	258
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.1
Magnesium	200 ug/L	49200	21900	36200	69100
Manganese	5 ug/L	107	6	1890	190
Potassium	100 ug/L	6170	1600	7710	20300
Sodium	200 ug/L	165000	47700	372000	764000
Zinc	5 ug/L	<5	<5	5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

	Client ID:	MW-C	MW-E	95-7	95-6
	Sample Date:	26-May-21 12:45	26-May-21 13:00	26-May-21 13:20	26-May-21 13:15
	Sample ID:	2122249-21	2122249-22	2122249-23	2122249-24
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	119%	121%	120%	119%

Certificate of Analysis

Client: **Golder Associates Ltd. (Ottawa)**

Client PO: **7145-21-00015**

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: **NAVAN 20412275**

	Client ID:	94-6	94-5	-	-
	Sample Date:	26-May-21 13:55	26-May-21 13:45	-	-
	Sample ID:	2122249-25	2122249-26	-	-
	MDL/Units	Water	Water	-	-
General Inorganics					
Alkalinity, total	5 mg/L	345	875	-	-
Alkalinity, bicarbonate	5 mg/L	344	867	-	-
Alkalinity, carbonate	5 mg/L	<5	8	-	-
Ammonia as N	0.01 mg/L	0.07	0.91	-	-
Chemical Oxygen Demand	10 mg/L	34	60	-	-
Hardness	mg/L	323	409	-	-
Phenolics	0.001 mg/L	0.002	<0.010 [1]	-	-
Phosphorus, total	0.01 mg/L	0.40	1.14	-	-
Total Dissolved Solids	10 mg/L	972	2130	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.8	1.4	-	-
Anions					
Chloride	1 mg/L	224	721	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-
Sulphate	1 mg/L	226	13	-	-
Metals					
Arsenic	1 ug/L	<1	1	-	-
Boron	10 ug/L	157	381	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Calcium	100 ug/L	77900	53900	-	-
Chromium	1 ug/L	<1	<1	-	-
Cobalt	0.5 ug/L	2.7	0.8	-	-
Copper	0.5 ug/L	2.0	1.1	-	-
Iron	100 ug/L	329	423	-	-
Lead	0.1 ug/L	<0.1	<0.1	-	-
Magnesium	200 ug/L	31200	66600	-	-
Manganese	5 ug/L	2140	2320	-	-
Potassium	100 ug/L	5540	9620	-	-
Sodium	200 ug/L	156000	551000	-	-
Zinc	5 ug/L	<5	<5	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

	Client ID:	94-6	94-5	-	-
	Sample Date:	26-May-21 13:55	26-May-21 13:45	-	-
	Sample ID:	2122249-25	2122249-26	-	-
	MDL/Units	Water	Water	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	119%	119%	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Alkalinity, bicarbonate	ND	5	mg/L						
Alkalinity, carbonate	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Surrogate: Toluene-d8	*95.0*		*ug/L*		*119*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	81.4	1	mg/L	81.0			0.5	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	87.0	1	mg/L	87.1			0.1	10	
General Inorganics									
Alkalinity, total	153	5	mg/L	154			0.5	14	
Alkalinity, bicarbonate	151	5	mg/L	151			0.6	14	
Alkalinity, carbonate	ND	5	mg/L	ND			NC	14	
Ammonia as N	0.067	0.01	mg/L	0.057			15.0	18	
Chemical Oxygen Demand	18	10	mg/L	20			10.5	12	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	1.54	0.02	mg/L	1.58			2.6	15	
Total Dissolved Solids	ND	10	mg/L	ND			NC	10	
Total Kjeldahl Nitrogen	16.4	1.0	mg/L	18.5			12.3	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	ND	10	ug/L	ND			NC	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	ND	100	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	ND	0.5	ug/L	ND			NC	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	ND	200	ug/L	ND			NC	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	ND	100	ug/L	ND			NC	20	
Sodium	ND	200	ug/L	ND			NC	20	
Zinc	ND	5	ug/L	ND			NC	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*95.4*		*ug/L*		*119*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	88.8	1	mg/L	81.0	77.8	77-123			
Nitrate as N	1.03	0.1	mg/L	ND	103	79-120			
Nitrite as N	0.871	0.05	mg/L	ND	87.1	84-117			
Sulphate	95.8	1	mg/L	87.1	86.8	74-126			
General Inorganics									
Ammonia as N	0.297	0.01	mg/L	0.057	95.7	81-124			
Chemical Oxygen Demand	223	10	mg/L	20	102	85-111			
Phenolics	0.021	0.001	mg/L	ND	86.0	69-132			
Phosphorus, total	0.463	0.01	mg/L	ND	92.7	80-120			
Total Dissolved Solids	102	10	mg/L	ND	102	75-125			
Total Kjeldahl Nitrogen	2.28	0.1	mg/L	0.27	101	81-126			
Metals									
Arsenic	52.7	1	ug/L	ND	105	80-120			
Boron	46	10	ug/L	ND	90.8	80-120			
Cadmium	51.2	0.1	ug/L	ND	102	80-120			
Calcium	9950	100	ug/L	ND	99.4	80-120			
Chromium	51.6	1	ug/L	ND	103	80-120			
Cobalt	50.4	0.5	ug/L	ND	101	80-120			
Copper	49.8	0.5	ug/L	ND	99.6	80-120			
Iron	2460	100	ug/L	ND	98.2	80-120			
Lead	45.2	0.1	ug/L	ND	90.4	80-120			
Magnesium	9740	200	ug/L	ND	97.4	80-120			
Manganese	51.0	5	ug/L	ND	102	80-120			
Potassium	9850	100	ug/L	ND	98.4	80-120			
Sodium	9440	200	ug/L	ND	94.2	80-120			
Zinc	54	5	ug/L	ND	102	80-120			
Volatiles									
Benzene	29.2	0.5	ug/L	ND	73.0	60-130			
1,1-Dichloroethane	29.2	0.5	ug/L	ND	73.0	60-130			
Ethylbenzene	33.2	0.5	ug/L	ND	82.9	60-130			
Methylene Chloride	28.8	5.0	ug/L	ND	72.1	60-130			
Toluene	33.2	0.5	ug/L	ND	83.0	60-130			
Vinyl chloride	27.5	0.5	ug/L	ND	68.7	50-140			
m,p-Xylenes	67.1	0.5	ug/L	ND	83.9	60-130			
o-Xylene	32.4	0.5	ug/L	ND	81.0	60-130			
Surrogate: Toluene-d8	*81.0*		*ug/L*		*101*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated Reporting Limit due to matrix interference.

2 : Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 2122249

PAL LABORATORY

Head Office
300-450 Rue St. Laurent Blvd.
Ottawa, Ontario K1K 4J8
p: 1-800-749-1947
e: paracel@paracellabs.com
www.paracellabs.com

Paracel Order Number (Lab Use Only): 2122249

Chain Of Custody (Lab Use Only): No 61596

Client name: Golder Assoc. Ltd
Contact name: Emily Bacon
Address: 1931 Robertson Rd Ottawa ON
Telephone: 613-592-9600

Project Ref: NAVAIR 20412225 21000X0-02
Quote #: 19-797 GW
P.O. #: 7145-21-00015
Email: ymercaredo@golder.com, ebacon@golder.com, henri.hunegnaut@wasteconnections.com

Page 1 of 3

Turnaround Time: ☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Date Required:

Regulation: ☐ MISA ☐ Sewer Use ☐ Other Regulations
☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ REG 558 ☒ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Reg 153 ☐ MMER
☐ Table 3 ☐ Agri/Other ☐ SU - Sani ☐ SU - Storm
☐ Table ____
For RSC: ☐ Yes ☐ No
Mun: ____
☒ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Special Instructions

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Time	19-797 GW BTEX/TCL/PCB/TPH/TCLP Metals
1	92-9	GW	6	05 26 21	8:20 AM	✓ ✓
2	92-8				8:30 AM	✓ ✓
3	05-1C				8:40 AM	✓ ✓
4	05-1D				8:45 AM	✓ ✓
5	05-3C				9:05 AM	✓ ✓
6	05-3D				9:15 AM	✓ ✓
7	07-1C				9:25 AM	✓ ✓
8	07-1D				9:30 AM	✓ ✓
9	92-10				9:40 AM	✓ ✓
10	05-11				9:50 AM	✓ ✓

Comments: INVOICES TO GO TO HENRI HUNEAULT FROM WCC. SITE FACILITY # FOR EQUIS IS 6253. THIS APPLIES TO ALL 3 COC'S.

Method of Delivery: Drop Box

Relinquished By (Sign): [signature]
Relinquished By (Print): Mike Armitage
Date/Time: 05 26 21

Received by Driver/Depot: [signature]
Received at Lab: Jennifer Dawson
Date/Time: May 26, 2021 04:10
Temperature: 5.1 °C

Verified: [signature]
Date/Time: May 26 2021 1649
pH Verified: ☐ By: 6

Chain of Custody (Blank).xlsx
Revision 4.0

002820

Paracel ID: 2122249

PARA LABORATORY

Paracel Order Number (Lab Use Only): 2122249

Chain Of Custody (Lab Use Only): No 61595

Client Name: GOLDER ASSOC. LTD

Contact Name: EMILY BACON

Address: 1931 ROBERTSON RD. OTTAWA ON

Telephone: 613 592-9600

Project Ref: MVAW 20412275

Quote #: 19-797 GW

PO #: 7145-21-00015

Email: ymarcoux@golder.com, ebacon@golder.com, henri.hanegulf@wastecconnections.com

Page 2 of 3

Turnaround Time: 1 day, 3 day, 2 day, X Regular

Date Required:

Regulation: Table 1, Table 2, Table 3, Table, For RSC: Yes No; Other Regulation: MISA, PWQO, CCME, SUB, SU / Sewer; Other: DPW QS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Time	19-797 GW	Metals Plating Parameters
1	DUP2-2	GW		26	05/21/21			
2	05-8					1:15PM	✓	✓
3	92-7					1:40PM	✓	✓
4	05-R3					10:25AM	✓	✓
5	95-8					10:50AM	✓	✓
6	98-1					10:55AM	✓	✓
7	DUP2-3						✓	✓
8	94-2					12:10PM	✓	✓
9	95-3					12:35PM	✓	✓
10	95-2					12:25PM	✓	✓

Comments:

Method of Delivery:

Relinquished By (Sign): Relinquished By (Print): EMILY ARMITAGE Date/Time: 05/26/21

Received By Driver/Depot: Out of Time: Temperature: °C

Received By: Sunkeeprum Colunai Date: MAY 26, 2021 Time: 04:10 Temperature: 5.1 °C

Verified By: Date: May 26, 2021 Time: 16:45

Chain of Custody (Blank).xlsx

Revised 4.0

002821

PARA LABORATORIES

Paracel ID: 2122249

Paracel Order Number (Lab Use Only): 212245 212252

Chain Of Custody (Lab Use Only): No 61594

Client Name: Golder Assoc. Ltd.

Contact Name: Emily Bacon

Address: 1931 Robertson Rd Ottawa ON

Telephone: 613 592 9600

Project No: NAVAM 204/2275

Quote #: 19-797 GW + 19-800-BA/EC

PO #: 7145-21-00015

Email: kmercerou@golder.com, ebacon@golder.com, henri.hunault@wsptecconnect.com, cm

Page 3 of 3

Turnaround Time: 1 day, 3 day, 2 day, Regular

Date Required:

Regulation: Table 1, Table 2, Table 3, Table, For RSC: Yes No; Other Regulation: Reg 558, Other, Sewer, SU - Sanit, SU - Storm; Other: OWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Potable) A (Air) O (Other)

Required Analysis: 19-797 GW Metals Filtered, 19-800 BA/EC

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Time	19-797 GW	Metals Filtered	19-800 BA/EC
1	MW-C	GW		6	05/21/21	12:45 pm	✓	✓	
2	MW-E					1 pm	✓	✓	
3	95-7					1:20 pm	✓	✓	
4	95-6					1:45 pm	✓	✓	
5	94-6					1:55 pm	✓	✓	
6	94-5					1:45 pm	✓	✓	
7	FIELD BLANK					12:25 pm	✓	✓	✓
8	TRIP BLANK				MAY 20, 2021				✓
9									
10									

Comments:

Sufficient Quantity: Yes

Relinquished By (Sign): Relinquished By (Print): Mike Armitage

Received By (Sign): Received By (Print): Date/Time: May 26, 2021 14:15

Temperature: 5.1 °C

Verified By: Date/Time: May 26 2021 16:20

Custody Seal Intact: Yes

Temperature: °C

Cooler Custody Seal(s) Intact:

Revision 4.0

002822

PARACEL LABORATORIES LTD.

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 20412275
Custody:

Report Date: 4-Jun-2021
Order Date: 27-May-2021

Order #: 2122437

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2122437-01	S-21
2122437-02	S-1
2122437-03	S-3
2122437-04	S-15
2122437-05	S-16
2122437-06	S-17
2122437-07	S-8
2122437-08	S-9
2122437-09	S-10
2122437-10	S-11
2122437-11	S-12
2122437-12	Dupe-1

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 04-Jun-2021
Order Date: 27-May-2021
Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	28-May-21	28-May-21
Ammonia, as N	EPA 351.2 - Auto Colour	31-May-21	1-Jun-21
Anions	EPA 300.1 - IC	28-May-21	28-May-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	28-May-21	2-Jun-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	28-May-21	31-May-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	28-May-21	31-May-21
Hardness	Hardness as CaCO3	1-Jun-21	1-Jun-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	1-Jun-21	1-Jun-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	2-Jun-21	2-Jun-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	31-May-21	31-May-21
Total Dissolved Carbon	MOE 3247B - Combustion IR	31-May-21	28-May-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	28-May-21	31-May-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	31-May-21	31-May-21
Total Suspended Solids	SM 2540D - Gravimetric	28-May-21	31-May-21

PARACEL LABORATORIES LTD.

Order #: 2122437

Certificate of Analysis

Report Date: 04-Jun-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

	Client ID:	S-21	S-1	S-3	S-15
	Sample Date:	27-May-21 12:25	27-May-21 12:55	27-May-21 14:15	27-May-21 13:55
	Sample ID:	2122437-01	2122437-02	2122437-03	2122437-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	212	399	392	298
Ammonia as N	0.01 mg/L	0.03	0.14	0.49	0.08
BOD	2 mg/L	2	<2	5	<2
Chemical Oxygen Demand	10 mg/L	32	34	51	34
Dissolved Inorganic Carbon	0.500 mg/L	46.8	82.5	86.6	67.4
Dissolved Organic Carbon	0.5 mg/L	11.0	12.8	13.7	10.6
Total Dissolved Carbon	0.5 mg/L	57.8	95.3	100	78.1
Hardness	mg/L	371	631	470	601
Phenolics	0.001 mg/L	0.003	0.003	0.007	0.002
Phosphorus, total	0.01 mg/L	0.02	<0.01	0.05	<0.01
Total Dissolved Solids	10 mg/L	758	1380	1000	892
Total Suspended Solids	2 mg/L	2	2	24	3
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	0.6	1.3	0.6
Anions					
Chloride	1 mg/L	196	387	289	86
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.5	0.4
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	190	194	116	317
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	142	121	65	66
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	85600	184000	142000	179000
Chromium	1 ug/L	<1	2	2	<1
Cobalt	0.5 ug/L	<0.5	0.8	1.3	<0.5
Copper	0.5 ug/L	1.1	1.3	1.8	1.0
Iron	100 ug/L	<100	1640	6480	415
Lead	0.1 ug/L	<0.1	0.5	0.5	0.2
Magnesium	200 ug/L	38100	41600	28100	37100
Manganese	5 ug/L	28	390	1530	509
Potassium	100 ug/L	9070	13800	9290	12200
Sodium	200 ug/L	139000	218000	178000	66000
Zinc	5 ug/L	<5	5	28	6

Certificate of Analysis

Client: **Golder Associates Ltd. (Ottawa)**

Client PO:

Report Date: 04-Jun-2021

Order Date: 27-May-2021

Project Description: 20412275

	Client ID:	S-16	S-17	S-8	S-9
	Sample Date:	27-May-21 14:55	27-May-21 14:35	27-May-21 09:05	27-May-21 10:20
	Sample ID:	2122437-05	2122437-06	2122437-07	2122437-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	256	247	441	337
Ammonia as N	0.01 mg/L	0.06	0.21	0.30	0.09
BOD	2 mg/L	<2	9	12	<2
Chemical Oxygen Demand	10 mg/L	28	45	112	65
Dissolved Inorganic Carbon	0.500 mg/L	56.2	56.6	92.1	69.9
Dissolved Organic Carbon	0.5 mg/L	9.7	13.7	19.0	13.9
Total Dissolved Carbon	0.5 mg/L	65.9	70.3	111	83.8
Hardness	mg/L	615	416	528	423
Phenolics	0.001 mg/L	0.002	0.005	0.010	0.004
Phosphorus, total	0.01 mg/L	0.03	0.09	0.46	0.10
Total Dissolved Solids	10 mg/L	834	1300	994	744
Total Suspended Solids	2 mg/L	24	5	64	35
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	1.1	2.5	0.9
Anions					
Chloride	1 mg/L	35	533	100	127
Nitrate as N	0.1 mg/L	0.4	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	370	99	222	150
Metals					
Arsenic	1 ug/L	<1	<1	1	<1
Boron	10 ug/L	69	47	92	112
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	188000	127000	138000	112000
Chromium	1 ug/L	2	1	3	4
Cobalt	0.5 ug/L	1.0	0.6	3.1	1.0
Copper	0.5 ug/L	1.7	1.3	3.2	3.4
Iron	100 ug/L	1260	844	1050	1470
Lead	0.1 ug/L	0.7	0.3	0.5	0.5
Magnesium	200 ug/L	35500	24100	44600	34900
Manganese	5 ug/L	216	438	12800	145
Potassium	100 ug/L	10400	9390	12800	8920
Sodium	200 ug/L	30300	300000	125000	115000
Zinc	5 ug/L	6	<5	9	8

PARACEL LABORATORIES LTD.

Order #: 2122437

Certificate of Analysis

Report Date: 04-Jun-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

	Client ID:	S-10	S-11	S-12	Dupe-1
	Sample Date:	27-May-21 09:20	27-May-21 09:55	27-May-21 10:55	27-May-21 09:00
	Sample ID:	2122437-09	2122437-10	2122437-11	2122437-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	215	204	166	213
Ammonia as N	0.01 mg/L	0.09	0.09	0.06	0.03
BOD	2 mg/L	<150 [1]	11	8	2
Chemical Oxygen Demand	10 mg/L	766	103	149	31
Dissolved Inorganic Carbon	0.500 mg/L	52.5	50.0	44.4	54.8
Dissolved Organic Carbon	0.5 mg/L	30.7	29.9	29.6	11.5
Total Dissolved Carbon	0.5 mg/L	83.2	79.9	74.0	66.3
Hardness	mg/L	279	204	146	388
Phenolics	0.001 mg/L	0.012	0.003	0.007	0.003
Phosphorus, total	0.01 mg/L	2.92	0.17	1.80	0.01
Total Dissolved Solids	10 mg/L	416	436	284	780
Total Suspended Solids	2 mg/L	221	4	59	2
Total Kjeldahl Nitrogen	0.1 mg/L	11.1	1.5	3.8	0.6
Anions					
Chloride	1 mg/L	71	104	47	192
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	16	<1	190
Metals					
Arsenic	1 ug/L	6	1	2	<1
Boron	10 ug/L	143	117	63	127
Cadmium	0.1 ug/L	0.3	<0.1	<0.1	<0.1
Calcium	100 ug/L	76700	53600	40100	90400
Chromium	1 ug/L	33	2	3	<1
Cobalt	0.5 ug/L	9.1	1.1	2.3	<0.5
Copper	0.5 ug/L	23.7	0.7	1.3	1.0
Iron	100 ug/L	54200	1180	9170	<100
Lead	0.1 ug/L	13.6	0.3	0.6	<0.1
Magnesium	200 ug/L	21300	16900	11100	39500
Manganese	5 ug/L	1970	1130	684	30
Potassium	100 ug/L	11300	8230	5860	9590
Sodium	200 ug/L	71800	79200	43500	147000
Zinc	5 ug/L	108	6	9	<5

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	35.0	1	mg/L	34.9			0.4	10	
Nitrate as N	0.37	0.1	mg/L	0.37			0.1	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	373	5	mg/L	370			1.0	10	
General Inorganics									
Alkalinity, total	291	5	mg/L	295			1.3	14	
Ammonia as N	0.067	0.01	mg/L	0.057			15.0	18	
BOD	36	2	mg/L	37			2.5	20	
Chemical Oxygen Demand	31	10	mg/L	32			3.2	12	
Dissolved Organic Carbon	2.4	0.5	mg/L	2.6			10.4	37	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.018	0.01	mg/L	0.018			1.9	15	
Total Dissolved Solids	1250	10	mg/L	1350			7.2	10	
Total Suspended Solids	7.0	2	mg/L	7.0			0.0	10	
Total Kjeldahl Nitrogen	0.59	0.1	mg/L	0.62			5.5	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	ND	10	ug/L	ND			NC	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	ND	100	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	1.26	0.5	ug/L	1.33			5.3	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	ND	200	ug/L	ND			NC	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	ND	100	ug/L	ND			NC	20	
Sodium	262	200	ug/L	258			1.5	20	
Zinc	ND	5	ug/L	ND			NC	20	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	43.7	1	mg/L	34.9	88.2	77-123			
Nitrate as N	1.45	0.1	mg/L	0.37	108	79-120			
Nitrite as N	0.903	0.05	mg/L	ND	90.3	84-117			
Sulphate	9.02	1	mg/L	ND	90.2	86-114			
General Inorganics									
Ammonia as N	0.297	0.01	mg/L	0.057	95.7	81-124			
BOD	145	2	mg/L	ND	72.5	71-121			
Chemical Oxygen Demand	227	10	mg/L	32	97.5	85-111			
Dissolved Organic Carbon	13.6	0.5	mg/L	2.6	110	60-133			
Phenolics	0.025	0.001	mg/L	ND	98.8	69-132			
Phosphorus, total	0.494	0.01	mg/L	0.018	95.2	80-120			
Total Dissolved Solids	90.0	10	mg/L	ND	90.0	75-125			
Total Suspended Solids	18.0	2	mg/L	ND	90.0	75-125			
Total Kjeldahl Nitrogen	2.62	0.1	mg/L	0.62	99.8	81-126			
Metals									
Arsenic	49.4	1	ug/L	ND	98.6	80-120			
Boron	46	10	ug/L	ND	88.4	80-120			
Cadmium	50.1	0.1	ug/L	ND	100	80-120			
Calcium	9480	100	ug/L	ND	94.2	80-120			
Chromium	48.0	1	ug/L	ND	95.6	80-120			
Cobalt	47.6	0.5	ug/L	ND	95.2	80-120			
Copper	48.1	0.5	ug/L	1.33	93.5	80-120			
Iron	2330	100	ug/L	ND	93.4	80-120			
Lead	42.8	0.1	ug/L	ND	85.6	80-120			
Magnesium	9140	200	ug/L	ND	91.4	80-120			
Manganese	47.0	5	ug/L	ND	93.7	80-120			
Potassium	9040	100	ug/L	ND	90.2	80-120			
Sodium	9000	200	ug/L	258	87.4	80-120			
Zinc	49	5	ug/L	ND	97.5	80-120			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 04-Jun-2021
Order Date: 27-May-2021
Project Description: 20412275

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.
Applies to samples: S-11

Sample Qualifiers :

1 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

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Paracel ID: 2122437

Chain of Custody (Lab Use Only)

Page 1 of 2

Client Name: Golder Associates	Project Reference: 20412275
Contact Name: Yannick Marcoux	Quote #: 19-738
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bacon@golder.com, henri.homeau@waste-connections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day

Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ___ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ___ ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2122437

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	~~S-20~~	~~SW~~			05/27/21		☑
2	S-21	SW		7		12:25 PM	☑
3	S-1	SW				12:35 PM	☑
4	S-3	SW				2:15 PM	☑
5	S-15	SW				6:55 PM	☑
6	S-16	SW				2:55 PM	☑
7	S-17	SW				2:35 PM	☑
8	~~S-5~~	~~SW~~					☑
9	S-6	SW				9:05 AM	☑
10	S-9	SW				10:20 AM	☑

Comments: Invoice to Waste Connections of Canada, with PO# to be sent along with the results.

EQuIS facility code 6255

Method of Delivery: Drop Box

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. MARTIN	Date/Time:	Date/Time: 27/05/21 16:30	Date/Time: 10:03 28 MAY 21
Date/Time: 05/27/21	Temperature: °C	Temperature: 10.2 °C	pH Verified ☑ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

002832

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Paracel ID: 2122437

Chain of Custody
(Lab Use Only)

Page 1 of 2

Client Name:	Golder Associates	Project Reference:	20412275
Contact Name:	Yannick Marcoux	Quote #:	19-798
Address:	1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	
Telephone:	613-592-9600	Email Address:	yannick_marcoux@golder.com, emily_bacon@golder.com jamil.hassan@wasteconnections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day

Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: COMOS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2122437

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote	Required Analyses
1	S-10	SW		7	05/27/21	9:20am	☑	
2	S-11	SW		1	1	9:55am	☑	
3	S-12	SW		1	1	10:55am	☑	
4	Dupe-1	SW		1	1	/	☑	
5							☐	
6							☐	
7							☐	
8							☐	
9							☐	
10							☐	

Comments: Invoice to Waste Connections of Canada, with POR to be sent along with the results
EQuIS facility code 8255

Method of Delivery: Drop Off

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): P. Arthurton	Date/Time:	Date/Time: 27-05-21 16:20	Date/Time: 28-05-2021 08:06
Date/Time: 27-05-21	Temperature: °C	Temperature: 10.2 °C	pH Verified ☐ By:

PARACEL LABORATORIES LTD.

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300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 30-Aug-2021
Order Date: 25-Aug-2021

Order #: 2135404

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2135404-01	Trip Blank
2135404-02	Field Blank

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-21-00015

Report Date: 30-Aug-2021
Order Date: 25-Aug-2021
Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	27-Aug-21	27-Aug-21

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 30-Aug-2021

Order Date: 25-Aug-2021

Project Description: 20412275

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	23-Aug-21 09:00	24-Aug-21 11:00	-	-
	Sample ID:	2135404-01	2135404-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
Chloroethane	1.0 ug/L	<1.0	<1.0	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Chloromethane	3.0 ug/L	<3.0	<3.0	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Hexane	1.0 ug/L	<1.0	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 30-Aug-2021

Order Date: 25-Aug-2021

Project Description: 20412275

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	23-Aug-21 09:00	24-Aug-21 11:00	-	-
	Sample ID:	2135404-01	2135404-02	-	-
	MDL/Units	Water	Water	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
4-Bromofluorobenzene	Surrogate	98.4%	101%	-	-
Dibromofluoromethane	Surrogate	85.3%	86.0%	-	-
Toluene-d8	Surrogate	103%	103%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroethane	ND	1.0	ug/L						
Chloroform	ND	0.5	ug/L						
Chloromethane	ND	3.0	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dibromoethane	ND	0.2	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloroethylene, total	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
1,3,5-Trimethylbenzene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*68.6*		*ug/L*		*85.7*	*50-140*			
Surrogate: Dibromofluoromethane	*59.2*		*ug/L*		*74.0*	*50-140*			
Surrogate: Toluene-d8	*82.8*		*ug/L*		*104*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	3.18	0.5	ug/L	2.83			11.6	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroethane	ND	1.0	ug/L	ND			NC	30	
Chloroform	9.52	0.5	ug/L	7.95			18.0	30	
Chloromethane	ND	3.0	ug/L	ND			NC	30	
Dibromochloromethane	1.82	0.5	ug/L	1.98			8.4	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dibromoethane	ND	0.2	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
1,3,5-Trimethylbenzene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*79.4*		*ug/L*		*99.2*	*50-140*			
Surrogate: Dibromofluoromethane	*70.3*		*ug/L*		*87.9*	*50-140*			
Surrogate: Toluene-d8	*82.4*		*ug/L*		*103*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	110	5.0	ug/L	ND	110	50-140			
Benzene	31.6	0.5	ug/L	ND	79.1	60-130			
Bromodichloromethane	29.0	0.5	ug/L	ND	72.6	60-130			
Bromoform	39.5	0.5	ug/L	ND	98.6	60-130			
Bromomethane	28.0	0.5	ug/L	ND	70.0	50-140			
Carbon Tetrachloride	30.3	0.2	ug/L	ND	75.8	60-130			
Chlorobenzene	31.5	0.5	ug/L	ND	78.8	60-130			
Chloroethane	30.4	1.0	ug/L	ND	75.9	50-140			
Chloroform	31.2	0.5	ug/L	ND	78.1	60-130			
Chloromethane	27.2	3.0	ug/L	ND	68.0	50-140			
Dibromochloromethane	39.9	0.5	ug/L	ND	99.7	60-130			
Dichlorodifluoromethane	32.8	1.0	ug/L	ND	82.1	50-140			
1,2-Dibromoethane	39.7	0.2	ug/L	ND	99.4	60-130			
1,2-Dichlorobenzene	28.3	0.5	ug/L	ND	70.8	60-130			
1,3-Dichlorobenzene	29.1	0.5	ug/L	ND	72.8	60-130			
1,4-Dichlorobenzene	29.0	0.5	ug/L	ND	72.4	60-130			
1,1-Dichloroethane	33.5	0.5	ug/L	ND	83.6	60-130			
1,2-Dichloroethane	34.1	0.5	ug/L	ND	85.4	60-130			
1,1-Dichloroethylene	29.3	0.5	ug/L	ND	73.3	60-130			
cis-1,2-Dichloroethylene	28.1	0.5	ug/L	ND	70.4	60-130			
trans-1,2-Dichloroethylene	28.2	0.5	ug/L	ND	70.4	60-130			
1,2-Dichloropropane	30.9	0.5	ug/L	ND	77.4	60-130			
cis-1,3-Dichloropropylene	34.2	0.5	ug/L	ND	85.6	60-130			
trans-1,3-Dichloropropylene	27.5	0.5	ug/L	ND	68.8	60-130			
Ethylbenzene	29.4	0.5	ug/L	ND	73.6	60-130			
Hexane	37.1	1.0	ug/L	ND	92.8	60-130			
Methyl Ethyl Ketone (2-Butanone)	73.1	5.0	ug/L	ND	73.1	50-140			
Methyl Butyl Ketone (2-Hexanone)	81.1	10.0	ug/L	ND	81.1	50-140			
Methyl Isobutyl Ketone	108	5.0	ug/L	ND	108	50-140			
Methyl tert-butyl ether	70.5	2.0	ug/L	ND	70.5	50-140			
Methylene Chloride	28.9	5.0	ug/L	ND	72.3	60-130			
Styrene	33.9	0.5	ug/L	ND	84.6	60-130			
1,1,1,2-Tetrachloroethane	41.9	0.5	ug/L	ND	105	60-130			
1,1,2,2-Tetrachloroethane	34.1	0.5	ug/L	ND	85.2	60-130			
Tetrachloroethylene	40.4	0.5	ug/L	ND	101	60-130			
Toluene	32.7	0.5	ug/L	ND	81.8	60-130			
1,1,1-Trichloroethane	28.4	0.5	ug/L	ND	71.0	60-130			
1,1,2-Trichloroethane	30.3	0.5	ug/L	ND	75.6	60-130			
Trichloroethylene	27.1	0.5	ug/L	ND	67.8	60-130			
Trichlorofluoromethane	33.9	1.0	ug/L	ND	84.7	60-130			
1,3,5-Trimethylbenzene	30.1	0.5	ug/L	ND	75.2	60-130			
Vinyl chloride	31.0	0.5	ug/L	ND	77.6	50-140			
m,p-Xylenes	61.5	0.5	ug/L	ND	76.9	60-130			
o-Xylene	30.3	0.5	ug/L	ND	75.8	60-130			
Surrogate: 4-Bromofluorobenzene	*79.8*		*ug/L*		*99.7*	*50-140*			
Surrogate: Dibromofluoromethane	*72.4*		*ug/L*		*90.5*	*50-140*			
Surrogate: Toluene-d8	*82.1*		*ug/L*		*103*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

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Paracel ID: 2135404

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name:	Golder Associates	Project Reference:	20412275
Contact Name:	Yannick Marcoux	Quote #:	19-888 QAQC
Address:	1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	7145-21-00015
Telephone:	613-592-9600	Email Address:	yannick_marcoux@golder.com, emily_bacon@golder.com ltestbureau@wasteconnections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day
Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: OCWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2135404

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	Trip Blank			1	Aug 24, 2021		☑
2	Field Blank			2	Aug 24, 2021	11:00	☑
3							
4							
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada

Method of Delivery: Swift

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Jamie Comm Bunnell	Verified By:
Relinquished By (Print): M. ARMITAGE	Date/Time:	Date/Time: AUG 25 2021 11:50	Date/Time: AUG 25 2021 11:55
Date/Time: 08 24 21	Temperature: °C	Temperature: 4.7 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

002842

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Emily Bacon

Client PO:
Project: 20412275
Custody: 63337

Report Date: 30-Nov-2021
Order Date: 24-Nov-2021

Order #: 2148345

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2148345-01	SED-W
2148345-02	SED-C
2148345-03	SED-E

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 30-Nov-2021
Order Date: 24-Nov-2021
Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.8 - ICP-MS	29-Nov-21	29-Nov-21
Mercury by CVAA	EPA 7471B - CVAA, digestion	30-Nov-21	30-Nov-21
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	29-Nov-21	29-Nov-21
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	29-Nov-21	29-Nov-21
Solids, %	Gravimetric, calculation	26-Nov-21	26-Nov-21

PARACEL LABORATORIES LTD.

Order #: 2148345

Certificate of Analysis

Report Date: 30-Nov-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

	Client ID:	SED-W	SED-C	SED-E	-
	Sample Date:	24-Nov-21 09:20	24-Nov-21 10:00	24-Nov-21 10:45	-
	Sample ID:	2148345-01	2148345-02	2148345-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	8.3	54.7	61.2	-
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	2.1	1.5	<1.0	-
Barium	1.0 ug/g dry	52.8	27.1	16.7	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Boron	5.0 ug/g dry	26.7	<5.0	<5.0	-
Boron, available	0.5 ug/g dry	7.2	1.0	<0.5	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	16.2	13.5	10.5	-
Cobalt	1.0 ug/g dry	3.2	2.0	1.6	-
Copper	5.0 ug/g dry	16.3	16.2	<5.0	-
Iron	200 ug/g dry	8340	5100	6290	-
Lead	1.0 ug/g dry	6.2	4.2	4.8	-
Manganese	5 ug/g dry	268	74	68	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	2.1	<1.0	<1.0	-
Nickel	5.0 ug/g dry	11.6	6.2	<5.0	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	1.7	<1.0	<1.0	-
Vanadium	10.0 ug/g dry	17.2	13.4	16.5	-
Zinc	20.0 ug/g dry	54.9	<20.0	<20.0	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 30-Nov-2021

Order Date: 24-Nov-2021

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Iron	ND	200	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Manganese	ND	5	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	1.5	1.0	ug/g dry	ND			NC	30	
Arsenic	8.9	1.0	ug/g dry	9.2			3.4	30	
Barium	80.0	1.0	ug/g dry	85.1			6.2	30	
Beryllium	0.6	0.5	ug/g dry	0.6			2.7	30	
Boron, available	ND	0.5	ug/g dry	ND			NC	35	
Boron	13.6	5.0	ug/g dry	13.1			3.9	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium	20.5	5.0	ug/g dry	20.8			1.6	30	
Cobalt	11.7	1.0	ug/g dry	11.8			1.3	30	
Copper	16.3	5.0	ug/g dry	17.0			3.8	30	
Lead	9.3	1.0	ug/g dry	9.6			3.8	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Molybdenum	2.9	1.0	ug/g dry	2.8			6.6	30	
Nickel	25.6	5.0	ug/g dry	27.1			5.5	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	30.6	10.0	ug/g dry	32.5			5.8	30	
Zinc	49.5	20.0	ug/g dry	48.4			2.1	30	
Physical Characteristics									
% Solids	95.1	0.1	% by Wt.	96.3			1.2	25	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	39.1	1.0	ug/g	ND	77.9	70-130			
Arsenic	49.6	1.0	ug/g	3.7	91.8	70-130			
Barium	73.7	1.0	ug/g	34.1	79.2	70-130			
Beryllium	43.5	0.5	ug/g	ND	86.6	70-130			
Boron, available	3.83	0.5	ug/g	ND	76.7	70-122			
Boron	47.1	5.0	ug/g	5.3	83.6	70-130			
Cadmium	41.3	0.5	ug/g	ND	82.5	70-130			
Chromium	53.5	5.0	ug/g	8.3	90.3	70-130			
Cobalt	49.8	1.0	ug/g	4.7	90.1	70-130			
Copper	48.9	5.0	ug/g	6.8	84.2	70-130			
Iron	2780	200	ug/g	ND	111	70-130			
Lead	43.1	1.0	ug/g	3.8	78.5	70-130			
Mercury	1.53	0.1	ug/g	ND	102	70-130			
Manganese	56.4	5	ug/g	ND	113	70-130			
Molybdenum	45.2	1.0	ug/g	1.1	88.1	70-130			
Nickel	53.8	5.0	ug/g	10.8	85.8	70-130			
Selenium	42.9	1.0	ug/g	ND	85.6	70-130			
Silver	45.5	0.3	ug/g	ND	90.9	70-130			
Thallium	40.6	1.0	ug/g	ND	81.0	70-130			
Uranium	40.9	1.0	ug/g	ND	81.1	70-130			
Vanadium	57.7	10.0	ug/g	13.0	89.4	70-130			
Zinc	59.8	20.0	ug/g	ND	80.9	70-130			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Paracel ID: 2148345

PARACEL LABORATORIES LTD.

Paracel Order Number (Lab Use Only): 2148345

Chain Of Custody (Lab Use Only): № 63337

Client Name: GOLDER ASSOC.

Contact Name: EMILY BACON

Address: 1931 ROBERTSON RD OTTAWA ON

Telephone: 613 592-9600

Project Ref: 20412225

Quote #: 19-798-SW, 19-801-SED, 19-799 LEACHATE

PO #:

E-mail: ebacon@golder.com

Page 2 of 2

Turnaround Time: ☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular

Date Required:

☐ REG 153/04 ☐ REG 406/19

Other Regulation

☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ REG 558 ☐ PWQO

☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ CCME ☐ MISA

☐ Table 3 ☐ Agri/Other ☐ SU - Sani ☐ SU - Storm

☐ Table ☐ Mun:

For RSC: ☐ Yes ☐ No ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: 19-798-SW; 19-801-SED; 19-799 LEACHATE

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	19-798-SW	19-801-SED	19-799 LEACHATE
1	S-15	SW		7	11/24/21	1:30 PM	✓		
2	S-3	SW		1		1:45 PM	✓		
3	S-17	SW				2:10 PM	✓		
4	S-16	SW		↓		2:30 PM	✓		
5	SED-W	S		1		9:20 AM		✓	
6	SED-C	S		1		10 AM		✓	
7	SED-E	S		1		10:45 AM		✓	
8	L-5	GW		9	↓	12:25 PM			✓
9									
10									

Comments: FACILITY #6253 FOR EQUIS FILES.
INVOICE: WASTE CONNECTIONS OF CANADA (HENRI HUNEAULT)

Method of Delivery: DROP BOX

Relinquished By (Sign):

Relinquished By (Print): P. MACKITAGGE

Date/Time: 11/24/21

Received By Driver/Depot:

Date/Time:

Temperature: °C

Received at Lab: SS

Date/Time: Nov 24/21 16:30

Temperature: 4.3 °C

Verified By: SS

Date/Time: Nov 24/2021 17:07

pH Verified: ☑ By: SS

Chain of Custody (Blank).doc

002850

PARACEL LABORATORIES LTD

Paracel ID: 2148345

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2148342 - (19-798) 2148345 - (011 2148346 - (19-799)	№ 63338

Client Name: GOLDER ASSOC.
Contact Name: EMILY BACON
Address: 1931 ROBERTSON RD OTTAWA ON
Telephone: 613-592-9600

Project Ref: 20412275
Quote #: 19-798-SW
PO #:
E-mail: @golder.com henri.hunegulf@wasteconnections.com

Page 1 of 2

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
Date Required:

☐ REG 153/04 ☐ REG 406/19

Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ REG 558 ☒ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other ☐ SU - Sani ☐ SU - Storm
☐ Table
For RSC: ☐ Yes ☐ No
Mun:
☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: 19-798-SW

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	
1	S-8	SW		7	11/24/21	8:50 AM	✓
2	S-10					9:10 AM	✓
3	S-5					9:55 AM	✓
4	S-11					9:55 AM	✓
5	S-9					10:15 AM	✓
6	S-12					10:40 AM	✓
7	DUP-1						✓
8	S-20					11 AM	✓
9	S-21					12:45 PM	✓
10	S-1	↓		↓	↓	1:10 PM	✓

Comments: FACILITY # 6253 PM GOWS FILES.
INVOICE WASTE CONNECTIONS OF CANADA (HENRI HUNEGULF)

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): P. MARTIAGES	Date/Time:	Date/Time: NOV 24, 2021 16:30	Date/Time: NOV 24, 2021 17:07
Date/Time: 11/24/21	Temperature: °C	Temperature: 7.3 °C	pH Verified: ☑ By:

Chain of Custody (Blank).xls

Revision 5.0

002851

PARACEL LABORATORIES LTD.

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300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 6-Dec-2021
Order Date: 2-Dec-2021

Order #: 2149553

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2149553-01	Trip Blank
2149553-02	Field Blank

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-21-00015

Report Date: 06-Dec-2021
Order Date: 2-Dec-2021
Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	5-Dec-21	5-Dec-21

PARACEL LABORATORIES LTD.

Order #: 2149553

Certificate of Analysis

Report Date: 06-Dec-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 2-Dec-2021

Client PO: **7145-21-00015**

Project Description: 20412275

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149553-01	2149553-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
Chloroethane	1.0 ug/L	<1.0	<1.0	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Chloromethane	3.0 ug/L	<3.0	<3.0	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Hexane	1.0 ug/L	<1.0	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-

PARACEL LABORATORIES LTD.

Order #: 2149553

Certificate of Analysis

Report Date: 06-Dec-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 2-Dec-2021

Client PO: **7145-21-00015**

Project Description: **20412275**

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149553-01	2149553-02	-	-
	MDL/Units	Water	Water	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
4-Bromofluorobenzene	Surrogate	105%	105%	-	-
Dibromofluoromethane	Surrogate	91.8%	93.2%	-	-
Toluene-d8	Surrogate	92.0%	91.7%	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 06-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroethane	ND	1.0	ug/L						
Chloroform	ND	0.5	ug/L						
Chloromethane	ND	3.0	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dibromoethane	ND	0.2	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloroethylene, total	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
1,3,5-Trimethylbenzene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*78.0*		*ug/L*		*97.5*	*50-140*			
Surrogate: Dibromofluoromethane	*58.7*		*ug/L*		*73.4*	*50-140*			
Surrogate: Toluene-d8	*75.0*		*ug/L*		*93.7*	*50-140*			

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 06-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroethane	ND	1.0	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Chloromethane	ND	3.0	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dibromoethane	ND	0.2	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
1,3,5-Trimethylbenzene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*84.6*		*ug/L*		*106*	*50-140*			
Surrogate: Dibromofluoromethane	*76.4*		*ug/L*		*95.6*	*50-140*			
Surrogate: Toluene-d8	*75.4*		*ug/L*		*94.3*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	99.7	5.0	ug/L	ND	99.7	50-140			
Benzene	34.8	0.5	ug/L	ND	87.0	60-130			
Bromodichloromethane	29.2	0.5	ug/L	ND	73.0	60-130			
Bromoform	33.1	0.5	ug/L	ND	82.8	60-130			
Bromomethane	42.2	0.5	ug/L	ND	105	50-140			
Carbon Tetrachloride	34.5	0.2	ug/L	ND	86.3	60-130			
Chlorobenzene	33.9	0.5	ug/L	ND	84.7	60-130			
Chloroethane	37.9	1.0	ug/L	ND	94.8	50-140			
Chloroform	33.8	0.5	ug/L	ND	84.6	60-130			
Chloromethane	41.0	3.0	ug/L	ND	102	50-140			
Dibromochloromethane	37.2	0.5	ug/L	ND	92.9	60-130			
Dichlorodifluoromethane	40.9	1.0	ug/L	ND	102	50-140			
1,2-Dibromoethane	37.3	0.2	ug/L	ND	93.2	60-130			
1,2-Dichlorobenzene	33.7	0.5	ug/L	ND	84.2	60-130			
1,3-Dichlorobenzene	34.3	0.5	ug/L	ND	85.8	60-130			
1,4-Dichlorobenzene	33.7	0.5	ug/L	ND	84.4	60-130			
1,1-Dichloroethane	33.3	0.5	ug/L	ND	83.2	60-130			
1,2-Dichloroethane	30.3	0.5	ug/L	ND	75.8	60-130			
1,1-Dichloroethylene	44.3	0.5	ug/L	ND	111	60-130			
cis-1,2-Dichloroethylene	31.3	0.5	ug/L	ND	78.2	60-130			
trans-1,2-Dichloroethylene	33.4	0.5	ug/L	ND	83.6	60-130			
1,2-Dichloropropane	36.0	0.5	ug/L	ND	90.0	60-130			
cis-1,3-Dichloropropylene	39.3	0.5	ug/L	ND	98.2	60-130			
trans-1,3-Dichloropropylene	39.2	0.5	ug/L	ND	98.0	60-130			
Ethylbenzene	33.1	0.5	ug/L	ND	82.8	60-130			
Hexane	37.8	1.0	ug/L	ND	94.4	60-130			
Methyl Ethyl Ketone (2-Butanone)	92.4	5.0	ug/L	ND	92.4	50-140			
Methyl Butyl Ketone (2-Hexanone)	112	10.0	ug/L	ND	112	50-140			
Methyl Isobutyl Ketone	108	5.0	ug/L	ND	108	50-140			
Methyl tert-butyl ether	117	2.0	ug/L	ND	117	50-140			
Methylene Chloride	36.4	5.0	ug/L	ND	90.9	60-130			
Styrene	32.2	0.5	ug/L	ND	80.4	60-130			
1,1,1,2-Tetrachloroethane	37.2	0.5	ug/L	ND	93.1	60-130			
1,1,2,2-Tetrachloroethane	40.2	0.5	ug/L	ND	100	60-130			
Tetrachloroethylene	32.9	0.5	ug/L	ND	82.2	60-130			
Toluene	33.4	0.5	ug/L	ND	83.4	60-130			
1,1,1-Trichloroethane	34.9	0.5	ug/L	ND	87.2	60-130			
1,1,2-Trichloroethane	38.7	0.5	ug/L	ND	96.8	60-130			
Trichloroethylene	36.0	0.5	ug/L	ND	90.0	60-130			
Trichlorofluoromethane	33.0	1.0	ug/L	ND	82.6	60-130			
1,3,5-Trimethylbenzene	34.7	0.5	ug/L	ND	86.7	60-130			
Vinyl chloride	35.7	0.5	ug/L	ND	89.2	50-140			
m,p-Xylenes	64.8	0.5	ug/L	ND	81.0	60-130			
o-Xylene	32.5	0.5	ug/L	ND	81.2	60-130			
Surrogate: 4-Bromofluorobenzene	*102*		*ug/L*		*128*	*50-140*			
Surrogate: Dibromofluoromethane	*90.5*		*ug/L*		*113*	*50-140*			
Surrogate: Toluene-d8	*73.4*		*ug/L*		*91.7*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.

Applies to samples: Trip , Field

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 2149553

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Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name:	Golder Associates	Project Reference:	20412275
Contact Name:	Yannick Marcoux	Quote #:	19-809 QAQC
Address:	1931 Robertson Rd, Ottawa, Ontario K2H 5B7	PO #:	7146-21-00015
Telephone:	613-592-9600	Email Address:	yannick_marcoux@golder.com, emily_bacon@golder.com, henri.hanegraaff@wasteconnections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day

Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other: QAVQC

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2149553

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote										
1	Trip Blank				11/30/21		☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2	Field Blank				"		☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10							☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Required Analyses

Comments: Invoice to Waste Connections of Canada PO#7146-21-00015

EQuIS Facility Number #253

Method of Delivery: Walked

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print):	Date/Time: 1/Dec/21 4:10pm	Date/Time: Dec 3 2021 10:54	Date/Time: Dec 3 2021 [illegible]
Date/Time: 1/Dec/21	Temperature: 8.3 °C	Temperature: 4.9 °C 5.7	Initial Verified By:

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 15-Dec-2021
Order Date: 2-Dec-2021

Order #: 2149547

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2149547-01	92-19
2149547-02	05-1D
2149547-03	95-8
2149547-04	92-18
2149547-05	98-1
2149547-06	05-1C
2149547-07	05-R3
2149547-08	05-8
2149547-09	05-11
2149547-10	05-3D
2149547-11	07-1D
2149547-12	MW-C
2149547-13	MW-E
2149547-14	92-7
2149547-15	92-10
2149547-16	94-2
2149547-17	94-6
2149547-18	95-3
2149547-19	95-7
2149547-20	05-3C
2149547-21	07-1C
2149547-22	94-5
2149547-23	95-2
2149547-24	95-6
2149547-25	92-16
2149547-26	05-1B
2149547-27	11-1
2149547-28	92-5
2149547-29	92-9
2149547-30	94-1

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

2149547-31	05-3B
2149547-32	07-1B
2149547-33	94-4
2149547-34	95-5
2149547-35	92-12
2149547-36	05-1A
2149547-37	92-1
2149547-38	05-3A
2149547-39	07-1A
2149547-40	Dupe-2
2149547-41	Dupe-3
2149547-42	Dupe-4

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-21-00015

Report Date: 15-Dec-2021
Order Date: 2-Dec-2021
Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, bicarbonate	calculated from EPA 310.1 - Titration to pH 4.5	6-Dec-21	6-Dec-21
Alkalinity, carbonate	calculated from EPA 310.1 - Titration to pH 4.5	6-Dec-21	6-Dec-21
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	6-Dec-21	6-Dec-21
Ammonia, as N	EPA 351.2 - Auto Colour	6-Dec-21	6-Dec-21
Anions	EPA 300.1 - IC	6-Dec-21	6-Dec-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	6-Dec-21	6-Dec-21
Hardness	Hardness as CaCO3	3-Dec-21	15-Dec-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	3-Dec-21	3-Dec-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	7-Dec-21	7-Dec-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	6-Dec-21	7-Dec-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	6-Dec-21	6-Dec-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	7-Dec-21	8-Dec-21
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	4-Dec-21	4-Dec-21

PARACEL LABORATORIES LTD.

Order #: 2149547

Certificate of Analysis

Report Date: 15-Dec-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 2-Dec-2021

Client PO: **7145-21-00015**

Project Description: 20412275

	Client ID:	92-19	05-1D	95-8	92-18
	Sample Date:	30-Nov-21 13:50	30-Nov-21 17:20	30-Nov-21 11:30	30-Nov-21 13:30
	Sample ID:	2149547-01	2149547-02	2149547-03	2149547-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	412	321	904	199
Alkalinity, bicarbonate	5 mg/L	412	320	903	197
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<5
Ammonia as N	0.01 mg/L	0.37	0.04	2.16	0.09
Chemical Oxygen Demand	10 mg/L	180	23	124	114
Hardness	mg/L	487	425	751	445
Phenolics	0.001 mg/L	<0.001	<0.001	<0.002 [1]	<0.001
Phosphorus, total	0.01 mg/L	4.69	0.07	0.96	0.90
Total Dissolved Solids	10 mg/L	1230	1130	1230	896
Total Kjeldahl Nitrogen	0.1 mg/L	1.4	0.3	3.7	0.4
Anions					
Chloride	1 mg/L	323	412	163	368
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	188	86	8	35
Metals					
Arsenic	1 ug/L	<1	<1	<1	3
Boron	10 ug/L	51	19	47	25
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	151000	125000	191000	120000
Chromium	1 ug/L	<1	<1	8	<1
Cobalt	0.5 ug/L	1.4	<0.5	1.9	<0.5
Copper	0.5 ug/L	7.8	5.4	41.5	2.5
Iron	100 ug/L	<100	<100	1150	<100
Lead	0.1 ug/L	0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	27000	27300	66400	35100
Manganese	5 ug/L	2520	15	8290	582
Potassium	100 ug/L	16700	7120	14800	6050
Sodium	200 ug/L	324000	187000	110000	79900
Zinc	5 ug/L	6	7	<5	7
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	92-19	05-1D	95-8	92-18
	Sample Date:	30-Nov-21 13:50	30-Nov-21 17:20	30-Nov-21 11:30	30-Nov-21 13:30
	Sample ID:	2149547-01	2149547-02	2149547-03	2149547-04
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.0%	92.7%	93.0%	93.0%

PARACEL LABORATORIES LTD.

Order #: 2149547

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	98-1	05-1C	05-R3	05-8
	Sample Date:	30-Nov-21 11:45	30-Nov-21 17:15	30-Nov-21 12:20	30-Nov-21 12:40
	Sample ID:	2149547-05	2149547-06	2149547-07	2149547-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	401	176	737	1260
Alkalinity, bicarbonate	5 mg/L	398	174	733	1260
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<25
Ammonia as N	0.01 mg/L	0.97	0.10	0.02	0.81
Chemical Oxygen Demand	10 mg/L	40	13	26	130
Hardness	mg/L	276	139	615	863
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.40	0.35	0.02	0.16
Total Dissolved Solids	10 mg/L	1120	236	1050	1260
Total Kjeldahl Nitrogen	0.1 mg/L	1.4	0.3	0.2	3.0
Anions					
Chloride	1 mg/L	470	51	13	45
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.2	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	44	252	<1
Metals					
Arsenic	1 ug/L	<1	2	<1	<1
Boron	10 ug/L	145	60	367	1410
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	59000	34300	148000	192000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	0.8
Copper	0.5 ug/L	0.7	1.3	1.6	1.1
Iron	100 ug/L	647	280	<100	6170
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	31200	12800	59600	93300
Manganese	5 ug/L	388	35	65	11200
Potassium	100 ug/L	12600	4380	7030	6490
Sodium	200 ug/L	293000	44700	123000	108000
Zinc	5 ug/L	<5	10	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	98-1	05-1C	05-R3	05-8
	Sample Date:	30-Nov-21 11:45	30-Nov-21 17:15	30-Nov-21 12:20	30-Nov-21 12:40
	Sample ID:	2149547-05	2149547-06	2149547-07	2149547-08
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	92.7%	93.2%	93.0%	93.3%

PARACEL LABORATORIES LTD.

Order #: 2149547

Certificate of Analysis

Report Date: 15-Dec-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 2-Dec-2021

Client PO: **7145-21-00015**

Project Description: 20412275

	Client ID:	05-11	05-3D	07-1D	MW-C
	Sample Date:	30-Nov-21 14:25	30-Nov-21 16:15	30-Nov-21 15:30	30-Nov-21 08:55
	Sample ID:	2149547-09	2149547-10	2149547-11	2149547-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	555	755	461	310
Alkalinity, bicarbonate	5 mg/L	554	748	459	306
Alkalinity, carbonate	5 mg/L	<5	7	<5	<5
Ammonia as N	0.01 mg/L	0.47	0.24	0.07	0.06
Chemical Oxygen Demand	10 mg/L	64	18	51	163
Hardness	mg/L	578	328	495	357
Phenolics	0.001 mg/L	<0.004 [1]	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.07	0.12	0.71	1.45
Total Dissolved Solids	10 mg/L	746	1010	720	770
Total Kjeldahl Nitrogen	0.1 mg/L	1.1	0.5	1.2	2.1
Anions					
Chloride	1 mg/L	17	107	11	71
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.6	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	188	94	187	266
Metals					
Arsenic	1 ug/L	<1	<1	<1	2
Boron	10 ug/L	592	418	175	251
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	145000	57500	136000	86500
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	1.0	0.5	<0.5	<0.5
Copper	0.5 ug/L	0.9	1.8	2.7	5.8
Iron	100 ug/L	3750	<100	898	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Magnesium	200 ug/L	52800	44800	37400	34200
Manganese	5 ug/L	2950	648	369	<5
Potassium	100 ug/L	6450	13100	5750	4950
Sodium	200 ug/L	41600	244000	39800	112000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	05-11	05-3D	07-1D	MW-C
	Sample Date:	30-Nov-21 14:25	30-Nov-21 16:15	30-Nov-21 15:30	30-Nov-21 08:55
	Sample ID:	2149547-09	2149547-10	2149547-11	2149547-12
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	91.4%	93.0%	92.0%	92.8%

PARACEL LABORATORIES LTD.

Order #: 2149547

Certificate of Analysis

Report Date: 15-Dec-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 2-Dec-2021

Client PO: **7145-21-00015**

Project Description: 20412275

	Client ID:	MW-E	92-7	92-10	94-2
	Sample Date:	30-Nov-21 09:10	30-Nov-21 12:50	30-Nov-21 14:35	30-Nov-21 08:05
	Sample ID:	2149547-13	2149547-14	2149547-15	2149547-16
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	241	646	807	879
Alkalinity, bicarbonate	5 mg/L	239	636	801	866
Alkalinity, carbonate	5 mg/L	<5	9	5	13
Ammonia as N	0.01 mg/L	0.05	0.84	0.34	0.11
Chemical Oxygen Demand	10 mg/L	73	46	159	83
Hardness	mg/L	370	215	511	224
Phenolics	0.001 mg/L	<0.001	<0.001	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.31	0.43	0.18	0.70
Total Dissolved Solids	10 mg/L	772	1330	1170	1670
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	1.5	0.9	0.8
Anions					
Chloride	1 mg/L	80	420	229	457
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	271	1	39	9
Metals					
Arsenic	1 ug/L	<1	<1	<1	3
Boron	10 ug/L	343	412	820	360
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	100000	31300	87800	33600
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	0.7	0.5
Copper	0.5 ug/L	3.9	1.0	1.5	1.1
Iron	100 ug/L	<100	182	781	397
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	29100	33100	70700	34100
Manganese	5 ug/L	<5	124	1650	599
Potassium	100 ug/L	1740	14700	17300	12700
Sodium	200 ug/L	75900	419000	277000	555000
Zinc	5 ug/L	10	<5	6	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	MW-E	92-7	92-10	94-2
	Sample Date:	30-Nov-21 09:10	30-Nov-21 12:50	30-Nov-21 14:35	30-Nov-21 08:05
	Sample ID:	2149547-13	2149547-14	2149547-15	2149547-16
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.3%	93.2%	91.9%	92.6%

PARACEL LABORATORIES LTD.

Order #: 2149547

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	94-6	95-3	95-7	05-3C
	Sample Date:	30-Nov-21 10:15	30-Nov-21 08:20	30-Nov-21 09:40	30-Nov-21 16:10
	Sample ID:	2149547-17	2149547-18	2149547-19	2149547-20
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	316	612	622	1040
Alkalinity, bicarbonate	5 mg/L	315	604	612	1030
Alkalinity, carbonate	5 mg/L	<5	8	10	<25
Ammonia as N	0.01 mg/L	0.03	0.21	0.03	1.75
Chemical Oxygen Demand	10 mg/L	63	96	80	84
Hardness	mg/L	349	159	231	93.7
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.40	16.1	0.40	2.27
Total Dissolved Solids	10 mg/L	1170	1000	1440	1720
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	5.1	0.9	3.1
Anions					
Chloride	1 mg/L	245	150	452	339
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	325	101	8	3
Metals					
Arsenic	1 ug/L	<1	<1	1	5
Boron	10 ug/L	274	819	401	1430
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	70900	25200	36200	11300
Chromium	1 ug/L	<1	<1	<1	1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	1.1
Copper	0.5 ug/L	2.2	1.4	3.3	1.6
Iron	100 ug/L	248	<100	<100	939
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	41700	23200	34100	15900
Manganese	5 ug/L	871	195	808	46
Potassium	100 ug/L	5090	6900	9280	14500
Sodium	200 ug/L	263000	320000	408000	562000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	94-6	95-3	95-7	05-3C
	Sample Date:	30-Nov-21 10:15	30-Nov-21 08:20	30-Nov-21 09:40	30-Nov-21 16:10
	Sample ID:	2149547-17	2149547-18	2149547-19	2149547-20
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.2%	92.8%	92.4%	91.5%

PARACEL LABORATORIES LTD.

Order #: 2149547

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	07-1C	94-5	95-2	95-6
	Sample Date:	30-Nov-21 15:20	30-Nov-21 10:40	30-Nov-21 08:30	30-Nov-21 09:50
	Sample ID:	2149547-21	2149547-22	2149547-23	2149547-24
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	684	870	1200	955
Alkalinity, bicarbonate	5 mg/L	674	857	1190	950
Alkalinity, carbonate	5 mg/L	10	13	<25	<25
Ammonia as N	0.01 mg/L	0.31	0.52	1.20	1.47
Chemical Oxygen Demand	10 mg/L	51	91	82	72
Hardness	mg/L	165	369	227	326
Phenolics	0.001 mg/L	<0.001	<0.004 [1]	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.56	0.83	0.92	0.54
Total Dissolved Solids	10 mg/L	1650	2120	2230	2270
Total Kjeldahl Nitrogen	0.1 mg/L	0.8	1.2	2.1	2.4
Anions					
Chloride	1 mg/L	454	779	631	846
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	97	15	2	<1
Metals					
Arsenic	1 ug/L	3	<1	1	1
Boron	10 ug/L	398	473	799	650
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	25100	49900	28600	43600
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	0.7	0.9	<0.5	0.6
Copper	0.5 ug/L	1.1	2.5	0.9	1.0
Iron	100 ug/L	241	<100	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	25000	59200	37800	52700
Manganese	5 ug/L	488	2360	41	187
Potassium	100 ug/L	13300	11500	15900	17300
Sodium	200 ug/L	457000	581000	641000	685000
Zinc	5 ug/L	6	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 2-Dec-2021

Client PO: **7145-21-00015**

Project Description: 20412275

	Client ID:	07-1C	94-5	95-2	95-6
	Sample Date:	30-Nov-21 15:20	30-Nov-21 10:40	30-Nov-21 08:30	30-Nov-21 09:50
	Sample ID:	2149547-21	2149547-22	2149547-23	2149547-24
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	92.4%	92.6%	91.9%	91.4%

PARACEL LABORATORIES LTD.

Order #: 2149547

Certificate of Analysis

Client: **Golder Associates Ltd. (Ottawa)**

Client PO: **7145-21-00015**

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: **20412275**

	Client ID:	92-16	05-1B	11-1	92-5
	Sample Date:	30-Nov-21 14:05	30-Nov-21 17:05	30-Nov-21 12:00	30-Nov-21 13:00
	Sample ID:	2149547-25	2149547-26	2149547-27	2149547-28
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	194	268	545	810
Alkalinity, bicarbonate	5 mg/L	188	260	537	790
Alkalinity, carbonate	5 mg/L	5	7	8	19
Ammonia as N	0.01 mg/L	0.96	0.24	0.89	2.19
Chemical Oxygen Demand	10 mg/L	207	78	37	303
Hardness	mg/L	52.4	20.4	257	260
Phenolics	0.001 mg/L	<0.001	<0.001	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	13.7	2.18	0.43	13.9
Total Dissolved Solids	10 mg/L	316	338	1610	2700
Total Kjeldahl Nitrogen	0.1 mg/L	7.5	0.9	1.2	7.3
Anions					
Chloride	1 mg/L	26	19	696	1100
Nitrate as N	0.1 mg/L	<0.1	0.5	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	6	14	1	<1
Metals					
Arsenic	1 ug/L	2	4	2	3
Boron	10 ug/L	114	258	252	954
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	11900	4190	48900	31600
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	1.4	0.7
Copper	0.5 ug/L	2.9	2.6	1.5	3.5
Iron	100 ug/L	<100	<100	102	322
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Magnesium	200 ug/L	5520	2410	32700	44000
Manganese	5 ug/L	50	10	479	80
Potassium	100 ug/L	4860	5710	16900	25100
Sodium	200 ug/L	58200	106000	492000	812000
Zinc	5 ug/L	<5	5	6	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	92-16	05-1B	11-1	92-5
	Sample Date:	30-Nov-21 14:05	30-Nov-21 17:05	30-Nov-21 12:00	30-Nov-21 13:00
	Sample ID:	2149547-25	2149547-26	2149547-27	2149547-28
	MDL/Units	Water	Water	Water	Water
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	91.2%	91.0%	92.6%	90.3%

PARACEL LABORATORIES LTD.

Order #: 2149547

Certificate of Analysis

Report Date: 15-Dec-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 2-Dec-2021

Client PO: **7145-21-00015**

Project Description: 20412275

	Client ID:	92-9	94-1	05-3B	07-1B
	Sample Date:	30-Nov-21 14:25	30-Nov-21 07:55	30-Nov-21 16:00	30-Nov-21 15:10
	Sample ID:	2149547-29	2149547-30	2149547-31	2149547-32
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	738	1150	1120	973
Alkalinity, bicarbonate	5 mg/L	734	1140	1110	967
Alkalinity, carbonate	5 mg/L	<5	<25	<25	6
Ammonia as N	0.01 mg/L	1.12	2.25	2.73	3.79
Chemical Oxygen Demand	10 mg/L	86	92	91	124
Hardness	mg/L	206	214	78.1	368
Phenolics	0.001 mg/L	<0.004 [1]	<0.004 [1]	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	1.01	1.74	6.33	1.62
Total Dissolved Solids	10 mg/L	2130	2940	1890	3360
Total Kjeldahl Nitrogen	0.1 mg/L	2.4	3.2	4.2	5.5
Anions					
Chloride	1 mg/L	820	1050	442	1440
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	0.39	<1.00 [2]
Sulphate	1 mg/L	1	<1	3	<1
Metals					
Arsenic	1 ug/L	3	3	2	3
Boron	10 ug/L	755	1400	1920	846
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	25300	25000	9000	41700
Chromium	1 ug/L	<1	<1	1	<1
Cobalt	0.5 ug/L	0.6	<0.5	<0.5	0.6
Copper	0.5 ug/L	1.2	0.8	1.2	1.2
Iron	100 ug/L	<100	128	519	<100
Lead	0.1 ug/L	<0.1	<0.1	0.1	<0.1
Magnesium	200 ug/L	34600	36700	13500	64100
Manganese	5 ug/L	68	104	27	76
Potassium	100 ug/L	21500	23200	18300	26900
Sodium	200 ug/L	669000	909000	637000	874000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	92-9	94-1	05-3B	07-1B
	Sample Date:	30-Nov-21 14:25	30-Nov-21 07:55	30-Nov-21 16:00	30-Nov-21 15:10
	Sample ID:	2149547-29	2149547-30	2149547-31	2149547-32
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	90.9%	90.9%	91.2%	90.7%

PARACEL LABORATORIES LTD.

Order #: 2149547

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	94-4	95-5	92-12	05-1A
	Sample Date:	30-Nov-21 10:25	30-Nov-21 09:30	30-Nov-21 13:45	30-Nov-21 16:50
	Sample ID:	2149547-33	2149547-34	2149547-35	2149547-36
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	1340	1250	669	1080
Alkalinity, bicarbonate	5 mg/L	1330	1250	655	1060
Alkalinity, carbonate	5 mg/L	<25	<25	14	<25 [2]
Ammonia as N	0.01 mg/L	4.34	3.60	1.06	1.93
Chemical Oxygen Demand	10 mg/L	195	129	48	333
Hardness	mg/L	451	355	29.3	46.7
Phenolics	0.001 mg/L	<0.004 [1]	<0.004 [1]	<0.001	<0.002 [1]
Phosphorus, total	0.01 mg/L	5.57	1.67	2.30	8.55
Total Dissolved Solids	10 mg/L	3970	3580	910	1770
Total Kjeldahl Nitrogen	0.1 mg/L	7.4	5.0	1.7	8.0
Anions					
Chloride	1 mg/L	1630	1420	131	203
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<1.00 [2]	<1.00 [2]	<0.05	<0.05
Sulphate	1 mg/L	<1	2	<1	2
Metals					
Arsenic	1 ug/L	2	2	<1	2
Boron	10 ug/L	1570	1620	861	1490
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	44800	37500	3880	4790
Chromium	1 ug/L	<1	<1	<1	1
Cobalt	0.5 ug/L	0.5	0.5	<0.5	<0.5
Copper	0.5 ug/L	1.1	1.1	1.2	1.0
Iron	100 ug/L	101	151	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	82300	63400	4760	8440
Manganese	5 ug/L	105	77	<5	<5
Potassium	100 ug/L	29900	28800	9730	13300
Sodium	200 ug/L	1090000	963000	308000	504000
Zinc	5 ug/L	<5	<5	6	6
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	94-4	95-5	92-12	05-1A
	Sample Date:	30-Nov-21 10:25	30-Nov-21 09:30	30-Nov-21 13:45	30-Nov-21 16:50
	Sample ID:	2149547-33	2149547-34	2149547-35	2149547-36
	MDL/Units	Water	Water	Water	Water
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	91.4%	91.4%	90.3%	90.9%

PARACEL LABORATORIES LTD.

Order #: 2149547

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-1	05-3A	07-1A	Dupe-2
	Sample Date:	30-Nov-21 13:10	30-Nov-21 15:50	30-Nov-21 15:00	30-Nov-21 09:00
	Sample ID:	2149547-37	2149547-38	2149547-39	2149547-40
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	780	834	830	905
Alkalinity, bicarbonate	5 mg/L	763	820	816	904
Alkalinity, carbonate	5 mg/L	16	14	14	<5
Ammonia as N	0.01 mg/L	0.97	0.80	1.66	2.57
Chemical Oxygen Demand	10 mg/L	65	34	38	131
Hardness	mg/L	41.1	33.3	68.3	761
Phenolics	0.001 mg/L	<0.001	<0.002 [1]	<0.001	0.002
Phosphorus, total	0.01 mg/L	1.25	0.17	0.42	0.04
Total Dissolved Solids	10 mg/L	1350	1280	1720	1200
Total Kjeldahl Nitrogen	0.1 mg/L	1.7	1.2	2.0	3.5
Anions					
Chloride	1 mg/L	336	287	522	169
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	0.21	<0.05
Sulphate	1 mg/L	<1	<1	<1	9
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	877	807	906	52
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	0.1
Calcium	100 ug/L	5420	4700	7150	195000
Chromium	1 ug/L	<1	<1	<1	7
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	1.1
Copper	0.5 ug/L	4.0	1.0	0.9	73.7
Iron	100 ug/L	<100	<100	142	<100
Lead	0.1 ug/L	0.2	<0.1	<0.1	<0.1
Magnesium	200 ug/L	6690	5240	12300	66400
Manganese	5 ug/L	10	6	<5	8330
Potassium	100 ug/L	12000	8480	15700	14400
Sodium	200 ug/L	490000	489000	570000	110000
Zinc	5 ug/L	<5	5	<5	7
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	92-1	05-3A	07-1A	Dupe-2
	Sample Date:	30-Nov-21 13:10	30-Nov-21 15:50	30-Nov-21 15:00	30-Nov-21 09:00
	Sample ID:	2149547-37	2149547-38	2149547-39	2149547-40
	MDL/Units	Water	Water	Water	Water
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	90.4%	91.2%	92.2%	91.2%

PARACEL LABORATORIES LTD.

Order #: 2149547

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	Dupe-3	Dupe-4	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149547-41	2149547-42	-	-
	MDL/Units	Water	Water	-	-
General Inorganics					
Alkalinity, total	5 mg/L	646	270	-	-
Alkalinity, bicarbonate	5 mg/L	639	266	-	-
Alkalinity, carbonate	5 mg/L	7	<5	-	-
Ammonia as N	0.01 mg/L	0.83	0.20	-	-
Chemical Oxygen Demand	10 mg/L	43	106	-	-
Hardness	mg/L	218	21.2	-	-
Phenolics	0.001 mg/L	<0.001	<0.001	-	-
Phosphorus, total	0.01 mg/L	0.45	2.01	-	-
Total Dissolved Solids	10 mg/L	1360	390	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	1.4	0.8	-	-
Anions					
Chloride	1 mg/L	426	19	-	-
Nitrate as N	0.1 mg/L	<0.1	0.5	-	-
Nitrite as N	0.05 mg/L	0.16	<0.05	-	-
Sulphate	1 mg/L	<1	14	-	-
Metals					
Arsenic	1 ug/L	<1	4	-	-
Boron	10 ug/L	458	247	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Calcium	100 ug/L	33100	4240	-	-
Chromium	1 ug/L	<1	<1	-	-
Cobalt	0.5 ug/L	<0.5	<0.5	-	-
Copper	0.5 ug/L	<0.5	3.6	-	-
Iron	100 ug/L	402	<100	-	-
Lead	0.1 ug/L	<0.1	<0.1	-	-
Magnesium	200 ug/L	33000	2570	-	-
Manganese	5 ug/L	257	9	-	-
Potassium	100 ug/L	14200	5670	-	-
Sodium	200 ug/L	401000	106000	-	-
Zinc	5 ug/L	9	<5	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

	Client ID:	Dupe-3	Dupe-4	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149547-41	2149547-42	-	-
	MDL/Units	Water	Water	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	91.4%	92.0%	-	-

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Alkalinity, bicarbonate	ND	5	mg/L						
Alkalinity, carbonate	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Surrogate: Toluene-d8	*75.0*		*ug/L*		*93.7*	*50-140*			

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 15-Dec-2021

Order Date: 2-Dec-2021

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	109	1	mg/L	107			1.3	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	94.3	1	mg/L	94.1			0.2	10	
General Inorganics									
Alkalinity, total	408	5	mg/L	412			0.9	14	
Alkalinity, bicarbonate	408	5	mg/L	412			0.9	14	
Alkalinity, carbonate	ND	5	mg/L	ND			NC	14	
Ammonia as N	0.744	0.02	mg/L	0.676			9.7	18	
Chemical Oxygen Demand	22	10	mg/L	23			4.4	12	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.074	0.01	mg/L	0.072			3.4	15	
Total Dissolved Solids	1190	10	mg/L	1230			3.6	10	
Total Kjeldahl Nitrogen	0.33	0.1	mg/L	0.34			4.2	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	19	10	ug/L	19			1.4	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	30000	100	ug/L	30100			0.3	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	0.94	0.5	ug/L	0.95			1.5	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	7440	200	ug/L	7310			1.9	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	1360	100	ug/L	1370			0.7	20	
Sodium	13900	200	ug/L	13500			3.0	20	
Zinc	9	5	ug/L	10			11.7	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*75.4*		*ug/L*		*94.3*	*50-140*			

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	115	1	mg/L	107	81.3	77-123			
Nitrate as N	1.07	0.1	mg/L	ND	107	79-120			
Nitrite as N	1.04	0.05	mg/L	ND	104	84-117			
Sulphate	102	1	mg/L	94.1	76.5	74-126			
General Inorganics									
Ammonia as N	0.556	0.01	mg/L	0.342	85.6	81-124			
Chemical Oxygen Demand	221	10	mg/L	23	99.0	85-111			
Phenolics	0.024	0.001	mg/L	ND	96.1	69-132			
Phosphorus, total	0.560	0.01	mg/L	0.072	97.8	80-120			
Total Dissolved Solids	94.0	10	mg/L	ND	94.0	75-125			
Total Kjeldahl Nitrogen	2.13	0.1	mg/L	0.34	89.3	81-126			
Metals									
Arsenic	49.6	1	ug/L	ND	98.4	80-120			
Boron	40	10	ug/L	ND	80.3	80-120			
Cadmium	48.5	0.1	ug/L	ND	97.1	80-120			
Calcium	38300	100	ug/L	30100	82.5	80-120			
Chromium	45.8	1	ug/L	ND	91.2	80-120			
Cobalt	45.2	0.5	ug/L	ND	90.4	80-120			
Copper	44.9	0.5	ug/L	0.95	87.9	80-120			
Iron	2190	100	ug/L	ND	86.0	80-120			
Lead	43.2	0.1	ug/L	ND	86.2	80-120			
Magnesium	15600	200	ug/L	7310	83.4	80-120			
Manganese	50.1	5	ug/L	ND	94.8	80-120			
Potassium	10600	100	ug/L	1370	91.9	80-120			
Sodium	21500	200	ug/L	13500	80.3	80-120			
Zinc	53	5	ug/L	10	85.9	80-120			
Volatiles									
Benzene	34.8	0.5	ug/L	ND	87.0	60-130			
1,1-Dichloroethane	33.3	0.5	ug/L	ND	83.2	60-130			
Ethylbenzene	33.1	0.5	ug/L	ND	82.8	60-130			
Methylene Chloride	36.4	5.0	ug/L	ND	90.9	60-130			
Toluene	33.4	0.5	ug/L	ND	83.4	60-130			
Vinyl chloride	35.7	0.5	ug/L	ND	89.2	50-140			
m,p-Xylenes	64.8	0.5	ug/L	ND	81.0	60-130			
o-Xylene	32.5	0.5	ug/L	ND	81.2	60-130			
Surrogate: Toluene-d8	*73.4*		*ug/L*		*91.7*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.

Applies to samples: 92-19, 05-1D, 95-8, 92-18, 98-1, 05-1C, 05-R3, 05-8, 05-11, 05-3D, 07-1D, MW-C, MW-E, 92-7, 92-10, 94-2, 94-6, 95-3, 95-7, 05-3C, 07-1C, 94-5, 95-2, 95-6, 92-16, 05-1B, 11-1, 92-5, 92-9, 94-1, 05-3B, 07-1B, 94-4, 95-5, 92-12, 05-1A, 92-1, 05-3A, 07-1A, Dupe-2, Dupe-3, Dupe-4

Sample Qualifiers :

1 : Elevated Reporting Limit due to matrix interference.

2 : Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 2149547

PARACE LABORATORIES

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Ottawa, Ontario K1G 4J8
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Chain of Custody (Lab Use Only)

Page 1 of 3

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Mercanti	Quote #: 19-797	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-80019	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_mercanti@golder.com, emily_bacon@golder.com henri.hansault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	92-19	GW			11 Nov 21	1:50 PM	☑
2	05-10	GW				5:10 PM	☑
3	05-8	GW				11:30 AM	☑
4	92-18	GW				1:20 PM	☑
5	88-1	GW				1:45 PM	☑
6	05-1C	GW				5:15 PM	☑
7	05-103	GW				12:20 PM	☑
8	05-8	GW				12:40 PM	☑
9	05-11	GW				2:25 PM	☑
10	05-3D	GW			↓	4:15 PM	☑

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-80019 to be sent along with the results
60Js5 facility code 6755

Method of Delivery: Walk-in

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M MARINOS	Date/Time: 12/10/2021 4:00 pm	Date/Time: DEC 3 2021 6:55	Date/Time: Dec 3 2021
Date/Time: 11/30/21	Temperature: 5.6 °C	Temperature: 5.2 °C	pH Verified ☐ By: KS

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

Paracel ID: 2149547

PARACEL LABORATORIES LTD. | RELIABLE.

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Chain of Custody
(Lab Use Only)

Page 2 of 6

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marcerou	Quote #: 19-297	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd.	PO #: 7145-21-00915	Date Required:	
Ottawa, Ontario K2H 5B7	Email Address: yannick_marcerou@golder.com, emily_bacon@golder.com		
Telephone: 613-592-9600	henri.hunsuk@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ___ ☐ RSC Filing ☐ O. Reg 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ___ ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	07-1D	GW			11/30/21	3:30pm	✓
2	MW-C	GW				8:55am	✓
3	MW-E	GW				9:10 am	✓
4	92-7	GW				12:50pm	✓
5	92-10	GW				2:35pm	✓
6	94-2	GW				8:05am	✓
7	94-6	GW				10:15am	✓
8	95-3	GW				8:20am	✓
9	95-7	GW				9:40 am	✓
10	95-3C	GW			↓	4:10pm	✓

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-00915 to be sent along with the results

EQuIS facility code E253

Method of Delivery: Walk-in

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. MARCEAU	Date/Time: 12/2/21 11:10	Date/Time: DEC 3 2021 8:35	Date/Time: DEC 3 2021 11:21
Date/Time: 11 30 21	Temperature: 5.2 °C	Temperature: 5.7 °C	eGF Verified By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

Paracel ID: 2149547

PARACEL LABORATORIES LTD.

TRI
RE:
REL

Chain of Custody
(Lab Use Only)

Page 3 of 5

Client Name:	Golder Associates	Project Reference:	20412276
Contact Name:	Yannick Marcenau	Quote #:	19-797
Address:	1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	7145-21-05015
Telephone:	613-592-9600	Email Address:	yannick_marcenau@golder.com, emily_bacon@golder.com hsmi.turcault@wasteconnections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day
Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Per quote
1	07-1C	GW			11/30/21	3:20pm	✓
2	94-6	GW				10:40am	✓
3	95-2	GW				8:30am	✓
4	95-6	GW				9:50am	✓
5	92-16	GW				2:05pm	✓
6	05-1B	GW				5:05pm	✓
7	11-1	GW				12pm	✓
8	92-5	GW				1pm	✓
9	92-9	GW				2:45pm	✓
10	94-1	GW			↓	7:55am	✓

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-05015 to be sent along with the results
EDD45 facility code 6255

Method of Delivery: Walk-in

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. MARRIAGE	Date/Time: 11/30/21 9:10pm	Date/Time: DEC 3 2021 8:57	Date/Time: DEC 3 2021 13
Date/Time: 11/30/21	Temperature: 8.3°C	Temperature: 5.7 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.5 Oct. 2014

002892

PARACEL LABORATORIES LTD.

Paracel ID: 2149547

Chain of Custody (Lab Use Only)

Page 1 of 6

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 1 Day	
Contact Name: Yannick Marcoux	Quote #: 19-397	☐ 2 Day ☐ 3 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-620015	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bacon@golder.com hann.hanouti@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ REC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ S.U.B (Storm) ☐ S.U.B (Sanitary) Municipality ☑ Other: DOWGS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Per quote										
1	05-3B	GW			14/21	4 PM	✓										
2	07-1B	GW				3:10 PM	✓										
3	94-4	GW				10:30AM	✓										
4	~~95-4~~	~~GW~~					✓										
5	95-5	GW				9:30AM	✓										
6	92-12	GW				1:45 PM	✓										
7	05-1A	GW				4:50 PM	✓										
8	92-1	GW				1:10 PM	✓										
9	05-3A	GW				3:50 PM	✓										
10	07-1A	GW				3 PM	✓										

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-620015 to be sent along with the results

EDoIS facility code 6353

Method of Delivery:

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): A. MARTAGE	Date/Time: 14/04/21 4:10pm	Date/Time: APR 23 2021 10:55	Date/Time: APR 23 2021 1:01
Date/Time: 14/04/21	Temperature: 5.5 °C	Temperature: 5.1 °C	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

002893

Paracel ID: 2149547

PARACEL LABORATORIES LTD.

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300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
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www.paracellabs.com

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marcoux	Quote #: 19797	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7165-21-00015	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bacon@golder.com henri.bureau@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWSR

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

	Paracel Order Number: / Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	~~Dupe-1~~	~~GW~~					☑
2	Dupe-2	GW			19-Oct-21		☑
3	Dupe-3	GW			"	"	☑
4	Dupe-4	GW			"	"	☑
5	~~Dupe-5~~	~~GW~~					☑
6							☐
7							☐
8							☐
9							☐
10							☐

Comments: Invoice to Waste Connections of Canada, with PO#7165-21-00015 to be sent along with the results

eDocS facility code 6253

Method of Delivery:

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. Mirfakhr	Date/Time: 19 Oct 21 4:40	Date/Time: 19-Oct-21 16:35	Date/Time: 19 Oct 21 4:40
Date/Time: 19 Oct 21	Temperature: 8.3 °C	Temperature: 5.2 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 6.3 Oct. 2014

002894

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1A 06-Sep-2005	05-1A 16-Nov-2005	05-1A 25-May-2006	05-1A 31-May-2012 05-1A	05-1A 28-Nov-2012 05-1A	05-1A 29-May-2014 [3] 05-1A	05-1A 26-Nov-2015 05-1A
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1180	228	1020	950	980	950	954
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	24	20	35	<25 [6]
Alkalinity (Total as CaCO3)	mg/l	--	--	969	935	1020	970	1000	990	975
Ammonia Nitrogen	mg/l	--	--	1.68	1.94	1.76	1.8	2.0	2.5	2.03
Chemical Oxygen Demand	mg/l	--	--	263	117	134	110	120	400	177
Chloride	mg/l	--	250	174	180	198	180	180	200	219
Conductivity (Field)	uS/cm	--	--	1950	2100	1300	2042	2125	2135	2315
Hardness, Calcium Carbonate	mg/l	--	--	49	54	44	46	50	49	39.3
Nitrate as N	mg/l	10.0	--	0.2	0.1	<0.1	<0.10	<0.10	<0.50	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	0.037	<0.010	<0.050	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	6.64	4.38	4.84	3.9	4.9	28	4.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	<0.10	<0.50	--
pH	-	--	--	--	--	--	8.44	--	8.59	--
pH (Field)	-	--	--	8.3	--	8.5	8.44	8.53	7.63	8.49
Phosphorus	mg/l	--	--	6.87	2.93	--	2.6	3.5	11	3.04
Sulphate	mg/l	--	500 [4]	17	18	16	<1	<1	<1	1
Temperature (Field)	deg c	--	15	16.3	--	6	9.9	7.1	9.3	8.9
Total Dissolved Solids	mg/l	--	500	1380	1420	1410	1480	1590	1820	1840
Total Organic Carbon	mg/l	--	--	199	47.7	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	2720	58	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	<0.001	0.001	0.0011	0.003	0.0031	0.002
Boron, dissolved	mg/l	5	--	1.43	1.54	1.33	1.5	1.7	1.7	1.64
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	6.22	5.92	4.05	4.3	4.9	4.3	4.16
Chromium, dissolved	mg/l	0.05	--	<0.002	0.002	<0.002	<0.0050	<0.005	<0.0050	0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.0019	<0.001	<0.0010	<0.0005
Iron, dissolved	mg/l	--	0.3	0.111	0.241	0.071	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0008	0.001	0.0002	<0.00050	<0.0005	<0.00050	0.0001
Magnesium, dissolved	mg/l	--	--	8.05	9.48	8.19	8.6	9.1	9.2	7.03
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.005	0.0080	0.006	0.0039	<0.005
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.2	17.7	14.8	14	16	16	12.7
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	587	638	573	550	580	580	612
Zinc, dissolved	mg/l	--	5	0.006	0.008	0.007	0.0070	<0.005	<0.0050	0.009
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	0.0014	<0.002 [7]
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00050	<0.00010	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00050	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00050	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00050	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.0025	<0.00050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00050	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.0010	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.0010	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1A 24-May-2017 05-1A	05-1A 29-Nov-2018 05-1A	05-1A 21-May-2020 05-1A	05-1A 30-Nov-2021 05-1A
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1050	1040	1040	1060
Alkalinity, Carbonate as CaCO3	mg/l	--	--	23	<25 [8]	27	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1080	1070	1060	1080
Ammonia Nitrogen	mg/l	--	--	1.92	1.65	2.31	1.93
Chemical Oxygen Demand	mg/l	--	--	183	181	788	333
Chloride	mg/l	--	250	189	214	243	203
Conductivity (Field)	uS/cm	--	--	2265	2042	2128	2188
Hardness, Calcium Carbonate	mg/l	--	--	46	64	54.5	46.7
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.0	3.5	6.6	8.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.38	8.31	8.46	8.51
Phosphorus	mg/l	--	--	3.49	3.24	9.44	8.55
Sulphate	mg/l	--	500 [4]	2	2	2	2
Temperature (Field)	deg c	--	15	10.4	7.1	10.0	6.3
Total Dissolved Solids	mg/l	--	500	1840	1720	1900	1770
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.004	0.002	0.001	0.002
Boron, dissolved	mg/l	5	--	1.57	1.65	1.42	1.49
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	4.03	9.36	5.71	4.79
Chromium, dissolved	mg/l	0.05	--	0.009	0.001	0.001	0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0011	0.0026	0.0033	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	0.119	0.151	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	0.0002	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	8.68	9.83	9.77	8.44
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.7	16.4	15.3	13.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	580	566	557	504
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.009	0.006
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [7]	<0.001	0.010	<0.002 [10]
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1B 06-Sep-2005	05-1B 16-Nov-2005	05-1B 25-May-2006	05-1B 31-May-2012	05-1B 28-Nov-2012	05-1B 29-May-2014	05-1B 26-Nov-2015
							05-1B	05-1B	05-1B	05-1B
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	163	262	250	260	240	262
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	3.6	4.0	5.3	6
Alkalinity (Total as CaCO3)	mg/l	--	--	254	268	262	250	270	250	268
Ammonia Nitrogen	mg/l	--	--	0.8	0.98	0.69	0.36	0.94	0.28	0.33
Chemical Oxygen Demand	mg/l	--	--	40	44	31	36	73	20	45
Chloride	mg/l	--	250	24	21.6	20.8	19	21	29	20
Conductivity (Field)	uS/cm	--	--	460	480	490	555	557	568	598
Hardness, Calcium Carbonate	mg/l	--	--	28	32	26	27	26	24	21.9
Nitrate as N	mg/l	10.0	--	0.1	1.5	0.2	<0.10	0.13	0.22	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	0.019	0.026	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	10.1	5.89	2.28	1.5	<1.0 [11]	<2.0 [11]	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	0.15	0.25	--
pH	-	--	--	--	--	--	8.19	--	8.36	--
pH (Field)	-	--	--	7.5	--	8.1	8.55	8.26	7.95	8.40
Phosphorus	mg/l	--	--	2.07	0.59	--	1.8	6.1	1.5	1.72
Sulphate	mg/l	--	500 [4]	47	36	32	27	23	24	18
Temperature (Field)	deg c	--	15	11.7	--	8	9.6	7.4	8.9	9.4
Total Dissolved Solids	mg/l	--	500	380	390	350	344	516	468	446
Total Organic Carbon	mg/l	--	--	89.2	17.7	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1810	120	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.003	<0.001	<0.001	0.0051	0.004	0.0045	0.004
Boron, dissolved	mg/l	5	--	0.263	0.267	0.228	0.24	0.28	0.27	0.244
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.0003	<0.005	<0.00010	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	6.27	6.91	5.46	5.3	5.5	4.9	4.7
Chromium, dissolved	mg/l	0.05	--	<0.002	0.003	<0.002	<0.0050	<0.005	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.004	0.004	0.003	0.0078	0.007	0.0032	0.0014
Iron, dissolved	mg/l	--	0.3	0.086	0.261	0.104	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	0.0003	<0.00050	<0.0005	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	3.02	3.51	3.11	3.3	3	2.8	2.46
Manganese, dissolved	mg/l	--	0.05	0.052	0.054	0.026	0.0051	0.012	0.018	0.013
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.01	0.02	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8	8.8	6.8	6.1	6.4	6.7	5.17
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	145	153	130	120	130	130	140
Zinc, dissolved	mg/l	--	5	0.006	0.009	0.01	<0.0050	<0.005	<0.0050	0.007
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.00020	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1B 24-May-2017 05-1B	05-1B 29-Nov-2018 05-1B	05-1B 21-May-2020 05-1B	05-1B 30-Nov-2021 05-1B
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	268	283	252	260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	6	6	7
Alkalinity (Total as CaCO3)	mg/l	--	--	273	288	258	268
Ammonia Nitrogen	mg/l	--	--	0.02	0.15	0.19	0.24
Chemical Oxygen Demand	mg/l	--	--	23	29	39	78
Chloride	mg/l	--	250	17	19	24	19
Conductivity (Field)	uS/cm	--	--	560	553	558	574
Hardness, Calcium Carbonate	mg/l	--	--	27	34	22.5	20.4
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.4	0.5
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.6	0.5	0.8	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.36	8.47	8.89	8.12
Phosphorus	mg/l	--	--	0.85	0.69	1.54	2.18
Sulphate	mg/l	--	500 [4]	20	18	22	14
Temperature (Field)	deg c	--	15	9.7	7.5	9.4	6.3
Total Dissolved Solids	mg/l	--	500	372	396	450	338
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004	0.003	0.004
Boron, dissolved	mg/l	5	--	0.278	0.263	0.248	0.258
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	5.27	8.1	4.59	4.19
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0046	0.0092	0.0066	0.0026
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0002	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	3.3	3.35	2.67	2.41
Manganese, dissolved	mg/l	--	0.05	<0.005	0.008	0.009	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.37	6.74	6.36	5.71
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	122	122	118	106
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.002	<0.001
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1C 06-Sep-2005	05-1C 16-Nov-2005	05-1C 25-May-2006	05-1C 31-May-2012 05-1C	05-1C 28-Nov-2012 05-1C	05-1C 29-May-2013 05-1C	05-1C 26-Nov-2013 GW-6	05-1C 29-May-2014 05-1C
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	190	201	136	170	180	170	170	170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	1.6	1.9	1.8	1.4	2.1
Alkalinity (Total as CaCO3)	mg/l	--	--	156	165	136	170	180	170	170	170
Ammonia Nitrogen	mg/l	--	--	1.73	0.9	0.06	<0.050	0.11	0.090	0.081	0.29
Chemical Oxygen Demand	mg/l	--	--	36	11	21	36	14	17	10	10
Chloride	mg/l	--	250	59.5	52.2	25.4	41	42	44	42	45
Conductivity (Field)	uS/cm	--	--	480	510	350	548	541	528	518	531
Hardness, Calcium Carbonate	mg/l	--	--	216	229	156	170	160	180	160	180
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.7	0.32	0.44	0.29	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	<0.010	<0.010	<0.010	0.013
Nitrogen, Total Kjeldahl	mg/l	--	--	18.9	5.2	0.73	1.2	0.64	0.46	0.66	0.88
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	0.32	0.44	0.29	<0.10	0.10
pH	-	--	--	--	--	--	8.00	--	8.05	7.94	8.12
pH (Field)	-	--	--	7.1	--	7.8	7.74	7.85	7.51	7.69	6.71
Phosphorus	mg/l	--	--	2.23	0.65	--	1.1	0.85	0.41	0.36	0.42
Sulphate	mg/l	--	500 [4]	113	86	46	53	48	57	54	50
Temperature (Field)	deg c	--	15	11.5	10.4	7	9.1	7.8	8.3	8.6	8.7
Total Dissolved Solids	mg/l	--	500	405	373	234	326	364	366	310	318
Total Organic Carbon	mg/l	--	--	65.1	8.3	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	2670	520	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.003	0.0032	0.003	0.0019	0.0025	0.0023
Boron, dissolved	mg/l	5	--	0.08	0.074	0.028	0.078	0.083	0.077	0.082	0.072
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	52.7	55.9	42.7	40	40	44	39	42
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.0050	<0.005	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.003	<0.002	0.0018	0.002	0.0018	0.0012	0.0025
Iron, dissolved	mg/l	--	0.3	0.167	0.025	0.009	0.38	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0002	<0.0002	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	20.5	21.7	11.8	16	15	17	15	17
Manganese, dissolved	mg/l	--	0.05	0.232	0.112	0.044	0.032	0.002	0.045	0.023	0.062
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.02	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.9	7.7	6.9	5.2	5.5	5.6	5.2	5
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	61.9	56.1	23.3	50	49	53	50	54
Zinc, dissolved	mg/l	--	5	0.007	0.008	0.011	<0.0050	<0.005	<0.0050	0.012	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.00020	<0.00020	0.00079	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1C 19-Nov-2014	05-1C 02-Jun-2015	05-1C 26-Nov-2015	05-1C 26-May-2016	05-1C 17-Nov-2016	05-1C 24-May-2017	05-1C 29-Nov-2017	05-1C 24-May-2018
				05-1C	05-1C	05-1C	05-1C	05-1C	05-1C	05-1C	05-1C
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	170	170	175	178	179	187	185	190
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.8	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	170	171	176	179	180	188	186	191
Ammonia Nitrogen	mg/l	--	--	0.096	0.30	0.09	0.30	0.27	0.02	0.16	0.29
Chemical Oxygen Demand	mg/l	--	--	5.1	15	17	<10	11	44	51	15
Chloride	mg/l	--	250	45	51	50	55	49	53	58	55
Conductivity (Field)	uS/cm	--	--	592	576	565	578	619	579	553	584
Hardness, Calcium Carbonate	mg/l	--	--	170	115	138	168	164	165	158	173
Nitrate as N	mg/l	10.0	--	<0.10	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.024	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.39	0.4	0.4	0.5	0.5	0.4	0.4	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--
pH	-	--	--	8.06	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.01	7.75	7.99	7.59	7.22	7.94	6.95	7.77
Phosphorus	mg/l	--	--	0.40	0.29	0.26	0.30	0.32	0.32	0.35	0.39
Sulphate	mg/l	--	500 [4]	50	53	52	56	52	53	55	51
Temperature (Field)	deg c	--	15	5.6	8.4	9.7	9.2	10.0	9.5	8.4	8.7
Total Dissolved Solids	mg/l	--	500	296	324	336	368	314	354	314	344
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0027	0.002	0.002	0.002	0.003	0.002	0.003	0.002
Boron, dissolved	mg/l	5	--	0.075	0.066	0.071	0.072	0.081	0.074	0.095	0.07
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	42	21.2	31.4	40.3	40.5	38.4	38.1	45
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.003	0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	<0.0005	<0.0005	0.0009	0.0031	0.0024	0.0022	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.109	0.231
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	17	15	14.1	16.2	15.4	16.8	15.3	14.8
Manganese, dissolved	mg/l	--	0.05	0.021	0.069	0.019	0.038	<0.005	0.005	0.026	0.056
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	4.17	4.45	5.45	5.26	5.14	5.34	4.66
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	55	53.2	62	48.4	52.5	53.2	52.2	51.5
Zinc, dissolved	mg/l	--	5	0.0074	<0.005	0.009	<0.005	0.02	0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1C 29-Nov-2018	05-1C 19-Jun-2019	05-1C 20-Nov-2019	05-1C 21-May-2020	05-1C 26-Nov-2020	05-1C 26-May-2021	05-1C 30-Nov-2021
				05-1C	05-1C	05-1C	05-1C	05-1C	05-1C	05-1C
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	198	181	166	176	176	172	174
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	199	183	167	178	178	173	176
Ammonia Nitrogen	mg/l	--	--	0.08	0.29	0.17	0.27	0.18	0.28	0.10
Chemical Oxygen Demand	mg/l	--	--	11	19	21	18	33	<10	13
Chloride	mg/l	--	250	56	55	53	64	51	50	51
Conductivity (Field)	uS/cm	--	--	518	540	567	547	541	574	571
Hardness, Calcium Carbonate	mg/l	--	--	171	172	192	161	158	161	139
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.2	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.5	0.4	0.5	0.4	0.4	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.79	6.89	7.98	9.04	8.02	8.03	7.86
Phosphorus	mg/l	--	--	0.34	0.91	0.33	0.45	0.42	0.46	0.35
Sulphate	mg/l	--	500 [4]	51	52	50	62	48	44	44
Temperature (Field)	deg c	--	15	7.4	10.2	8.0	8.1	8.3	10.1	7.5
Total Dissolved Solids	mg/l	--	500	270	330	356	334	302	342	236
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.113	0.071	0.077	0.061	0.066	0.063	0.06
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	41.3	41.6	46.2	38.4	37.8	38.2	34.3
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0027	0.0025	0.0016	0.0031	0.0011	0.0011	0.0013
Iron, dissolved	mg/l	--	0.3	0.129	0.188	0.311	0.297	0.311	0.252	0.28
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	16.5	16.6	18.6	15.7	15.6	15.9	12.8
Manganese, dissolved	mg/l	--	0.05	0.016	0.046	0.074	0.058	0.035	0.054	0.035
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.32	5.53	6.8	4.81	4.87	4.92	4.38
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	54.1	53	57.3	51.5	52	51.1	44.7
Zinc, dissolved	mg/l	--	5	<0.005	0.005	<0.005	<0.005	0.009	<0.005	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1D 06-Sep-2005	05-1D 16-Nov-2005	05-1D 25-May-2006	05-1D 31-May-2012 05-1D	05-1D 28-Nov-2012 [13] 05-1D	05-1D 29-May-2013 05-1D	05-1D 26-Nov-2013 GW-1	05-1D 29-May-2014 95-1D
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	218	218	169	240	--	220	200	240
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	2.0	--	1.5	1.4	1.4
Alkalinity (Total as CaCO3)	mg/l	--	--	179	179	169	240	--	220	200	240
Ammonia Nitrogen	mg/l	--	--	4.94	0.26	0.56	<0.050	--	0.082	<0.050	0.063
Chemical Oxygen Demand	mg/l	--	--	37	12	20	13	--	78	11	16
Chloride	mg/l	--	250	46.9	27.2	53	30	--	170	200	480
Conductivity (Field)	uS/cm	--	--	550	440	470	601	--	922	952	1734
Hardness, Calcium Carbonate	mg/l	--	--	303	204	191	250	--	470	460	860
Nitrate as N	mg/l	10.0	--	0.4	1.4	0.7	<0.10	--	<0.10	0.13	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	--	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	30.3	1.45	2.1	0.93	--	0.99	0.28	0.68
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	--	<0.10	0.13	<0.10
pH	-	--	--	--	--	--	7.96	--	7.86	7.87	7.79
pH (Field)	-	--	--	6.9	--	7.8	7.59	--	7.36	7.25	6.26
Phosphorus	mg/l	--	--	1.45	0.66	--	0.30	--	0.38	0.16	0.22
Sulphate	mg/l	--	500 [4]	163	53	82	49	--	56	58	110
Temperature (Field)	deg c	--	15	17.5	9.9	6	11.0	--	10.0	8.4	9.5
Total Dissolved Solids	mg/l	--	500	476	301	351	342	--	796	780	1690
Total Organic Carbon	mg/l	--	--	78.8	5.5	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1380	420	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.0010	--	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.053	0.039	0.057	0.039	--	0.042	0.033	0.038
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	--	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	87.1	56.9	45.9	69	--	140	130	250
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.0050	--	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	--	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.004	<0.002	0.0037	--	0.0035	0.0040	0.0064
Iron, dissolved	mg/l	--	0.3	0.077	0.005	0.123	<0.1	--	<0.1	<0.1	0.5
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0002	0.0003	<0.00050	--	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	20.8	15	18.5	18	--	32	34	56
Manganese, dissolved	mg/l	--	0.05	0.422	0.081	0.1	0.03	--	0.016	0.023	0.0095
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.9	9.8	5.7	7	--	9.5	9.2	12
Selenium, dissolved	mg/l	0.05	--	<0.001	0.001	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	42.6	34.5	46.4	30	--	51	46	69
Zinc, dissolved	mg/l	--	5	0.007	0.01	0.019	<0.0050	--	0.0097	0.022	0.052
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	--	<0.0010	<0.0010	<0.0010
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	--	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	--	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	--	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	--	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	--	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	--	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	--	<0.00020	0.00037	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	--	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1D 19-Nov-2014	05-1D 02-Jun-2015	05-1D 26-Nov-2015	05-1D 26-May-2016	05-1D 17-Nov-2016	05-1D 24-May-2017	05-1D 29-Nov-2017	05-1D 24-May-2018
				05-1D	05-1D	05-1D	05-1D	05-1D	05-1D	05-1D	05-1D
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	240	242	234	259	248	244	251	269
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<1.0	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	240	243	234	259	249	245	251	270
Ammonia Nitrogen	mg/l	--	--	<0.050	0.06	0.03	0.03	0.03	0.03	0.05	0.02
Chemical Oxygen Demand	mg/l	--	--	8.1	17	42	31	15	25	14	37
Chloride	mg/l	--	250	510	469	418	475	285	374	271	524
Conductivity (Field)	uS/cm	--	--	2164	1924	1782	1940	1444	1600	961	2163
Hardness, Calcium Carbonate	mg/l	--	--	890	628	674	644	486	502	358	589
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	0.1	<0.1	0.3	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.37	0.3	0.4	0.4	0.3	0.2	0.5	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--
pH	-	--	--	7.63	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.16	7.24	7.44	7.41	7.03	7.40	7.05	7.30
Phosphorus	mg/l	--	--	0.33	0.20	0.12	0.20	0.17	0.08	0.05	0.13
Sulphate	mg/l	--	500 [4]	120	121	122	127	86	103	76	109
Temperature (Field)	deg c	--	15	5.8	9.1	8.9	10.5	9.2	9.9	7.6	8.2
Total Dissolved Solids	mg/l	--	500	1530	1400	1250	1550	832	1170	718	1630
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.034	0.031	0.033	0.031	0.04	0.024	0.061	0.029
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	250	169	180	181	139	153	102	180
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.006	0.005	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0022	0.0009	0.0011	0.0033	0.0051	0.0046	0.0032	0.0034
Iron, dissolved	mg/l	--	0.3	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	63	50.1	54.4	46.4	34	29.3	24.7	34
Manganese, dissolved	mg/l	--	0.05	0.14	0.042	0.059	0.06	<0.005	<0.005	0.109	0.043
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13	10.7	9.88	12.6	10.6	10.1	8.35	10.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	110	121	122	138	121	136	136	227
Zinc, dissolved	mg/l	--	5	0.0063	<0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1D 29-Nov-2018 05-1D	05-1D 19-Jun-2019 05-1D	05-1D 20-Nov-2019 05-1D	05-1D 21-May-2020 05-1D	05-1D 26-Nov-2020 05-1D	05-1D 26-May-2021 05-1D	05-1D 30-Nov-2021 05-1D
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	246	247	269	268	313	296	320
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	246	248	270	269	315	297	321
Ammonia Nitrogen	mg/l	--	--	0.06	0.09	0.02	0.02	0.02	0.03	0.04
Chemical Oxygen Demand	mg/l	--	--	19	<10	11	24	19	13	23
Chloride	mg/l	--	250	277	528	323	591	358	370	412
Conductivity (Field)	uS/cm	--	--	1089	1920	1721	1889	1601	1843	1758
Hardness, Calcium Carbonate	mg/l	--	--	428	617	474	501	479	486	425
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.4	0.2	0.4	0.3	0.2	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.45	7.04	7.23	8.01	7.63	7.36	7.40
Phosphorus	mg/l	--	--	0.04	0.08	0.10	0.04	0.04	0.03	0.07
Sulphate	mg/l	--	500 [4]	57	99	85	126	88	86	86
Temperature (Field)	deg c	--	15	6.7	11	7.6	8.8	6.1	13.2	6.9
Total Dissolved Solids	mg/l	--	500	720	1400	970	1300	1010	1060	1130
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.039	0.04	0.028	0.02	0.02	0.024	0.019
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	119	175	128	142	131	136	125
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0053	0.0069	0.0054	0.0060	0.0048	0.0056	0.0054
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31.5	43.4	37.3	35.5	37	35.7	27.3
Manganese, dissolved	mg/l	--	0.05	0.01	<0.005	0.005	0.047	0.006	0.014	0.015
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	15	11.1	12.8	7.87	11.6	7.12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	152	240	173	210	196	187	187
Zinc, dissolved	mg/l	--	5	0.005	<0.005	<0.005	0.005	0.009	<0.005	0.007
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.004 [10]	0.002	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	11-1 29-Nov-2011 [14] 11-1	11-1 28-Nov-2012 11-1	11-1 29-May-2014 MW11-1	11-1 26-Nov-2015 11-1	11-1 24-May-2017 11-1	11-1 22-Nov-2018 11-1	11-1 21-May-2020 11-1	11-1 30-Nov-2021 11-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	480	460	470	477	527	570	461	537
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	4.5	10	9	9	8	8	8
Alkalinity (Total as CaCO3)	mg/l	--	--	490	460	480	486	536	578	469	545
Ammonia Nitrogen	mg/l	--	--	1.20	1.2	1.3	1.05	0.03	0.68	0.60	0.89
Chemical Oxygen Demand	mg/l	--	--	50	28	27	46	32	48	45	37
Chloride	mg/l	--	250	657	700	780	770	630	742	912	696
Conductivity	uS/cm	--	--	3000	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2787	2473	2552	2975	3214	2823	2664	3057
Hardness, Calcium Carbonate	mg/l	--	--	292	270	270	219	243	314	277	257
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.31	<0.1	0.6	0.1	0.6	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	0.015	0.226	<0.05	<0.25 [8]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.48	1.7	1.8	1.7	0.5	1.5	1.1	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	0.53	--	--	--	--	--
pH	-	--	--	8.33	--	8.36	--	--	--	--	--
pH (Field)	-	--	--	7.93	8.15	7.26	8.29	8.04	7.92	7.58	8.04
Phosphorus	mg/l	--	--	0.65	0.53	0.62	0.24	0.14	0.49	0.25	0.43
Sulphate	mg/l	--	500 [4]	8	<1	<1	<1	3	2	<1	1
Temperature (Field)	deg c	--	15	7.0	6.3	9.7	8.0	11.7	7.8	11.4	7.0
Total Dissolved Solids	mg/l	--	500	1950	1650	1650	1630	1550	1660	1640	1610
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.002	0.0022	0.001	0.005	0.002	0.001	0.002
Boron, dissolved	mg/l	5	--	0.30	0.36	0.37	0.328	0.281	0.442	0.236	0.252
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	61	49	49	35.7	46.2	61.9	52.2	48.9
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.0050	<0.001	0.013	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0015	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	0.0014
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0034	<0.0005	0.0029	0.0046	0.0048	0.0015
Iron, dissolved	mg/l	--	0.3	<0.03	0.5	0.16	0.158	<0.1	<0.1	0.189	0.102
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001	0.0007	<0.0001
Magnesium, dissolved	mg/l	--	--	34	36	36	31.5	30.9	38.7	35.5	32.7
Manganese, dissolved	mg/l	--	0.05	0.39	0.11	0.11	0.081	<0.005	0.027	0.046	0.479
Potassium, dissolved	mg/l	--	--	16	19	19	15.6	16.8	20.4	18.7	16.9
Sodium, dissolved	mg/l	--	200 [5]	490	590	520	646	523	611	554	492
Zinc, dissolved	mg/l	--	5	0.01	<0.005	0.0063	0.016	0.006	0.006	0.005	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.001	<0.002 [7]	<0.001	<0.001	<0.004 [10]
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-12 09-Jun-1992	92-12 01-Nov-1992	92-12 15-Jun-1994	92-12 02-Nov-1994	92-12 22-Nov-1995	92-12 12-Oct-1996	92-12 06-Nov-1997	92-12 05-Jun-1998	92-12 06-May-1999
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	756	822	--	771	787	--	--	--	821
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	13	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	684	674	680	642	672	676	332	654	673
Ammonia Nitrogen	mg/l	--	--	--	--	--	0.72	0.69	0.97	0.62	0.6	0.94
Chemical Oxygen Demand	mg/l	--	--	--	--	386	113	50	38	36	46	45
Chloride	mg/l	--	250	121	122.8	170	125	109	133	300	118	117
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1528	1516	1620	1564	1610	1570	1460	1566	1500
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	6.42	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	37.65	34	78	34	36	32.9	29	32	28
Nitrate as N	mg/l	10.0	--	--	--	0.01	0.34	0.4	0.1	0.1	1.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	5.75	--	--	--	2.18
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	5.06	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.47	8.21	8.57	8.8	8.72	8.39	8.21	--	8.4
Phosphate	mg/l	--	--	--	--	--	--	2.6	--	--	--	--
Phosphorus	mg/l	--	--	--	--	3.2	2.288	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	4.1	1	6.7	2.5	2	2	69	37	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	820	785	800	790	730	790	750
Total Organic Carbon	mg/l	--	--	--	--	19	19.6	15.4	14.5	15.6	16.5	18.8
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	480	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.202	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	1.04	0.89	0.87	0.84	0.91	0.99	1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	3.7	5.42	10.3	2.698	3.97	3.62	2.67	2.62	1.1
Chromium, dissolved	mg/l	0.05	--	--	--	0.037	0.01	0.02	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0215	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	11.42	0.1	1.39	0.39	0.38	0.84	0.16
Lead, dissolved	mg/l	0.01	--	--	--	0.0032	0.1	0.0021	0.0002	0.0002	0.0002	0.0006
Magnesium, dissolved	mg/l	--	--	6.9	5.04	12.7	1.778	6.2	5.27	5.45	6.03	6
Manganese, dissolved	mg/l	--	0.05	--	--	0.179	0.012	0.03	0.02	0.01	0.02	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.039	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.2	12.2	25.3	7.441	13.4	11.9	13.1	15.4	5.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	358.9	387	313	333.9	373	314	316	416	370
Zinc, dissolved	mg/l	--	5	--	--	0.034	0.01	0.01	0.01	0.01	0.02	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.074	0.001	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-12 24-Oct-2000	92-12 14-Jun-2001	92-12 06-Nov-2002	92-12 30-May-2003	92-12 19-Nov-2004	92-12 16-Nov-2005	92-12 15-May-2007	92-12 10-Nov-2008	92-12 26-Nov-2009 M-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	887	765	794	811	856	171	690	699	648
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	7	1	1	1	<5	<5	<5	26
Alkalinity (Total as CaCO3)	mg/l	--	--	727	639	651	645	702	700	690	699	674
Ammonia Nitrogen	mg/l	--	--	0.47	0.88	0.99	0.73	0.87	1.02	0.89	0.98	0.94
Chemical Oxygen Demand	mg/l	--	--	--	35	54	108	52	42	54	28	45
Chloride	mg/l	--	250	133	132	128	127	110	129	131	129	129
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	1610
Conductivity (Field)	uS/cm	--	--	1570	1300	1410	1370	1690	1600	1100	1300	1442
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	27	28	28	27	26	31	27	26	28
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	<1	0.1	<0.1	<0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.62	2.75	1.83	1.61	1.73	1.78	1.8	1.72	1.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	8.63
pH (Field)	-	--	--	8.33	8.6	8.4	7.4	8.4	--	8.8	8.5	8.48
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.25	3.37	2.43	2.42	2.3	2.12	--	--	2.32
Sulphate	mg/l	--	500 [4]	1	1	1	1	10	<1	6	<1	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	10.9	8.3	7	9.3
Total Dissolved Solids	mg/l	--	500	928	900	876	685	845	981	941	945	1050
Total Organic Carbon	mg/l	--	--	--	14.8	15.9	17.8	15.9	19.5	--	--	--
Total Suspended Solids	mg/l	--	--	22	239	33	12	6	13	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	<0.001	0.0008	0.0006	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.93	0.99	0.98	0.94	0.992	1	0.919	0.919	1.0
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0005	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	2.85	2.43	2.44	2.76	2.19	3.08	2.39	2.14	3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	0.006
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005	0.006	<0.005	<0.0002
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	0.001
Iron, dissolved	mg/l	--	0.3	0.15	0.1	0.06	0.19	0.093	0.09	0.06	0.054	0.07
Lead, dissolved	mg/l	0.01	--	0.0022	0.0002	0.0011	0.0004	0.0004	0.0004	0.00007	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	4.92	5.27	5.29	3	5.03	5.57	5.06	4.95	5
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.01	0.003	0.002	0.013	0.002	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	10.5	6.2	8.6	10.8	11.1	13	11.7	11.5	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	430	353	368	363	374	420	370	377	397
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.006	0.008	<0.005	<0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.022	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	0.0006	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-12 24-May-2011 G-10	92-12 28-Nov-2012 92-12	92-12 29-May-2014 [3] 92-12	92-12 26-Nov-2015 92-12	92-12 24-May-2017 92-12	92-12 29-Nov-2018 92-12	92-12 21-May-2020 92-12	92-12 30-Nov-2021 92-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	637	630	630	661	680	729	647	655
Alkalinity, Carbonate as CaCO3	mg/l	--	--	33	22	28	19	17	18	29	14
Alkalinity (Total as CaCO3)	mg/l	--	--	670	650	660	680	697	747	676	669
Ammonia Nitrogen	mg/l	--	--	0.94	1.1	1.1	1.04	1.04	0.93	1.10	1.06
Chemical Oxygen Demand	mg/l	--	--	45	49	49	54	38	46	60	48
Chloride	mg/l	--	250	128	130	140	138	108	139	160	131
Conductivity	uS/cm	--	--	1640	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1472	1484	1383	1512	1595	1393	1530	1537
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	28	28	30	24.6	29	43	35.5	29.3
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.50	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.60	2.9	1.9	1.7	2.0	2.0	1.8	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.50	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.74	--	8.67	--	--	--	--	--
pH (Field)	-	--	--	8.79	8.72	8.14	8.86	8.30	8.36	7.20	8.82
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.39	2.5	2.2	2.11	2.06	2.09	2.31	2.30
Sulphate	mg/l	--	500 [4]	<1	<1	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	12.8	6.9	11.2	9.3	10.5	7.3	11.2	7.0
Total Dissolved Solids	mg/l	--	500	1070	946	916	936	956	974	980	910
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.96	1.1	1.1	0.106	1.07	1.06	0.821	0.861
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3	2.5	2.9	2.57	2.7	7.63	5.04	3.88
Chromium, dissolved	mg/l	0.05	--	0.005	<0.005	<0.0050	0.001	0.008	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0003	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0012	<0.0005	0.0011	<0.0005	<0.0005	0.0012
Iron, dissolved	mg/l	--	0.3	0.07	<0.1	<0.1	<0.1	<0.1	0.106	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	5	5.2	5.5	4.41	5.32	5.86	5.57	4.76
Manganese, dissolved	mg/l	--	0.05	<0.01	0.002	0.0028	<0.005	5.32	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	11	11	9.57	10.9	12.2	10.3	9.73
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	344	370	390	393	383	408	365	308
Zinc, dissolved	mg/l	--	5	0.02	<0.005	0.0051	0.01	<0.005	<0.005	<0.005	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.002 [7]	<0.002 [7]	0.003	0.004	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.00050	0.00016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0025	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0010	0.00031	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-16 09-Jun-1992	92-16 01-Nov-1992	92-16 08-Jun-1993	92-16 04-Nov-1993	92-16 15-Jun-1994	92-16 02-Nov-1994	92-16 28-Jun-1995	92-16 22-Nov-1995
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	224	226	201	195	--	190	205	218
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	--	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	184	185	165	160	164	156	168	179
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	0.95	0.62	0.27
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	42	194	350	23
Chloride	mg/l	--	250	31	12	4	6	4	2	7.7	2.5
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	556	398	358	446	400	391	460	380
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	7	9.65	--
Hardness, Calcium Carbonate	mg/l	--	--	95.53	68	58	76	63	70	59	56
Nitrate as N	mg/l	10.0	--	--	--	0.42	0.48	0.24	0.54	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	11.5	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	10.88	2.83
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.87	7.52	7.74	8.33	8.14	8.95	8.35	8.38
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.8
Phosphorus	mg/l	--	--	--	--	--	--	1.86	0.282	14.5	--
Sulphate	mg/l	--	500 [4]	43	21.2	19.2	28.3	27.7	24.8	22	22
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	280	212	200	197	190	180
Total Organic Carbon	mg/l	--	--	--	--	--	--	8.3	4.8	5.5	3.9
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	1.827	0.42	--	1.039	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.1	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.022	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	0.12	0.129	0.11	0.07
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.01	0.0001	0.0001
Calcium, dissolved	mg/l	--	--	20.1	14	12.4	14.9	12.4	13.67	13.5	11.4
Chromium, dissolved	mg/l	0.05	--	--	--	0.014	0.01	0.01	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.1	0.01	0.007	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.109	0.1	1.25	1.293	0.03	0.76
Lead, dissolved	mg/l	0.01	--	--	--	0.1	0.0033	0.0004	0.1	0.0001	0.0009
Magnesium, dissolved	mg/l	--	--	11	7.99	6.6	9.3	7.8	2.614	5.95	6.7
Manganese, dissolved	mg/l	--	0.05	--	--	0.04	0.022	0.046	0.058	0.02	0.04
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.7	6.81	7.4	7.7	7.8	6.645	--	11.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	88.5	73.5	57.9	119	55	56.14	58.1	65.2
Zinc, dissolved	mg/l	--	5	--	--	0.048	0.01	0.01	0.03	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.002	0.053	0.001	0.001	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-16 12-Oct-1996	92-16 06-Nov-1997	92-16 05-Jun-1998	92-16 06-May-1999	92-16 24-Oct-2000	92-16 14-Jun-2001	92-16 16-Dec-2002	92-16 30-May-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	217	226	210	187	205
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	174	186	190	178	185	172	153	168
Ammonia Nitrogen	mg/l	--	--	0.74	0.27	0.2	0.04	0.03	0.48	0.38	0.13
Chemical Oxygen Demand	mg/l	--	--	5	3	22	3	--	18	23	9
Chloride	mg/l	--	250	2.4	3	2.8	2.3	2.8	2.8	16.4	4.2
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	370	380	370	350	346	340	374	300
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	50	59	68	56	46	52	47	47
Nitrate as N	mg/l	10.0	--	0.1	0.2	1	--	0.2	0.2	1.4	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	1.39	0.46	1.88	0.08	0.64
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.93	7.4	--	7.9	7.79	8.2	8.2	7.2
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.67	6.07	3	1.49
Sulphate	mg/l	--	500 [4]	19	18	49	15	15	15	30	13
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	180	190	184	180	214	250	236	150
Total Organic Carbon	mg/l	--	--	4.1	4.5	5	4.6	--	4.2	4	4.1
Total Suspended Solids	mg/l	--	--	1900	--	--	--	256	2760	2120	516
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.003	0.003	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.12	0.11	0.21	0.13	0.12	0.14	0.12	0.12
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	10	12.9	12.7	11.8	10.5	12	9.48	10.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.61	1.17	6.26	0.02	0.02	0.02	0.02	0.04
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0006	0.0002
Magnesium, dissolved	mg/l	--	--	5.87	6.5	8.72	6.36	4.81	5.45	5.58	5.07
Manganese, dissolved	mg/l	--	0.05	0.03	0.06	0.12	0.01	0.02	0.03	0.01	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	4.3	8.6	9.4	1.9	5.9	2.3	1.5	5.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	57.3	56.7	77.6	66.3	61.5	63	72.9	64.9
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.07	0.02	0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.024	0.001	0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)- Health [1]	ODWQS- AO [2]	92-16 19-Nov-2004	92-16 16-Nov-2005	92-16 15-May-2007	92-16 10-Nov-2008	92-16 26-Nov-2009 M-7	92-16 24-May-2011 [14] G-2	92-16 28-Nov-2012 92-16	92-16 29-May-2014 92-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	220	233	186	183	179	178	180	180
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<2 [15]	4	2.7	2.6
Alkalinity (Total as CaCO3)	mg/l	--	--	180	191	186	180	179	182	180	180
Ammonia Nitrogen	mg/l	--	--	0.07	0.23	0.1	0.2	0.14	0.10	0.33	0.16
Chemical Oxygen Demand	mg/l	--	--	14	21	86	<5	15	25	14	7.3
Chloride	mg/l	--	250	4.3	5.4	7.1	6.4	11	13	21	25
Conductivity	uS/cm	--	--	--	--	--	--	390	404	--	--
Conductivity (Field)	uS/cm	--	--	440	350	280	390	360	379	391	366
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	44	48	43	47	41	48	48	52
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.3	0.1	<0.10	0.17	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.61	0.79	0.39	0.23	0.12	0.15	0.78	0.95
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	8.16	8.38	--	8.19
pH (Field)	-	--	--	8.2	8.93	8.4	8	7.8	8.02	8.16	8.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.68	1.41	--	--	0.61	0.87	0.60	0.59
Sulphate	mg/l	--	500 [4]	19	16	12	11	11	10	10	10
Temperature (Field)	deg c	--	15	--	11.6	8.7	7	8.5	10.6	7.5	10.7
Total Dissolved Solids	mg/l	--	500	220	229	224	218	254	263	340	414
Total Organic Carbon	mg/l	--	--	4.1	5.5	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	910	1800	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.0045	0.0035	0.003	<0.01	0.002	0.0025
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.118	0.12	0.107	0.105	0.12	0.11	0.12	0.12
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	9.89	10.8	9.42	10.5	10	11	11	12
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	--	<0.005	0.015	<0.005	<0.0002	0.0002	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.004	<0.002	0.003	0.005	0.006	0.003	0.0045
Iron, dissolved	mg/l	--	0.3	0.01	0.012	0.261	<0.005	<0.03	<0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0002	0.00034	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	4.8	5.17	4.62	5	4	5	5.2	5.6
Manganese, dissolved	mg/l	--	0.05	0.017	0.018	0.044	<0.001	<0.01	<0.01	<0.002	<0.0020
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.1	6.1	5.4	5.7	5	5	5.2	5.3
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	68.4	75.5	72.2	68.8	65	64	65	70
Zinc, dissolved	mg/l	--	5	0.005	0.008	<0.005	<0.005	0.01	0.01	0.006	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-16 26-Nov-2015 92-16	92-16 24-May-2017 92-16	92-16 29-Nov-2018 92-16	92-16 21-May-2020 92-16	92-16 30-Nov-2021 92-16
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	188	200	215	177	188
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	6	<5	5
Alkalinity (Total as CaCO3)	mg/l	--	--	189	202	221	180	194
Ammonia Nitrogen	mg/l	--	--	0.24	0.03	0.51	0.14	0.96
Chemical Oxygen Demand	mg/l	--	--	32	27	122	39	207
Chloride	mg/l	--	250	17	19	21	33	26
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	417	409	394	410	508
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	43.4	56	74	56.4	52.4
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.7	2.3	0.5	7.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.14	7.82	8.21	8.06	7.82
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.38	6.56	0.49	13.7
Sulphate	mg/l	--	500 [4]	8	9	6	10	6
Temperature (Field)	deg c	--	15	9.7	9.7	7.9	8.3	8.0
Total Dissolved Solids	mg/l	--	500	256	272	270	276	316
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003	0.002	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.11	0.145	0.114	0.112	0.114
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	9.82	12.1	19.3	12.5	11.9
Chromium, dissolved	mg/l	0.05	--	<0.001	0.002	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0037	0.0038	0.0032	0.0029
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.233	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	4.58	6.3	6.31	6.15	5.52
Manganese, dissolved	mg/l	--	0.05	0.028	<0.005	<0.005	0.066	0.05
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.34	5.65	5.76	5.35	4.86
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	79.3	68.3	70.4	65.3	58.2
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.007	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 09-Jun-1992	92-18 01-Nov-1992	92-18 04-Nov-1993	92-18 15-Jun-1994	92-18 02-Nov-1994	92-18 28-Jun-1995	92-18 22-Nov-1995	92-18 12-Jun-1996
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	244	198	210	--	190	193	195	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	--	1	1	5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	200	162	172	140	156	158	168	273
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	0.17	0.16	0.01	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	67	62	170	25	18
Chloride	mg/l	--	250	87	35.8	38	26	22	23	23.1	368
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	831	540	539	480	453	460	440	1790
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	11.65	9.65	--	--
Hardness, Calcium Carbonate	mg/l	--	--	276.9	178	150	136	138	144	137	587
Nitrate as N	mg/l	10.0	--	--	--	0.44	0.1	0.48	0.1	0.4	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	7.8	0.87	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	7.64	0.86	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.96	7.78	8.1	7.9	8.25	7.82	8.18	7
Phosphate	mg/l	--	--	--	--	--	--	--	--	0.2	--
Phosphorus	mg/l	--	--	--	--	--	2.96	0.148	7.62	--	--
Sulphate	mg/l	--	500 [4]	88	68.8	40.3	44.9	36.4	36	31	117
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	248	250	228	230	220	900
Total Organic Carbon	mg/l	--	--	--	--	--	6.8	4.8	6.3	3.1	7.2
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	579
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	**0.1**	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	0.022	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	0.03	0.06	0.04	0.01	0.038
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	**0.01**	0.0001	0.0001	--
Calcium, dissolved	mg/l	--	--	69.62	45.4	38.3	35.3	32.09	38.7	35.6	169
Chromium, dissolved	mg/l	0.05	--	--	--	0.01	0.01	0.01	0.01	0.02	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.01	0.003	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.124	0.336	0.103	0.02	1.04	1.17
Lead, dissolved	mg/l	0.01	--	--	--	0.0062	0.0002	**0.1**	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	25	15.7	13.3	11.7	4.599	11.3	11.5	39.9
Manganese, dissolved	mg/l	--	0.05	--	--	0.032	0.086	0.028	0.04	0.02	0.97
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	3.9	4.54	5.3	4.9	1.864	--	7.7	8.88
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	77.76	53.6	72	33	37.41	40.3	42.6	286
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.111	0.001	0.001	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 09-Jun-1992	92-18 01-Nov-1992	92-18 04-Nov-1993	92-18 15-Jun-1994	92-18 02-Nov-1994	92-18 28-Jun-1995	92-18 22-Nov-1995	92-18 12-Jun-1996
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 12-Oct-1996	92-18 18-Jun-1997	92-18 06-Nov-1997	92-18 05-Jun-1998	92-18 29-Oct-1998	92-18 06-May-1999	92-18 19-Oct-1999	92-18 05-May-2000
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	380	386	427	488
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	273	297	842	304	312	632	350	400
Ammonia Nitrogen	mg/l	--	--	0.14	0.65	0.05	0.1	0.11	0.04	0.11	0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	10	25	38	5	15	12	45
Chloride	mg/l	--	250	470	339	916	685	580	403	627	400
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1790	1670	2990	3060	3170	1870	2413	2850
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	3.16	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	590	608	829	543	379	482	593	551
Nitrate as N	mg/l	10.0	--	0.8	1	1.5	1.3	--	--	0.1	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	0.48	0.51	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.63	6.85	6.29	--	6.5	6.5	7.1	6.5
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	107	109	1	147	116	111	106	80
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	900	890	1500	1516	1590	930	1206	1425
Total Organic Carbon	mg/l	--	--	7.2	7.7	8.9	11.4	13.1	9.3	8.9	7.2
Total Suspended Solids	mg/l	--	--	1030	665	--	--	--	--	506	828
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.07	0.05	0.05	0.14	0.05	0.06	0.14	0.14
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	176	184	249	173	121	172	180	160
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.57	1.52	1.41	0.31	1.44	0.02	1.78	0.61
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	35.7	35.3	49.5	26.6	18.7	34.8	34.3	36.4
Manganese, dissolved	mg/l	--	0.05	0.81	1.01	1.8	1.26	1.82	1.14	2.51	1.61
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	7	7.4	7.7	9.7	12	2.7	10.6	3.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	232	253	437	343	358	387	400	300
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.23	0.01	0.01	0.11	0.22
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 12-Oct-1996	92-18 18-Jun-1997	92-18 06-Nov-1997	92-18 05-Jun-1998	92-18 29-Oct-1998	92-18 06-May-1999	92-18 19-Oct-1999	92-18 05-May-2000
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 24-Oct-2000	92-18 14-Jun-2001	92-18 23-Nov-2001	92-18 23-May-2002	92-18 06-Nov-2002	92-18 30-May-2003	92-18 09-Oct-2003	92-18 14-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	356	315	304	216	198	200	--	194
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	7	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	292	258	249	189	162	164	161	159
Ammonia Nitrogen	mg/l	--	--	0.07	0.21	0.2	0.03	0.02	0.01	0.03	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	1	--
Chemical Oxygen Demand	mg/l	--	--	--	13	22	3	9	2	2	11
Chloride	mg/l	--	250	614	468	1470	89.1	103	102	100	108
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2490	1750	454	640	468	540	720	710
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	37	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	394	379	866	191	186	199	197	211
Nitrate as N	mg/l	10.0	--	0.7	0.4	0.9	0.2	0.2	0.2	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.52	0.46	0.67	0.05	0.21	0.12	0.19	0.28
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.6	6.8	6.08	7.21	8.2	7.1	7.5	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.28	0.58	0.13	0.17	0.19	0.24	0.4	1.41
Sulphate	mg/l	--	500 [4]	85	72	146	29	29	28	36	25
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1290	1150	2900	436	340	270	365	355
Total Organic Carbon	mg/l	--	--	--	6.1	11	16	2.8	3.5	5	2.4
Total Suspended Solids	mg/l	--	--	348	415	117	94	251	100	280	1180
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.002	0.003	0.002	0.002	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.06	0.05	0.07	0.05	0.06	0.04	0.043	0.038
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	123	124	282	50.8	49.2	53	51.3	56.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.002	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.59	0.03	0.05	0.02	0.02	0.11	0.792	0.005
Lead, dissolved	mg/l	0.01	--	0.0022	0.0002	0.0002	0.0002	0.0009	0.0003	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	21	16.8	39.3	15.6	15.4	16.1	16.8	17.2
Manganese, dissolved	mg/l	--	0.05	2.38	1.68	1.5	0.01	0.01	0.01	0.012	0.003
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.04	0.02	0.02	0.02	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	14.6	6.2	22.7	5.3	5.6	4.3	4.8	4.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	411	272	730	56.7	55.8	61.5	58.2	57.4
Zinc, dissolved	mg/l	--	5	0.02	0.01	0.01	0.01	0.02	0.01	0.005	0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.042	0.001	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 24-Oct-2000	92-18 14-Jun-2001	92-18 23-Nov-2001	92-18 23-May-2002	92-18 06-Nov-2002	92-18 30-May-2003	92-18 09-Oct-2003	92-18 14-May-2004
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 19-Nov-2004	92-18 24-May-2005	92-18 16-Nov-2005	92-18 25-May-2006	92-18 21-Nov-2006	92-18 15-May-2007	92-18 30-Nov-2007	92-18 22-May-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	212	220	220	172	184	177	183	150
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	170	180	180	170	184	177	183	150
Ammonia Nitrogen	mg/l	--	--	0.05	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	6	<5	<5	7	27	47	<5
Chloride	mg/l	--	250	117	135	132	156	156	175	176	175
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	900	1200	1000	400	725	700	525	850
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	215	258	258	244	265	297	281	301
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.3	0.1	<0.1	0.2	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.31	0.31	0.05	0.13	0.1	0.1	0.28	0.18
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	6	8	8.3	6.9	8.3	7.5	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.18	0.8	0.12	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	25	31	29	29	27	30	28	28
Temperature (Field)	deg c	--	15	--	12.6	10.5	5.5	5	8.8	6	11
Total Dissolved Solids	mg/l	--	500	450	437	429	432	456	489	481	467
Total Organic Carbon	mg/l	--	--	2.5	1.9	3.5	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	468	1560	531	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.001	0.001	0.0035	0.0041	0.0037	0.0036
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.049	0.026	0.049	0.034	0.041	0.037	0.042	0.037
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	57.4	67.5	68.6	64.6	69.9	79.2	74.5	81.1
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.004	0.003	0.005	0.01	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Lead, dissolved	mg/l	0.01	--	0.0002	0.0005	<0.0002	<0.0002	<0.0001	0.00004	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	17.3	21.8	21	20.2	22	24.2	23	23.9
Manganese, dissolved	mg/l	--	0.05	0.01	<0.001	0.002	0.001	0.178	0.002	0.027	0.002
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.3	4.9	6.1	4.5	5.5	5.2	5.5	4.9
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	57	73	68.9	59.3	64.7	67.7	63.7	63.7
Zinc, dissolved	mg/l	--	5	0.005	0.008	0.01	<0.005	0.008	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 19-Nov-2004	92-18 24-May-2005	92-18 16-Nov-2005	92-18 25-May-2006	92-18 21-Nov-2006	92-18 15-May-2007	92-18 30-Nov-2007	92-18 22-May-2008
Semi-VOCs											
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 10-Nov-2008	92-18 19-May-2009 G-1	92-18 26-Nov-2009 M-12	92-18 25-May-2010 [14] M-2	92-18 20-Oct-2010 [14] G-2	92-18 24-May-2011 [14] G-5	92-18 29-Nov-2011 [14] 92-18	92-18 31-May-2012 92-18
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	183	174	175	168	172	174	177	170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	1.8
Alkalinity (Total as CaCO3)	mg/l	--	--	180	174	175	168	172	174	177	180
Ammonia Nitrogen	mg/l	--	--	<0.01	0.02	0.02	<0.02	0.03	<0.02	0.04	<0.050
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	<5	5	13	10	15	8	25	12
Chloride	mg/l	--	250	182	179	197	193	215	213	226	210
Conductivity	uS/cm	--	--	--	1000	1010	1060	1060	1090	1120	--
Conductivity (Field)	uS/cm	--	--	825	800	834	1119	1020	1021	1028	1076
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	296	315	297	345	365	352	358	410
Nitrate as N	mg/l	10.0	--	0.2	0.24	0.13	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.08	0.16	<0.10	<0.10	<0.10	<0.10	0.14	0.51
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	7.98	8.09	8.11	7.91	8.22	8.15	8.05
pH (Field)	-	--	--	7.8	--	7.58	6.95	7.61	7.85	7.71	6.73
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.18	0.15	0.08	0.09	0.11	0.07	0.054
Sulphate	mg/l	--	500 [4]	27	26	31	28	28	28	29	27
Temperature (Field)	deg c	--	15	9	7	9.7	14.8	10.1	13.6	9.3	10.2
Total Dissolved Solids	mg/l	--	500	491	650	657	689	689	708	728	836
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0032	0.003	0.002	<0.01	<0.01	<0.01	<0.01	0.0028
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.036	0.05	0.05	0.04	0.04	0.04	0.05	0.043
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	79.8	85	81	92	100	93	97	110
Chromium, dissolved	mg/l	0.05	--	<0.002	0.005	0.004	0.002	0.004	0.003	0.003	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.0002	<0.0002	<0.0002	0.0005	0.0003	<0.0002	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.003	0.003	0.001	0.004	<0.001	0.0036
Iron, dissolved	mg/l	--	0.3	<0.005	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	23.4	25	23	28	28	29	28	33
Manganese, dissolved	mg/l	--	0.05	<0.001	<0.01	<0.01	<0.01	0.40	<0.01	0.21	0.079
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	5	5	6	5	5	5	5.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	62.9	63	65	66	68	64	67	76
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	0.01	<0.01	0.01	<0.01	0.011
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 10-Nov-2008	92-18 19-May-2009 G-1	92-18 26-Nov-2009 M-12	92-18 25-May-2010 [14] M-2	92-18 20-Oct-2010 [14] G-2	92-18 24-May-2011 [14] G-5	92-18 29-Nov-2011 [14] 92-18	92-18 31-May-2012 92-18
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 28-Nov-2012 92-18	92-18 29-May-2013 92-18	92-18 26-Nov-2013 GW-17	92-18 29-May-2014 92-18	92-18 19-Nov-2014 92-18	92-18 02-Jun-2015 92-18	92-18 26-Nov-2015 92-18	92-18 26-May-2016 92-18
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	190	170	170	180	180	181	184	195
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.5	1.7	1.7	2.0	1.5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	190	170	180	180	180	182	185	196
Ammonia Nitrogen	mg/l	--	--	0.093	0.082	<0.050	<0.050	0.051	0.08	0.07	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	22	6.8	23	6.3	<4.0	21	13	12
Chloride	mg/l	--	250	220	230	230	270	260	356	340	329
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1084	1032	1081	1105	1215	1238	1282	1362
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	370	430	310	460	410	395	358	469
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.36	0.31	0.30	0.43	0.22	0.2	0.2	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.04	8.02	8.09	7.97	--	--	--
pH (Field)	-	--	--	7.81	6.40	6.42	7.57	7.95	7.40	8.11	7.42
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.13	0.20	0.11	0.089	0.26	0.15	0.11	0.15
Sulphate	mg/l	--	500 [4]	28	28	26	31	30	31	30	35
Temperature (Field)	deg c	--	15	7.5	9.6	7.7	11.8	5.4	9.1	9.5	10.1
Total Dissolved Solids	mg/l	--	500	636	852	836	912	776	884	836	1080
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.002	0.0030	0.0023	0.0032	0.0028	0.003	0.003	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.04	0.033	0.042	0.04	0.034	0.024	0.033	0.025
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	97	120	83	120	110	92.8	98.2	123
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.001	0.0027	0.0012	0.0031	0.0020	<0.0005	<0.0005	0.0013
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	0.00051	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31	34	25	37	34	39.7	27.2	39
Manganese, dissolved	mg/l	--	0.05	0.004	0.0048	0.0080	<0.0020	<0.0020	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.5	5.7	5.4	6.1	5.7	5.15	4.89	7.06
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	67	76	57	85	76	86.4	85.3	83.8
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.0056	0.0051	<0.0050	0.007	0.007	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 28-Nov-2012 92-18	92-18 29-May-2013 92-18	92-18 26-Nov-2013 GW-17	92-18 29-May-2014 92-18	92-18 19-Nov-2014 92-18	92-18 02-Jun-2015 92-18	92-18 26-Nov-2015 92-18	92-18 26-May-2016 92-18
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 17-Nov-2016 92-18	92-18 24-May-2017 92-18	92-18 29-Nov-2017 92-18	92-18 24-May-2018 92-18	92-18 29-Nov-2018 92-18	92-18 19-Jun-2019 92-18	92-18 20-Nov-2019 92-18	92-18 21-May-2020 92-18
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	193	204	202	213	213	197	187	200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	193	205	203	214	214	198	189	202
Ammonia Nitrogen	mg/l	--	--	0.12	0.03	0.11	0.03	0.03	0.03	0.03	0.08
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	12	39	22	53	30	72	14	17
Chloride	mg/l	--	250	307	325	361	348	333	356	393	456
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1439	1373	1318	1463	1331	1395	1505	1434
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	462	495	442	499	455	511	539	499
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.2	0.3	0.3	0.3	0.3	0.1	<0.1	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.61	7.44	6.53	7.34	6.5	6.24	7.65	7.76
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.18	0.19	0.49	0.27	0.44	0.09	0.10	0.30
Sulphate	mg/l	--	500 [4]	33	33	36	36	36	38	<1	48
Temperature (Field)	deg c	--	15	10.9	9.3	8.9	8.8	8.2	12.1	7.6	9.7
Total Dissolved Solids	mg/l	--	500	886	1080	882	1280	882	1040	976	1140
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004	0.004	0.003	0.003	0.004	0.004	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.03	0.029	0.06	0.028	0.048	0.026	0.031	0.024
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	126	140	117	134	119	132	140	130
Chromium, dissolved	mg/l	0.05	--	0.004	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0030	0.0019	0.0013	0.0013	0.0023	0.0022	0.0028	0.0038
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	35.9	35.4	36.4	40	38.2	43.8	46.4	42.4
Manganese, dissolved	mg/l	--	0.05	<0.005	0.018	<0.005	0.008	<0.005	<0.005	0.182	0.013
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.1	5.87	6.15	6.17	6.83	7.89	8.73	7.02
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	82.6	84.6	79.4	89.6	81.5	96	97.6	95.6
Zinc, dissolved	mg/l	--	5	0.014	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 17-Nov-2016 92-18	92-18 24-May-2017 92-18	92-18 29-Nov-2017 92-18	92-18 24-May-2018 92-18	92-18 29-Nov-2018 92-18	92-18 19-Jun-2019 92-18	92-18 20-Nov-2019 92-18	92-18 21-May-2020 92-18
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 26-Nov-2020 92-18	92-18 26-May-2021 92-18	92-18 30-Nov-2021 92-18
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	210	199	197
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	212	200	199
Ammonia Nitrogen	mg/l	--	--	0.29	0.07	0.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	166	20	114
Chloride	mg/l	--	250	363	353	368
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1387	1563	1533
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	484	522	445
Nitrate as N	mg/l	10.0	--	<0.1	0.2	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.8	0.1	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	7.43	7.79	7.84
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	5.50	0.35	0.90
Sulphate	mg/l	--	500 [4]	36	36	35
Temperature (Field)	deg c	--	15	7.4	10.0	6.9
Total Dissolved Solids	mg/l	--	500	1090	954	896
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.003	0.004	0.003
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.025	0.023	0.025
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	126	137	120
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0015	0.0016	0.0025
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	41.2	44	35.1
Manganese, dissolved	mg/l	--	0.05	0.02	<0.005	0.582
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.46	7.2	6.05
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	92.7	98.2	79.9
Zinc, dissolved	mg/l	--	5	0.008	0.005	0.007
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 26-Nov-2020 92-18	92-18 26-May-2021 92-18	92-18 30-Nov-2021 92-18
Semi-VOCs						
Naphthalene	mg/l	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 09-Jun-1992	92-19 01-Nov-1992	92-19 08-Jun-1993	92-19 15-Jun-1994	92-19 02-Nov-1994	92-19 28-Jun-1995	92-19 22-Nov-1995	92-19 12-Jun-1996
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	390	283	381	--	326	336	327	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	--	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	320	232	312	320	267	276	268	242
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	0.1	0.06	0.01	0.02
Chemical Oxygen Demand	mg/l	--	--	--	--	--	34	77	35	33	11
Chloride	mg/l	--	250	254	97.8	315	860	400	250	156	25
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1688	934	1750	2490	1950	2120	1180	470
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	9.69	8.52	--	--
Hardness, Calcium Carbonate	mg/l	--	--	687.61	459	719	637	561	605	525	137
Nitrate as N	mg/l	10.0	--	--	--	0.6	0.1	0.42	0.1	0.7	0.6
Nitrite as N	mg/l	1.0	--	--	--	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	2.3	29	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	2.24	28.99	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.69	7.09	6.35	6.5	6.73	6.64	6.9	7.88
Phosphate	mg/l	--	--	--	--	--	--	--	--	0.4	--
Phosphorus	mg/l	--	--	--	--	--	0.3	0.203	0.62	--	--
Sulphate	mg/l	--	500 [4]	165	146.5	154	147	116	107	118	35
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	--	--	4900
Total Organic Carbon	mg/l	--	--	--	--	--	9	9.4	8.8	55	4.1
Total Suspended Solids	mg/l	--	--	--	--	1140	1260	980	1060	590	240
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	0.168	--	0.093	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.1	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	0.164	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	0.07	0.078	0.01	0.01	0.04
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	0.01	0.0001	0.0001	--
Calcium, dissolved	mg/l	--	--	189.1	138	210	167	154.8	176	157	34.9
Chromium, dissolved	mg/l	0.05	--	--	--	0.015	0.01	0.01	0.02	0.03	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.012	0.0113	0.01	0.02	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.47	0.621	0.412	0.02	0.36	0.492
Lead, dissolved	mg/l	0.01	--	--	--	0.1	0.0008	0.1	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	52.18	27.8	47.3	53.4	23.506	39.6	31.7	11.9
Manganese, dissolved	mg/l	--	0.05	--	--	2.722	1.449	1.056	1.02	0.52	0.054
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.03	0.02	0.02
Potassium, dissolved	mg/l	--	--	5.39	5.33	6.9	11.6	3.634	--	8.9	4.03
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	89.81	33.5	112	185	164.6	180	130	45.7
Zinc, dissolved	mg/l	--	5	--	--	0.037	0.01	0.018	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.047	0.001	0.001	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 09-Jun-1992	92-19 01-Nov-1992	92-19 08-Jun-1993	92-19 15-Jun-1994	92-19 02-Nov-1994	92-19 28-Jun-1995	92-19 22-Nov-1995	92-19 12-Jun-1996
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 12-Oct-1996	92-19 18-Jun-1997	92-19 06-Nov-1997	92-19 05-Jun-1998	92-19 29-Oct-1998	92-19 06-May-1999	92-19 19-Oct-1999	92-19 05-May-2000
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	205	222	244	227
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	183	158	188	174	168	182	200	186
Ammonia Nitrogen	mg/l	--	--	0.36	0.41	0.14	0.11	0.07	0.01	0.11	0.03
Chemical Oxygen Demand	mg/l	--	--	15	6	5	20	3	3	3	3
Chloride	mg/l	--	250	26.3	28	29	40.5	41.9	46.1	46.8	51.8
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	450	480	450	521	493	540	521	575
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	3.75	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	134	160	152	153	129	163	168	174
Nitrate as N	mg/l	10.0	--	0.4	0.1	0.1	1	--	--	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	0.51	0.4	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.62	7.64	6.05	--	7.5	7.4	7.8	7.9
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	32	33	21	61	28	30	24	25
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2580	2740	--	--	--	--	3100	5840
Total Organic Carbon	mg/l	--	--	3.6	3.2	3.9	3.1	4.8	3.2	3.2	3.4
Total Suspended Solids	mg/l	--	--	230	240	220	260	245	270	260	288
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.05	0.04	0.04	0.21	0.22	0.05	0.15	0.13
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.6	43.4	41.1	38.8	35.5	40	44.6	46.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.07	0.56	0.53	2.24	2.03	0.02	1.94	2.87
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	10.8	12.4	11.9	13.4	9.83	13.8	13.6	14
Manganese, dissolved	mg/l	--	0.05	0.05	0.04	0.05	0.07	0.08	0.01	0.09	0.06
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	3.8	0.9	6.8	8	4.5	4.2	4.4	2.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	40.7	40.1	39.7	67.8	50	55.6	60	62.1
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.12	0.08	0.02	0.03	0.03
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 12-Oct-1996	92-19 18-Jun-1997	92-19 06-Nov-1997	92-19 05-Jun-1998	92-19 29-Oct-1998	92-19 06-May-1999	92-19 19-Oct-1999	92-19 05-May-2000
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 24-Oct-2000	92-19 14-Jun-2001	92-19 23-Nov-2001	92-19 23-May-2002	92-19 06-Nov-2002	92-19 30-May-2003	92-19 09-Oct-2003	92-19 14-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	228	216	201	395	326	355	--	381
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	7	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	187	189	165	324	267	291	273	312
Ammonia Nitrogen	mg/l	--	--	0.01	0.08	0.11	0.24	0.31	0.1	0.23	0.06
Chemical Oxygen Demand	mg/l	--	--	--	6	4	10	28	14	21	26
Chloride	mg/l	--	250	63.5	75.9	76.7	502	617	168	582	293
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	564	500	508	1890	2630	1440	3020	2230
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	62	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	144	181	189	554	503	441	418	469
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.2	0.5	0.4	0.6	0.3	1.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.37	0.37	0.22	0.36	0.73	0.45	0.6	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.62	8	7.49	6.68	8.66	6.4	7	6.8
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.9	1.49	0.14	0.2	0.21	0.22	0.35	0.66
Sulphate	mg/l	--	500 [4]	28	29	28	103	117	166	109	146
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	870	3910	136	168	308	246	294	796
Total Organic Carbon	mg/l	--	--	--	2.6	4	6	9	8.7	10	9.1
Total Suspended Solids	mg/l	--	--	310	366	320	1370	1510	720	1307	1115
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.003	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.05	0.05	0.07	0.07	0.06	0.06	0.06	0.057
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	37.5	49.5	49.7	183	165	150	140	159
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.005	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.008	0.004
Iron, dissolved	mg/l	--	0.3	0.05	0.02	0.13	0.02	0.11	0.51	2.3	0.019
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0016	0.0002	0.0007	0.0002
Magnesium, dissolved	mg/l	--	--	12.3	13.9	15.7	23.6	22	16.2	16.6	17.5
Manganese, dissolved	mg/l	--	0.05	0.02	0.01	0.02	1.8	1.35	0.74	1.77	0.847
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	3.4	0.4	1.9	16.7	16.9	11.3	14.7	13.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	52.4	55.2	60.6	284	320	151	367	202
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.03	0.01	0.01	0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.048	0.001	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 24-Oct-2000	92-19 14-Jun-2001	92-19 23-Nov-2001	92-19 23-May-2002	92-19 06-Nov-2002	92-19 30-May-2003	92-19 09-Oct-2003	92-19 14-May-2004
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 19-Nov-2004	92-19 24-May-2005	92-19 16-Nov-2005	92-19 25-May-2006	92-19 21-Nov-2006	92-19 15-May-2007	92-19 30-Nov-2007	92-19 22-May-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	370	332	227	286	284	364	332	237
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	303	272	186	286	284	364	332	240
Ammonia Nitrogen	mg/l	--	--	0.19	0.06	0.1	0.27	0.06	0.14	0.31	<0.01
Chemical Oxygen Demand	mg/l	--	--	23	21	22	9	9	97	61	14
Chloride	mg/l	--	250	736	199	271	298	463	571	957	318
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3060	1400	1400	1425	2100	1400	2700	1800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	436	179	146	371	484	367	421	354
Nitrate as N	mg/l	10.0	--	1	0.2	0.1	0.2	0.9	1.1	0.7	1.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.73	0.6	0.45	0.54	0.5	0.91	0.87	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	5.8	8.57	7.5	6.5	7.7	6.5	6.7
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.73	0.51	0.55	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	110	87	60	119	82	121	111	105
Temperature (Field)	deg c	--	15	--	10.8	9.2	7	7	8.9	5	10
Total Dissolved Solids	mg/l	--	500	296	695	715	855	1150	1420	1920	887
Total Organic Carbon	mg/l	--	--	8.7	9.5	10.7	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1530	250	118	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.001	0.0013	0.0011	0.0018	0.0014
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.064	0.04	0.067	0.037	0.045	0.078	0.071	0.063
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.0005	<0.005	0.0002	0.00014	0.00012	<0.00002
Calcium, dissolved	mg/l	--	--	147	55.8	46.8	127	164	125	145	121
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.006	0.007	0.008	0.003	0.003	0.006	0.004	0.002
Iron, dissolved	mg/l	--	0.3	0.128	0.015	0.062	0.071	0.032	0.1	0.06	0.006
Lead, dissolved	mg/l	0.01	--	0.0006	0.0004	<0.0002	<0.0002	<0.0001	0.00006	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	16.5	9.61	6.94	13.2	18.1	13.6	14.4	12.4
Manganese, dissolved	mg/l	--	0.05	1.74	0.118	0.399	0.598	1.56	1.19	1.65	0.774
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13.7	6.3	5.9	7.9	11.5	10.1	9.7	7.7
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	413	179	219	125	237	357	478	175
Zinc, dissolved	mg/l	--	5	0.005	0.006	0.009	0.006	0.009	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 19-Nov-2004	92-19 24-May-2005	92-19 16-Nov-2005	92-19 25-May-2006	92-19 21-Nov-2006	92-19 15-May-2007	92-19 30-Nov-2007	92-19 22-May-2008
Semi-VOCs											
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 10-Nov-2008	92-19 19-May-2009 G-2	92-19 26-Nov-2009 J-16	92-19 25-May-2010 M-1	92-19 20-Oct-2010 G-1	92-19 24-May-2011 G-1	92-19 29-Nov-2011 92-19	92-19 31-May-2012 92-19
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	264	290	361	235	344	336	362	320
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<1.0
Alkalinity (Total as CaCO3)	mg/l	--	--	260	290	361	235	344	336	362	320
Ammonia Nitrogen	mg/l	--	--	0.17	0.09	0.25	0.07	<0.02	<0.02	<0.02	<0.050
Chemical Oxygen Demand	mg/l	--	--	22	13	33	28	30	25	28	24
Chloride	mg/l	--	250	459	432	594	325	738	434	67	110
Conductivity	uS/cm	--	--	--	2120	2700	1740	3100	2220	1020	--
Conductivity (Field)	uS/cm	--	--	3100	1900	2300	926	2994	1943	1044	1192
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	351	411	391	283	725	440	419	340
Nitrate as N	mg/l	10.0	--	0.8	0.59	0.16	<0.10	1.28	0.81	1.07	4.1
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.6	0.33	0.48	0.20	0.48	0.35	0.18	0.88
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	4.2
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	7.17	7.50	7.67	7.04	7.76	7.61	7.51
pH (Field)	-	--	--	6.7	--	6.63	6.70	6.46	6.52	6.64	6.69
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	1.13	0.20	0.99	0.29	0.76	0.30	0.22
Sulphate	mg/l	--	500 [4]	72	86	90	56	118	109	85	140
Temperature (Field)	deg c	--	15	11	7	9.6	13.6	11.3	11.4	10.0	9.5
Total Dissolved Solids	mg/l	--	500	1060	1380	1760	1130	2010	1440	663	774
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.044	0.05	0.08	0.05	0.07	0.07	0.06	0.052
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	120	140	130	92	244	148	143	120
Chromium, dissolved	mg/l	0.05	--	<0.002	0.009	<0.005	0.003	0.009	0.007	0.004	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	0.0005	0.0009	0.0019	0.0021	0.0016	0.0008	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.004	0.007	0.005	0.008	0.010	0.003	0.0035
Iron, dissolved	mg/l	--	0.3	0.305	<0.03	<0.03	0.08	0.09	0.12	0.10	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	12.2	15	16	13	28	17	15	11
Manganese, dissolved	mg/l	--	0.05	0.29	0.22	0.60	1.09	1.51	0.74	0.37	0.13
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.7	8	8	7	12	8	6	5.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	227	246	466	221	290	266	49	100
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	<0.01	<0.01	0.01	0.02	<0.01	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 10-Nov-2008	92-19 19-May-2009 G-2	92-19 26-Nov-2009 J-16	92-19 25-May-2010 M-1	92-19 20-Oct-2010 G-1	92-19 24-May-2011 G-1	92-19 29-Nov-2011 92-19	92-19 31-May-2012 92-19
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 28-Nov-2012 92-19	92-19 29-May-2013 92-19	92-19 26-Nov-2013 GW-18	92-19 29-May-2014 92-19	92-19 19-Nov-2014 92-19	92-19 02-Jun-2015 92-19	92-19 26-Nov-2015 92-19	92-19 26-May-2016 92-19
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	360	360	310	360	260	300	391	328
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.6	1.1	<1.0	<1.0	<1.0	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	360	360	310	360	260	300	391	328
Ammonia Nitrogen	mg/l	--	--	0.082	0.080	<0.050	0.14	<0.050	0.06	0.04	0.05
Chemical Oxygen Demand	mg/l	--	--	23	31	20	34	9.3	30	53	30
Chloride	mg/l	--	250	110	84	220	170	100	118	163	84
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1256	1200	1449	1579	1081	1493	1583	1308
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	570	440	430	420	270	294	470	353
Nitrate as N	mg/l	10.0	--	2.1	<0.10	<0.10	<0.10	0.39	0.3	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.60	0.72	0.68	0.95	0.32	0.4	0.5	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	2.1	<0.10	<0.10	<0.10	0.39	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	7.50	7.50	7.45	7.39	--	--	--
pH (Field)	-	--	--	6.64	6.13	6.53	6.80	6.83	6.66	6.84	6.92
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.26	0.48	0.20	0.14	0.19	0.11	0.10	0.11
Sulphate	mg/l	--	500 [4]	180	210	190	300	98	231	268	255
Temperature (Field)	deg c	--	15	7.3	8.7	9.5	10.4	8.5	8.5	10.1	8.6
Total Dissolved Solids	mg/l	--	500	1080	840	952	1100	458	836	990	866
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.046	0.071	0.06	0.074	0.08	0.057	0.074	0.067
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	0.00011	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	200	150	140	140	92	92.8	154	108
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0010	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.0062	0.0048	0.0081	0.0045	<0.0005	0.0024	0.0038
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	19	17	17	18	10	15	20.5	20
Manganese, dissolved	mg/l	--	0.05	0.27	0.62	0.18	0.49	0.079	0.012	0.141	0.114
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.9	7.7	6.5	7.1	5	4.28	6.65	6.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	89	230	110	210	65	70.3	173	121
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.032	0.011	0.0059	0.007	0.008	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 28-Nov-2012 92-19	92-19 29-May-2013 92-19	92-19 26-Nov-2013 GW-18	92-19 29-May-2014 92-19	92-19 19-Nov-2014 92-19	92-19 02-Jun-2015 92-19	92-19 26-Nov-2015 92-19	92-19 26-May-2016 92-19
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 17-Nov-2016 92-19	92-19 24-May-2017 92-19	92-19 29-Nov-2017 92-19	92-19 24-May-2018 92-19	92-19 29-Nov-2018 92-19	92-19 19-Jun-2019 92-19	92-19 20-Nov-2019 92-19	92-19 21-May-2020 92-19
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	381	354	309	290	400	191	332	266
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	381	354	309	291	400	191	332	267
Ammonia Nitrogen	mg/l	--	--	0.04	0.10	0.07	0.07	0.17	0.10	0.04	0.08
Chemical Oxygen Demand	mg/l	--	--	36	36	45	92	45	14	30	21
Chloride	mg/l	--	250	85	115	119	60	420	76	93	47
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1414	1291	1081	949	1625	719	1113	767
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	408	457	392	303	393	213	428	270
Nitrate as N	mg/l	10.0	--	0.3	<0.1	4.7	0.2	<0.1	<0.1	0.3	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.6	0.5	0.5	0.8	0.2	0.2	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.67	6.94	6.41	6.86	6.54	6.48	6.72	7.68
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.14	0.16	0.11	0.14	0.19	0.17	0.16	0.08
Sulphate	mg/l	--	500 [4]	250	171	199	96	158	39	123	115
Temperature (Field)	deg c	--	15	11.2	9.5	7.9	8.0	8.5	10.5	9.4	8.1
Total Dissolved Solids	mg/l	--	500	750	782	756	520	1280	406	662	464
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.077	0.067	0.106	0.054	0.111	0.047	0.078	0.052
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	130	150	127	97.6	127	67.7	137	86.3
Chromium, dissolved	mg/l	0.05	--	0.007	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0019	0.0014
Copper, dissolved	mg/l	--	1	0.0064	0.0064	0.0051	0.0033	0.0035	0.0027	0.0021	0.0076
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.199
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	20	20.2	18.2	14.5	18.6	10.7	21.1	13.3
Manganese, dissolved	mg/l	--	0.05	0.096	0.12	0.05	0.612	0.436	0.023	1.04	3.13
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.15	5.7	5.31	4.22	7.3	3.12	10.8	6.54
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	137	124	86.4	48.1	38	42.3	69.8	69.5
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.006	<0.005	0.009	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 17-Nov-2016 92-19	92-19 24-May-2017 92-19	92-19 29-Nov-2017 92-19	92-19 24-May-2018 92-19	92-19 29-Nov-2018 92-19	92-19 19-Jun-2019 92-19	92-19 20-Nov-2019 92-19	92-19 21-May-2020 92-19
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 26-Nov-2020 92-19	92-19 26-May-2021 92-19	92-19 30-Nov-2021 92-19
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	338	312	412
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	339	312	412
Ammonia Nitrogen	mg/l	--	--	0.05	0.06	0.37
Chemical Oxygen Demand	mg/l	--	--	50	20	180
Chloride	mg/l	--	250	143	222	323
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1342	1663	1801
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	403	500	487
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.4	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	6.84	6.62	6.77
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.13	0.08	4.69
Sulphate	mg/l	--	500 [4]	148	210	188
Temperature (Field)	deg c	--	15	9.1	11.6	7.7
Total Dissolved Solids	mg/l	--	500	738	1030	1230
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Aluminum, dissolved	mg/l	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.06	0.05	0.051
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	129	160	151
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0012	<0.0005	0.0014
Copper, dissolved	mg/l	--	1	0.0027	0.0021	0.0078
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	19.5	24.2	27
Manganese, dissolved	mg/l	--	0.05	0.695	0.472	2.52
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.4	18.2	16.7
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	86	64.7	324
Zinc, dissolved	mg/l	--	5	0.009	0.007	0.006
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.002	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 26-Nov-2020 92-19	92-19 26-May-2021 92-19	92-19 30-Nov-2021 92-19
Semi-VOCs						
Naphthalene	mg/l	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 28-Jun-1995	95-4 22-Nov-1995	95-4 12-Jun-1996	95-4 12-Oct-1996	95-4 18-Jun-1997	95-4 06-Nov-1997	95-4 05-Jun-1998	95-4 29-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	158	142	--	--	--	--	--	239
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	130	116	143	179	123	170	156	196
Ammonia Nitrogen	mg/l	--	--	0.04	0.01	0.01	0.05	0.17	0.01	0.03	0.04
Chemical Oxygen Demand	mg/l	--	--	40	25	11	8	3	5	3	3
Chloride	mg/l	--	250	42	18.8	22	15.7	12.2	14.3	11.9	14.1
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	610	430	--	--	410	500	497	520
Dissolved Oxygen (Field)	mg/l	--	--	7.45	--	--	--	5.96	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	265	180	242	223	212	273	212	239
Nitrate as N	mg/l	10.0	--	11.6	5.8	9.1	7.7	5.6	6.8	6.7	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.5	0.48	--	--	--	--	--	0.47
Nitrogen, Organic	mg/l	--	--	3.46	0.47	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.99	7.35	--	--	7.31	6.15	--	7
Phosphate	mg/l	--	--	--	0.2	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.44	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	59	42	50	40	37	38	71	47
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	310	220	--	--	210	250	250	260
Total Organic Carbon	mg/l	--	--	2	1.7	2.3	2.8	2.2	3.1	1.7	4.2
Total Suspended Solids	mg/l	--	--	--	--	201	640	873	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.01	0.018	0.04	0.02	0.04	0.07	0.06
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	78.6	52.7	70	64.1	62.8	81.6	59.1	73.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.11	0.03	0.07	0.15	0.1	0.06	0.17
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	16.5	11.7	16.3	15.1	13.1	16.5	15.5	13.6
Manganese, dissolved	mg/l	--	0.05	0.06	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Nickel, dissolved	mg/l	--	--	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	9.5	4.6	4.6	0.6	6.5	5	5.3
Sodium, dissolved	mg/l	--	200 [5]	10.6	6.2	11.6	8.8	8.6	7.9	14.5	10.4
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.019	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 06-May-1999	95-4 19-Oct-1999	95-4 05-May-2000	95-4 24-Oct-2000	95-4 14-Jun-2001	95-4 23-Nov-2001	95-4 23-May-2002 [13]	95-4 06-Nov-2002 [13]
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	176	268	382	277	251	306	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	144	220	313	227	206	251	--	--
Ammonia Nitrogen	mg/l	--	--	0.01	0.04	0.01	0.01	0.01	0.01	--	--
Chemical Oxygen Demand	mg/l	--	--	4	6	3	--	5	3	--	--
Chloride	mg/l	--	250	7.1	10.2	37.7	16.9	11	10.3	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	370	460	850	630	500	522	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	185	233	479	216	268	302	--	--
Nitrate as N	mg/l	10.0	--	--	2.4	12.8	4.3	2.9	0.6	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.36	--	--	0.46	0.33	0.29	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	7.7	6.9	7.06	7.5	--	--	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.08	0.1	0.06	--	--
Sulphate	mg/l	--	500 [4]	34	39	97	63	47	30	--	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	190	230	425	354	320	468	--	--
Total Organic Carbon	mg/l	--	--	3.6	2.4	6.5	--	3.6	5	--	--
Total Suspended Solids	mg/l	--	--	--	182	154	108	259	74	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001	--	--
Boron, dissolved	mg/l	5	--	0.03	0.19	0.12	0.04	0.02	0.04	--	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	54.2	66.8	135	54.2	75.4	81	--	--
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	--	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	--	--
Iron, dissolved	mg/l	--	0.3	0.02	0.13	0.05	0.02	0.02	0.02	--	--
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0007	--	--
Magnesium, dissolved	mg/l	--	--	13.3	15.8	33.4	19.7	19.4	21	--	--
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.01	0.01	0.02	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	--	--
Potassium, dissolved	mg/l	--	--	0.4	5.1	2.2	5.4	2	0.4	--	--
Sodium, dissolved	mg/l	--	200 [5]	9.5	22.1	16.7	30	14.5	15.6	--	--
Zinc, dissolved	mg/l	--	5	0.01	0.1	0.14	0.03	0.01	0.01	--	--
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.007	0.001	--	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 30-May-2003 [13]	95-4 09-Oct-2003 [13]	95-4 14-May-2004 [13]	95-4 19-Nov-2004 [13]	95-4 24-May-2005 [13]	95-4 16-Nov-2005 [13]	95-4 25-May-2006	95-4 16-Nov-2006 [13]
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	222	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	--	--	--	--	222	--
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	--	<0.01	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--	36	--
Chloride	mg/l	--	250	--	--	--	--	--	--	5	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	--	--	--	--	460	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	--	--	--	--	323	--
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	--	1.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	0.64	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	--	--	--	--	7.8	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	--	--	--	--	--	--	124	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	9.5	--
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	--	393	--
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--	0.021	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.005	--
Calcium, dissolved	mg/l	--	--	--	--	--	--	--	--	84	--
Chromium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.002	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	--
Copper, dissolved	mg/l	--	1	--	--	--	--	--	--	0.003	--
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--	<0.005	--
Lead, dissolved	mg/l	0.01	--	--	--	--	--	--	--	<0.0002	--
Magnesium, dissolved	mg/l	--	--	--	--	--	--	--	--	27.5	--
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--	0.187	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	--	--	--	--	--	5.6	--
Sodium, dissolved	mg/l	--	200 [5]	--	--	--	--	--	--	14.2	--
Zinc, dissolved	mg/l	--	5	--	--	--	--	--	--	0.013	--
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	<0.001	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 15-May-2007 [13]	95-4 30-Nov-2007 [16]	95-4 22-May-2008 [13]	95-4 10-Nov-2008 [13]	95-4 19-May-2009 [13]	95-4 27-Nov-2009
								95-4	J-52
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	112
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	--	--	--	112
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	<0.02
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	33
Chloride	mg/l	--	250	--	--	--	--	--	10
Conductivity	uS/cm	--	--	--	--	--	--	--	341
Conductivity (Field)	uS/cm	--	--	--	--	--	--	--	309
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	--	--	--	76
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	0.20
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	8.17
pH (Field)	-	--	--	--	--	--	--	--	8.97
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.21
Sulphate	mg/l	--	500 [4]	--	--	--	--	--	42
Temperature (Field)	deg c	--	15	--	--	--	--	--	8.4
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	222
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.004
Boron, dissolved	mg/l	5	--	--	--	--	--	--	0.07
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	--	--	--	--	--	19
Chromium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.0002
Copper, dissolved	mg/l	--	1	--	--	--	--	--	0.001
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	<0.03
Lead, dissolved	mg/l	0.01	--	--	--	--	--	--	<0.001
Magnesium, dissolved	mg/l	--	--	--	--	--	--	--	7
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	--	--	--	--	4
Sodium, dissolved	mg/l	--	200 [5]	--	--	--	--	--	40
Zinc, dissolved	mg/l	--	5	--	--	--	--	--	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0004
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0040
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 20-Oct-2010 G-13	95-4 24-May-2011 G-44	95-4 22-Nov-2011 [13] 95-4	95-4 31-May-2012 [17] 95-4
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	244	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [15]	6	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	310	250	--	--
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	--	--
Chemical Oxygen Demand	mg/l	--	--	25	10	--	--
Chloride	mg/l	--	250	10	8	--	--
Conductivity	uS/cm	--	--	701	550	--	--
Conductivity (Field)	uS/cm	--	--	701	552	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	342	267	--	--
Nitrate as N	mg/l	10.0	--	<0.10	0.15	--	--
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.34	0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	8.16	8.40	--	--
pH (Field)	-	--	--	7.46	7.49	--	--
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.09	0.07	--	--
Sulphate	mg/l	--	500 [4]	63	42	--	--
Temperature (Field)	deg c	--	15	13.8	16.9	--	--
Total Dissolved Solids	mg/l	--	500	456	358	--	--
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--
Boron, dissolved	mg/l	5	--	0.05	0.03	--	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	--	--
Calcium, dissolved	mg/l	--	--	86	69	--	--
Chromium, dissolved	mg/l	0.05	--	0.003	<0.001	--	--
Cobalt, dissolved	mg/l	--	--	0.0005	0.0003	--	--
Copper, dissolved	mg/l	--	1	0.003	0.006	--	--
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	--	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--
Magnesium, dissolved	mg/l	--	--	31	23	--	--
Manganese, dissolved	mg/l	--	0.05	0.25	0.03	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6	4	--	--
Sodium, dissolved	mg/l	--	200 [5]	18	15	--	--
Zinc, dissolved	mg/l	--	5	<0.01	0.02	--	--
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	--	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	--	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	--	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 28-Jun-1995	95-8 22-Nov-1995	95-8 12-Jun-1996	95-8 12-Oct-1996	95-8 18-Jun-1997	95-8 06-Nov-1997	95-8 05-Jun-1998	95-8 29-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	173	174	--	--	--	--	--	161
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	142	143	151	143	123	150	150	132
Ammonia Nitrogen	mg/l	--	--	0.18	0.15	0.12	0.11	0.01	0.09	0.22	0.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	33	13	15	3	3	19	3
Chloride	mg/l	--	250	122	121	115	130	136	146	140	142
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	840	860	810	850	840	770	836	888
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	8.18	--	--	--	2.84	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	251	265	259	234	288	288	242	227
Nitrate as N	mg/l	10.0	--	0.1	0.3	0.1	0.1	0.1	0.1	1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	4.5	--	--	--	--	--	0.49
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.32	4.35	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.23	6.87	7.26	7	6.18	--	6.7
Phosphate	mg/l	--	--	--	1.4	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.66	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	74	84	76	79	72	64	92	75
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	420	440	410	430	420	360	416	445
Total Organic Carbon	mg/l	--	--	7.3	3.6	5.9	4.8	3.8	5.3	5.2	6.2
Total Suspended Solids	mg/l	--	--	--	--	1480	1780	1230	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.01	0.021	0.05	0.03	0.04	0.14	0.07
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	56.3	56	57.7	50.7	69.5	65	52.3	50.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.75	3.79	0.56	2.22	0.4	1.58	2.72
Lead, dissolved	mg/l	0.01	--	0.0002	0.0004	0.0002	0.0002	0.0002	0.0015	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	26.7	30	27.4	25.7	27.3	30.1	26.6	24.8
Manganese, dissolved	mg/l	--	0.05	0.24	0.27	0.383	0.25	0.39	0.27	0.3	0.37
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	7.6	6.98	3.8	7.7	7.5	6.5	9.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	63	67.7	78.5	71.1	71.8	61.4	93.9	69.1
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.35	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 28-Jun-1995	95-8 22-Nov-1995	95-8 12-Jun-1996	95-8 12-Oct-1996	95-8 18-Jun-1997	95-8 06-Nov-1997	95-8 05-Jun-1998	95-8 29-Oct-1998
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 06-May-1999	95-8 19-Oct-1999	95-8 05-May-2000	95-8 24-Oct-2000	95-8 14-Jun-2001	95-8 23-Nov-2001	95-8 23-May-2002	95-8 06-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	178	220	177	187	160	150	173	194
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	146	180	145	153	131	123	142	159
Ammonia Nitrogen	mg/l	--	--	0.03	0.08	0.01	0.04	0.31	0.03	0.22	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	3	13	--	11	4	3	12
Chloride	mg/l	--	250	135	151	138	152	139	136	144	158
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	840	908	700	780	850	750	770	652
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	266	269	259	208	230	238	250	247
Nitrate as N	mg/l	10.0	--	--	0.1	0.2	0.2	0.2	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.84	--	--	0.52	0.86	0.66	1.4	0.33
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.4	7.4	7.2	7.14	7.1	6.23	6.74	7.2
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	1.28	2.22	1.01	0.6	0.48
Sulphate	mg/l	--	500 [4]	68	71	67	75	76	79	77	64
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	430	450	350	486	496	448	564	576
Total Organic Carbon	mg/l	--	--	4.8	3.8	6	--	5	6	5	5.2
Total Suspended Solids	mg/l	--	--	--	712	598	1010	2150	682	436	554
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.04	0.16	0.12	0.04	0.04	0.05	0.04	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	61.4	61.4	58.2	41.6	54.3	51	53.1	53
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.17	1.47	1.73	0.03	0.08	0.04	1.8	0.75
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0002	0.0002	0.0008
Magnesium, dissolved	mg/l	--	--	27.1	27.6	27.2	25.2	22.9	26.8	28.4	27.9
Manganese, dissolved	mg/l	--	0.05	0.37	0.28	0.32	0.26	0.23	0.28	0.23	0.23
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5	7	2	4.5	2.4	2.6	6.5	7.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	81.3	90.5	71.7	90	70.1	71.1	64.6	76.7
Zinc, dissolved	mg/l	--	5	0.01	0.16	0.12	0.01	0.01	0.01	0.01	0.02
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.05	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 06-May-1999	95-8 19-Oct-1999	95-8 05-May-2000	95-8 24-Oct-2000	95-8 14-Jun-2001	95-8 23-Nov-2001	95-8 23-May-2002	95-8 06-Nov-2002
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 30-May-2003	95-8 09-Oct-2003	95-8 14-May-2004	95-8 19-Nov-2004	95-8 24-May-2005	95-8 16-Nov-2005	95-8 25-May-2006	95-8 21-Nov-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	154	--	162	275	310	222	358	492
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	126	184	133	230	254	364	358	492
Ammonia Nitrogen	mg/l	--	--	0.16	0.1	0.16	0.09	0.05	0.11	0.13	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	1	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	7	12	13	24	13	31	16	28
Chloride	mg/l	--	250	145	142	153	166	193	181	193	167
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	780	940	840	1110	1400	1300	1000	1300
Dissolved Inorganic Carbon	mg/l	--	--	--	44	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	231	265	233	310	366	579	408	552
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.2	0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.38	0.36	0.498	0.57	0.44	0.56	0.51	0.92
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.4	7	6.9	6.7	5.9	--	6.9	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.25	0.19	0.608	1.06	0.33	0.29	--	--
Sulphate	mg/l	--	500 [4]	65	73	71	77	79	107	90	103
Temperature (Field)	deg c	--	15	--	--	--	--	6.6	10.7	4	7.5
Total Dissolved Solids	mg/l	--	500	390	512	420	550	631	800	734	866
Total Organic Carbon	mg/l	--	--	5.2	10	3.6	5	5.2	10.2	--	--
Total Suspended Solids	mg/l	--	--	128	132	424	528	149	165	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	0.0007
Boron, dissolved	mg/l	5	--	0.03	0.039	0.027	0.038	0.025	0.044	0.038	0.043
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.005	0.0001
Calcium, dissolved	mg/l	--	--	48.9	56.5	48.9	66.9	75.8	124	86.3	119
Chromium, dissolved	mg/l	0.05	--	0.01	0.005	0.001	0.002	<0.002	0.003	<0.002	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.007	0.003	0.002	<0.002	0.007	0.004	0.011
Iron, dissolved	mg/l	--	0.3	1.13	2.73	0.497	0.205	2.02	0.674	2.16	1.17
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0006	<0.0002	<0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	26.4	30.2	27	34.8	42.9	65.7	46.7	62
Manganese, dissolved	mg/l	--	0.05	0.18	0.203	0.17	0.242	0.344	0.312	0.328	0.443
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	5.5	6.9	5.7	6.7	6.2	9.3	6.3	8.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [5]	68.4	90.3	70.9	89.2	85.1	103	100	110
Zinc, dissolved	mg/l	--	5	0.01	0.005	0.005	0.005	0.008	0.008	0.008	0.008
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.002	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 30-May-2003	95-8 09-Oct-2003	95-8 14-May-2004	95-8 19-Nov-2004	95-8 24-May-2005	95-8 16-Nov-2005	95-8 25-May-2006	95-8 21-Nov-2006
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 15-May-2007	95-8 30-Nov-2007	95-8 22-May-2008	95-8 10-Nov-2008	95-8 19-May-2009 G-12	95-8 27-Nov-2009 J-1	95-8 25-May-2010 [14] M-4	95-8 20-Oct-2010 G-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	507	531	501	519	417	417	475	452
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	507	531	501	519	417	417	475	452
Ammonia Nitrogen	mg/l	--	--	0.52	1.45	0.85	1.14	0.68	1.68	1.60	1.77
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	92	48	36	27	23	35	45	40
Chloride	mg/l	--	250	172	161	171	151	152	157	126	145
Conductivity	uS/cm	--	--	--	--	--	--	1350	1350	1410	1360
Conductivity (Field)	uS/cm	--	--	1100	1200	1300	1250	1000	1209	1511	1395
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	537	517	518	521	432	423	445	478
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	0.13
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.49	2.49	2	1.95	1.00	1.90	2.00	2.31
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.25	7.32	7.31	7.21
pH (Field)	-	--	--	7	6.7	6.5	6.5	--	6.64	6.48	6.63
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.4	0.09	0.11	0.06
Sulphate	mg/l	--	500 [4]	101	89	88	80	59	51	58	56
Temperature (Field)	deg c	--	15	6.3	5	8.5	7	5	4.7	9.4	8.8
Total Dissolved Solids	mg/l	--	500	881	879	871	857	878	878	917	884
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0011	0.0011	0.0013	0.001	<0.001	0.001	<0.01	<0.001
Boron, dissolved	mg/l	5	--	0.038	0.044	0.036	0.042	0.07	0.05	0.05	0.05
Cadmium, dissolved	mg/l	0.005	--	0.00007	<0.00002	<0.00002	0.00025	<0.0001	<0.0001	0.0003	0.0001
Calcium, dissolved	mg/l	--	--	115	117	117	122	97	97	104	114
Chromium, dissolved	mg/l	0.05	--	0.003	<0.002	0.002	0.002	0.007	0.008	0.008	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0014	0.0017	0.0029	0.0017
Copper, dissolved	mg/l	--	1	0.003	0.005	<0.002	0.045	0.010	0.005	0.046	0.005
Iron, dissolved	mg/l	--	0.3	3.16	1.55	3.35	0.038	0.03	3.11	0.54	2.83
Lead, dissolved	mg/l	0.01	--	0.00011	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	60.7	54.6	54.7	52.5	46	44	45	47
Manganese, dissolved	mg/l	--	0.05	0.508	0.551	0.593	1.36	1.12	1.57	2.30	1.54
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.5	10.7	9.4	12.4	8	10	10	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	114	127	125	124	111	116	102	116
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.005	<0.005	<0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 15-May-2007	95-8 30-Nov-2007	95-8 22-May-2008	95-8 10-Nov-2008	95-8 19-May-2009 G-12	95-8 27-Nov-2009 J-1	95-8 25-May-2010 [14] M-4	95-8 20-Oct-2010 G-11
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8	95-8	95-8	95-8	95-8	95-8	95-8	95-8
				24-May-2011 [18]	29-Nov-2011	31-May-2012	28-Nov-2012	29-May-2013 [19]	26-Nov-2013	29-May-2014	19-Nov-2014
				G-6	95-8	95-8	95-8	95-8	GW-13	95-8	95-8
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	486	521	540	690	700	670	710	670
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [15]	<2 [15]	1.2	1.6	1.5	1.2	1.9	1.0
Alkalinity (Total as CaCO3)	mg/l	--	--	486	521	540	690	700	670	720	680
Ammonia Nitrogen	mg/l	--	--	2.03	2.08	2.3	2.6	3.6	2.5	2.7	2.8
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	45	53	90	75	59	70	65
Chloride	mg/l	--	250	142	137	130	120	130	140	160	170
Conductivity	uS/cm	--	--	1410	1450	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1342	--	1416	1467	1448	1415	1576	1781
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	569	516	510	700	730	680	760	700
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.30	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.010	<0.010	0.010	<0.010	0.068	0.013
Nitrogen, Total Kjeldahl	mg/l	--	--	2.64	2.27	3.3	3.6	4.4	3.1	3.3	3.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	0.30	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.78	7.40	7.36	--	7.36	7.27	7.45	7.22
pH (Field)	-	--	--	6.57	--	6.51	6.51	6.61	6.73	6.57	6.62
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.02	0.08	0.058	0.052	0.19	0.11	0.07	0.063
Sulphate	mg/l	--	500 [4]	56	70	69	69	67	55	42	45
Temperature (Field)	deg c	--	15	13.2	--	11.0	7.4	12	8.7	9.2	6.0
Total Dissolved Solids	mg/l	--	500	916	942	872	990	1050	1010	1050	1010
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.05	0.04	0.056	0.052	0.054	0.057	0.065	0.063
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0002	0.00027	0.0004	0.00025	0.00023	0.00048	0.00050
Calcium, dissolved	mg/l	--	--	139	129	130	170	180	170	190	180
Chromium, dissolved	mg/l	0.05	--	0.006	0.006	<0.0050	<0.005	<0.0050	0.0059	0.0054	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0030	0.0020	0.0013	0.0029	0.0035	0.0032	0.0034	0.0027
Copper, dissolved	mg/l	--	1	0.037	0.046	0.054	0.05	0.011	0.031	0.015	0.0040
Iron, dissolved	mg/l	--	0.3	0.10	<0.03	<0.1	<0.1	1.8	<0.1	1.6	3.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	0.00060	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	54	47	49	64	64	62	69	64
Manganese, dissolved	mg/l	--	0.05	3.44	2.61	2.6	6.7	7.4	6.9	8.2	6.7
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16	13	13	19	18	16	17	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	94	100	100	100	100	100	120	120
Zinc, dissolved	mg/l	--	5	0.01	<0.01	0.0064	<0.005	0.0093	0.0087	0.0082	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 24-May-2011 [18] G-6	95-8 29-Nov-2011 95-8	95-8 31-May-2012 95-8	95-8 28-Nov-2012 95-8	95-8 29-May-2013 [19] 95-8	95-8 26-Nov-2013 GW-13	95-8 29-May-2014 95-8	95-8 19-Nov-2014 95-8
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.004	<0.0004	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.005	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.005	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.01	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.04	<0.0040	<0.00050	<0.0013	<0.0013	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.005	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.005	<0.0005	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.002	<0.0002	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 02-Jun-2015	95-8 26-Nov-2015	95-8 26-May-2016	95-8 17-Nov-2016	95-8 24-May-2017	95-8 29-Nov-2017	95-8 24-May-2018	95-8 22-Nov-2018
				95-8	95-8	95-8	95-8	95-8	95-8	95-8	95-8
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	712	779	768	773	856	836	941	953
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	713	779	768	773	856	836	942	953
Ammonia Nitrogen	mg/l	--	--	2.57	2.60	2.83	2.25	1.80	2.17	2.42	1.92
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	81	94	91	88	286	94	129	117
Chloride	mg/l	--	250	185	177	188	181	172	226	200	199
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1782	1822	1817	1894	1915	1818	2068	1819
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	650	826	776	712	769	771	962	1120
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.7	3.7	3.5	3.2	3.0	3.3	4.0	3.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.57	6.74	6.77	7.05	6.62	6.67	6.48	6.68
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.05	0.05	0.07	0.06	0.02	0.06	0.04	0.08
Sulphate	mg/l	--	500 [4]	37	32	39	33	26	25	17	16
Temperature (Field)	deg c	--	15	10.7	8.4	13.5	10.4	12.0	8.3	11.9	6.8
Total Dissolved Solids	mg/l	--	500	1080	1110	1180	1030	1130	1140	1410	1210
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.001	0.002	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.059	0.068	0.084	0.058	0.051	0.083	0.065	0.091
Cadmium, dissolved	mg/l	0.005	--	0.0003	0.0003	0.0003	0.0003	0.0002	0.0004	0.0005	0.0003
Calcium, dissolved	mg/l	--	--	148	197	197	185	209	200	263	313
Chromium, dissolved	mg/l	0.05	--	0.004	0.006	0.006	0.014	0.014	0.007	0.008	0.007
Cobalt, dissolved	mg/l	--	--	0.0031	0.0034	0.0035	0.0012	0.0026	0.0031	0.0033	0.0035
Copper, dissolved	mg/l	--	1	0.0196	0.0571	0.0351	0.0547	0.0371	0.0087	0.112	0.107
Iron, dissolved	mg/l	--	0.3	<0.1	0.226	<0.1	<0.1	<0.1	1.33	<0.1	0.124
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	68	81.1	68.7	60.6	59.8	65.9	73.8	82.8
Manganese, dissolved	mg/l	--	0.05	10.2	8.9	9.2	5.7	8.23	8.27	11.8	5.83
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.7	16.7	21.5	16.5	16.5	17.8	17.9	20.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	116	139	120	129	128	125	117	145
Zinc, dissolved	mg/l	--	5	<0.005	0.016	0.006	0.008	0.008	<0.005	0.007	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [7]	<0.001	0.006	<0.002 [7]	<0.002 [7]	<0.001	<0.002 [7]	0.004

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 02-Jun-2015	95-8 26-Nov-2015	95-8 26-May-2016	95-8 17-Nov-2016	95-8 24-May-2017	95-8 29-Nov-2017	95-8 24-May-2018	95-8 22-Nov-2018
				95-8	95-8	95-8	95-8	95-8	95-8	95-8	95-8
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 19-Jun-2019 95-8	95-8 20-Nov-2019 95-8	95-8 21-May-2020 95-8	95-8 26-Nov-2020 95-8	95-8 26-May-2021 95-8	95-8 30-Nov-2021 95-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	943	916	1010	1160	934	903
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<25 [9]	<25	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	944	916	1010	1170	935	904
Ammonia Nitrogen	mg/l	--	--	2.25	2.66	2.82	1.70	2.51	2.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	124	121	138	169	107	124
Chloride	mg/l	--	250	161	165	198	166	174	163
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1848	2070	1876	1855	1973	1966
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	864	911	853	925	833	751
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1	<0.5 [10]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.4	3.3	3.5	3.0	3.5 [20]	3.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	6.5	7.14	6.8	6.49	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.02	0.02	0.03	0.04	0.03	0.96
Sulphate	mg/l	--	500 [4]	14	14	15	9	11	8
Temperature (Field)	deg c	--	15	12.5	7.1	16.7	6.8	11.7	6.6
Total Dissolved Solids	mg/l	--	500	1260	1250	1350	1270	1250	1230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.073	0.067	0.05	0.057	0.053	0.047
Cadmium, dissolved	mg/l	0.005	--	0.0003	0.0004	0.0001	0.0002	0.0003	<0.0001
Calcium, dissolved	mg/l	--	--	213	225	212	230	206	191
Chromium, dissolved	mg/l	0.05	--	0.009	0.013	0.013	0.011	0.011	0.008
Cobalt, dissolved	mg/l	--	--	0.0027	0.0043	0.0042	0.0027	0.0021	0.0019
Copper, dissolved	mg/l	--	1	0.0948	0.0094	0.0096	0.0926	0.0919	0.0415
Iron, dissolved	mg/l	--	0.3	<0.1	4.02	3.51	<0.1	<0.1	1.15
Lead, dissolved	mg/l	0.01	--	0.0001	0.0002	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	80.6	84.9	78.6	85.4	77.5	66.4
Manganese, dissolved	mg/l	--	0.05	11.3	10.6	10.9	10.8	9.67	8.29
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	22.6	24.2	19.3	18.8	17	14.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	124	131	132	125	122	110
Zinc, dissolved	mg/l	--	5	<0.005	0.008	0.006	0.014	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.010 [7]	0.009	<0.004 [10]	0.004	<0.002 [10]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 19-Jun-2019 95-8	95-8 20-Nov-2019 95-8	95-8 21-May-2020 95-8	95-8 26-Nov-2020 95-8	95-8 26-May-2021 95-8	95-8 30-Nov-2021 95-8
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 29-Oct-1998	98-1 06-May-1999	98-1 05-May-2000	98-1 24-Oct-2000	98-1 14-Jun-2001	98-1 23-Nov-2001	98-1 23-May-2002	98-1 06-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	293	342	357	323	272	267	266	271
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1	4	1
Alkalinity (Total as CaCO3)	mg/l	--	--	240	280	293	265	223	219	224	222
Ammonia Nitrogen	mg/l	--	--	0.34	0.63	0.01	0.01	0.34	0.33	0.26	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	7	6	--	12	5	3	13
Chloride	mg/l	--	250	210	290	197	209	184	181	189	182
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1066	1420	1200	1260	1050	1140	1210	1190
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	256	214	218	233	273	278	266	253
Nitrate as N	mg/l	10.0	--	--	--	0.3	0.5	0.4	0.2	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.87	0.99	--	0.5	0.57	0.62	0.5	0.43
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.1	7.7	7.7	7.7	6.87	7.06	7.6
Phosphorus	mg/l	--	--	--	--	--	0.13	0.12	0.07	0.09	0.06
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	116	33	47	55	63	77	63	61
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	536	710	600	612	584	556	20800	588
Total Organic Carbon	mg/l	--	--	13.8	8.4	4.6	--	3.8	6	4	4.6
Total Suspended Solids	mg/l	--	--	--	--	284	98	74	91	80	74
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.12	0.13	0.19	0.08	0.06	0.09	0.07	0.08
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	64.6	45.2	48.5	49.4	65.9	63.4	61.2	58.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.13	2.41	0.42	0.03	0.02	0.02	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0002	0.0002	0.0004
Magnesium, dissolved	mg/l	--	--	22.9	24.3	23.1	26.7	26.3	29.1	27.6	26
Manganese, dissolved	mg/l	--	0.05	0.53	0.27	0.18	0.19	0.26	0.33	0.33	0.28
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.5	6.7	8.2	12.4	3.4	5.3	9.3	8.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	150	239	200	148	114	131	120	120
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.08	0.01	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 29-Oct-1998	98-1 06-May-1999	98-1 05-May-2000	98-1 24-Oct-2000	98-1 14-Jun-2001	98-1 23-Nov-2001	98-1 23-May-2002	98-1 06-Nov-2002
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.055	0.001	0.001	0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 30-May-2003	98-1 09-Oct-2003	98-1 14-May-2004	98-1 19-Nov-2004	98-1 24-May-2005	98-1 16-Nov-2005	98-1 25-May-2006	98-1 21-Nov-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	271	--	282	329	310	178	310	300
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	222	227	231	270	254	292	310	300
Ammonia Nitrogen	mg/l	--	--	0.3	0.22	0.27	0.48	0.23	<0.01	0.16	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	2	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	10	7	16	248	9	9	6	6
Chloride	mg/l	--	250	192	196	183	199	191	246	205	224
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1060	1280	1200	1170	1800	930	1075	1100
Dissolved Inorganic Carbon	mg/l	--	--	--	53	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	268	242	263	284	222	258	263	260
Nitrate as N	mg/l	10.0	--	0.3	0.3	0.4	0.4	0.2	0.5	0.4	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.99	0.62	0.659	2.82	0.54	0.2	0.37	0.33
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7.4	7.5	7.3	6.1	--	7.7	8.2
Phosphorus	mg/l	--	--	0.55	0.36	0.136	3.09	0.11	0.09	--	--
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	57	51	57	63	55	35	52	42
Temperature (Field)	deg c	--	15	--	--	--	--	6.9	11.2	5	7
Total Dissolved Solids	mg/l	--	500	530	626	600	585	681	725	701	723
Total Organic Carbon	mg/l	--	--	4.6	8	4	6.2	4	5.4	--	--
Total Suspended Solids	mg/l	--	--	627	340	66	740	38	22	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.0001	0.001	<0.001	<0.001	0.002
Boron, dissolved	mg/l	5	--	0.05	0.072	0.065	0.062	0.095	0.089	0.074	0.084
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.005	<0.0001
Calcium, dissolved	mg/l	--	--	62.4	54.4	60.3	66.8	47.7	59.3	59	58.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.004	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.002	0.003	0.006	<0.002	0.004	0.009	0.003
Iron, dissolved	mg/l	--	0.3	0.19	1.02	0.01	0.007	0.013	0.007	0.014	0.008
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0005	<0.0002	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	27.2	25.7	27.4	28.5	25.1	26.6	28	27.7
Manganese, dissolved	mg/l	--	0.05	0.38	0.274	0.408	0.454	0.215	0.192	0.32	0.022
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	7.5	8.8	8.6	8.2	10.1	10.3	8.3	9.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [5]	114	153	148	119	208	180	169	180
Zinc, dissolved	mg/l	--	5	0.01	0.005	0.005	0.005	<0.005	0.009	<0.005	0.009

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 30-May-2003	98-1 09-Oct-2003	98-1 14-May-2004	98-1 19-Nov-2004	98-1 24-May-2005	98-1 16-Nov-2005	98-1 25-May-2006	98-1 21-Nov-2006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.002	<0.001	<0.001	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 15-May-2007	98-1 30-Nov-2007	98-1 22-May-2008	98-1 10-Nov-2008	98-1 19-May-2009 G-18	98-1 27-Nov-2009 J-4	98-1 25-May-2010 [14] M-3	98-1 20-Oct-2010 [14] G-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	328	336	333	327	364	369	476	502
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	328	336	333	327	364	369	476	502
Ammonia Nitrogen	mg/l	--	--	0.21	<0.01	0.02	0.08	0.27	0.57	1.09	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	47	10	<5	20	25	28	35
Chloride	mg/l	--	250	275	214	247	265	341	467	714	819
Conductivity	uS/cm	--	--	--	--	--	--	1830	2120	3320	3480
Conductivity (Field)	uS/cm	--	--	1100	1100	1250	1300	1200	750	3200	3190
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	246	291	278	251	292	213	246	260
Nitrate as N	mg/l	10.0	--	0.3	0.5	0.3	0.3	0.15	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.78	0.25	0.69	0.4	0.46	0.66	1.16	1.61
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.77	8.22	8.29	8.21
pH (Field)	-	--	--	8.2	7.6	--	7.4	--	7.15	7.78	7.82
Phosphorus	mg/l	--	--	--	--	--	--	--	0.32	0.54	0.53
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	0.76	--	--	--
Sulphate	mg/l	--	500 [4]	37	48	43	38	24	6	8	2
Temperature (Field)	deg c	--	15	6.9	6	--	6	6	5.5	12.6	8.7
Total Dissolved Solids	mg/l	--	500	824	788	798	822	1190	1380	2160	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0029	0.0028	0.0025	0.0023	0.003	0.004	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.109	0.095	0.092	0.109	0.21	0.18	0.26	0.30
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	54.6	67	63.6	56.7	64	44	44	48
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	0.009	<0.005	0.007	<0.005
Cobalt, dissolved	mg/l	--	--	0.007	<0.005	<0.005	<0.005	0.0003	0.0004	0.0004	0.0003
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.002	0.003	0.001	0.006	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.235	0.056	0.013	<0.005	0.22	<0.03	<0.03	0.08
Lead, dissolved	mg/l	0.01	--	0.00007	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	26.7	30.2	28.9	26.5	32	25	33	34
Manganese, dissolved	mg/l	--	0.05	0.19	0.319	0.379	0.039	0.27	0.27	0.11	0.09
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	10.2	9.1	10.4	11	11	18	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	222	215	206	229	243	386	516	578
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.01	0.01	<0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 15-May-2007	98-1 30-Nov-2007	98-1 22-May-2008	98-1 10-Nov-2008	98-1 19-May-2009 G-18	98-1 27-Nov-2009 J-4	98-1 25-May-2010 [14] M-3	98-1 20-Oct-2010 [14] G-12
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2011 [14] G-3	98-1 08-Dec-2011 [14] B-1	98-1 31-May-2012 98-1	98-1 28-Nov-2012 98-1	98-1 29-May-2013 98-1	98-1 26-Nov-2013 GW-4	98-1 29-May-2014 98-1	98-1 19-Nov-2014 98-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	355	343	370	390	350	400	300	380
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7	<2 [15]	3.7	3.3	3.2	3.8	3.2	4.1
Alkalinity (Total as CaCO3)	mg/l	--	--	362	343	370	390	360	410	300	380
Ammonia Nitrogen	mg/l	--	--	0.88	0.84	0.12	0.77	1.2	0.92	0.89	0.94
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	33	20	23	30	36	23	29	21
Chloride	mg/l	--	250	488	389	320	360	400	260	330	470
Conductivity	uS/cm	--	--	2260	1860	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1897	2049	1615	1676	1459	1659	1613	1934
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	222	245	240	280	320	340	250	290
Nitrate as N	mg/l	10.0	--	<0.10	0.37	0.80	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.075	0.10	0.22	0.018	0.165	0.064
Nitrogen, Total Kjeldahl	mg/l	--	--	1.46	1.09	0.79	1.1	1.4	1.4	1.4	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	0.88	0.19	0.26	<0.10	0.19	<0.10
pH	-	--	--	8.32	8.16	8.02	--	7.98	8.00	8.06	8.06
pH (Field)	-	--	--	7.75	7.93	7.59	7.48	7.40	7.63	7.44	7.52
Phosphorus	mg/l	--	--	0.66	0.65	0.073	0.30	0.47	0.48	0.46	0.49
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	9	6	9	4	10	12	28	5
Temperature (Field)	deg c	--	15	12.6	7.1	11.0	7.2	10.1	7.3	9.4	7.9
Total Dissolved Solids	mg/l	--	500	1470	1210	974	986	1040	1100	1050	1090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	0.0016	0.001	<0.0010	<0.0010	0.0015	0.0017
Boron, dissolved	mg/l	5	--	0.16	0.13	0.21	0.21	0.15	0.11	0.16	0.17
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	46	57	50	58	82	80	65	68
Chromium, dissolved	mg/l	0.05	--	0.005	0.004	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0004	0.0003	<0.00050	<0.0005	0.00096	0.00053	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0017	<0.001	0.0012	0.0012	0.0027	<0.0020
Iron, dissolved	mg/l	--	0.3	<0.03	0.58	<0.1	0.52	<0.1	0.26	0.85	1.6
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	26	25	28	34	28	35	20	30
Manganese, dissolved	mg/l	--	0.05	0.10	0.14	0.25	0.35	0.78	0.34	0.17	0.46
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	10	12	14	14	15	12	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	388	271	350	350	230	140	250	300
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.0091	<0.005	<0.0050	<0.0050	0.0054	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2011 [14] G-3	98-1 08-Dec-2011 [14] B-1	98-1 31-May-2012 98-1	98-1 28-Nov-2012 98-1	98-1 29-May-2013 98-1	98-1 26-Nov-2013 GW-4	98-1 29-May-2014 98-1	98-1 19-Nov-2014 98-1
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 02-Jun-2015	98-1 26-Nov-2015	98-1 26-May-2016	98-1 17-Nov-2016	98-1 24-May-2017	98-1 29-Nov-2017	98-1 24-May-2018	98-1 29-Nov-2018
				98-1	98-1	98-1	98-1	98-1	98-1	98-1	98-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	404	389	426	477	442	547	501	548
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	406	392	428	479	445	549	504	550
Ammonia Nitrogen	mg/l	--	--	0.92	0.98	1.49	1.28	1.43	2.00	1.73	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	28	30	28	56	35	47	42	48
Chloride	mg/l	--	250	465	472	406	430	458	455	478	423
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1909	2143	2053	2259	2194	1982	2196	1901
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	293	235	399	322	315	357	330	400
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.6	0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07
Nitrogen, Total Kjeldahl	mg/l	--	--	1.5	1.4	1.8	1.6	1.8	2.5	3.0	2.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.52	8.02	7.95	7.39	7.75	7.61	7.44	7.47
Phosphorus	mg/l	--	--	0.39	0.36	0.31	0.41	0.35	0.46	0.45	0.69
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	5	3	7	3	3	3	2	3
Temperature (Field)	deg c	--	15	10.1	8.1	13.8	9.7	11.2	7.7	10.9	7.3
Total Dissolved Solids	mg/l	--	500	1200	1180	1090	1130	1130	1170	1390	1120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	0.001	0.002	0.003	0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.112	0.175	0.17	0.31	0.154	0.201	0.173	0.153
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	56.8	51.7	63.5	70.4	74.9	78.8	74	82.4
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.008	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	0.0009
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0010	0.0053	0.0012	0.0008	0.0008	0.0031
Iron, dissolved	mg/l	--	0.3	<0.1	0.584	<0.1	<0.1	0.942	4.67	0.699	0.581
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	36.7	25.8	36.3	35.5	31.1	39	35.2	47.2
Manganese, dissolved	mg/l	--	0.05	0.162	0.285	0.066	0.119	0.816	0.8	0.352	0.504
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11.6	10.8	15.3	14.5	12.8	15	13.5	16.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	164	376	283	319	353	317	335	332
Zinc, dissolved	mg/l	--	5	0.067	0.012	<0.005	0.017	0.009	<0.005	0.006	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 02-Jun-2015 98-1	98-1 26-Nov-2015 98-1	98-1 26-May-2016 98-1	98-1 17-Nov-2016 98-1	98-1 24-May-2017 98-1	98-1 29-Nov-2017 98-1	98-1 24-May-2018 98-1	98-1 29-Nov-2018 98-1
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	0.003	0.003	<0.001	<0.001	<0.001	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 19-Jun-2019	98-1 20-Nov-2019	98-1 21-May-2020	98-1 26-Nov-2020	98-1 26-May-2021	98-1 30-Nov-2021
				98-1	98-1	98-1	98-1	98-1	98-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	523	501	409	429	412	398
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	6	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	526	505	414	435	417	401
Ammonia Nitrogen	mg/l	--	--	2.15	1.23	0.63	1.12	0.69	0.97
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	51	39	37	<10	40
Chloride	mg/l	--	250	433	413	588	508	503	470
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2053	2260	1960	2033	2131	2161
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	414	412	312	334	302	276
Nitrate as N	mg/l	10.0	--	0.2	0.5	0.2	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.33	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.1	1.7	1.1	1.5	1.0	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.37	7.7	7.57	8.07	7.71	7.69
Phosphorus	mg/l	--	--	0.39	0.40	0.18	0.58	0.19	0.40
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	3	2	3	1	<1	2
Temperature (Field)	deg c	--	15	13.2	5.5	13.2	7.0	11.0	7.8
Total Dissolved Solids	mg/l	--	500	1170	1080	1190	1210	1250	1120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.163	0.157	0.163	0.156	0.161	0.145
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	93.7	87	66.1	69.8	61.8	59
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0009	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0011	0.0016	0.0031	0.0008	0.0012	0.0007
Iron, dissolved	mg/l	--	0.3	6.58	0.77	<0.1	2.47	<0.1	0.647
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	43.8	47.2	35.7	38.7	35.8	31.2
Manganese, dissolved	mg/l	--	0.05	1.39	0.288	0.222	0.344	0.047	0.388
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18.6	19.2	14.4	14.9	14.1	12.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	327	322	354	345	352	293
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.006	0.008	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 19-Jun-2019 98-1	98-1 20-Nov-2019 98-1	98-1 21-May-2020 98-1	98-1 26-Nov-2020 98-1	98-1 26-May-2021 98-1	98-1 30-Nov-2021 98-1
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.002	<0.004 [10]	<0.004 [10]	<0.001
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-2 06-May-1999	98-2 19-Oct-1999	98-2 24-Oct-2000	98-2 14-Jun-2001	98-2 06-Nov-2002	98-2 30-May-2003	98-2 19-Nov-2004	98-2 16-Nov-2005
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	610	584	382	289	296	215	348	189
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	13	1	2	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	500	500	313	241	243	176	290	314
Ammonia Nitrogen	mg/l	--	--	0.83	1.12	0.35	0.76	0.36	0.31	0.36	1.1
Chemical Oxygen Demand	mg/l	--	--	18	10	--	8	34	12	13	70
Chloride	mg/l	--	250	831	834	355	278	305	171	255	350
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	1710	1050	2100	890	1540	1800
Hardness, Calcium Carbonate	mg/l	--	--	263	268	189	198	207	195	211	198
Nitrate as N	mg/l	10.0	--	--	4.5	0.3	0.4	0.6	0.4	2	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	--	1.8	1.66	0.56	1.09	0.64	2.65
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.88	7.7	7.9	6.9	7.5	--
Phosphorus	mg/l	--	--	--	--	4.33	2.68	1.97	2.54	0.17	8.32
Sulphate	mg/l	--	500 [4]	11	13	42	46	46	54	40	39
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	11.4
Total Dissolved Solids	mg/l	--	500	--	--	836	764	738	445	770	958
Total Organic Carbon	mg/l	--	--	11.8	10	--	5.2	4.7	4.5	1.8	8.8
Total Suspended Solids	mg/l	--	--	--	1020	5450	3560	2430	2170	32	404
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	0.002	0.001	0.004	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	0.32	0.44	0.17	0.1	0.09	0.06	0.097	0.252
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	44.8	48.6	35.3	44.1	46.2	42.3	44.8	36.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.02	2.15	0.2	0.02	0.07	0.14	0.105	0.051
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0022	0.0002	0.0005	0.0003	0.0005	<0.0002
Magnesium, dissolved	mg/l	--	--	31.5	35.2	24.4	21.4	22.2	21.8	24	25.7
Manganese, dissolved	mg/l	--	0.05	0.08	0.24	0.33	0.38	0.53	0.49	0.217	0.197
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	16.8	19.2	8.4	2.5	8.3	7	12.6	12.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [5]	586	718	340	200	213	112	226	314
Zinc, dissolved	mg/l	--	5	0.01	0.06	0.01	0.01	0.01	0.01	0.005	0.007
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.001	0.049	0.001	0.001	0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-2 15-May-2007	98-2 10-Nov-2008	98-2 27-Nov-2009 J-11
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	422	423	533
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	422	423	533
Ammonia Nitrogen	mg/l	--	--	0.43	1.14	1.40
Chemical Oxygen Demand	mg/l	--	--	77	17	55
Chloride	mg/l	--	250	594	547	913
Conductivity	uS/cm	--	--	--	--	3710
Conductivity (Field)	uS/cm	--	--	1900	2550	2870
Hardness, Calcium Carbonate	mg/l	--	--	236	229	247
Nitrate as N	mg/l	10.0	--	0.3	0.4	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	2.28	1.65
pH	-	--	--	--	--	8.25
pH (Field)	-	--	--	8.1	7.8	8.8
Phosphorus	mg/l	--	--	--	--	1.66
Sulphate	mg/l	--	500 [4]	31	32	3
Temperature (Field)	deg c	--	15	8.2	9	4.3
Total Dissolved Solids	mg/l	--	500	1430	1320	2410
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.0049	0.0034	0.005
Boron, dissolved	mg/l	5	--	0.243	0.197	0.37
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	45	45.8	43
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0006
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.339	<0.005	<0.03
Lead, dissolved	mg/l	0.01	--	0.0002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	30	27.7	34
Manganese, dissolved	mg/l	--	0.05	0.202	0.002	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.2	13.1	18
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	460	399	635
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-3 06-May-1999	98-3 24-Oct-2000	98-3 14-Jun-2001	98-3 06-Nov-2002	98-3 30-May-2003	98-3 19-Nov-2004	98-3 16-Nov-2005	98-3 15-May-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	184	282	154	194	181	198	217	165
Alkalinity, Carbonate as CaCO3	mg/l	--	--	29	1	13	1	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	200	231	150	159	148	160	178	165
Ammonia Nitrogen	mg/l	--	--	2.03	1.3	1.19	0.17	0.09	0.98	0.26	<0.01
Chemical Oxygen Demand	mg/l	--	--	92	--	47	11	2	257	16	27
Chloride	mg/l	--	250	3.4	4.1	2	20.8	2.6	2	2.9	2.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	440	375	270	320	370	376	240
Hardness, Calcium Carbonate	mg/l	--	--	15	8	13	26	29	26	22	28
Nitrate as N	mg/l	10.0	--	--	0.2	0.3	2.3	1.2	0.9	0.4	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4.24	2.52	4.05	0.05	0.29	0.98	0.39	0.26
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	8.31	9	8.8	7.5	8.2	--	8.8
Phosphorus	mg/l	--	--	--	4.11	5.9	1.29	0.96	7.9	1.31	--
Sulphate	mg/l	--	500 [4]	34	38	42	33	27	26	19	28
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	8.7
Total Dissolved Solids	mg/l	--	500	--	340	260	400	160	185	218	216
Total Organic Carbon	mg/l	--	--	9	--	3.8	2.7	3.4	3.2	3.6	--
Total Suspended Solids	mg/l	--	--	--	11600	8900	1380	1300	2310	11400	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	0.006	0.008	0.006	0.005	0.004	<0.001	0.0077
Boron, dissolved	mg/l	5	--	0.16	0.14	0.15	0.15	0.14	0.144	0.147	0.135
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	0.00005
Calcium, dissolved	mg/l	--	--	2.37	2	3.29	5.72	7	6.34	5.57	6.56
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	0.008
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.004	<0.002
Iron, dissolved	mg/l	--	0.3	1.1	0.12	0.02	0.02	0.03	0.009	0.007	0.197
Lead, dissolved	mg/l	0.01	--	0.0026	0.0006	0.0003	0.0014	0.0005	0.0002	<0.0002	0.00079
Magnesium, dissolved	mg/l	--	--	2.22	0.82	1.24	2.82	2.86	2.57	2.07	2.83
Manganese, dissolved	mg/l	--	0.05	0.03	0.01	0.01	0.03	0.01	0.015	0.015	0.015
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	0.01	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	<0.01	--
Potassium, dissolved	mg/l	--	--	2.4	3	0.4	0.4	3.2	3.1	3.7	3.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001	--
Sodium, dissolved	mg/l	--	200 [5]	99.3	120	83.9	78.3	72.1	67.6	79.6	72.1
Zinc, dissolved	mg/l	--	5	0.05	0.01	0.01	0.01	0.01	0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	0.003	0.049	0.001	0.001	0.001	<0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	<0.0001
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-3	98-3	98-3
				10-Nov-2008	27-Nov-2009	24-May-2011 [14]
					J-50	G-36
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	158	153	156
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	4	4
Alkalinity (Total as CaCO3)	mg/l	--	--	160	158	160
Ammonia Nitrogen	mg/l	--	--	0.2	0.15	<0.02
Chemical Oxygen Demand	mg/l	--	--	<100	25	10
Chloride	mg/l	--	250	2	4	3
Conductivity	uS/cm	--	--	--	342	360
Conductivity (Field)	uS/cm	--	--	335	331	338
Hardness, Calcium Carbonate	mg/l	--	--	24	30	30
Nitrate as N	mg/l	10.0	--	0.4	1.05	1.15
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.62	0.15	0.14
pH	-	--	--	--	8.48	8.43
pH (Field)	-	--	--	8.2	7.74	8.36
Phosphorus	mg/l	--	--	--	1.34	0.67
Sulphate	mg/l	--	500 [4]	20	21	21
Temperature (Field)	deg c	--	15	9	8.3	20.8
Total Dissolved Solids	mg/l	--	500	202	222	234
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.007	0.006	<0.01
Boron, dissolved	mg/l	5	--	0.131	0.16	0.14
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	5.74	7	7
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.0002	0.0002
Copper, dissolved	mg/l	--	1	<0.002	0.004	0.005
Iron, dissolved	mg/l	--	0.3	<0.005	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	0.00011	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	2.39	3	3
Manganese, dissolved	mg/l	--	0.05	0.013	0.01	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.7	4	3
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	71.9	75	71
Zinc, dissolved	mg/l	--	5	<0.005	0.01	<0.01
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 29-Oct-1998	98-4 06-May-1999	98-4 19-Oct-1999	98-4 05-May-2000	98-4 24-Oct-2000	98-4 14-Jun-2001	98-4 23-Nov-2001	98-4 23-May-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	151	148	159	143	134	140	131	131
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	2	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	124	121	130	117	110	119	107	107
Ammonia Nitrogen	mg/l	--	--	0.08	0.02	0.04	0.01	0.01	0.03	0.01	0.21
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	3	6	4	--	3	6	3
Chloride	mg/l	--	250	8.2	6.9	8	7.1	8.8	8.5	9.5	8.8
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	888	360	--	330	325	340	340	320
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	125	117	114	100	83	100	95	97
Nitrate as N	mg/l	10.0	--	--	--	0.6	0.6	0.6	0.7	0.6	0.6
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.04	1.27	--	--	0.32	0.32	0.45	0.14
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	6.9	--	7.9	7.55	7.9	7.65	7.32
Phosphorus	mg/l	--	--	--	--	--	--	0.26	0.67	0.5	0.3
Sulphate	mg/l	--	500 [4]	116	57	59	49	51	52	50	50
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	445	180	--	165	193	292	212	306
Total Organic Carbon	mg/l	--	--	12.7	5.1	3.9	2.8	--	1.9	4	2
Total Suspended Solids	mg/l	--	--	--	--	352	728	324	1060	1620	1220
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.002	0.002	0.004	0.002
Boron, dissolved	mg/l	5	--	0.08	0.06	0.17	0.14	0.07	0.06	0.08	0.06
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	37.8	29.3	29	25.7	21.4	26.2	23.9	24.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	0.02	1.64	1.12	0.03	0.02	0.05	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	7.34	10.6	9.97	8.51	7.14	8.42	8.51	9.02
Manganese, dissolved	mg/l	--	0.05	0.19	0.07	0.06	0.03	0.03	0.02	0.03	0.03
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5	0.8	5.9	0.4	4.3	0.4	0.4	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	53.3	35.7	44.8	39.9	36.5	35.1	40.1	36.7
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.07	0.02	0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.047	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 29-Oct-1998	98-4 06-May-1999	98-4 19-Oct-1999	98-4 05-May-2000	98-4 24-Oct-2000	98-4 14-Jun-2001	98-4 23-Nov-2001	98-4 23-May-2002
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 06-Nov-2002	98-4 30-May-2003	98-4 09-Oct-2003	98-4 14-May-2004	98-4 19-Nov-2004	98-4 24-May-2005	98-4 16-Nov-2005	98-4 25-May-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	132	134	--	118	137	132	138	108
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	1	1	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	108	110	102	97	112	110	113	108
Ammonia Nitrogen	mg/l	--	--	0.01	0.03	0.02	0.06	0.02	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	1	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	6	9	4	2	5	6	<5	10
Chloride	mg/l	--	250	8.9	8.5	8.2	9.2	8.4	8.7	8.9	9.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	241	290	360	320	450	360	320	280
Dissolved Inorganic Carbon	mg/l	--	--	--	--	25	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	87	88	87	88	87	92	91	81
Nitrate as N	mg/l	10.0	--	0.7	0.5	0.6	0.5	0.6	0.4	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.24	0.67	0.13	0.16	0.16	0.14	0.06	0.32
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.2	7.2	7.4	8.2	8.1	6.4	--	8.1
Phosphorus	mg/l	--	--	0.1	1	0.2	0.332	0.17	0.21	0.21	--
Sulphate	mg/l	--	500 [4]	48	49	46	49	51	49	47	48
Temperature (Field)	deg c	--	15	--	--	--	--	--	9.7	10.9	11.5
Total Dissolved Solids	mg/l	--	500	222	145	185	160	225	192	196	186
Total Organic Carbon	mg/l	--	--	2.1	2.3	4	1.5	1.4	1.5	3.3	--
Total Suspended Solids	mg/l	--	--	974	1480	564	416	113	108	96	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.003	0.001	0.002	0.002	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.07	0.05	0.063	0.05	0.067	0.042	0.071	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001	<0.0001	<0.005
Calcium, dissolved	mg/l	--	--	22.2	22.5	19.8	22.3	22.3	22.9	23.2	20.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.009	0.001	0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.004	0.002	0.002	<0.002	<0.002	0.003
Iron, dissolved	mg/l	--	0.3	0.02	0.05	0.23	0.006	0.005	<0.005	0.025	<0.005
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	0.0002	0.0002	0.0002	0.0003	<0.0002	<0.0002
Magnesium, dissolved	mg/l	--	--	7.64	7.69	9.01	7.75	7.62	8.34	7.99	7.38
Manganese, dissolved	mg/l	--	0.05	0.02	0.01	0.057	0.001	0.004	<0.001	0.003	0.002
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006	<0.00006	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01	<0.01	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.01	0.01	<0.01	<0.01	--
Potassium, dissolved	mg/l	--	--	1.1	3.5	5.3	3.8	4.1	3.6	4.5	3.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001	<0.001	--
Sodium, dissolved	mg/l	--	200 [5]	36.6	37.7	35.5	37.3	38.4	36.2	39.9	33.7
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.011	0.005	0.005	<0.005	<0.005	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 06-Nov-2002	98-4 30-May-2003	98-4 09-Oct-2003	98-4 14-May-2004	98-4 19-Nov-2004	98-4 24-May-2005	98-4 16-Nov-2005	98-4 25-May-2006
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	<0.0007	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0004	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	<0.0001	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0002	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	<0.0001	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	<0.0002	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	<0.002	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	<0.0002	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	<0.0002	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	<0.0003	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	<0.0002	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	<0.0001	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 21-Nov-2006	98-4 15-May-2007	98-4 30-Nov-2007	98-4 22-May-2008	98-4 10-Nov-2008	98-4 19-May-2009 G-3	98-4 26-Nov-2009 [13] 98-4	98-4 25-May-2010 [14] M-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	115	117	112	109	108	109	--	107
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [15]	--	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	115	117	112	109	108	109	--	107
Ammonia Nitrogen	mg/l	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	--	<0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	<5	8	42	7	<5	8	--	10
Chloride	mg/l	--	250	8.6	9.2	8.2	8.8	8.8	9	--	10
Conductivity	uS/cm	--	--	--	--	--	--	--	332	--	336
Conductivity (Field)	uS/cm	--	--	350	220	380	320	340	340	--	344
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	88	86	84	83	79	76	--	83
Nitrate as N	mg/l	10.0	--	0.3	0.4	0.4	0.3	0.2	0.50	--	0.13
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.12	0.07	0.05	0.15	0.05	<0.10	--	0.14
pH	-	--	--	--	--	--	--	--	8.03	--	8.14
pH (Field)	-	--	--	7.8	8.8	8.8	8.2	8.1	--	--	8.07
Phosphorus	mg/l	--	--	--	--	--	--	--	0.25	--	0.18
Sulphate	mg/l	--	500 [4]	45	45	45	46	44	42	--	43
Temperature (Field)	deg c	--	15	10.5	0	9.5	8.5	10	6	--	18.6
Total Dissolved Solids	mg/l	--	500	199	197	193	193	186	216	--	218
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0051	0.0041	0.0048	0.0033	0.0044	0.004	--	<0.01
Boron, dissolved	mg/l	5	--	0.059	0.052	0.061	0.049	0.056	0.05	--	0.09
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	--	--	22.4	21.6	21.6	21.2	20.4	19	--	20
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.001	--	0.002
Cobalt, dissolved	mg/l	--	--	<0.005	0.008	<0.005	<0.005	<0.005	<0.0002	--	<0.0002
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	<0.002	<0.002	0.002	--	0.029
Iron, dissolved	mg/l	--	0.3	<0.005	0.048	<0.005	0.008	0.017	<0.03	--	<0.03
Lead, dissolved	mg/l	0.01	--	<0.0001	0.00006	<0.00002	<0.00002	<0.00002	<0.001	--	<0.001
Magnesium, dissolved	mg/l	--	--	7.75	7.8	7.44	7.35	6.78	7	--	8
Manganese, dissolved	mg/l	--	0.05	<0.001	0.011	<0.001	<0.001	0.001	<0.01	--	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.1	3.6	4	3.6	4	3	--	4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	41.1	38.1	37.3	38.8	36.9	32	--	38
Zinc, dissolved	mg/l	--	5	0.005	<0.005	<0.005	<0.005	<0.005	0.01	--	0.02
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 21-Nov-2006	98-4 15-May-2007	98-4 30-Nov-2007	98-4 22-May-2008	98-4 10-Nov-2008	98-4 19-May-2009 G-3	98-4 26-Nov-2009 [13] 98-4	98-4 25-May-2010 [14] M-16
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	<0.0006	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	--	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	--	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	--	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 20-Oct-2010 [14] G-14	98-4 24-May-2011 [14] G-45	98-4 29-Nov-2011 [14] 98-4	98-4 31-May-2012 [17] 98-4
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	111	108	111	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [15]	2	<2 [15]	--
Alkalinity (Total as CaCO3)	mg/l	--	--	111	110	111	--
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	0.02	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	<5	5	--
Chloride	mg/l	--	250	10	10	10	--
Conductivity	uS/cm	--	--	336	344	340	--
Conductivity (Field)	uS/cm	--	--	339	330	374	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	89	85	88	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	--
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.25	<0.10	<0.10	--
pH	-	--	--	8.11	8.32	8.19	--
pH (Field)	-	--	--	7.96	8.02	8.43	--
Phosphorus	mg/l	--	--	0.22	0.19	0.14	--
Sulphate	mg/l	--	500 [4]	44	43	42	--
Temperature (Field)	deg c	--	15	13.3	12.7	9.9	--
Total Dissolved Solids	mg/l	--	500	218	224	221	--
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	--
Boron, dissolved	mg/l	5	--	0.07	0.05	0.08	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	24	21	22	--
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	0.002	--
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0002	<0.0002	--
Copper, dissolved	mg/l	--	1	0.003	0.003	0.002	--
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	--
Magnesium, dissolved	mg/l	--	--	7	8	8	--
Manganese, dissolved	mg/l	--	0.05	<0.01	<0.01	0.02	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	3	4	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	41	37	38	--
Zinc, dissolved	mg/l	--	5	<0.01	0.03	<0.01	--
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4	98-4	98-4	98-4
				20-Oct-2010 [14]	24-May-2011 [14]	29-Nov-2011 [14]	31-May-2012 [17]
				G-14	G-45	98-4	98-4
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	--

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(4)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L
(5)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(6)	Elevated detection limit due to dilution required because of high target analyte concentration.
(7)	Elevated Reporting Limit due to matrix interference.
(8)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(9)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes
(10)	GEN02 Elevated Reporting Limit due to matrix interference.
(11)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
(12)	REV 1 Revision 1 - This report now includes data for Xylenes
(13)	Monitoring location was dry during this sampling event. No sample was collected.
(14)	Arsenic MRL elevated due to matrix interference.
(15)	pH < 8.3. Calculations not available.
(16)	Insufficient water for sample collection or analysis at this monitoring location during sampling event.
(17)	Monitoring location has been decommissioned.
(18)	Due to matrix interference 10x dilution factor required for VOCs.
(19)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(20)	REV 1 Revision 1 - This report includes revised TKN data based on re-digestion and analysis.

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 06-Sep-2005 [3]	05-11 16-Nov-2005	05-11 25-May-2006	05-11 21-Nov-2006	05-11 15-May-2007	05-11 30-Nov-2007	05-11 28-Feb-2008	05-11 22-May-2008	05-11 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	157	474	422	444	955	740	1030	1830
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	645	474	422	444	955	740	1030	1830
Ammonia Nitrogen	mg/l	--	--	--	2	0.93	0.91	0.52	0.96	0.87	0.46	0.61
Chemical Oxygen Demand	mg/l	--	--	--	54	26	25	53	112	41	86	242
Chloride	mg/l	--	250	--	38	26.5	7.9	7.9	118	68.6	156	351
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1700	1025	1400	1100	1500	--	2000	3300
Hardness, Calcium Carbonate	mg/l	--	--	--	645	427	553	539	889	745	995	1600
Nitrate as N	mg/l	10.0	--	--	<0.1	0.1	0.2	0.2	<0.1	0.3	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.79	1.56	1.49	1.15	2.23	2.08	2.49	4.27
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.3	7	7.4	7.3	--	6.6	6.7
Phosphorus	mg/l	--	--	--	0.6	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	320	240	540	360	183	230	153	69
Temperature (Field)	deg c	--	15	--	--	8.5	10.5	11.8	11	--	10	9
Total Dissolved Solids	mg/l	--	500	--	1180	822	1140	937	1390	1150	1460	2500
Total Organic Carbon	mg/l	--	--	--	16.3	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	1310	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.005	<0.001	0.0007	0.0006	0.0032	0.0016	0.0027	0.0035
Boron, dissolved	mg/l	5	--	--	0.832	0.566	0.572	0.547	1.97	1.19	2.38	13.4
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	--	153	98.7	136	130	206	170	231	356
Chromium, dissolved	mg/l	0.05	--	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	0.006
Iron, dissolved	mg/l	--	0.3	--	17.3	5	3.01	4.59	19.1	9.53	13.9	4.13
Lead, dissolved	mg/l	0.01	--	--	<0.0002	<0.0002	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	--	63.9	43.9	51.9	52.3	91.1	77.6	102	172
Manganese, dissolved	mg/l	--	0.05	--	2.14	1.13	1.21	1.3	3.14	2.52	3.65	4.17
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	10.6	7.4	5.8	6.8	10.4	9.2	8.4	15
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	197	119	143	102	191	130	176	430
Zinc, dissolved	mg/l	--	5	--	0.015	0.01	0.008	<0.005	<0.005	0.01	0.006	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	<0.0006	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	0.0013	--	0.0007	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	0.0014	<0.0005	0.0013	0.0012
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	0.0009	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 19-Dec-2008	05-11 19-May-2009 G-8	05-11 26-Nov-2009 J-19	05-11 25-May-2010 [4] M-11	05-11 20-Oct-2010 [4] G-6	05-11 24-May-2011 G-18	05-11 29-Nov-2011 05-11	05-11 31-May-2012 05-11	05-11 28-Nov-2012 05-11
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1400	793	723	921	696	744	678	630	580
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	3.5	1.4
Alkalinity (Total as CaCO3)	mg/l	--	--	1400	793	723	921	696	744	678	630	580
Ammonia Nitrogen	mg/l	--	--	0.56	0.42	0.57	0.53	0.68	0.35	0.49	0.26	0.65
Chemical Oxygen Demand	mg/l	--	--	117	45	63	73	55	35	40	30	32
Chloride	mg/l	--	250	267	218	76	115	80	89	66	49	42
Conductivity	uS/cm	--	--	--	2190	1700	2120	1650	1760	1550	--	--
Conductivity (Field)	uS/cm	--	--	2100	--	2119	2095	1805	934	1151	1015	1085
Hardness, Calcium Carbonate	mg/l	--	--	1030	558	700	947	661	634	578	610	560
Nitrate as N	mg/l	10.0	--	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.018	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.63	1.14	1.26	1.30	1.57	0.85	0.77	0.75	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	7.56	7.47	7.47	7.23	7.96	7.72	7.77	--
pH (Field)	-	--	--	607	--	6.54	6.63	7	6.86	6.74	6.85	6.73
Phosphorus	mg/l	--	--	--	0.40	0.06	0.05	0.08	0.03	0.03	<0.020	0.024
Sulphate	mg/l	--	500 [6]	107	97	146	128	135	117	131	130	160
Temperature (Field)	deg c	--	15	5	--	11.0	21.3	11.3	15.8	9.5	9.9	10.5
Total Dissolved Solids	mg/l	--	500	1810	1420	1110	1380	1070	1140	1010	744	878
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	<0.01	<0.01	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	6.33	1.24	4.2	3.6	2.2	0.51	2.4	2.1	1.7
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	240	98	155	206	146	132	126	130	120
Chromium, dissolved	mg/l	0.05	--	<0.002	0.009	0.009	0.004	0.006	0.005	0.004	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0002	0.0014	0.0035	0.0012	0.0016	0.0008	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.004	0.002	0.002	0.001	0.004	0.002	<0.0010	<0.001
Iron, dissolved	mg/l	--	0.3	3.29	<0.03	12.0	12.5	9.65	<0.03	<0.03	3.6	2.2
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	104	76	76	105	72	74	64	71	63
Manganese, dissolved	mg/l	--	0.05	3.4	0.04	2.37	2.95	1.57	0.84	0.65	0.69	0.34
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.8	14	10	11	9	10	9	10	10
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	235	241	105	149	111	111	106	110	83
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	0.01	<0.01	0.01	<0.01	<0.0050	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025	<0.00050
Benzene	mg/l	0.001	--	0.001	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.00025	<0.00050
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0025
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0010
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.0010

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 29-May-2013 05-11	05-11 26-Nov-2013 [5] GW-25	05-11 29-May-2014 05-11	05-11 19-Nov-2014 05-11	05-11 02-Jun-2015 05-11	05-11 26-Nov-2015 05-11	05-11 26-May-2016 05-11	05-11 17-Nov-2016 05-11	05-11 24-May-2017 05-11
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	400	440	390	390	442	471	432	389	672
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.2	1.6	1.6	<1.0	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	400	440	390	390	443	472	432	389	673
Ammonia Nitrogen	mg/l	--	--	0.15	0.90	0.26	0.12	0.24	0.05	0.28	0.27	0.16
Chemical Oxygen Demand	mg/l	--	--	27	34	15	17	21	33	24	24	24
Chloride	mg/l	--	250	11	8	10	5	9	5	7	6	22
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	822	889	813	908	973	1097	979	1785	1337
Hardness, Calcium Carbonate	mg/l	--	--	510	510	500	480	389	585	473	890	655
Nitrate as N	mg/l	10.0	--	0.11	<0.10	<0.10	<0.10	<0.1	0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.018	0.027	0.048	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.34	1.3	0.52	0.48	0.3	0.4	0.5	0.5	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.12	<0.10	0.13	<0.10	--	--	--	--	--
pH	-	--	--	7.50	7.60	7.65	7.38	--	--	--	--	--
pH (Field)	-	--	--	6.82	7.09	6.88	6.88	6.91	6.82	7.10	6.91	6.81
Phosphorus	mg/l	--	--	0.035	0.048	0.045	0.056	<0.01	0.01	0.09	0.06	0.03
Sulphate	mg/l	--	500 [6]	150	160	150	110	148	183	136	708	130
Temperature (Field)	deg c	--	15	8.6	9.0	9.8	6.8	8.5	10.4	11.8	12.0	10.4
Total Dissolved Solids	mg/l	--	500	682	650	650	526	662	732	630	1320	812
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.41	0.36	0.41	0.65	0.148	0.405	0.397	0.663	0.361
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	120	130	120	110	84.6	128	110	230	170
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.006	0.005
Cobalt, dissolved	mg/l	--	--	0.0016	0.0026	0.0016	0.00057	0.0009	0.0011	0.0020	0.0010	0.0024
Copper, dissolved	mg/l	--	1	0.0015	0.0015	0.0034	0.0018	<0.0005	<0.0005	0.0008	0.0013	0.0057
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	0.0007
Magnesium, dissolved	mg/l	--	--	50	48	50	50	43	64.4	48.4	76.4	56
Manganese, dissolved	mg/l	--	0.05	0.64	1.1	0.64	0.63	0.472	0.51	1.04	0.626	1.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.6	6.6	6.1	7.1	4.48	5.84	6.96	7.92	5.83
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	37	39	33	41	23.3	43.4	33.5	42.8	22.7
Zinc, dissolved	mg/l	--	5	<0.0050	0.0090	<0.0050	<0.0050	0.005	0.01	0.006	<0.005	0.008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	0.003	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 29-Nov-2017	05-11 24-May-2018	05-11 29-Nov-2018	05-11 19-Jun-2019	05-11 20-Nov-2019	05-11 21-May-2020	05-11 26-Nov-2020	05-11 26-May-2021	05-11 30-Nov-2021
				05-11	05-11	05-11	05-11	05-11	05-11	05-11	05-11	05-11
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	900	1400	1800	1330	1170	773	762	613	554
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25 [9]	<25 [9]	<25 [9]	<25	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	901	1400	1800	1330	1170	775	764	614	555
Ammonia Nitrogen	mg/l	--	--	0.50	1.72	1.99	2.27	0.76	0.64	0.58	0.48	0.47
Chemical Oxygen Demand	mg/l	--	--	93	138	192	124	129	66	65	25	64
Chloride	mg/l	--	250	120	199	250	173	128	69	47	30	17
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1913	3123	3102	2431	2670	1412	1575	1453	1252
Hardness, Calcium Carbonate	mg/l	--	--	916	1190	2030	1160	939	748	826	621	578
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.6	4.6	5.2	4.1	2.8	1.5	1.4	0.8	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.51	6.69	6.67	6.85	6.97	7.14	7.06	6.86	6.55
Phosphorus	mg/l	--	--	0.11	0.13	0.17	0.12	0.16	0.10	0.10	0.06	0.07
Sulphate	mg/l	--	500 [6]	63	64	35	44	77	126	267	126	188
Temperature (Field)	deg c	--	15	9.3	10.2	9.1	14.2	8.5	12.0	8.3	10.9	8.5
Total Dissolved Solids	mg/l	--	500	1130	2060	2210	1660	1480	978	1130	744	746
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	0.002	0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	2.46	3.93	13.9	5.73	6.13	1.96	2.05	1.01	0.592
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	215	288	516	266	185	171	186	146	145
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.002	0.001	0.002	0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0053	0.0027	0.0059	0.0029	0.0026	0.0012	<0.0005	<0.0005	0.0010
Copper, dissolved	mg/l	--	1	0.0008	0.0014	0.0036	0.0013	0.0007	0.0034	0.0040	0.0019	0.0009
Iron, dissolved	mg/l	--	0.3	5.8	<0.1	1.17	<0.1	10.2	10.4	<0.1	0.388	3.75
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	92.2	113	181	121	116	77.7	88.2	62.1	52.8
Manganese, dissolved	mg/l	--	0.05	3.72	5.23	5.63	6.68	4.34	3.24	0.678	0.31	2.95
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.5	9.51	19	14.5	16.3	9.61	9.44	7.08	6.45
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	79.9	166	335	189	189	89.7	98.4	61.7	41.6
Zinc, dissolved	mg/l	--	5	<0.005	0.007	<0.005	<0.005	<0.005	0.007	0.005	0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	0.004	0.003	<0.004 [10]	0.009	<0.004 [11]	0.003	<0.004 [11]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3A 06-Sep-2005	05-3A 16-Nov-2005	05-3A 25-May-2006	05-3A 15-May-2007	05-3A 10-Nov-2008	05-3A 26-Nov-2009 M-11	05-3A 24-May-2011 [4] G-42	05-3A 29-Nov-2012 05-3A	05-3A 29-May-2014 05-3A
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1030	200	845	885	800	829	778	790	770
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	29	42	34	30
Alkalinity (Total as CaCO3)	mg/l	--	--	845	820	845	885	800	858	820	830	800
Ammonia Nitrogen	mg/l	--	--	0.78	0.77	0.72	0.64	0.79	0.75	0.76	0.96	0.88
Chemical Oxygen Demand	mg/l	--	--	278	33	351	83	93	85	575	45	39
Chloride	mg/l	--	250	226	235	272	270	265	160	273	240	260
Conductivity	uS/cm	--	--	--	--	--	--	--	2330	2410	--	--
Conductivity (Field)	uS/cm	--	--	1900	3000	1800	1700	1800	2075	2157	1898	1998
Hardness, Calcium Carbonate	mg/l	--	--	42	31	25	25	25	28	35	28	31
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	0.1	0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	6.01	1.2	1.99	1.42	2.16	0.82	1.55	2.2	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	--	--	--	--	8.57	8.76	8.66	8.62
pH (Field)	-	--	--	8.4	--	8.5	8.9	8.4	8.83	8.71	8.65	7.79
Phosphorus	mg/l	--	--	8.2	0.15	--	--	--	2.48	1.09	0.51	0.26
Sulphate	mg/l	--	500 [6]	5	<1	1	2	2	2	<1	<1	<1
Temperature (Field)	deg c	--	15	11.8	--	7	8.8	4	8.7	12.0	6.9	9.0
Total Dissolved Solids	mg/l	--	500	1380	1340	1320	1280	1300	1510	1570	1310	1320
Total Organic Carbon	mg/l	--	--	53.2	10.9	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	6760	63	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	<0.001	0.0015	0.0021	0.002	<0.01	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.978	0.964	0.828	0.826	0.878	0.98	0.87	0.97	1
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00002	<0.00002	<0.0001	<0.0001	0.00011	<0.00010
Calcium, dissolved	mg/l	--	--	7.05	3.62	2.32	2.41	2.38	3	4	3.2	3.3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.009	<0.005	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0002	0.0003	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	0.002	<0.002	<0.002	<0.002	0.001	0.002	<0.0010	0.0023
Iron, dissolved	mg/l	--	0.3	0.334	0.08	0.062	0.128	<0.005	0.08	0.07	0.12	<0.1
Lead, dissolved	mg/l	0.01	--	0.0008	0.0017	0.0002	0.00002	<0.00002	<0.001	<0.001	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	6.03	5.26	4.59	4.66	4.74	5	6	4.9	5.6
Manganese, dissolved	mg/l	--	0.05	0.017	0.003	0.002	0.005	0.008	<0.01	<0.01	0.0025	<0.0020
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.5	10.6	8.5	8.9	9.5	8	9	8.3	8.9
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	625	599	535	461	533	493	476	540	580
Zinc, dissolved	mg/l	--	5	0.007	0.007	0.01	0.02	<0.005	<0.01	0.01	<0.0050	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3A 26-Nov-2015	05-3A 24-May-2017	05-3A 29-Nov-2018	05-3A 21-May-2020	05-3A 30-Nov-2021
				05-3A	05-3A	05-3A	05-3A	05-3A
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	823	858	889	788	820
Alkalinity, Carbonate as CaCO3	mg/l	--	--	22	16	20	33	14
Alkalinity (Total as CaCO3)	mg/l	--	--	845	874	910	822	834
Ammonia Nitrogen	mg/l	--	--	0.84	0.81	0.77	0.82	0.80
Chemical Oxygen Demand	mg/l	--	--	118	32	40	51	34
Chloride	mg/l	--	250	294	285	297	365	287
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2246	2266	2042	2116	2177
Hardness, Calcium Carbonate	mg/l	--	--	25.5	41	51	38.9	33.3
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.4	1.5	1.4	1.3	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.64	8.37	8.54	8.76	8.64
Phosphorus	mg/l	--	--	0.67	0.12	0.19	0.25	0.17
Sulphate	mg/l	--	500 [6]	<1	3	<1	<1	<1
Temperature (Field)	deg c	--	15	8.4	10.1	7.8	11.2	6.7
Total Dissolved Solids	mg/l	--	500	1440	1340	1360	1380	1280
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.962	1.01	0.98	0.778	0.807
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	2.73	5.45	9.76	5.91	4.7
Chromium, dissolved	mg/l	0.05	--	<0.001	0.009	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0005	0.0022	0.0031	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.13	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	4.54	6.67	6.45	5.86	5.24
Manganese, dissolved	mg/l	--	0.05	<0.005	0.025	0.011	0.005	0.006
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.01	9.62	10	9.19	8.48
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	617	572	536	555	489
Zinc, dissolved	mg/l	--	5	0.01	<0.005	<0.005	<0.005	0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.002 [10]	0.002	0.006	<0.002 [11]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3B 06-Sep-2005	05-3B 16-Nov-2005	05-3B 25-May-2006	05-3B 15-May-2007	05-3B 10-Nov-2008	05-3B 26-Nov-2009 J-20	05-3B 24-May-2011 [4] G-41	05-3B 29-Nov-2012 05-3B	05-3B 29-May-2014 [13] 05-3B
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1340	256	1160	1190	1170	1130	1080	1100	1100
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	27	52	35	36
Alkalinity (Total as CaCO3)	mg/l	--	--	1100	1050	1160	1190	1170	1160	1135	1100	1100
Ammonia Nitrogen	mg/l	--	--	18	7.1	3.21	2.38	2.84	2.83	2.64	0.51	2.8
Chemical Oxygen Demand	mg/l	--	--	143	139	124	142	104	95	85	41	76
Chloride	mg/l	--	250	434	423	482	465	469	451	433	410	440
Conductivity	uS/cm	--	--	--	--	--	--	--	3410	3510	--	--
Conductivity (Field)	uS/cm	--	--	2800	2100	2900	2400	2900	2820	2563	2776	2865
Hardness, Calcium Carbonate	mg/l	--	--	60	91	77	70	65	69	76	70	80
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.1	0.1	0.2	<0.10	<0.10	<0.10	<0.50
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.010	<0.050
Nitrogen, Total Kjeldahl	mg/l	--	--	19.7	10.9	6.3	6.12	5.29	4.12	4.70	4.6	4.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.50
pH	-	--	--	--	--	--	--	--	8.41	8.71	8.53	8.54
pH (Field)	-	--	--	7.7	--	8.2	8.5	8.2	8.2	8.40	8.43	8.10
Phosphorus	mg/l	--	--	1.41	3.18	--	--	--	6.94	7.09	7.1	6.6
Sulphate	mg/l	--	500 [6]	109	152	72	23	2	4	<1	<1	<1
Temperature (Field)	deg c	--	15	12.5	--	9	8.6	7	8.0	10.2	6.8	10.2
Total Dissolved Solids	mg/l	--	500	2110	2100	2030	1920	1880	2220	2280	1880	1830
Total Organic Carbon	mg/l	--	--	87	47.6	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	220	30	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.007	0.013	0.01	0.0138	0.0006	0.010	<0.01	0.0038	0.0034
Boron, dissolved	mg/l	5	--	1.64	1.74	1.52	1.46	1.53	1.8	1.5	1.8	1.8
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00005	<0.00002	<0.0001	<0.0001	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	8.66	10.7	8.92	8.11	7.27	8	9	8.3	9.3
Chromium, dissolved	mg/l	0.05	--	0.005	0.005	0.004	0.003	<0.002	<0.005	<0.005	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	0.0005	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.009	0.003	0.009	<0.002	<0.002	0.002	0.003	<0.0010	0.0023
Iron, dissolved	mg/l	--	0.3	0.766	1.15	3.05	1.68	0.374	1.19	0.65	0.45	0.65
Lead, dissolved	mg/l	0.01	--	0.0029	0.0007	0.0013	0.00041	<0.00002	<0.001	<0.001	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	9.43	15.7	13.4	12.2	11.4	12	13	12	14
Manganese, dissolved	mg/l	--	0.05	0.12	0.128	0.071	0.037	0.016	0.03	0.02	0.02	0.024
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.06	0.04	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.4	25.7	21.6	21	19.8	19	19	18	20
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	866	862	751	673	669	816	784	740	720
Zinc, dissolved	mg/l	--	5	<0.005	0.01	0.02	<0.005	<0.005	<0.01	<0.01	<0.0050	0.0052
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00020	<0.00020
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00020	<0.00020
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0010	<0.0010
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00040	<0.00040
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00040	<0.00040

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3B 26-Nov-2015	05-3B 24-May-2017	05-3B 29-Nov-2018	05-3B 21-May-2020 [14]	05-3B 30-Nov-2021
				05-3B	05-3B	05-3B	05-3B	05-3B
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1090	1050	1150	1120	1110
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [15]	<25 [9]	<25 [9]	<25 [16]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1110	1070	1170	1140	1120
Ammonia Nitrogen	mg/l	--	--	3.35	2.76	3.09	2.83	2.73
Chemical Oxygen Demand	mg/l	--	--	115	89	102	120	91
Chloride	mg/l	--	250	470	459	449	596	442
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3230	3248	2919	--	3122
Hardness, Calcium Carbonate	mg/l	--	--	249	73	105	86.4	78.1
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	0.39
Nitrogen, Total Kjeldahl	mg/l	--	--	5.3	4.3	4.7	3.8	4.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.43	8.35	8.49	--	8.47
Phosphorus	mg/l	--	--	6.72	5.73	5.95	5.89	6.33
Sulphate	mg/l	--	500 [6]	<1	5	9	4	3
Temperature (Field)	deg c	--	15	8.5	10.5	7.6	--	6.4
Total Dissolved Solids	mg/l	--	500	2020	1990	2020	2010	1890
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.004	0.01	0.005	0.003	0.002
Boron, dissolved	mg/l	5	--	1.97	1.62	1.97	1.78	1.92
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	8.04	8.55	16.1	10	9
Chromium, dissolved	mg/l	0.05	--	0.006	0.013	0.002	0.002	0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0008	0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0040	0.0035	0.0010	0.0012
Iron, dissolved	mg/l	--	0.3	0.632	0.125	0.805	0.76	0.519
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0003	0.0004	0.0002	0.0001
Magnesium, dissolved	mg/l	--	--	11.3	12.6	15.7	14.9	13.5
Manganese, dissolved	mg/l	--	0.05	0.022	0.019	0.027	0.029	0.027
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.2	19.8	23.8	20.3	18.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	878	817	842	719	637
Zinc, dissolved	mg/l	--	5	0.009	0.013	<0.005	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.004 [10]	<0.001	0.005	<0.004 [11]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 06-Sep-2005	05-3C 16-Nov-2005	05-3C 25-May-2006	05-3C 15-May-2007	05-3C 30-Nov-2007	05-3C 22-May-2008	05-3C 10-Nov-2008	05-3C 19-May-2009 G-14	05-3C 26-Nov-2009 J-17
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1090	227	880	995	1050	1010	1030	960	946
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	21	21
Alkalinity (Total as CaCO3)	mg/l	--	--	891	930	880	995	1050	1010	1030	981	967
Ammonia Nitrogen	mg/l	--	--	28.9	9.81	2.46	1.88	2.02	1.28	1.53	1.67	1.52
Chemical Oxygen Demand	mg/l	--	--	139	151	113	134	150	104	91	70	98
Chloride	mg/l	--	250	264	269	286	320	331	330	335	303	302
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	2700	2640
Conductivity (Field)	uS/cm	--	--	2600	860	1950	1500	1700	2300	2100	1300	2287
Hardness, Calcium Carbonate	mg/l	--	--	71	91	85	87	92	88	53	83	92
Nitrate as N	mg/l	10.0	--	<0.1	0.2	1.2	0.1	0.3	0.2	0.2	<0.10	0.23
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	34.8	12.6	4.46	5.04	3.9	3.63	3.55	3.35	2.46
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	8.36	8.38
pH (Field)	-	--	--	7.7	--	8.2	8.6	8.2	8.2	8.1	--	8.27
Phosphorus	mg/l	--	--	2	1.2	--	--	--	--	--	2.12	2.61
Sulphate	mg/l	--	500 [6]	200	119	80	35	19	13	15	14	30
Temperature (Field)	deg c	--	15	14.4	--	6.5	8.8	5.5	10.5	8	11	8.1
Total Dissolved Solids	mg/l	--	500	1770	1700	1560	1530	1770	1620	1560	1760	1720
Total Organic Carbon	mg/l	--	--	72.6	41.3	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	524	2520	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.003	0.008	0.009	**0.013**	**0.0246**	**0.0141**	0.0008	**0.013**	**0.016**
Boron, dissolved	mg/l	5	--	1.32	1.47	1.28	1.06	1.41	1.35	1.37	1.43	1.4
Cadmium, dissolved	mg/l	0.005	--	0.0002	<0.0001	<0.005	0.00008	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	11.4	13.5	10.7	10.6	12.6	11.6	5.92	10	12
Chromium, dissolved	mg/l	0.05	--	0.003	0.005	0.003	0.002	<0.002	<0.002	0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.011	0.006	0.003	0.003	<0.002	<0.002	0.004	0.006	0.011
Iron, dissolved	mg/l	--	0.3	0.199	1.81	1.56	2.05	2.77	2.08	0.477	0.58	0.41
Lead, dissolved	mg/l	0.01	--	0.0012	0.0003	0.0011	0.00032	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	10.4	14	14.3	14.7	14.6	14.4	9.37	14	15
Manganese, dissolved	mg/l	--	0.05	0.156	0.225	0.111	0.074	0.119	0.091	0.021	0.05	0.03
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.04	0.04	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.02	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	23	21.4	16.6	15.9	17.8	16	15.8	13	15
Selenium, dissolved	mg/l	0.05	--	0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	711	708	635	536	736	630	560	565	535
Zinc, dissolved	mg/l	--	5	0.009	0.01	0.006	<0.005	<0.005	<0.005	<0.005	<0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	0.0013	<0.0006	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 25-May-2010 [4] M-21	05-3C 20-Oct-2010 [4] G-26	05-3C 24-May-2011 [4] G-43	05-3C 29-Nov-2011 05-3C	05-3C 31-May-2012 05-3C	05-3C 29-Nov-2012 05-3C	05-3C 29-May-2013 [5] 05-3C	05-3C 26-Nov-2013 [17] GW-15	05-3C 29-May-2014 [18] 05-3C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	935	932	936	976	970	950	900	1000	910
Alkalinity, Carbonate as CaCO3	mg/l	--	--	22	22	44	33	21	25	17	22	25
Alkalinity (Total as CaCO3)	mg/l	--	--	957	954	980	1010	990	970	920	1000	940
Ammonia Nitrogen	mg/l	--	--	1.27	1.14	1.44	1.20	0.95	0.79	0.81	1.6	1.3
Chemical Oxygen Demand	mg/l	--	--	70	80	70	55	66	54	53	72	66
Chloride	mg/l	--	250	281	308	291	304	280	270	270	320	270
Conductivity	uS/cm	--	--	2680	2610	2770	2760	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2641	2533	1162	2144	2225	1873	1478	2124	1893
Hardness, Calcium Carbonate	mg/l	--	--	87	88	96	93	94	160	140	110	88
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	0.16	0.23	<1.0	<0.50
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.20	0.10	0.40	0.14	0.287
Nitrogen, Total Kjeldahl	mg/l	--	--	2.27	2.52	2.97	2.08	2.4	2.3	1.8	3.5	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	0.26	0.26	0.64	<1.0	<0.50
pH	-	--	--	8.39	8.39	8.70	8.56	8.37	8.44	8.29	8.38	8.46
pH (Field)	-	--	--	8.24	8.4	8.29	8.00	8.12	7.86	7.82	7.73	7.76
Phosphorus	mg/l	--	--	2.38	2.22	2.40	1.57	0.63	1.1	1.0	2.3	1.8
Sulphate	mg/l	--	500 [6]	15	25	10	9	<1	3	8	<1	<1
Temperature (Field)	deg c	--	15	21.4	11.9	11.0	7.3	10.7	7.4	11.4	6.7	9.2
Total Dissolved Solids	mg/l	--	500	1740	1700	1800	1790	1510	1410	1570	1530	1530
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	0.0045	0.0039	0.0039	0.0038	0.0042
Boron, dissolved	mg/l	5	--	1.8	1.4	1.6	1.6	1.4	1.1	1.3	1.3	1.6
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	10	12	12	11	12	28	22	17	11
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.005	<0.0050	0.0068	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0006	0.0006	0.00055	0.00058	<0.00050	0.00076	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.003	0.002	0.002	0.0071	0.0021	0.0018	0.0012	0.0023
Iron, dissolved	mg/l	--	0.3	1.53	0.29	2.64	0.36	0.62	0.26	0.3	0.2	1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.00050	0.00059	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	15	14	16	16	16	22	20	17	15
Manganese, dissolved	mg/l	--	0.05	0.06	0.03	0.06	0.04	0.052	0.11	0.079	0.28	0.057
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	14	15	14	14	15	14	14	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	559	629	561	615	620	490	530	570	560
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	<0.01	0.017	0.0077	<0.0050	0.0099	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.0013	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 19-Nov-2014 [19] 05-3C	05-3C 02-Jun-2015 05-3C	05-3C 26-Nov-2015 05-3C	05-3C 26-May-2016 05-3C	05-3C 17-Nov-2016 05-3D	05-3C 24-May-2017 05-3C	05-3C 29-Nov-2017 05-3C	05-3C 24-May-2018 05-3C	05-3C 29-Nov-2018 05-3C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	920	969	868	928	1000	674	880	932	1050
Alkalinity, Carbonate as CaCO3	mg/l	--	--	18	25	14	14	13	<5	<25 [9]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	940	994	882	942	1010	678	891	942	1070
Ammonia Nitrogen	mg/l	--	--	1.3	1.48	1.20	0.28	2.12	0.01	1.62	1.71	1.75
Chemical Oxygen Demand	mg/l	--	--	74	85	58	78	111	28	86	97	88
Chloride	mg/l	--	250	270	348	214	257	316	107	360	341	364
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2090	2319	2053	2106	2751	1537	2439	2639	2434
Hardness, Calcium Carbonate	mg/l	--	--	150	127	79.1	158	280	323	83	82	121
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	0.1	<0.1	0.3	0.2	<0.1
Nitrite as N	mg/l	1.0	--	0.126	<0.05	<0.05	<0.05	<0.05	<0.05	0.27	0.05	0.08
Nitrogen, Total Kjeldahl	mg/l	--	--	2.9	3.3	2.6	1.5	3.3	0.3	3.3	3.5	3.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.17	--	--	--	--	--	--	--	--
pH	-	--	--	8.31	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.10	8.15	7.94	7.97	7.91	7.64	7.81	8.11	8.39
Phosphorus	mg/l	--	--	2.2	1.77	1.38	0.98	2.41	0.15	2.18	2.05	2.21
Sulphate	mg/l	--	500 [6]	3	10	50	29	16	94	8	11	2
Temperature (Field)	deg c	--	15	3.2	8.8	7.9	9.9	8.9	8.9	7.8	10.6	7.7
Total Dissolved Solids	mg/l	--	500	1470	1560	1270	1440	1610	928	1570	1740	1680
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0033	0.003	0.004	0.003	0.003	0.001	0.005	0.005	0.005
Boron, dissolved	mg/l	5	--	1.2	0.864	1.71	1.05	0.839	0.434	1.67	1.59	1.54
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	22	20.4	9.86	25.3	50.7	61.3	10.3	10.7	18.8
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	0.001	<0.001	0.008	0.005	0.001	0.001	0.002
Cobalt, dissolved	mg/l	--	--	0.00091	0.0019	<0.0005	0.0005	<0.0005	<0.0005	0.0006	0.0005	0.0014
Copper, dissolved	mg/l	--	1	0.0033	<0.0005	<0.0005	0.0008	0.0044	0.0046	0.0037	0.0030	0.0065
Iron, dissolved	mg/l	--	0.3	0.14	0.621	0.558	0.278	<0.1	<0.1	0.149	0.194	1.32
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	22	18.4	13.2	23	37.2	41.4	14	13.4	17.9
Manganese, dissolved	mg/l	--	0.05	0.055	0.312	0.05	0.159	0.289	<0.005	0.024	0.018	0.058
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13	9.97	13.3	12.9	11.4	11.4	15.1	14.6	16.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	520	470	71.7	420	339	245	608	574	658
Zinc, dissolved	mg/l	--	5	0.011	0.012	0.01	0.006	0.016	0.008	<0.005	0.009	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.002 [10]	<0.002 [10]	0.006	0.007	<0.001	<0.001	<0.001	0.005
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 19-Jun-2019 05-3C	05-3C 20-Nov-2019 05-3C	05-3C 21-May-2020 05-3C	05-3C 26-Nov-2020 05-3C	05-3C 26-May-2021 05-3C	05-3C 30-Nov-2021 05-3C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	957	1030	942	970	954	1030
Alkalinity, Carbonate as CaCO3	mg/l	--	--	25	<25	18	37	8	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	982	1040	960	1010	962	1040
Ammonia Nitrogen	mg/l	--	--	0.62	1.71	0.65	1.93	1.20	1.75
Chemical Oxygen Demand	mg/l	--	--	84	80	92	81	71	84
Chloride	mg/l	--	250	316	385	392	349	276	339
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2497	2730	2565	2368	2672	2608
Hardness, Calcium Carbonate	mg/l	--	--	90.4	121	95.0	99.6	105	93.7
Nitrate as N	mg/l	10.0	--	0.9	0.2	0.9	<0.5 [11]	0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.10	0.40	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.1	2.9	2.1	3.1	2.9	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.77	8.27	8.46	8.41	8.28	8.34
Phosphorus	mg/l	--	--	0.83	2.31	1.04	2.30	1.89	2.27
Sulphate	mg/l	--	500 [6]	23	2	25	3	12	3
Temperature (Field)	deg c	--	15	13.3	5.8	12	8.2	11.8	7.3
Total Dissolved Solids	mg/l	--	500	1580	1710	1630	1630	1560	1720
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	0.005	0.004	0.003	0.004	0.005
Boron, dissolved	mg/l	5	--	1.49	1.42	1.52	1.48	1.54	1.43
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	10.7	14.4	11.2	11.2	11.3	11.3
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	0.001	0.001	0.001	0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0006	0.0006	0.0005	0.0006	0.0011
Copper, dissolved	mg/l	--	1	0.0106	0.0031	0.0045	0.0075	0.0062	0.0016
Iron, dissolved	mg/l	--	0.3	0.502	0.429	0.977	0.304	0.194	0.939
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0004	0.0002	0.0002	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	15.4	20.7	16.3	17.4	18.6	15.9
Manganese, dissolved	mg/l	--	0.05	0.029	0.052	0.042	0.034	0.006	0.046
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.2	21.2	16.8	15.4	15.3	14.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	557	640	641	620	553	562
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.006	0.01	0.007	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	0.008	<0.010 [11]	<0.004 [11]	<0.004 [11]
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 06-Sep-2005	05-3D 16-Nov-2005	05-3D 25-May-2006	05-3D 15-May-2007	05-3D 30-Nov-2007	05-3D 22-May-2008	05-3D 10-Nov-2008	05-3D 19-May-2009 G-15	05-3D 26-Nov-2009 J-13
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	593	271	480	478	507	484	505	508	538
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	486	444	480	478	507	484	505	508	538
Ammonia Nitrogen	mg/l	--	--	0.3	<0.01	0.21	<0.01	<0.01	<0.01	<0.01	0.05	0.02
Chemical Oxygen Demand	mg/l	--	--	43	12	28	47	59	15	<5	10	15
Chloride	mg/l	--	250	80.7	66.7	77.1	76	77.8	83.6	84	79	89
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	1310	1370
Conductivity (Field)	uS/cm	--	--	1600	2500	950	900	750	1050	1100	1050	1227
Hardness, Calcium Carbonate	mg/l	--	--	233	258	224	249	257	251	264	268	239
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.3	0.2	0.2	0.3	0.2	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.82	0.41	0.67	0.44	0.37	0.42	0.37	0.18	<0.10
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	8.04	8.05
pH (Field)	-	--	--	7.4	--	7.7	7.9	8.1	7.5	7.5	--	7.23
Phosphorus	mg/l	--	--	3.35	0.55	--	--	--	--	--	0.15	0.35
Sulphate	mg/l	--	500 [6]	137	101	96	94	91	89	91	78	90
Temperature (Field)	deg c	--	15	17.3	--	8.5	8.5	5	10.5	8	8	7.8
Total Dissolved Solids	mg/l	--	500	843	720	722	701	775	743	771	852	890
Total Organic Carbon	mg/l	--	--	35.2	4.1	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	4570	659	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.005	0.001	0.001	0.0014	0.0019	0.0014	0.0016	0.001	0.001
Boron, dissolved	mg/l	5	--	0.621	0.483	0.376	0.31	0.421	0.346	0.427	0.45	0.51
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00013	<0.00002	0.00015	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	44.3	47.5	39.1	44.5	46.8	45.1	48.6	48	48
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.004	0.004
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.0002	<0.0002
Copper, dissolved	mg/l	--	1	0.003	0.006	0.013	0.003	0.004	0.004	0.003	0.006	0.005
Iron, dissolved	mg/l	--	0.3	0.038	0.012	0.014	0.009	0.005	0.02	<0.005	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	0.0005	0.0004	0.0007	0.0002	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	29.8	33.8	30.8	33.5	34.1	33.6	34.7	36	29
Manganese, dissolved	mg/l	--	0.05	0.255	0.269	0.232	0.079	0.013	0.366	0.004	0.09	0.02
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.02	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.2	13.6	10.7	9.4	11.8	10	12.3	9	10
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	258	204	189	156	208	190	197	195	207
Zinc, dissolved	mg/l	--	5	0.014	0.017	0.017	0.015	<0.005	0.017	<0.005	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 25-May-2010 [4] M-26	05-3D 20-Oct-2010 [4] G-27	05-3D 24-May-2011 G-40	05-3D 29-Nov-2011 [4] 05-3D	05-3D 31-May-2012 05-3D	05-3D 29-Nov-2012 05-3D	05-3D 29-May-2013 05-3D	05-3D 26-Nov-2013 GW-19	05-3D 29-May-2014 05-3D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	515	565	576	617	610	640	640	670	660
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	14	<2 [8]	6.5	8.5	6.1	6.0	6.8
Alkalinity (Total as CaCO3)	mg/l	--	--	515	565	590	617	620	650	650	680	670
Ammonia Nitrogen	mg/l	--	--	0.06	0.05	0.06	<0.02	<0.050	0.080	0.11	<0.050	0.11
Chemical Oxygen Demand	mg/l	--	--	10	15	10	8	9.2	15	21	11	46
Chloride	mg/l	--	250	76	84	82	84	75	74	77	78	77
Conductivity	uS/cm	--	--	1320	1400	1430	1460	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1246	1400	1122	1437	1313	1341	1241	1324	1324
Hardness, Calcium Carbonate	mg/l	--	--	274	312	296	291	290	330	320	330	280
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010	0.018	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.13	0.12	0.56	0.16	0.64	0.63	0.57	0.54	0.55
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
pH	-	--	--	8.14	8.00	8.42	8.16	8.05	8.15	8.01	7.98	8.04
pH (Field)	-	--	--	7.46	7.62	7.38	7.68	7.95	7.75	7.47	7.55	7.35
Phosphorus	mg/l	--	--	0.17	0.11	0.08	0.06	0.089	0.085	0.17	0.070	0.052
Sulphate	mg/l	--	500 [6]	79	80	79	82	71	71	72	77	72
Temperature (Field)	deg c	--	15	20.2	12.2	15.0	6.9	11.3	6.0	11.8	6.8	8.6
Total Dissolved Solids	mg/l	--	500	858	910	930	949	840	858	920	866	866
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.001	<0.001	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.40	0.50	0.39	0.46	0.39	0.53	0.4	0.5	0.39
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	47	54	51	54	50	59	56	58	49
Chromium, dissolved	mg/l	0.05	--	0.004	0.006	<0.005	0.005	<0.0050	0.0060	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0011	0.0006	0.0020	<0.0002	0.0017	0.00072	0.0012	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.008	0.003	0.005	0.005	0.0042	0.0033	0.0055	0.0041	0.0044
Iron, dissolved	mg/l	--	0.3	0.05	<0.03	<0.03	<0.03	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	38	43	41	38	39	45	43	45	38
Manganese, dissolved	mg/l	--	0.05	1.99	0.62	1.60	0.08	1.7	0.84	0.98	0.18	0.23
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	13	11	11	10	13	11	13	9.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	209	235	187	216	210	240	220	260	220
Zinc, dissolved	mg/l	--	5	0.02	<0.01	0.02	<0.01	0.015	0.012	0.0070	0.036	0.0090
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 19-Nov-2014	05-3D 02-Jun-2015	05-3D 26-Nov-2015	05-3D 26-May-2016	05-3D 17-Nov-2016	05-3D 24-May-2017	05-3D 29-Nov-2017	05-3D 24-May-2018	05-3D 29-Nov-2018
				05-3D	05-3D	05-3D	05-3D	05-3C	05-3D	05-3D	05-3D	05-3D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	650	658	642	646	651	1070	714	714	753
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.1	<5	<5	<5	<5	17	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	660	661	644	648	654	1090	718	718	756
Ammonia Nitrogen	mg/l	--	--	<0.050	0.10	0.02	0.04	0.08	1.91	0.22	0.03	0.16
Chemical Oxygen Demand	mg/l	--	--	9.6	18	18	19	40	98	33	20	37
Chloride	mg/l	--	250	88	92	98	104	106	342	126	111	112
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1499	1419	1494	1455	1596	2590	1470	1608	1457
Hardness, Calcium Carbonate	mg/l	--	--	320	190	322	276	315	86	322	334	369
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.24	0.2	0.3	0.3	0.3	3.2	0.6	0.4	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--	--
pH	-	--	--	7.83	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.49	7.49	7.67	7.78	7.56	8.18	7.40	7.49	7.78
Phosphorus	mg/l	--	--	0.076	<0.01	0.04	0.06	0.25	2.28	0.40	0.10	0.20
Sulphate	mg/l	--	500 [6]	79	83	87	91	100	9	113	107	107
Temperature (Field)	deg c	--	15	5.9	8.7	7.1	9.4	9.7	10.2	8.8	9.0	8.2
Total Dissolved Solids	mg/l	--	500	850	918	874	896	882	1660	970	992	646
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	0.001	0.01	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.46	0.193	0.424	0.343	0.578	1.32	0.523	0.593	0.581
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	57	29.4	45.7	49.8	57	10.9	53.5	60.1	62.7
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.006	0.011	<0.001	<0.001	0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0067	0.0013	0.0006	0.0027	0.0045	0.0008	0.0070	0.0039	0.0109
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.635	<0.1	<0.1	0.499
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0018
Magnesium, dissolved	mg/l	--	--	43	28.3	50.5	36.8	41.9	14.4	45.8	44.7	51.6
Manganese, dissolved	mg/l	--	0.05	0.063	0.06	<0.005	0.091	0.058	0.046	0.6	<0.005	0.248
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	7.92	10	10.7	11.7	14.3	13	11.7	14.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	260	222	282	188	249	697	247	236	0.283
Zinc, dissolved	mg/l	--	5	0.024	0.007	0.009	0.011	0.007	<0.005	0.01	0.006	0.015
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.002	<0.001	<0.004 [10]	<0.001	<0.001	0.003
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 19-Jun-2019 05-3D	05-3D 20-Nov-2019 05-3D	05-3D 21-May-2020 05-3D	05-3D 26-Nov-2020 05-3D	05-3D 26-May-2021 05-3D	05-3D 30-Nov-2021 05-3D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	694	666	704	719	738	748
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	5	8	6	<5	7
Alkalinity (Total as CaCO3)	mg/l	--	--	701	671	712	725	742	755
Ammonia Nitrogen	mg/l	--	--	0.04	0.22	0.02	0.14	0.05	0.24
Chemical Oxygen Demand	mg/l	--	--	11	25	25	33	<10	18
Chloride	mg/l	--	250	113	116	139	117	110	107
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1518	1646	1541	1490	1671	1700
Hardness, Calcium Carbonate	mg/l	--	--	380	378	366	344	388	328
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.2	0.4	0.4	0.4	0.2	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.53	7.4	8.24	7.64	7.36	7.41
Phosphorus	mg/l	--	--	0.16	0.16	0.12	0.16	0.10	0.12
Sulphate	mg/l	--	500 [6]	111	110	126	103	96	94
Temperature (Field)	deg c	--	15	12.7	9.3	12.4	7.4	10.8	8.1
Total Dissolved Solids	mg/l	--	500	970	1060	1040	1000	1040	1010
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.444	0.435	0.411	0.436	0.441	0.418
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	67.2	60	62.7	57.2	65.6	57.5
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.0051	0.0030	0.0061	0.0018	0.0044	0.0018
Iron, dissolved	mg/l	--	0.3	0.122	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	51.5	55.4	50.9	48.9	54.5	44.8
Manganese, dissolved	mg/l	--	0.05	0.052	0.623	0.04	0.401	0.494	0.648
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.8	18.3	13.6	13.7	13.7	13.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	258	276	272	268	244	244
Zinc, dissolved	mg/l	--	5	0.006	0.008	<0.005	0.01	0.013	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.003	0.004	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 06-Sep-2005 [3]	05-8 16-Nov-2005	05-8 25-May-2006	05-8 21-Nov-2006	05-8 15-May-2007	05-8 30-Nov-2007	05-8 28-Feb-2008	05-8 22-May-2008	05-8 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	159	855	876	980	1040	940	970	1900
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	650	855	876	980	1040	940	970	1900
Ammonia Nitrogen	mg/l	--	--	--	3.29	2.02	0.79	2.22	0.35	0.44	<0.01	0.8
Chemical Oxygen Demand	mg/l	--	--	--	61	57	39	169	108	43	67	214
Chloride	mg/l	--	250	--	89.9	27.9	16.8	24.3	122	81.2	103	444
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1600	1400	1425	1300	1500	--	1700	3500
Hardness, Calcium Carbonate	mg/l	--	--	--	649	794	769	794	1040	925	1030	1500
Nitrate as N	mg/l	10.0	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	5.48	3.48	1.74	4.35	1.69	1.75	1.81	5.56
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	6.8	6.9	7.2	6.9	--	6.5	6.6
Phosphorus	mg/l	--	--	--	2.06	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	220	203	169	79	139	144	123	12
Temperature (Field)	deg c	--	15	--	--	4	11	9	11.5	--	10.5	11
Total Dissolved Solids	mg/l	--	500	--	1100	1120	1070	1080	1370	1200	1260	2560
Total Organic Carbon	mg/l	--	--	--	17.5	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	4590	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.007	<0.001	0.0006	0.0013	0.0013	0.0015	0.0011	0.0023
Boron, dissolved	mg/l	5	--	--	0.642	0.262	0.368	0.306	1.51	0.966	1.01	13.1
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00007	<0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	--	136	179	165	174	222	200	223	341
Chromium, dissolved	mg/l	0.05	--	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	0.045	<0.002	<0.002	<0.002	<0.002	<0.002	0.006
Iron, dissolved	mg/l	--	0.3	--	19.6	21	2.49	9.56	6.03	6.52	4.52	0.054
Lead, dissolved	mg/l	0.01	--	--	<0.0002	0.0008	<0.0001	0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	--	75.4	84.4	86.9	87.5	119	103	116	158
Manganese, dissolved	mg/l	--	0.05	--	1.63	2.36	3.23	3.02	4.47	4.09	4.88	5.75
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	14.6	5.9	5.8	6.8	6.4	6	4.9	12.3
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	169	86.8	91.4	109	129	93.6	98.4	443
Zinc, dissolved	mg/l	--	5	--	0.016	0.026	0.01	0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	<0.0006	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0011
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 19-Dec-2008	05-8 19-May-2009 G-20	05-8 26-Nov-2009 M-15	05-8 25-May-2010 [4] M-12	05-8 20-Oct-2010 G-8	05-8 24-May-2011 G-14	05-8 29-Nov-2011 [4] 05-8	05-8 31-May-2012 05-8	05-8 28-Nov-2012 05-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1850	1610	1400	1250	1210	1100	1170	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	2.7	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	1850	1613	1400	1248	1210	1100	1170	1200	1200
Ammonia Nitrogen	mg/l	--	--	0.72	0.72	0.67	0.57	0.76	0.70	1.16	0.74	1.0
Chemical Oxygen Demand	mg/l	--	--	272	140	130	75	85	55	85	56	61
Chloride	mg/l	--	250	409	302	243	133	135	91	158	43	96
Conductivity	uS/cm	--	--	--	3450	2960	2490	2420	2110	2380	--	--
Conductivity (Field)	uS/cm	--	--	3200	--	2511	2474	2277	1688	2127	1866	1922
Hardness, Calcium Carbonate	mg/l	--	--	1390	1220	1120	1040	1140	982	818	960	920
Nitrate as N	mg/l	10.0	--	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	5.34	3.34	2.56	1.51	2.29	1.55	2.71	1.7	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	6.71	7.21	7.14	7.02	7.76	7.51	7.38	--
pH (Field)	-	--	--	6.6	--	6.34	6.64	6.64	6.40	6.67	6.56	6.50
Phosphorus	mg/l	--	--	--	0.53	0.79	0.20	0.70	0.50	0.52	0.29	0.29
Sulphate	mg/l	--	500 [6]	7	16	21	29	36	34	5	<1	<1
Temperature (Field)	deg c	--	15	5	--	11.4	16.3	13	16.5	9.3	11.0	10.1
Total Dissolved Solids	mg/l	--	500	2490	2240	1920	1620	1570	1370	1550	1240	1330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.005	0.003	0.004	<0.01	<0.001	<0.001	<0.01	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	12.6	8.71	5.9	4.8	3.6	0.50	3.6	1.6	2.7
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	325	262	248	222	255	207	166	210	190
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.005	<0.005	0.006	0.006	0.008	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0022	0.0015	0.0010	0.0012	0.0010	0.0004	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.006	0.001	0.006	0.003	0.004	<0.001	0.0016	0.001
Iron, dissolved	mg/l	--	0.3	0.938	<0.03	7.09	0.92	2.39	0.11	13.0	1.8	3.8
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	140	138	122	119	122	113	98	110	110
Manganese, dissolved	mg/l	--	0.05	5.26	6.76	5.29	5.63	6.38	6.78	3.19	7	4.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.5	8	12	10	9	8	12	7.6	12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	476	297	263	211	194	140	225	130	190
Zinc, dissolved	mg/l	--	5	0.026	0.02	0.01	0.02	0.02	0.02	<0.01	<0.0050	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00050	<0.00050
Benzene	mg/l	0.001	--	0.0015	0.0020	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.00050	<0.00050
Ethylbenzene	mg/l	0.14	0.0016	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
m,p-Xylenes	mg/l	--	--	0.0053	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00050	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0025	<0.0025
o-Xylene	mg/l	--	--	0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	<0.0010
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	<0.0010

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 29-May-2013 [5] 05-8	05-8 26-Nov-2013 [5] GW-23	05-8 29-May-2014 05-8	05-8 19-Nov-2014 [19] 05-8	05-8 02-Jun-2015 05-8	05-8 26-Nov-2015 [3] 05-8	05-8 26-May-2016 05-8	05-8 17-Nov-2016 05-8	05-8 24-May-2017 05-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1200	1200	1100	1200	983	--	1080	1030	1120
Alkalinity, Carbonate as CaCO3	mg/l	--	--	2.2	2.2	1.8	1.9	<50	--	<25 [9]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1200	1100	1200	984	--	1080	1040	1120
Ammonia Nitrogen	mg/l	--	--	1.8	1.7	1.5	0.95	1.04	--	0.88	1.25	0.21
Chemical Oxygen Demand	mg/l	--	--	78	57	51	61	69	--	54	95	54
Chloride	mg/l	--	250	70	64	30	95	67	--	55	90	14
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1733	1727	1566	2174	2045	--	1983	2205	1888
Hardness, Calcium Carbonate	mg/l	--	--	1000	990	970	1100	933	--	987	937	1140
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	2.5	2.4	2.0	2.0	--	1.6	2.1	1.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--	--	--	--
pH	-	--	--	7.29	7.29	7.25	7.21	--	--	--	--	--
pH (Field)	-	--	--	6.52	6.40	6.65	6.86	6.58	--	6.58	6.94	6.65
Phosphorus	mg/l	--	--	0.14	0.13	0.21	0.21	0.09	--	0.18	0.79	0.06
Sulphate	mg/l	--	500 [6]	<1	<1	3	<1	<1	--	2	<1	<1
Temperature (Field)	deg c	--	15	9.7	8.6	10.6	7.0	9.2	--	13.4	11.4	10.4
Total Dissolved Solids	mg/l	--	500	1330	1280	1030	1300	1300	--	1330	1300	1170
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	--	<0.001	0.002	<0.001
Boron, dissolved	mg/l	5	--	1.6	1.2	0.4	1.9	1.07	--	0.824	2.36	0.273
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	220	220	220	230	169	--	208	197	258
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	--	<0.001	0.016	0.01
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	<0.0010	0.0023	0.0010	<0.0005	--	<0.0005	0.0017	0.0019
Iron, dissolved	mg/l	--	0.3	0.69	8.8	<0.1	0.76	<0.1	--	<0.1	10	0.46
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	120	110	100	120	124	--	114	108	120
Manganese, dissolved	mg/l	--	0.05	6.8	8.2	7.6	7	6.82	--	8.74	5.59	12.6
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.3	7.1	4	8.6	6.37	--	8.06	11.7	3.69
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	140	110	49	150	126	--	84.9	159	55.4
Zinc, dissolved	mg/l	--	5	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	--	<0.005	0.005	0.006
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.0056	0.0019	0.0015	0.0048	<0.002 [10]	--	<0.004 [11]	0.007	<0.002 [10]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00025	<0.00025	0.00033	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.0013	<0.00050	<0.0010	<0.0050	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00050	<0.00050	<0.00020	<0.00040	<0.0005	--	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00050	<0.00020	<0.00040	<0.0005	--	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 29-Nov-2017	05-8 24-May-2018	05-8 22-Nov-2018	05-8 19-Jun-2019	05-8 20-Nov-2019	05-8 21-May-2020	05-8 26-Nov-2020	05-8 26-May-2021	05-8 30-Nov-2021
				05-8	05-8	05-8	05-8	05-8	05-8	05-8	05-8	05-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1020	1310	1500	1250	1310	979	1430	1010	1260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25 [9]	<25 [9]	<25 [9]	<25	<25 [16]	<25	<25	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1020	1310	1500	1260	1310	980	1440	1020	1260
Ammonia Nitrogen	mg/l	--	--	0.84	0.39	0.90	0.79	0.42	1.03	0.17	1.33	0.81
Chemical Oxygen Demand	mg/l	--	--	87	134	174	110	141	89	122	72	130
Chloride	mg/l	--	250	68	121	219	113	94	24	113	38	45
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2003	2388	2506	2173	2520	1667	1975	1925	1993
Hardness, Calcium Carbonate	mg/l	--	--	891	1220	1630	942	1200	899	1000	758	863
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.3	2.1	3.5	2.5	2.2	2.4	1.9	2.9	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.41	6.52	6.65	6.71	6.87	8.12	6.86	6.64	6.67
Phosphorus	mg/l	--	--	1.95	0.14	0.24	0.13	0.11	0.16	0.14	0.14	0.16
Sulphate	mg/l	--	500 [6]	1	1	3	1	9	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	9.4	12.0	9.8	13.3	6.5	10.8	8.0	11	8.5
Total Dissolved Solids	mg/l	--	500	1130	1570	1700	1400	1550	1020	1420	1090	1260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1.98	3.21	12.9	2.48	4.67	0.932	3.4	0.64	1.41
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	200	274	396	195	254	191	206	163	192
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.001	0.001	0.002	0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	0.0027	0.0009	0.0027	<0.0005	0.0009	<0.0005	0.0008
Copper, dissolved	mg/l	--	1	0.0008	0.0008	0.0012	0.0046	0.0015	0.0031	0.0027	0.0019	0.0011
Iron, dissolved	mg/l	--	0.3	4.12	0.878	7.95	0.21	10.3	11.7	3.26	<0.1	6.17
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	0.0003	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	95.1	130	156	110	137	102	119	85.3	93.3
Manganese, dissolved	mg/l	--	0.05	9.67	12.5	12.9	13.7	13.2	9.57	11.4	8.69	11.2
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.93	4.96	11.6	6.52	11.7	5.91	10.4	5.25	6.49
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	90.4	124	226	136	190	88.5	182	72.5	108
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.002 [11]	0.006	0.003	0.006	0.005	<0.004 [11]	0.006	<0.004 [11]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 06-Sep-2005 [3]	05-R3 16-Nov-2005	05-R3 25-May-2006	05-R3 21-Nov-2006	05-R3 15-May-2007	05-R3 30-Nov-2007	05-R3 28-Feb-2008	05-R3 22-May-2008	05-R3 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	140	720	765	768	815	800	850	920
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	575	720	765	768	815	800	850	920
Ammonia Nitrogen	mg/l	--	--	--	6.74	0.54	0.38	0.11	0.12	<0.01	0.04	0.26
Chemical Oxygen Demand	mg/l	--	--	--	106	25	15	38	57	<5	17	14
Chloride	mg/l	--	250	--	80.2	81.9	76	79.6	68.6	72.8	71.7	74.1
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1600	1300	1425	1300	1375	--	--	1600
Hardness, Calcium Carbonate	mg/l	--	--	--	556	501	547	554	601	601	639	639
Nitrate as N	mg/l	10.0	--	--	<0.1	0.8	0.8	0.5	0.5	0.4	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	33.1	1.16	0.84	0.67	0.49	0.34	0.5	0.65
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.2	7.1	7.6	7.6	--	--	6.8
Phosphorus	mg/l	--	--	--	5.05	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	300	185	196	198	211	202	186	158
Temperature (Field)	deg c	--	15	--	--	4.5	11.5	11.1	9	--	--	9
Total Dissolved Solids	mg/l	--	500	--	1160	1080	1150	1150	1230	1180	1210	1240
Total Organic Carbon	mg/l	--	--	--	26.6	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	1200	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.008	<0.001	0.001	0.0008	0.001	0.001	0.0008	0.0008
Boron, dissolved	mg/l	5	--	--	1.27	1.06	1.28	1.1	1.18	1.08	1.01	1.17
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00006	<0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	--	129	108	121	122	139	136	142	143
Chromium, dissolved	mg/l	0.05	--	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	--	15.2	0.022	<0.005	0.06	0.089	0.031	0.279	0.099
Lead, dissolved	mg/l	0.01	--	--	<0.0002	<0.0002	<0.0001	0.00005	<0.00002	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	--	57	56.1	59.9	60.5	62	63.6	69.3	68.5
Manganese, dissolved	mg/l	--	0.05	--	1.19	1.18	1.21	0.844	0.551	0.614	1.19	0.964
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	15.3	10.1	11.7	10.3	10.2	9.5	10.3	11.7
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	225	208	220	212	246	213	218	230
Zinc, dissolved	mg/l	--	5	--	0.017	0.006	0.008	<0.005	<0.005	<0.005	0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	<0.0006	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 19-Dec-2008	05-R3 19-May-2009 G-24	05-R3 26-Nov-2009 M-16	05-R3 25-May-2010 M-15	05-R3 20-Oct-2010 G-10	05-R3 24-May-2011 G-16	05-R3 29-Nov-2011 05-R3	05-R3 31-May-2012 05-R3	05-R3 28-Nov-2012 05-R3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	870	899	908	852	896	951	968	940	940
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	4.4	5.0
Alkalinity (Total as CaCO3)	mg/l	--	--	870	899	908	852	896	951	968	940	940
Ammonia Nitrogen	mg/l	--	--	0.03	0.09	0.53	0.10	0.06	0.26	0.25	<0.050	0.11
Chemical Oxygen Demand	mg/l	--	--	15	23	27	23	30	23	25	21	25
Chloride	mg/l	--	250	65.9	60	73	58	55	51	81	46	44
Conductivity	uS/cm	--	--	--	1940	2000	1950	1970	1980	2030	--	--
Conductivity (Field)	uS/cm	--	--	1500	1500	1776	1954	1905	1745	1852	1780	1792
Hardness, Calcium Carbonate	mg/l	--	--	666	646	580	732	784	766	660	750	780
Nitrate as N	mg/l	10.0	--	0.5	0.18	<0.10	0.14	<0.10	<0.10	0.11	0.21	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.37	0.36	0.60	0.28	0.83	0.50	0.62	0.58	0.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	0.21	<0.10
pH	-	--	--	--	7.06	7.45	7.76	7.40	7.98	7.76	7.70	--
pH (Field)	-	--	--	7.3	--	6.79	6.88	6.98	6.86	6.83	6.99	6.79
Phosphorus	mg/l	--	--	--	0.06	0.18	0.07	0.04	0.05	0.05	0.059	0.028
Sulphate	mg/l	--	500 [6]	150	173	153	192	193	158	131	160	170
Temperature (Field)	deg c	--	15	5	8	10.7	14.5	11.9	16.7	9.5	10.6	8.6
Total Dissolved Solids	mg/l	--	500	1210	1260	1300	1270	1280	1290	1320	1230	1280
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0008	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	1.24	1.75	1.4	1.4	1.1	0.97	1.4	0.97	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	152	145	120	163	187	173	134	170	180
Chromium, dissolved	mg/l	0.05	--	<0.002	0.009	0.003	0.005	0.005	0.002	0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0005	0.0008	0.0007	0.0012	0.0007	0.0007	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.002	0.003	0.004	0.006	0.002	0.0024	0.002
Iron, dissolved	mg/l	--	0.3	0.006	<0.03	3.93	0.24	0.31	<0.03	1.18	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	69.5	69	68	79	77	81	79	81	81
Manganese, dissolved	mg/l	--	0.05	1.5	0.42	1.61	0.81	1.10	0.52	1.91	1.1	0.39
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.5	9	11	12	10	10	12	11	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	236	204	224	218	197	170	222	180	190
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.02	0.01	<0.01	0.01	<0.01	0.016	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	--	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	--	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	--	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0002	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 29-May-2013 05-R3	05-R3 26-Nov-2013 [5] GW-22	05-R3 29-May-2014 05-R3	05-R3 19-Nov-2014 05-R3	05-R3 02-Jun-2015 05-R3	05-R3 26-Nov-2015 05-R3	05-R3 26-May-2016 05-R3	05-R3 17-Nov-2016 05-R3	05-R3 24-May-2017 05-R3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	940	970	960	940	958	978	960	981	939
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.2	4.1	5.2	3.2	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	950	970	960	940	959	980	961	983	941
Ammonia Nitrogen	mg/l	--	--	0.074	0.087	0.075	0.051	0.07	0.05	0.02	0.13	0.03
Chemical Oxygen Demand	mg/l	--	--	27	27	15	17	19	32	16	28	17
Chloride	mg/l	--	250	43	42	46	39	48	49	42	42	20
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1611	1646	1704	1878	1860	1849	1880	2018	1874
Hardness, Calcium Carbonate	mg/l	--	--	820	750	790	820	702	800	764	788	933
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.17	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.50	0.45	0.43	0.33	0.2	0.4	0.3	0.4	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	0.17	<0.10	--	--	--	--	--
pH	-	--	--	7.68	7.65	7.76	7.56	--	--	--	--	--
pH (Field)	-	--	--	6.95	6.93	7.27	7.08	6.99	6.98	7.18	7.34	6.89
Phosphorus	mg/l	--	--	0.046	0.053	0.049	0.060	0.04	0.04	0.07	0.08	0.03
Sulphate	mg/l	--	500 [6]	150	150	160	170	184	144	223	168	296
Temperature (Field)	deg c	--	15	9.9	9.0	11.4	7.2	10.2	10.4	13.1	11.8	11.8
Total Dissolved Solids	mg/l	--	500	1250	1220	1220	1180	1290	1250	1320	1200	1290
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.97	0.96	0.91	0.94	0.698	0.838	0.796	1.14	0.58
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	190	170	180	190	132	153	172	174	229
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.012	0.008
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0019	0.0024	0.0031	0.0017	<0.0005	<0.0005	0.0010	0.0026	0.0024
Iron, dissolved	mg/l	--	0.3	<0.1	0.2	<0.1	0.31	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	83	81	84	85	90.3	101	81.5	85.7	87.5
Manganese, dissolved	mg/l	--	0.05	0.51	0.55	0.25	0.41	0.583	0.804	0.233	0.725	0.008
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.8	11	9.2	9.7	7.95	9.9	9.76	11.7	6.97
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	180	180	190	180	195	187	173	169	171
Zinc, dissolved	mg/l	--	5	<0.0050	0.0074	<0.0050	0.0065	0.011	0.01	<0.005	<0.005	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	0.001	<0.001	0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 29-Nov-2017 05-R3	05-R3 24-May-2018 05-R3	05-R3 22-Nov-2018 05-R3	05-R3 19-Jun-2019 05-R3	05-R3 20-Nov-2019 05-R3	05-R3 21-May-2020 05-R3	05-R3 26-Nov-2020 05-R3	05-R3 26-May-2021 05-R3	05-R3 30-Nov-2021 05-R3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	917	1030	991	899	756	845	821	772	733
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	919	1030	992	902	760	848	826	774	737
Ammonia Nitrogen	mg/l	--	--	0.12	0.10	0.03	0.05	0.02	<0.01	0.03	0.04	0.02
Chemical Oxygen Demand	mg/l	--	--	30	48	21	18	23	28	24	<10	26
Chloride	mg/l	--	250	21	20	21	21	18	25	20	15	13
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1656	1790	1435	1560	1625	1516	1436	1570	1598
Hardness, Calcium Carbonate	mg/l	--	--	789	824	797	814	613	719	722	688	615
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.2	1.2	<0.5 [11]	<0.1	0.2
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.5	0.3	0.3	0.2	0.3	0.3	0.2	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.81	6.92	7.25	7.22	7.07	7.69	7.09	6.94	6.94
Phosphorus	mg/l	--	--	0.04	0.06	0.06	0.03	0.04	0.04	0.03	0.03	0.02
Sulphate	mg/l	--	500 [6]	282	131	127	123	162	182	137	222	252
Temperature (Field)	deg c	--	15	10.6	11.2	9.2	14.1	7.4	12.8	8.6	12.4	7.2
Total Dissolved Solids	mg/l	--	500	1130	1150	990	1020	1100	1070	956	1020	1050
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.649	0.501	0.62	0.507	0.446	0.416	0.478	0.373	0.367
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	186	195	185	183	118	165	161	160	148
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	<0.001	<0.001	0.003	0.001	<0.001	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0016	0.0015	0.0037	0.0019	0.0025	0.0044	0.0041	0.0020	0.0016
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	78.8	81.7	81.5	86.4	77.1	74.3	78.1	70.2	59.6
Manganese, dissolved	mg/l	--	0.05	0.063	1.38	0.363	0.417	0.083	0.014	0.546	<0.005	0.065
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.7	7.99	9.51	9.85	10.2	8.27	9.84	7.78	7.03
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	167	137	123	128	125	117	111	135	123
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.003	0.001	<0.001	0.004	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1A 30-Nov-2007	07-1A 28-Feb-2008	07-1A 22-May-2008	07-1A 13-Aug-2008	07-1A 10-Nov-2008	07-1A 25-May-2010 [4] M-8	07-1A 24-May-2011 [4] G-7	07-1A 28-Nov-2012 07-1A	07-1A 29-May-2014 07-1A
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	860	795	820	805	800	761	784	780	770
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	28	37	18	30
Alkalinity (Total as CaCO3)	mg/l	--	--	860	795	820	805	800	789	821	800	800
Ammonia Nitrogen	mg/l	--	--	1.42	1.48	1.39	1.38	1.39	1.27	1.37	2.1	1.6
Chemical Oxygen Demand	mg/l	--	--	68	32	85	45	23	33	33	820	110
Chloride	mg/l	--	250	421	402	407	405	402	343	382	360	380
Conductivity	uS/cm	--	--	--	--	--	--	--	2640	2730	--	--
Conductivity (Field)	uS/cm	--	--	2000	--	2350	2500	2250	2693	2429	2381	2336
Hardness, Calcium Carbonate	mg/l	--	--	44	40	40	42	40	49	45	45	46
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1	<0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.19	2.65	3.92	2.93	1.99	1.66	1.78	13	5.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	--	--	--	--	8.59	8.70	--	8.62
pH (Field)	-	--	--	8.6	--	8.6	9	8.5	8.72	8.59	8.64	8.10
Phosphorus	mg/l	--	--	--	--	--	--	--	1.07	0.52	30	3.0
Sulphate	mg/l	--	500 [6]	4	1	2	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	3.5	--	11.5	11	7	11.9	18.0	7.5	9.9
Total Dissolved Solids	mg/l	--	500	1660	1440	1510	1440	1460	1720	1770	1560	1460
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0044	0.0035	0.0025	0.0008	0.001	<0.01	<0.01	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	1.05	0.993	1.01	1.03	1.06	1.3	1.0	1.3	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	2.8	2.4	2.4	2.9	2.27	3	3	3.1	3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.008	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0003	<0.0002	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.004	<0.002	0.002	<0.001	<0.001	0.0017
Iron, dissolved	mg/l	--	0.3	0.018	0.071	0.054	0.05	0.015	0.06	0.07	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	0.0002	0.00015	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	8.98	8.25	8.33	8.46	8.44	10	9	9.1	9.3
Manganese, dissolved	mg/l	--	0.05	0.004	0.005	0.003	0.003	0.002	<0.01	<0.01	0.003	0.0050
Potassium, dissolved	mg/l	--	--	17.5	14.2	14.9	15.6	15.9	16	15	15	14
Sodium, dissolved	mg/l	--	200 [7]	687	531	578	518	550	515	606	630	530
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00020	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00020	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0010	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00040	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00040	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1A 26-Nov-2015 07-1A	07-1A 24-May-2017 07-1A	07-1A 29-Nov-2018 07-1A	07-1A 21-May-2020 07-1A	07-1A 30-Nov-2021 07-1A
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	815	864	898	800	816
Alkalinity, Carbonate as CaCO3	mg/l	--	--	20	18	22	38	14
Alkalinity (Total as CaCO3)	mg/l	--	--	835	882	920	838	830
Ammonia Nitrogen	mg/l	--	--	1.50	1.61	1.89	1.93	1.66
Chemical Oxygen Demand	mg/l	--	--	56	34	39	45	38
Chloride	mg/l	--	250	406	469	482	728	522
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2585	2885	2620	2706	2966
Hardness, Calcium Carbonate	mg/l	--	--	36.5	54	79	70.8	68.3
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	0.21
Nitrogen, Total Kjeldahl	mg/l	--	--	2.0	2.5	2.7	2.1	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.68	8.51	8.57	8.99	8.67
Phosphorus	mg/l	--	--	0.49	0.34	0.46	0.48	0.42
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	8.7	10.4	6.8	11.2	6.8
Total Dissolved Solids	mg/l	--	500	1600	1640	1650	1840	1720
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1.26	1.24	1.26	0.947	0.906
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	2.73	3.23	10.5	7.23	7.15
Chromium, dissolved	mg/l	0.05	--	<0.001	0.011	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0015	0.0024	0.0016	0.0009
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.182	<0.1	0.142
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	7.21	11.1	12.9	12.8	12.3
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	<0.005	<0.005	<0.005
Potassium, dissolved	mg/l	--	--	12.9	16.6	18.7	17.1	15.7
Sodium, dissolved	mg/l	--	200 [7]	677	674	706	669	570
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	0.008	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.002 [10]	<0.001	0.003	<0.001
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1B 30-Nov-2007	07-1B 28-Feb-2008	07-1B 22-May-2008	07-1B 13-Aug-2008	07-1B 10-Nov-2008	07-1B 25-May-2010 [4] M-7	07-1B 24-May-2011 [4] G-9	07-1B 28-Nov-2012 07-1B	07-1B 29-May-2014 [5] 07-1B
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	965	925	920	945	950	902	942	910	900
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]	20	8.5	18
Alkalinity (Total as CaCO3)	mg/l	--	--	965	925	920	945	950	902	962	920	920
Ammonia Nitrogen	mg/l	--	--	2.99	3.06	2.51	2.74	3.14	2.54	2.77	3.2	3.2
Chemical Oxygen Demand	mg/l	--	--	130	82	77	124	68	65	63	69	61
Chloride	mg/l	--	250	1470	1480	1470	1510	1520	1280	1360	1300	1400
Conductivity	uS/cm	--	--	--	--	--	--	--	5690	6020	--	--
Conductivity (Field)	uS/cm	--	--	4500	--	>5000	>5000	>5000	>3999	>3999	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	389	333	357	362	366	346	355	380	370
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	0.1	<0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	5.21	5.31	4.41	5.6	4.85	3.89	3.95	4.3	4.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	--	--	--	--	8.28	8.35	--	8.34
pH (Field)	-	--	--	7.8	--	7.8	8.2	7.6	7.54	7.78	7.99	7.73
Phosphorus	mg/l	--	--	--	--	--	--	--	0.67	0.99	0.96	1.5
Sulphate	mg/l	--	500 [6]	200	185	132	73	52	30	7	<1	<1
Temperature (Field)	deg c	--	15	3	--	11.5	12	7	11.0	10.0	7.0	10.5
Total Dissolved Solids	mg/l	--	500	3890	3430	3420	3320	3330	3700	3910	3190	3050
Metals												
Arsenic, dissolved	mg/l	0.01	--	**0.0119**	**0.0216**	**0.0154**	**0.0108**	0.0049	<0.1	<0.1	0.006	0.0077 [20]
Boron, dissolved	mg/l	5	--	1.06	1.04	1.05	1.06	1.1	0.95	0.9	1.3	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	45.8	33.6	40.7	43.1	42.2	38	40	42	41
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0010	0.0011	0.0007	0.00074
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002	<0.002	<0.002	0.002	0.003	<0.001	0.0010
Iron, dissolved	mg/l	--	0.3	0.6	2.71	1.06	0.179	0.033	1.35	1.59	1.3	0.75
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	0.0005	<0.00002	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	66.8	60.6	62.1	61.8	63.4	61	62	66	65
Manganese, dissolved	mg/l	--	0.05	0.111	0.09	0.084	0.104	0.075	0.09	0.14	0.083	0.079
Potassium, dissolved	mg/l	--	--	40.7	34.4	35.8	38.1	36.1	32	30	32	30
Sodium, dissolved	mg/l	--	200 [7]	1440	1070	1120	1030	1040	955	1190	1100	1200
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	0.01	<0.005	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00050	<0.00020
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00050	<0.00020
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0025	<0.0010
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	<0.00040
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	<0.00040

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1B 26-Nov-2015 07-1B	07-1B 24-May-2017 07-1B	07-1B 22-Nov-2018 07-1B	07-1B 21-May-2020 07-1B	07-1B 30-Nov-2021 07-1B
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	967	1030	1040	917	967
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	17	8	19	6
Alkalinity (Total as CaCO3)	mg/l	--	--	987	1050	1050	936	973
Ammonia Nitrogen	mg/l	--	--	3.06	3.31	3.14	3.47	3.79
Chemical Oxygen Demand	mg/l	--	--	119	91	80	99	124
Chloride	mg/l	--	250	1420	1480	1390	1670	1440
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	>3999	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	376	331	562	425	368
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.50 [9]	<0.05	<0.05	<1.00 [16]
Nitrogen, Total Kjeldahl	mg/l	--	--	4.1	4.1	4.8	3.4	5.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.02	7.94	8.1	8.39	8.11
Phosphorus	mg/l	--	--	0.89	1.05	0.92	0.93	1.62
Sulphate	mg/l	--	500 [6]	4	3	2	2	<1
Temperature (Field)	deg c	--	15	8.8	9.9	7.1	10.4	7.2
Total Dissolved Solids	mg/l	--	500	3160	3340	3160	3190	3360
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.003	0.012	0.003	0.003	0.003
Boron, dissolved	mg/l	5	--	1.31	0.914	1.47	1.15	0.846
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29.2	40.5	60.6	47.1	41.7
Chromium, dissolved	mg/l	0.05	--	<0.001	0.04	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0012	0.0007	0.0006
Copper, dissolved	mg/l	--	1	<0.0005	0.0034	0.0029	0.0026	0.0012
Iron, dissolved	mg/l	--	0.3	0.519	0.832	1.53	0.541	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0003	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	73.4	55.9	99.7	74.7	64.1
Manganese, dissolved	mg/l	--	0.05	0.067	0.07	0.119	0.089	0.076
Potassium, dissolved	mg/l	--	--	27.2	31.6	47.6	32.7	26.9
Sodium, dissolved	mg/l	--	200 [7]	1260	1180	1180	1030	874
Zinc, dissolved	mg/l	--	5	0.008	0.012	<0.005	0.009	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.010 [11]	<0.001	0.007	<0.004 [11]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 30-Nov-2007	07-1C 28-Feb-2008	07-1C 22-May-2008	07-1C 13-Aug-2008	07-1C 10-Nov-2008	07-1C 19-May-2009 G-4	07-1C 26-Nov-2009 J-15	07-1C 25-May-2010 [4] M-6	07-1C 20-Oct-2010 [4] G-5
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	642	672	660	660	666	657	666	639	661
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	642	672	660	660	666	657	666	639	661
Ammonia Nitrogen	mg/l	--	--	1.41	0.73	0.66	0.79	0.75	0.30	0.53	0.49	0.28
Chemical Oxygen Demand	mg/l	--	--	360	13	40	102	29	18	30	25	40
Chloride	mg/l	--	250	562	471	507	505	605	425	454	422	468
Conductivity	uS/cm	--	--	--	--	--	--	--	2760	2820	2760	2820
Conductivity (Field)	uS/cm	--	--	2100	--	2850	2600	2350	2300	2420	2845	2945
Hardness, Calcium Carbonate	mg/l	--	--	252	245	260	245	235	243	158	186	191
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.1	0.2	0.2	0.42	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	5.52	2.23	1.93	1.88	1.73	0.66	0.70	0.62	0.60
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	7.78	8.06	8.10	7.79
pH (Field)	-	--	--	7.6	--	7.4	7.8	7.3	--	7.16	7.65	7.04
Phosphorus	mg/l	--	--	--	--	--	--	--	0.26	0.21	0.26	0.10
Sulphate	mg/l	--	500 [6]	197	176	163	158	119	119	115	108	98
Temperature (Field)	deg c	--	15	3.5	--	10.5	11	8	8	9.3	10.2	10.2
Total Dissolved Solids	mg/l	--	500	1900	1670	1710	1640	1740	1790	1830	1790	1830
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0048	0.0068	0.0084	0.0026	0.012	0.004	0.005	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.474	0.45	0.429	0.432	0.474	0.48	0.52	0.43	0.44
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	37.5	33.8	36.2	33.9	33.2	33	22	25	27
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	0.004	0.009
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0006	0.0007	0.0006	0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.003	<0.002	<0.002	0.003	0.004	0.002	0.002	<0.001
Iron, dissolved	mg/l	--	0.3	0.149	0.122	1.44	0.005	0.01	<0.03	0.11	0.40	0.75
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	38.5	39	41.2	39	37.1	39	25	30	30
Manganese, dissolved	mg/l	--	0.05	0.479	0.403	0.469	0.461	0.466	0.40	0.38	0.32	0.38
Potassium, dissolved	mg/l	--	--	17.9	14.9	14.9	16.1	15.6	12	12	12	11
Sodium, dissolved	mg/l	--	200 [7]	662	535	551	495	526	471	537	531	510
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	0.01	<0.01	<0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 24-May-2011 [4] G-4	07-1C 29-Nov-2011 [4] 07-1C	07-1C 31-May-2012 07-1C	07-1C 28-Nov-2012 07-1C	07-1C 29-May-2013 07-1C	07-1C 26-Nov-2013 GW-20	07-1C 29-May-2014 07-1C	07-1C 19-Nov-2014 07-1C	07-1C 02-Jun-2015 07-1C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	671	674	650	670	680	680	660	660	693
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	14	7.7	5.5	5.8	7.6	8.6	6.2	8
Alkalinity (Total as CaCO3)	mg/l	--	--	671	688	660	680	690	680	670	670	701
Ammonia Nitrogen	mg/l	--	--	0.59	0.40	0.56	0.41	0.49	0.25	0.60	0.25	0.60
Chemical Oxygen Demand	mg/l	--	--	30	30	34	28	29	26	26	23	40
Chloride	mg/l	--	250	452	460	420	400	310	410	440	510	528
Conductivity	uS/cm	--	--	2840	2870	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2576	2534	2433	2423	1976	2172	2366	2664	2555
Hardness, Calcium Carbonate	mg/l	--	--	199	136	150	150	230	180	200	160	161
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	0.11	0.16	0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.050	<0.010	0.057	0.021	0.060	0.049	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.81	0.50	1.4	1.6	0.93	0.85	1.2	0.94	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	0.11	<0.10	0.17	0.18	0.16	<0.10	--
pH	-	--	--	8.26	8.35	8.10	--	7.96	8.08	8.14	8.00	--
pH (Field)	-	--	--	7.57	7.47	7.40	7.62	6.99	7.23	7.65	7.69	7.46
Phosphorus	mg/l	--	--	0.40	0.29	0.34	0.36	0.21	0.25	0.49	0.33	0.38
Sulphate	mg/l	--	500 [6]	86	84	72	75	94	81	66	54	56
Temperature (Field)	deg c	--	15	13.6	7.9	9.2	8.5	8.7	7.7	9.8	6.0	9.5
Total Dissolved Solids	mg/l	--	500	1850	1870	1560	1590	1600	1560	1490	1460	1700
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	0.0043	0.004	0.0030	0.0029	0.0049	0.0038	0.003
Boron, dissolved	mg/l	5	--	0.44	0.50	0.5	0.59	0.56	0.48	0.52	0.53	0.314
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	27	18	21	20	31	25	27	23	22.9
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.0050	<0.005	<0.0050	0.0054	<0.0050	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0003	<0.00050	<0.0005	<0.00050	<0.00050	0.00054	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.0010	<0.001	0.0014	0.0012	0.0025	<0.0020	<0.0005
Iron, dissolved	mg/l	--	0.3	0.88	<0.03	0.5	0.46	<0.1	<0.1	1.4	0.87	0.563
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	0.0004
Magnesium, dissolved	mg/l	--	--	32	22	24	24	38	28	31	24	25.2
Manganese, dissolved	mg/l	--	0.05	0.34	0.14	0.24	0.32	0.33	0.28	0.35	0.27	0.33
Potassium, dissolved	mg/l	--	--	13	11	12	13	14	12	13	12	10.7
Sodium, dissolved	mg/l	--	200 [7]	502	521	560	570	560	510	570	550	586
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.0050	<0.005	<0.0050	0.0086	<0.0050	<0.0050	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 26-Nov-2015	07-1C 26-May-2016	07-1C 17-Nov-2016	07-1C 24-May-2017	07-1C 29-Nov-2017	07-1C 24-May-2018	07-1C 22-Nov-2018	07-1C 19-Jun-2019	07-1C 20-Nov-2019 [21]
				07-1C	07-1C	07-1C	07-1C	07-1C	07-1C	07-1C	07-1C	07-1C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	709	712	713	735	737	742	781	661	682
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	5	5	<5	8	8	7	<5	9
Alkalinity (Total as CaCO3)	mg/l	--	--	716	718	718	740	745	750	788	665	690
Ammonia Nitrogen	mg/l	--	--	0.32	0.71	0.54	1.14	0.40	0.68	0.38	0.61	0.36
Chemical Oxygen Demand	mg/l	--	--	32	31	49	30	39	67	40	28	42
Chloride	mg/l	--	250	450	509	511	434	478	465	552	418	448
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2678	2628	2773	2528	2303	2701	2379	2442	2600
Hardness, Calcium Carbonate	mg/l	--	--	114	177	152	192	153	201	192	229	276
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.2	0.8	1.6	0.8	1.3	0.8	0.9	0.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.65	7.73	7.28	7.55	7.50	7.36	7.85	7.49	--
Phosphorus	mg/l	--	--	0.50	0.45	0.32	0.64	0.35	0.64	0.41	0.66	0.54
Sulphate	mg/l	--	500 [6]	73	63	65	105	108	93	81	117	115
Temperature (Field)	deg c	--	15	9.3	9.3	10.1	8.5	8.2	9.0	7.7	11.7	8.4
Total Dissolved Solids	mg/l	--	500	1460	1630	1570	1520	1560	1560	1730	1440	1470
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.007	0.005	0.003	0.003	0.003	0.003	0.004
Boron, dissolved	mg/l	5	--	0.535	0.482	0.619	0.456	0.522	0.542	0.55	0.452	0.421
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	17	24.7	21.4	27	22.1	30.1	29.1	34	39.6
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.006	0.01	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.0007	0.0006
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0006	0.0012	0.0011	0.0005	0.0038	0.0010	0.0016
Iron, dissolved	mg/l	--	0.3	0.724	0.351	0.273	<0.1	0.133	0.426	0.218	0.917	0.411
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0006	0.0002
Magnesium, dissolved	mg/l	--	--	17.4	27.9	23.9	30.2	23.7	30.5	28.9	35	43.1
Manganese, dissolved	mg/l	--	0.05	0.34	0.279	0.429	0.341	0.3	0.312	0.22	0.389	0.401
Potassium, dissolved	mg/l	--	--	10.8	14.2	12.5	13.1	13.6	13.4	16.2	14.1	19.5
Sodium, dissolved	mg/l	--	200 [7]	587	502	587	583	553	509	597	442	518
Zinc, dissolved	mg/l	--	5	0.009	<0.005	<0.005	0.006	<0.005	0.005	<0.005	0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.003	0.004	<0.002 [11]	<0.001	<0.001	0.006	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 21-May-2020	07-1C 26-Nov-2020	07-1C 26-May-2021	07-1C 30-Nov-2021
				07-1C	07-1C	07-1C	07-1C
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	657	671	667	674
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	7	<5	10
Alkalinity (Total as CaCO3)	mg/l	--	--	660	679	670	684
Ammonia Nitrogen	mg/l	--	--	0.54	0.27	0.58	0.31
Chemical Oxygen Demand	mg/l	--	--	49	65	38	51
Chloride	mg/l	--	250	566	419	412	454
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2387	2316	2544	2500
Hardness, Calcium Carbonate	mg/l	--	--	238	193	241	165
Nitrate as N	mg/l	10.0	--	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.4	0.8	0.9	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.25	7.64	7.36	7.49
Phosphorus	mg/l	--	--	1.01	0.72	0.58	0.56
Sulphate	mg/l	--	500 [6]	113	120	97	97
Temperature (Field)	deg c	--	15	8.1	8.1	9.3	7.1
Total Dissolved Solids	mg/l	--	500	1570	1490	1550	1650
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.003	0.003
Boron, dissolved	mg/l	5	--	0.389	0.411	0.409	0.398
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	34	27.2	31.4	25.1
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0007	0.0005	0.0008	0.0007
Copper, dissolved	mg/l	--	1	0.0034	0.0013	0.0009	0.0011
Iron, dissolved	mg/l	--	0.3	0.853	0.295	0.287	0.241
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	37.1	30.3	39.4	25
Manganese, dissolved	mg/l	--	0.05	0.396	0.371	0.348	0.488
Potassium, dissolved	mg/l	--	--	14.4	13.7	14.7	13.3
Sodium, dissolved	mg/l	--	200 [7]	537	521	501	457
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.006
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.004	<0.004 [11]	<0.004 [11]	<0.001
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 30-Nov-2007	07-1D 28-Feb-2008	07-1D 22-May-2008	07-1D 13-Aug-2008	07-1D 10-Nov-2008	07-1D 19-May-2009 G-6	07-1D 26-Nov-2009 J-14	07-1D 25-May-2010 [4] M-5	07-1D 20-Oct-2010 [4] G-3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	730	690	654	681	717	618	697	635	709
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	730	690	654	681	717	618	697	635	709
Ammonia Nitrogen	mg/l	--	--	1.31	1.26	0.8	1.18	1.21	1.75	1.52	1.73	1.21
Chemical Oxygen Demand	mg/l	--	--	307	58	54	114	43	33	90	40	38
Chloride	mg/l	--	250	105	90.7	77.2	96.4	104	63	95	59	84
Conductivity	uS/cm	--	--	--	--	--	--	--	1460	1660	1440	1590
Conductivity (Field)	uS/cm	--	--	1300	--	1500	1450	1400	1100	1456	1423	1530
Hardness, Calcium Carbonate	mg/l	--	--	383	401	381	357	386	319	333	369	404
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.2	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	7.44	3.91	3.24	3.32	3.2	2.37	1.94	2.23	1.75
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	7.23	7.64	7.39	7.16
pH (Field)	-	--	--	6.8	--	6.8	7.2	6.7	--	6.51	6.99	6.73
Phosphorus	mg/l	--	--	--	--	--	--	--	1.15	1.12	0.92	1.39
Sulphate	mg/l	--	500 [6]	182	164	150	140	140	108	102	59	60
Temperature (Field)	deg c	--	15	5.5	--	10.5	15	8	8	9.1	13.2	9
Total Dissolved Solids	mg/l	--	500	1210	1050	1040	1020	1080	949	1080	936	1030
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0086	0.0048	0.0044	0.0015	0.0045	<0.001	0.004	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.431	0.314	0.326	0.424	0.446	0.33	0.48	0.31	0.52
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	65.1	71.9	65.1	61.3	72.6	57	64	67	81
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.006	0.005	0.004	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	0.0007	0.0006	0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	0.002	<0.001
Iron, dissolved	mg/l	--	0.3	8.46	12.8	14.1	2.95	8.04	2.19	9.01	14.2	19.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	53.5	53.7	53.2	49.6	49.8	43	42	49	49
Manganese, dissolved	mg/l	--	0.05	2.14	2.67	2.13	2.14	2.71	2.78	2.01	2.79	3.55
Potassium, dissolved	mg/l	--	--	12	8	9.5	11.2	10.3	6	9	8	8
Sodium, dissolved	mg/l	--	200 [7]	347	234	270	248	259	187	237	211	207
Zinc, dissolved	mg/l	--	5	<0.005	0.013	0.008	<0.005	<0.005	0.03	0.01	<0.01	<0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 24-May-2011 [4] G-12	07-1D 29-Nov-2011 [4] 07-1D	07-1D 31-May-2012 07-1D	07-1D 28-Nov-2012 07-1D	07-1D 29-May-2013 7-1D	07-1D 26-Nov-2013 GW-12	07-1D 29-May-2014 [22] 07-1D	07-1D 19-Nov-2014 07-1D	07-1D 02-Jun-2015 07-1D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	642	690	620	700	510	630	370	610	503
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	2.0	1.5	1.8	1.9	1.8	1.5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	642	690	630	700	510	630	370	610	504
Ammonia Nitrogen	mg/l	--	--	0.62	0.98	1.0	1.4	0.82	1.6	0.90	0.61	1.23
Chemical Oxygen Demand	mg/l	--	--	30	33	33	41	36	34	25	25	37
Chloride	mg/l	--	250	58	62	46	75	30	41	19	58	42
Conductivity	uS/cm	--	--	1440	1450	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1070	1468	1201	1447	977	1202	862	1161	1153
Hardness, Calcium Carbonate	mg/l	--	--	397	403	380	430	390	360	350	400	236
Nitrate as N	mg/l	10.0	--	0.12	0.10	<0.10	<0.10	0.69	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.014	0.016	0.095	0.016	0.043	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.09	1.96	1.7	2.1	1.3	2.4	1.5	1.1	1.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	<0.10	<0.10	0.78	<0.10	<0.10	<0.10	--
pH	-	--	--	7.86	7.73	7.54	--	7.57	7.51	7.70	7.43	--
pH (Field)	-	--	--	6.89	7.07	6.95	6.76	6.62	6.76	7.07	6.83	6.85
Phosphorus	mg/l	--	--	0.55	0.34	0.32	0.51	0.35	0.58	0.41	0.38	0.37
Sulphate	mg/l	--	500 [6]	80	52	66	50	65	50	34	44	61
Temperature (Field)	deg c	--	15	14.0	7.7	9.9	7.8	9.0	7.7	9.5	7.6	9.3
Total Dissolved Solids	mg/l	--	500	936	942	824	950	746	736	418	600	684
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.0010	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	0.26	0.44	0.39	0.64	0.41	0.36	0.42	0.28	0.293
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	78	79	74	78	75	81	65	96	48.6
Chromium, dissolved	mg/l	0.05	--	0.002	0.006	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0009	0.0006	<0.00050	0.0008	<0.00050	0.00079	<0.00050	0.0011	0.0006
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0014	0.001	0.0015	0.0014	0.0016	0.0013	<0.0005
Iron, dissolved	mg/l	--	0.3	4.81	10.5	4.5	7	3.4	2.1	10	3.5	3.28
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	49	50	48	57	50	40	45	38	27.7
Manganese, dissolved	mg/l	--	0.05	1.63	3.22	1.7	4.1	2.2	1.7	2.1	3	1.57
Potassium, dissolved	mg/l	--	--	8	8	6.5	9.3	6.1	6.8	6.9	7.6	5.78
Sodium, dissolved	mg/l	--	200 [7]	174	208	170	230	160	130	160	100	121
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.0050	<0.005	<0.0050	0.011	<0.0050	0.0056	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0013	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 26-Nov-2015 07-1D	07-1D 26-May-2016 07-1D	07-1D 17-Nov-2016 07-1D	07-1D 24-May-2017 07-1D	07-1D 29-Nov-2017 07-1D	07-1D 24-May-2018 07-1D	07-1D 22-Nov-2018 07-1D	07-1D 19-Jun-2019 07-1D	07-1D 20-Nov-2019 07-1D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	471	477	516	383	455	439	545	426	361
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	471	477	517	384	456	440	546	428	361
Ammonia Nitrogen	mg/l	--	--	1.48	1.00	0.48	0.45	0.26	0.28	0.04	0.26	0.10
Chemical Oxygen Demand	mg/l	--	--	32	38	27	61	51	55	30	68	52
Chloride	mg/l	--	250	33	54	71	23	34	24	35	17	28
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1138	1261	1571	1046	1175	1099	971	1025	1178
Hardness, Calcium Carbonate	mg/l	--	--	365	441	561	438	527	503	592	485	539
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	<0.1	0.5	1.4	0.6	0.8	1.7
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.9	1.3	1.0	1.8	1.7	2.1	0.9	2.2	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.95	7.19	7.25	7.09	7.04	6.92	7.17	7.05	6.8
Phosphorus	mg/l	--	--	0.58	0.40	0.34	0.60	1.07	1.08	0.73	1.42	0.61
Sulphate	mg/l	--	500 [6]	58	153	313	220	270	196	207	197	215
Temperature (Field)	deg c	--	15	9.0	9.3	10.3	9.3	7.1	9.5	7	12.6	7.8
Total Dissolved Solids	mg/l	--	500	596	760	986	698	796	748	822	686	752
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.33	0.359	0.386	0.172	0.267	0.245	0.877	0.247	0.286
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	68.9	84.8	142	127	143	136	122	119	134
Chromium, dissolved	mg/l	0.05	--	0.001	<0.001	0.006	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0009	0.0019	0.0030	0.0025	0.0022	0.0042	0.0032	0.0031
Iron, dissolved	mg/l	--	0.3	4.66	4.71	2.05	0.497	1.1	0.57	2.61	<0.1	0.662
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	46.7	55.7	50.1	29.2	41.3	39.7	69.7	45.6	49.7
Manganese, dissolved	mg/l	--	0.05	1.31	2.03	0.624	0.27	0.487	0.334	1.03	0.67	0.344
Potassium, dissolved	mg/l	--	--	6.12	7.68	7.53	7.08	7.51	5.38	9.11	7.07	7.56
Sodium, dissolved	mg/l	--	200 [7]	137	152	105	42.3	62.9	48.6	139	63.8	63.3
Zinc, dissolved	mg/l	--	5	0.009	0.009	<0.005	<0.005	<0.005	<0.005	0.007	0.008	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.005	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 21-May-2020 07-1D	07-1D 26-Nov-2020 07-1D	07-1D 26-May-2021 07-1D	07-1D 30-Nov-2021 07-1D
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	391	426	401	459
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	393	428	402	461
Ammonia Nitrogen	mg/l	--	--	0.23	0.20	0.38	0.07
Chemical Oxygen Demand	mg/l	--	--	142	93	251	51
Chloride	mg/l	--	250	21	26	18	11
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1019	1111	1092	1145
Hardness, Calcium Carbonate	mg/l	--	--	466	513	483	495
Nitrate as N	mg/l	10.0	--	1.8	0.2	0.7	0.6
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.2	1.9	5.7	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.06	7.05	6.94	6.81
Phosphorus	mg/l	--	--	2.89	0.91	3.23	0.71
Sulphate	mg/l	--	500 [6]	253	254	186	187
Temperature (Field)	deg c	--	15	7.86	6.8	9.9	6.9
Total Dissolved Solids	mg/l	--	500	716	764	670	720
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.185	0.248	0.173	0.175
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	116	127	123	136
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0047	0.0031	0.0026	0.0027
Iron, dissolved	mg/l	--	0.3	0.195	<0.1	0.184	0.898
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	42.8	47.6	42.3	37.4
Manganese, dissolved	mg/l	--	0.05	0.392	0.07	0.144	0.369
Potassium, dissolved	mg/l	--	--	5.54	6.08	5.47	5.75
Sodium, dissolved	mg/l	--	200 [7]	55	62.9	43.8	39.8
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 09-Jun-1992	92-1 01-Nov-1992	92-1 15-Jun-1994	92-1 02-Nov-1994	92-1 22-Nov-1995	92-1 12-Oct-1996	92-1 06-Nov-1997
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	996	1061	--	771	848	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	10	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	816	870	706	642	712	716	640
Ammonia Nitrogen	mg/l	--	--	--	--	--	1.09	0.77	1.12	0.7
Chemical Oxygen Demand	mg/l	--	--	--	--	323	363	27	20	17
Chloride	mg/l	--	250	307	404	390	266	235	186	196
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2486	2579	2210	2140	2180	1910	1900
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	4.14	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	73.89	66	63	49	40	36	36
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	3.1	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	2.33	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.21	8.12	8.52	8.82	9.13	8.31	8.01
Phosphate	mg/l	--	--	--	--	--	--	1.7	--	--
Phosphorus	mg/l	--	--	--	--	1.63	1.095	--	--	--
Sulphate	mg/l	--	500 [6]	70	87.5	5.3	6	5	3	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1120	1080	1090	960	950
Total Organic Carbon	mg/l	--	--	--	--	11.8	23.3	10.8	8.9	9.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	4560	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.199	--	--	--
Boron, dissolved	mg/l	5	--	--	--	0.98	0.868	0.89	0.8	0.91
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.001	--	--
Calcium, dissolved	mg/l	--	--	7	7.77	9	3.8	4.5	4.4	4.14
Chromium, dissolved	mg/l	0.05	--	--	--	0.012	0.01	0.03	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0154	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	2.993	1.19	2.11	2.4	1.29
Lead, dissolved	mg/l	0.01	--	--	--	0.0012	0.1	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	13.7	11.4	10	2.115	7.01	5.96	6.1
Manganese, dissolved	mg/l	--	0.05	--	--	0.062	0.032	0.04	0.04	0.03
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	22.49	18	22	8.481	13.3	12.9	13.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	555.9	728	423	414.9	461	386	384
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.072	0.001	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 05-Jun-1998	92-1 26-Aug-1998	92-1 29-Oct-1998	92-1 06-May-1999	92-1 24-Oct-2000	92-1 14-Jun-2001	92-1 06-Nov-2002	92-1 30-May-2003	92-1 19-Nov-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	359	910	824	997	865	955	893	889
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	1	19	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	450	294	746	710	817	741	783	732	729
Ammonia Nitrogen	mg/l	--	--	0.63	0.21	6.05	1.34	0.06	1.26	0.74	0.62	1.03
Chemical Oxygen Demand	mg/l	--	--	35	49	392	310	--	27	39	27	41
Chloride	mg/l	--	250	450	20.9	275	285	275	219	334	236	248
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1893	1130	2040	1930	2130	1550	2020	1780	2180
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	552	559	54	36	28	25	30	29	27
Nitrate as N	mg/l	10.0	--	1	1.1	--	--	0.1	0.1	0.1	0.1	<1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	7.18	9.11	1.56	1.69	1.33	1.32	1.67
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.21	8.4	8.4	8.59	8.4	8.2	7.3	8.4
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	1.59	1.37	1.27	1.26	1.48
Sulphate	mg/l	--	500 [6]	39	314	2	1	1	1	1	1	10
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	946	563	1020	960	1170	966	1160	1150	1090
Total Organic Carbon	mg/l	--	--	7.4	22	11.7	16.5	--	10.4	11	12	10
Total Suspended Solids	mg/l	--	--	--	--	--	--	244	2490	102	80	114
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.002	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.04	0.47	1.08	1.03	0.96	0.94	0.99	0.94	1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	165	136	6.61	2.32	2.39	2.26	3.08	3.44	2.22
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.06	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.002
Iron, dissolved	mg/l	--	0.3	19.6	2.6	0.45	0.06	0.07	0.07	0.02	0.07	0.041
Lead, dissolved	mg/l	0.01	--	0.0067	0.0002	0.0002	0.0015	0.022	0.0002	0.0013	0.0005	0.0007
Magnesium, dissolved	mg/l	--	--	33.4	52.6	9.01	6.69	5.3	4.6	5.48	4.85	5.14
Manganese, dissolved	mg/l	--	0.05	1.05	1.16	0.02	0.01	0.01	0.01	0.01	0.01	0.003
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	20.9	6.5	28.5	10.2	13.7	6.8	10.7	11.1	11.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	281	78.6	499	532	490	423	498	448	477
Zinc, dissolved	mg/l	--	5	0.14	0.52	0.01	0.01	0.01	0.01	0.01	0.01	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.039	0.001	0.001	0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 16-Nov-2005	92-1 15-May-2007	92-1 10-Nov-2008	92-1 26-Nov-2009 M-4	92-1 24-May-2011 [4] G-19	92-1 28-Nov-2012 92-1	92-1 29-May-2014 92-1	92-1 26-Nov-2015 92-1	92-1 24-May-2017 92-1
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	188	770	750	724	713	700	700	746	776
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	27	37	25	30	16	18
Alkalinity (Total as CaCO3)	mg/l	--	--	770	770	750	751	750	730	730	762	795
Ammonia Nitrogen	mg/l	--	--	0.95	0.67	0.9	1.01	0.96	1.2	1.2	1.22	1.21
Chemical Oxygen Demand	mg/l	--	--	35	84	<100	93	35	37	40	67	41
Chloride	mg/l	--	250	240	268	286	277	299	290	320	347	334
Conductivity	uS/cm	--	--	--	--	--	2250	2340	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1900	1500	1900	1995	2089	2191	2031	2262	2309
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	32	31	41	35	39	36	36	28.4	36
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	<0.10	<0.10	<0.010	0.014	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.56	2.05	7.62	1.32	1.37	2.7	6.2	1.8	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	8.60	8.74	--	8.66	--	--
pH (Field)	-	--	--	--	8.9	8.2	8.55	8.72	8.53	8.39	8.69	8.63
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.98	--	--	2.98	1.31	1.3	1.2	1.13	1.13
Sulphate	mg/l	--	500 [6]	<1	1	2	2	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	--	10.2	9	10	12.5	6.0	11.1	9.7	11.4
Total Dissolved Solids	mg/l	--	500	1260	1210	1280	1460	1520	1360	1350	1370	1360
Total Organic Carbon	mg/l	--	--	12	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	50	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0013	0.0025	0.002	<0.01	<0.001	<0.0010	<0.001	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.02	0.927	0.939	0.9	1.0	1.2	1.1	1.16	1.08
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3.11	3.1	4.14	4	4	3.5	3.5	2.5	3.3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	0.007	<0.005	<0.005	<0.0050	<0.001	0.01
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.0002	0.0003	<0.0005	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.001	0.002	<0.001	0.0020	<0.0005	0.0007
Iron, dissolved	mg/l	--	0.3	0.039	0.131	0.065	0.09	0.03	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0002	0.00006	<0.00002	<0.001	<0.001	<0.0005	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	5.8	5.74	7.35	6	7	6.6	6.7	5.39	6.69
Manganese, dissolved	mg/l	--	0.05	0.004	0.017	0.013	0.02	0.01	0.004	0.0036	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13.8	12.8	14.3	11	12	13	13	11.1	13.1
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	548	458	511	449	552	550	550	592	557
Zinc, dissolved	mg/l	--	5	0.006	<0.005	<0.005	<0.01	0.01	<0.005	<0.0050	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 22-Nov-2018 92-1	92-1 21-May-2020 92-1	92-1 30-Nov-2021 92-1
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	830	729	763
Alkalinity, Carbonate as CaCO3	mg/l	--	--	11	31	16
Alkalinity (Total as CaCO3)	mg/l	--	--	841	760	780
Ammonia Nitrogen	mg/l	--	--	1.15	1.13	0.97
Chemical Oxygen Demand	mg/l	--	--	68	71	65
Chloride	mg/l	--	250	372	423	336
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2096	2186	2296
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	63	74.5	41.1
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.1	1.7	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.47	8.06	8.70
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	1.40	1.22	1.25
Sulphate	mg/l	--	500 [6]	<1	<1	<1
Temperature (Field)	deg c	--	15	9.1	13.0	8.2
Total Dissolved Solids	mg/l	--	500	1390	1410	1350
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	1.08	0.83	0.877
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	11.9	14.5	5.42
Chromium, dissolved	mg/l	0.05	--	<0.001	0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0020	0.0032	0.0040
Iron, dissolved	mg/l	--	0.3	0.111	0.825	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	8.06	9.26	6.69
Manganese, dissolved	mg/l	--	0.05	0.016	0.055	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.9	14	12
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	549	563	490
Zinc, dissolved	mg/l	--	5	<0.005	0.008	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	0.004	0.007	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 09-Jun-1992	92-5 01-Nov-1992	92-5 08-Jun-1993	92-5 04-Nov-1993	92-5 15-Jun-1994	92-5 02-Nov-1994	92-5 28-Jun-1995
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	922	928	926	910	--	669	871
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	<1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	756	761	759	746	752	724	714
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	1.73	2.3
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	138	242	188
Chloride	mg/l	--	250	928	1240	1315	1375	1480	1090	167
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4255	4404	3990	4380	4890	4880	4820
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	6.02	4.64
Hardness, Calcium Carbonate	mg/l	--	--	361.84	361	286	276	318	320	221
Nitrate as N	mg/l	10.0	--	--	--	0.3	8.17	0.1	0.4	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	5.7
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.67	8.05	7.9	8.06	7.94	8.27	7.85
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	1.45	0.577	4.3
Sulphate	mg/l	--	500 [6]	29	25.5	4.8	7.1	1.9	1.9	6
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	2555	2520	2460	2440	2410
Total Organic Carbon	mg/l	--	--	--	--	--	--	22.2	26.6	24.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	0.139	0.068	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.088	--
Boron, dissolved	mg/l	5	--	--	--	--	--	1.19	1.068	0.83
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**	0.0001
Calcium, dissolved	mg/l	--	--	47.6	46	36.1	35	42.1	28.04	28.5
Chromium, dissolved	mg/l	0.05	--	--	--	**0.1**	<0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.017	0.01	0.0151	0.01	0.02
Iron, dissolved	mg/l	--	0.3	--	--	0.247	<0.1	0.436	0.159	0.06
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	**0.116**	0.0013	**0.1**	0.0002
Magnesium, dissolved	mg/l	--	--	59	59.8	47.6	45.7	51.6	23.816	36.1
Manganese, dissolved	mg/l	--	0.05	--	--	0.087	0.01	0.192	0.075	0.1
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.023	<0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	23	28.1	28.3	26.7	35	21.69	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	827.7	1050	909	945	791	848.8	693
Zinc, dissolved	mg/l	--	5	--	--	0.083	<0.01	0.01	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.007	0.063	0.001	0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 23-Nov-1995	92-5 12-Oct-1996	92-5 06-Nov-1997	92-5 05-Jun-1998	92-5 06-May-1999	92-5 24-Oct-2000	92-5 14-Jun-2001	92-5 06-Nov-2002	92-5 30-May-2003
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	893	--	--	--	900	1050	936	977	911
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	732	764	808	672	738	861	768	801	747
Ammonia Nitrogen	mg/l	--	--	1.34	2.18	1.25	0.93	1.98	1.07	1.99	2.63	2.14
Chemical Oxygen Demand	mg/l	--	--	68	43	36	31	51	--	51	99	68
Chloride	mg/l	--	250	1100	1110	944	1120	1110	1230	1100	1120	1190
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5080	4550	4600	4550	4400	4660	4350	4530	4270
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	269	239	266	252	246	272	214	250	227
Nitrate as N	mg/l	10.0	--	0.6	0.1	0.1	2.8	--	0.1	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4.5	--	--	--	5.84	2.77	3.14	4.89	3.63
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	3.16	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.75	7.76	7.48	--	7.8	8.06	7.8	7.8	7.1
Phosphate	mg/l	--	--	0.7	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	3.42	2.79	4.96	1.2
Sulphate	mg/l	--	500 [6]	1	4	1	39	2	3	1	2	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2540	2280	2310	2270	2200	2700	2300	2610	--
Total Organic Carbon	mg/l	--	--	19.9	17.5	18.4	18.8	22.4	--	18.7	19.1	17.9
Total Suspended Solids	mg/l	--	--	--	1730	--	--	--	4360	2070	2220	856
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.003	0.001	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.91	0.96	1.8	1.18	1.13	1.15	1.18	1.18	1.11
Cadmium, dissolved	mg/l	0.005	--	0.0001	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	32.1	28	32.7	30	31.2	28.7	26.9	29.5	29
Chromium, dissolved	mg/l	0.05	--	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.38	0.97	0.54	1.27	0.45	0.27	0.12	0.56	1.06
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0008	0.022	0.0002	0.0059	0.0006
Magnesium, dissolved	mg/l	--	--	45.2	40.5	44.2	42.5	40.3	48.6	35.6	42.8	37.5
Manganese, dissolved	mg/l	--	0.05	0.12	0.11	0.1	0.13	0.12	0.09	0.08	0.1	0.08
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	26.2	25.4	24.7	31	27.2	26.4	21	25.8	27.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	841	937	908	1140	951	937	923	984	812
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.003	0.08	0.001	0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 19-Nov-2004	92-5 16-Nov-2005	92-5 15-May-2007	92-5 10-Nov-2008	92-5 26-Nov-2009 [23] M-2	92-5 24-May-2011 [4] G-23	92-5 28-Nov-2012 92-5	92-5 29-May-2014 92-5	92-5 26-Nov-2015 92-5
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	982	198	840	810	796	766	750	760	790
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<2 [8]	23	9.7	15	13
Alkalinity (Total as CaCO3)	mg/l	--	--	805	810	840	810	796	789	760	770	803
Ammonia Nitrogen	mg/l	--	--	2.38	1.7	1.16	1.64	2.01	1.92	1.9	1.7	0.05
Chemical Oxygen Demand	mg/l	--	--	67	74	107	61	60	65	68	53	105
Chloride	mg/l	--	250	1200	1120	1200	1230	1110	1100	1100	1200	1180
Conductivity	uS/cm	--	--	--	--	--	--	4850	4890	--	--	--
Conductivity (Field)	uS/cm	--	--	4710	3400	3500	4350	>3999	>3999	3871	3903	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	231	253	235	229	224	244	250	260	271
Nitrate as N	mg/l	10.0	--	1	1.4	0.2	0.2	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.3	3.3	2.76	3.25	2.99	3.05	2.7	2.5	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	8.19	8.50	--	8.33	--
pH (Field)	-	--	--	7.9	--	8.4	8	7.9	8.09	8.04	7.63	8.01
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1	1.62	--	--	0.95	1.52	1.5	0.98	0.96
Sulphate	mg/l	--	500 [6]	10	<1	2	1	4	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	--	--	10.2	8	10.8	12.5	8.5	11.6	9.8
Total Dissolved Solids	mg/l	--	500	2355	2700	2700	2680	3150	3180	2590	2590	2730
Total Organic Carbon	mg/l	--	--	16.3	20.6	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	710	28	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.0076	0.0064	0.009	<0.01	0.002	0.0037 [20]	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.14	1.21	1.1	1.11	0.96	1.3	1.4	1.3	1.35
Cadmium, dissolved	mg/l	0.005	--	--	0.0001	0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	29.4	32.2	30.3	29.2	27	30	31	32	29
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	0.0006	0.0008	0.0005	0.00059	0.0005
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.006	0.003	0.007	0.006	0.003	0.0028	<0.0005
Iron, dissolved	mg/l	--	0.3	0.404	0.312	0.413	0.015	<0.03	<0.03	<0.1	0.18	<0.1
Lead, dissolved	mg/l	0.01	--	0.0013	0.0007	0.00016	<0.00002	<0.001	<0.001	<0.0005	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	38.3	41.9	38.7	37.9	38	41	42	44	48.2
Manganese, dissolved	mg/l	--	0.05	0.083	0.081	0.023	0.032	<0.01	0.02	<0.002	0.036	0.011
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.2	31.7	29.9	27.8	24	27	27	27	22.7
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	877	1010	887	864	884	833	930	830	1060
Zinc, dissolved	mg/l	--	5	0.005	0.006	<0.005	<0.005	0.01	0.02	<0.005	<0.0050	0.008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0010	<0.004 [10]
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00025	<0.00010	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00025	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0013	<0.00050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.00020	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 24-May-2017	92-5 29-Nov-2018	92-5 21-May-2020	92-5 30-Nov-2021
				92-5	92-5	92-5	92-5
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	834	884	766	790
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	15	13	19
Alkalinity (Total as CaCO3)	mg/l	--	--	847	899	779	810
Ammonia Nitrogen	mg/l	--	--	0.01	0.20	1.44	2.19
Chemical Oxygen Demand	mg/l	--	--	111	147	127	303
Chloride	mg/l	--	250	1160	1120	1400	1100
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	94	327	290	260
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.25 [9]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	2.1	2.6	7.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.00	8.1	8.14	8.17
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.92	1.43	1.50	13.9
Sulphate	mg/l	--	500 [6]	1	<1	<1	<1
Temperature (Field)	deg c	--	15	11.9	6.9	13.6	8.2
Total Dissolved Solids	mg/l	--	500	2620	2600	2680	2700
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.008	0.003	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.981	1.26	0.92	0.954
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31.1	41.8	35.5	31.6
Chromium, dissolved	mg/l	0.05	--	0.017	0.002	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0012	0.0011	0.0007
Copper, dissolved	mg/l	--	1	0.0013	0.0046	0.0035	0.0035
Iron, dissolved	mg/l	--	0.3	<0.1	0.645	0.998	0.322
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0002	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	3.9	54	48.8	44
Manganese, dissolved	mg/l	--	0.05	0.12	0.024	0.122	0.08
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	27.9	33.6	28.9	25.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	981	1010	899	812
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.006	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.010 [10]	<0.001	0.005	<0.004 [11]
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 09-Jun-1992	92-7 01-Nov-1992	92-7 08-Jun-1993	92-7 04-Nov-1993	92-7 15-Jun-1994	92-7 02-Nov-1994	92-7 28-Jun-1995	92-7 23-Nov-1995	92-7 12-Jun-1996
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	561	529	515	538	--	503	524	597	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	<1	--	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	460	434	422	441	442	420	430	462	462
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	0.89	0.8	0.39	0.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	143	115	125	48	45
Chloride	mg/l	--	250	298	407	465	568	720	410	300	342	377
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1822	1687	1780	1930	2060	2050	2030	2100	1970
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	8.72	6.07	--	--
Hardness, Calcium Carbonate	mg/l	--	--	219.79	161	145	147	167	169	155	158	159
Nitrate as N	mg/l	10.0	--	--	--	0.3	3.1	0.1	1.08	0.1	0.8	0.6
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	6.8	1.8	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	6	1.41	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.76	8.02	7.3	7.7	7.53	7.94	7.49	8.16	7.69
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.3	--
Phosphorus	mg/l	--	--	--	--	--	--	3.85	0.356	4.1	--	--
Sulphate	mg/l	--	500 [6]	13	4.7	1.8	4.4	2.6	2.3	2	4	4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1176	1000	1040	1030	1020	1050	990
Total Organic Carbon	mg/l	--	--	--	--	--	--	15.2	19	15.8	14.8	15.2
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	1960
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	2.91	0.344	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.1	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.04	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	0.4	0.442	0.37	0.36	0.387
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.01	0.0001	0.0001	--
Calcium, dissolved	mg/l	--	--	34.9	24	21.1	22.5	25.5	20.64	24.4	23.8	22.6
Chromium, dissolved	mg/l	0.05	--	--	--	0.018	0.01	0.01	0.01	0.01	0.02	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.1	0.01	0.0116	0.029	0.02	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.587	0.1	1.891	0.742	0.05	0.82	1.27
Lead, dissolved	mg/l	0.01	--	--	--	0.1	0.0356	0.0012	0.1	0.0003	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	32.18	24.6	22.3	22	25.2	10.426	22.5	23.6	24.5
Manganese, dissolved	mg/l	--	0.05	--	--	0.238	0.261	0.405	0.213	0.38	0.4	0.361
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.024	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.06	13.1	15.7	13.4	35.3	8.746	--	14	16.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	313.3	369	349	388	320	331	339	371	38.1
Zinc, dissolved	mg/l	--	5	--	--	0.059	0.01	0.01	0.456	0.01	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.019	0.087	0.001	0.001	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 09-Jun-1992	92-7 01-Nov-1992	92-7 08-Jun-1993	92-7 04-Nov-1993	92-7 15-Jun-1994	92-7 02-Nov-1994	92-7 28-Jun-1995	92-7 23-Nov-1995	92-7 12-Jun-1996
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 12-Oct-1996	92-7 18-Jun-1997	92-7 06-Nov-1997	92-7 05-Jun-1998	92-7 30-Oct-1998	92-7 06-May-1999	92-7 19-Oct-1999	92-7 05-May-2000	92-7 24-Oct-2000
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	366	372	471	684	620
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	23	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	479	452	466	456	300	305	424	561	508
Ammonia Nitrogen	mg/l	--	--	0.99	0.49	0.68	0.5	0.93	0.27	0.9	0.03	0.41
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	30	34	34	43	28	21	21	33	--
Chloride	mg/l	--	250	320	404	396	388	250	226	368	375	410
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1800	1980	2020	2020	1562	1180	1740	1800	2100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	2.77	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	149	176	176	173	142	165	176	166	168
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	1.6	--	--	0.1	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	3.93	1.44	--	--	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.23	7.69	7.27	--	7.3	7.1	7.6	7.6	7.57
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--	0.46
Sulphate	mg/l	--	500 [6]	9	1	2	47	29	31	13	9	8
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	900	990	1010	1000	783	590	870	900	1100
Total Organic Carbon	mg/l	--	--	15	13.5	14.7	13.7	9.4	9.2	10.6	11.8	--
Total Suspended Solids	mg/l	--	--	546	1340	--	--	--	--	1640	210	116
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.39	0.52	0.45	0.54	0.4	0.25	0.46	0.53	0.45
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	21.3	26.8	27.2	26.1	28.2	32.6	32.3	28.7	25.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.6	0.57	2.67	2.49	0.39	0.14	2.34	0.68	0.18
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0008	0.0002	0.0002	0.0003	0.0002	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	22.9	26.1	25.9	25.9	17.4	20	22.8	22.6	25.4
Manganese, dissolved	mg/l	--	0.05	0.39	0.33	0.45	0.37	0.27	0.24	0.19	0.03	0.37
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.4	12.9	15.9	14.4	12.5	11.3	12.7	6.2	11.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	321	325	331	443	244	226	334	382	459
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.22	0.01	0.01	0.13	0.1	0.02
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--	0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 12-Oct-1996	92-7 18-Jun-1997	92-7 06-Nov-1997	92-7 05-Jun-1998	92-7 30-Oct-1998	92-7 06-May-1999	92-7 19-Oct-1999	92-7 05-May-2000	92-7 24-Oct-2000
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 14-Jun-2001	92-7 23-Nov-2001	92-7 23-May-2002	92-7 06-Nov-2002	92-7 30-May-2003	92-7 09-Oct-2003	92-7 14-May-2004	92-7 19-Nov-2004	92-7 24-May-2005
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	561	583	542	597	575	--	597	634	605
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	18	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	460	478	474	489	471	480	489	520	496
Ammonia Nitrogen	mg/l	--	--	0.74	0.86	0.59	0.95	0.44	1.15	0.71	1.12	0.58
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	3	--	--	--
Chemical Oxygen Demand	mg/l	--	--	30	32	19	42	68	43	44	43	33
Chloride	mg/l	--	250	414	400	396	388	410	396	397	397	381
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1700	1750	1980	2000	1940	2000	2090	2290	2500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	112	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	135	179	178	166	159	161	167	169	174
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.1	0.2	0.2	0.1	0.2	1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.57	1.73	1.09	1.89	1.33	1.83	1.53	1.8	1.27
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.03	7.17	7.7	7	7.4	7.3	7.9	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.65	0.3	0.27	0.62	0.34	0.55	0.35	0.57	0.31
Sulphate	mg/l	--	500 [6]	5	12	7	8	6	4	10	20	9
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	10.6
Total Dissolved Solids	mg/l	--	500	1100	1040	1080	1180	970	1139	1045	1145	1130
Total Organic Carbon	mg/l	--	--	12.9	17	13	13.2	13.2	15	11.7	12.5	12.8
Total Suspended Solids	mg/l	--	--	167	82	45	202	76	100	43	910	31
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.47	0.56	0.47	0.44	0.44	0.445	0.451	0.478	0.451
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	20.9	28.6	29.5	25.3	24.9	23.8	25.8	26.3	25.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.006	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.003	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.16	0.15	0.05	0.05	0.2	2.19	0.052	0.747	0.039
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.001	0.0005	0.0009	0.0003	0.0006	0.0011
Magnesium, dissolved	mg/l	--	--	20	26.2	25.4	25	23.4	24.6	24.9	25.2	26.5
Manganese, dissolved	mg/l	--	0.05	0.01	0.36	0.31	0.57	0.27	0.296	0.163	0.349	0.098
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	9.5	13.7	15.3	12.8	13.2	13.9	14.3	14.1	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	382	388	366	348	385	386	411	397	384
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.01	0.01	0.005	0.005	0.005	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.054	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 14-Jun-2001	92-7 23-Nov-2001	92-7 23-May-2002	92-7 06-Nov-2002	92-7 30-May-2003	92-7 09-Oct-2003	92-7 14-May-2004	92-7 19-Nov-2004	92-7 24-May-2005
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 16-Nov-2005	92-7 25-May-2006	92-7 21-Nov-2006	92-7 15-May-2007	92-7 30-Nov-2007	92-7 22-May-2008	92-7 10-Nov-2008	92-7 19-May-2009 G-9	92-7 26-Nov-2009 M-6
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	303	515	528	531	540	531	543	517	534
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	496	515	528	531	540	531	543	517	534
Ammonia Nitrogen	mg/l	--	--	1.08	0.72	1.05	<0.01	0.94	0.46	1.08	0.36	1.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	35	38	55	72	26	34	30	40
Chloride	mg/l	--	250	387	413	387	437	432	413	413	402	421
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	2240	2280
Conductivity (Field)	uS/cm	--	--	2000	1700	2000	2190	1500	1900	1850	--	1998
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	178	160	175	168	170	166	174	165	163
Nitrate as N	mg/l	10.0	--	0.6	0.1	0.1	0.6	0.2	0.1	0.1	0.29	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.63	1.79	1.72	0.69	1.58	1.25	1.69	0.93	1.41
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	7.97	8.21
pH (Field)	-	--	--	--	7.7	6.7	8.1	7.9	7.7	7.5	--	7.66
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.44	--	--	--	--	--	--	0.36	0.45
Sulphate	mg/l	--	500 [6]	10	10	12	9	4	8	13	7	7
Temperature (Field)	deg c	--	15	--	5.5	11.5	10	8	12	8	--	11.6
Total Dissolved Solids	mg/l	--	500	1210	1180	1200	1250	1330	1230	1220	1460	1480
Total Organic Carbon	mg/l	--	--	14.6	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	110	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.0015	0.0019	0.0015	0.0021	0.0013	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.489	0.404	0.448	0.468	0.469	0.43	0.435	1.62	0.49
Cadmium, dissolved	mg/l	0.005	--	0.0002	<0.005	<0.0001	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	27.2	24	26.7	25.4	26	25.1	26.5	25	24
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	0.008
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0002	0.0003
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	0.001
Iron, dissolved	mg/l	--	0.3	0.667	0.053	1.19	0.019	0.728	0.025	0.009	<0.03	0.28
Lead, dissolved	mg/l	0.01	--	0.0009	0.0002	<0.0001	0.00004	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	26.8	24.4	26.2	25.4	25.5	25.1	26.3	25	25
Manganese, dissolved	mg/l	--	0.05	0.319	0.267	0.718	0.004	0.325	0.32	0.025	<0.01	0.29
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.2	13.2	14.3	15	15.5	13.6	14.6	13	15
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	456	402	410	417	502	422	403	389	427
Zinc, dissolved	mg/l	--	5	0.009	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 16-Nov-2005	92-7 25-May-2006	92-7 21-Nov-2006	92-7 15-May-2007	92-7 30-Nov-2007	92-7 22-May-2008	92-7 10-Nov-2008	92-7 19-May-2009 G-9	92-7 26-Nov-2009 M-6
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 25-May-2010 [4] M-13	92-7 20-Oct-2010 [4] G-9	92-7 24-May-2011 [4] G-15	92-7 29-Nov-2011 [4] 92-7	92-7 31-May-2012 92-7	92-7 28-Nov-2012 92-7	92-7 29-May-2013 [5] 92-7	92-7 26-Nov-2013 [5] GW-21	92-7 29-May-2014 92-7
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	513	534	541	552	530	540	540	570	570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	12	12	8.7	4.3	6.3	6.4	9.8
Alkalinity (Total as CaCO3)	mg/l	--	--	513	534	553	565	540	550	540	570	580
Ammonia Nitrogen	mg/l	--	--	0.34	0.95	0.56	0.74	0.10	1.1	1.0	1.2	0.59
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	55	35	38	45	50	45	41	45
Chloride	mg/l	--	250	387	393	403	399	370	380	400	380	390
Conductivity	uS/cm	--	--	2260	2210	2300	2350	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2306	2108	2099	2165	2011	1979	1818	1891	1939
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	179	197	176	186	170	190	190	190	210
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.028	<0.010	0.026	0.029	0.026
Nitrogen, Total Kjeldahl	mg/l	--	--	0.64	1.67	0.90	0.90	1.1	1.5	1.5	1.9	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	0.11	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.25	7.94	8.38	8.38	8.24	--	8.09	8.08	8.27
pH (Field)	-	--	--	7.69	7.62	7.73	8.12	7.79	7.77	7.18	7.09	7.52
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.31	0.43	0.27	0.46	0.21	0.47	0.47	0.77	0.35
Sulphate	mg/l	--	500 [6]	10	7	6	14	9	7	3	4	<1
Temperature (Field)	deg c	--	15	17.6	11.3	12.2	9.2	11.0	9.8	10.6	10.5	10.9
Total Dissolved Solids	mg/l	--	500	1470	1440	1500	1530	1240	1250	1260	1240	1230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	<0.0010	<0.001	0.0017	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.49	0.47	0.48	0.46	0.52	0.58	0.48	0.47	0.56
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	27	31	26	30	26	28	28	29	32
Chromium, dissolved	mg/l	0.05	--	<0.005	0.009	<0.005	<0.005	<0.0050	<0.005	0.012	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0005	0.0003	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.001	0.003	0.001	0.0018	<0.001	0.0020	<0.0010	0.0024
Iron, dissolved	mg/l	--	0.3	0.49	0.90	0.18	0.58	<0.1	<0.1	<0.1	0.56	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	27	29	27	27	26	30	28	29	32
Manganese, dissolved	mg/l	--	0.05	0.54	0.41	0.41	0.10	0.042	0.003	0.02	0.42	0.33
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	14	14	13	14	15	14	14	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	387	388	384	378	420	440	440	410	460
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	<0.01	<0.0050	<0.005	0.0062	0.0096	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 25-May-2010 [4] M-13	92-7 20-Oct-2010 [4] G-9	92-7 24-May-2011 [4] G-15	92-7 29-Nov-2011 [4] 92-7	92-7 31-May-2012 92-7	92-7 28-Nov-2012 92-7	92-7 29-May-2013 [5] 92-7	92-7 26-Nov-2013 [5] GW-21	92-7 29-May-2014 92-7
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	0.0005	<0.0004	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0025	<0.0013	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0010	<0.00050	<0.00050	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.0010	<0.00050	<0.00050	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Nov-2014	92-7 02-Jun-2015	92-7 26-Nov-2015	92-7 26-May-2016	92-7 17-Nov-2016	92-7 24-May-2017	92-7 29-Nov-2017	92-7 24-May-2018	92-7 22-Nov-2018
				92-7	92-7	92-7	92-7	92-7	92-7	92-7	92-7	92-7
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	560	585	598	609	617	635	645	673	697
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6.0	6	<5	<5	<5	5	6	5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	570	591	602	612	620	640	651	678	702
Ammonia Nitrogen	mg/l	--	--	1.1	0.47	1.07	0.72	1.30	0.69	1.17	0.71	1.20
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	83	72	63	84	46	41	74	35
Chloride	mg/l	--	250	420	428	431	446	434	433	462	430	429
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2268	2185	2257	2242	2376	2262	2053	2308	2153
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	210	159	167	209	208	199	206	212	265
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.022	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	0.9	1.8	1.5	2.0	1.2	1.6	1.4	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.06	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.76	7.73	8.04	8.30	7.55	7.72	7.56	7.59	7.83
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.56	0.19	0.46	0.51	0.65	0.28	0.40	0.28	0.49
Sulphate	mg/l	--	500 [6]	1	4	2	4	2	3	5	4	4
Temperature (Field)	deg c	--	15	7.4	10.2	9.5	14.7	11.6	10.3	9.2	10.3	9.2
Total Dissolved Solids	mg/l	--	500	1270	1320	1320	1360	1270	1300	1330	1390	1320
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	0.001	0.002	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.53	0.334	0.522	0.555	0.711	0.46	0.535	0.527	0.57
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	33	26.2	26.5	31	31.2	31.3	30.1	33.3	38.4
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	0.002	<0.001	0.009	0.011	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0020	<0.0005	<0.0005	0.0020	0.0008	0.0013	0.0014	0.0011	0.0033
Iron, dissolved	mg/l	--	0.3	0.68	0.214	0.404	<0.1	<0.1	<0.1	<0.1	<0.1	0.574
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	32	22.8	24.4	31.9	31.7	29.3	31.7	31.3	41.2
Manganese, dissolved	mg/l	--	0.05	0.5	0.236	0.431	0.019	0.023	0.197	<0.005	0.13	0.411
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	12.5	12.4	16.6	14.6	14	15.1	14.4	18
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	450	466	491	436	464	469	441	426	529
Zinc, dissolved	mg/l	--	5	0.039	0.055	0.008	0.007	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.005	0.003	<0.002 [10]	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Nov-2014 92-7	92-7 02-Jun-2015 92-7	92-7 26-Nov-2015 92-7	92-7 26-May-2016 92-7	92-7 17-Nov-2016 92-7	92-7 24-May-2017 92-7	92-7 29-Nov-2017 92-7	92-7 24-May-2018 92-7	92-7 22-Nov-2018 92-7
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Jun-2019 92-7	92-7 20-Nov-2019 92-7	92-7 21-May-2020 92-7	92-7 26-Nov-2020 92-7	92-7 26-May-2021 92-7	92-7 30-Nov-2021 92-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	640	621	617	628	652	636
Alkalinity, Carbonate as CaCO3	mg/l	--	--	9	6	13	9	6	9
Alkalinity (Total as CaCO3)	mg/l	--	--	649	627	630	637	658	646
Ammonia Nitrogen	mg/l	--	--	0.38	1.03	0.17	0.27	0.21	0.84
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	41	51	79	25	46
Chloride	mg/l	--	250	428	457	564 [24]	450	423	420
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2202	2390	2247	2134	2338	2332
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	394	288	239	241	259	215
Nitrate as N	mg/l	10.0	--	<0.1	0.3	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.7	1.3	0.7	0.9	0.6	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.71	7.74	8.68	8.07	7.74	7.93
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.20	0.38	0.25	0.35	0.23	0.43
Sulphate	mg/l	--	500 [6]	4	8	3	1	2	1
Temperature (Field)	deg c	--	15	13.3	8.8	12.0	8.1	12.1	8.3
Total Dissolved Solids	mg/l	--	500	1350	1290	1410	1310	1380	1330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.765	0.453	0.41	0.43	0.442	0.412
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	58.8	42.5	35.6	34.6	35.2	31.3
Chromium, dissolved	mg/l	0.05	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0046	0.0015	0.0035	0.0043	0.0026	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.182
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	60	44.2	36.5	37.5	41.5	33.1
Manganese, dissolved	mg/l	--	0.05	<0.005	0.047	0.203	0.039	<0.005	0.124
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	26.7	20.3	16.3	15.9	16.4	14.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	444	448	459	465	454	419
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.005	0.007	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.005	<0.001	<0.004 [11]	<0.004 [11]	<0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Jun-2019	92-7 20-Nov-2019	92-7 21-May-2020	92-7 26-Nov-2020	92-7 26-May-2021	92-7 30-Nov-2021
				92-7	92-7	92-7	92-7	92-7	92-7
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 09-Jun-1992	92-8 01-Nov-1992	92-8 22-Jun-1994	92-8 02-Nov-1994	92-8 28-Jun-1995	92-8 23-Nov-1995	92-8 12-Jun-1996	92-8 12-Oct-1996	92-8 18-Jun-1997
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	503	1010	--	763	500	694	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	412	828	804	637	410	569	416	410	341
Ammonia Nitrogen	mg/l	--	--	--	--	--	4.62	3.1	0.15	6.2	1.96	0.18
Chemical Oxygen Demand	mg/l	--	--	--	--	214	194	138	85	72	45	44
Chloride	mg/l	--	250	173	213	310	156	102	148	68	29.3	72.8
Conductivity (Field)	uS/cm	--	--	1613	2300	2200	1650	1270	2200	1360	1250	1470
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	9.22	7.64	--	--	--	4.23
Hardness, Calcium Carbonate	mg/l	--	--	485.3	760	596	416	341	890	429	575	756
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.54	1.3	0.8	0.1	0.1	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	10.8	5.7	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	7.7	5.55	--	--	--
pH (Field)	-	--	--	7.07	7.04	6.5	7.06	6.74	7.06	6.81	6.53	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	0.3	--	--	--
Phosphorus	mg/l	--	--	--	--	0.82	0.249	3.25	--	--	--	--
Sulphate	mg/l	--	500 [6]	159	223.5	67.3	55.1	492	352	214	299	365
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1110	630	640	1100	680	620	740
Total Organic Carbon	mg/l	--	--	--	--	55.6	32	35.7	26.4	29	18.9	7.9
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	379	146	435
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.058	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	2.1	1.635	1.84	2.4	1.19	0.78	0.33
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	130.9	174	132	68.36	75.3	179	93.1	135	179
Chromium, dissolved	mg/l	0.05	--	--	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0198	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.433	0.491	0.07	10.4	27.2	12.2	5.19
Lead, dissolved	mg/l	0.01	--	--	--	0.0003	0.1	0.0012	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	38.44	78.9	64.6	25.716	36.8	106	47	57.1	74.2
Manganese, dissolved	mg/l	--	0.05	--	--	4.193	1.802	1.85	3.26	3.05	3.48	1.08
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.59	21.5	27.9	9.917	--	21.4	14.4	11.7	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	143.4	233	166	171.6	130	144	165	75.6	88.6
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.021	0.01	0.01	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 09-Jun-1992	92-8 01-Nov-1992	92-8 22-Jun-1994	92-8 02-Nov-1994	92-8 28-Jun-1995	92-8 23-Nov-1995	92-8 12-Jun-1996	92-8 12-Oct-1996	92-8 18-Jun-1997
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.142	0.001	0.001	--	--	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 06-Nov-1997	92-8 26-Aug-1998	92-8 29-Oct-1998	92-8 06-May-1999	92-8 19-Oct-1999	92-8 05-May-2000	92-8 24-Oct-2000	92-8 14-Jun-2001	92-8 23-Nov-2001
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	826	468	344	512	803	741	403	604
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	12	1	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	396	697	384	282	420	659	607	330	495
Ammonia Nitrogen	mg/l	--	--	4.66	1.01	1.24	0.01	0.47	0.01	1	1.52	1.94
Chemical Oxygen Demand	mg/l	--	--	82	56	7	39	19	372	--	47	45
Chloride	mg/l	--	250	26	387	39.4	18.7	12.9	30	50.7	18.8	45.8
Conductivity (Field)	uS/cm	--	--	1200	2370	1310	1230	1000	1500	1400	1050	1400
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	745	59	553	710	481	814	703	507	618
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	--	0.1	0.1	0.1	0.1	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	1.43	1.24	--	--	3.35	2.08	2.6
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.74	8.4	6.5	6.9	6.9	6.7	6.57	6.7	6.31
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.67	0.38	0.28
Sulphate	mg/l	--	500 [6]	348	5	325	460	110	240	184	315	208
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	600	1200	660	615	500	750	870	830	868
Total Organic Carbon	mg/l	--	--	28.8	7	18	14	9.5	122	--	14.8	23
Total Suspended Solids	mg/l	--	--	--	--	--	--	128	428	1800	170	204
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.22	1.14	0.44	0.09	0.45	0.27	0.21	0.21	0.4
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	181	6.12	144	188	130	178	143	115	139
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	22.2	5.02	9.21	7.93	3.91	52.7	12.6	16	32.7
Lead, dissolved	mg/l	0.01	--	0.0002	0.0004	0.0002	0.0003	0.0002	0.0002	0.0012	0.0002	--
Magnesium, dissolved	mg/l	--	--	70.2	10.6	47.1	57.6	37.4	88.5	84.1	53.5	65.9
Manganese, dissolved	mg/l	--	0.05	0.66	0.11	3.83	0.83	0.85	4.48	4.53	1.88	2.35
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.2	16.2	8.4	1.1	4.2	0.4	6.5	1.5	2.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	56.7	621	93	27.1	53.6	60	74.9	50	94.7
Zinc, dissolved	mg/l	--	5	0.01	0.08	0.01	0.02	0.47	0.03	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 06-Nov-1997	92-8 26-Aug-1998	92-8 29-Oct-1998	92-8 06-May-1999	92-8 19-Oct-1999	92-8 05-May-2000	92-8 24-Oct-2000	92-8 14-Jun-2001	92-8 23-Nov-2001
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.006	0.073	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 23-May-2002	92-8 06-Nov-2002 [3]	92-8 30-May-2003	92-8 09-Oct-2003 [3]	92-8 14-May-2004	92-8 19-Nov-2004	92-8 24-May-2005	92-8 16-Nov-2005 [3]	92-8 25-May-2006
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	401	--	641	--	772	750	714	--	685
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	--	1	1	<5	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	329	--	525	--	633	615	585	--	685
Ammonia Nitrogen	mg/l	--	--	1.16	--	1.12	--	0.83	0.94	0.76	--	1.03
Chemical Oxygen Demand	mg/l	--	--	37	--	74	--	55	50	35	--	42
Chloride	mg/l	--	250	51.8	--	24.4	--	67.7	28	23.3	--	15.2
Conductivity (Field)	uS/cm	--	--	980	--	1150	--	1600	1750	1800	--	1200
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	486	--	468	--	781	778	757	--	696
Nitrate as N	mg/l	10.0	--	0.1	--	0.2	--	0.2	1	0.1	--	<0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	1.95	--	3.63	--	1.81	1.76	1.43	--	1.81
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.82	--	6.4	--	6.9	6.8	6.6	--	6.9
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.3	--	0.41	--	0.31	0.24	0.24	--	--
Sulphate	mg/l	--	500 [6]	208	--	197	--	269	290	260	--	208
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	9.4	--	5
Total Dissolved Solids	mg/l	--	500	736	--	--	--	800	875	980	--	964
Total Organic Carbon	mg/l	--	--	13	--	13.8	--	10.6	10.7	12	--	--
Total Suspended Solids	mg/l	--	--	184	--	200	--	112	100	80	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	--	0.001	--	0.001	0.001	0.001	--	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.21	--	0.25	--	0.484	0.446	0.382	--	0.284
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	<0.005
Calcium, dissolved	mg/l	--	--	119	--	117	--	178	189	177	--	166
Chromium, dissolved	mg/l	0.05	--	0.01	--	0.01	--	0.001	0.002	<0.002	--	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	--	0.01	--	0.002	0.002	<0.002	--	<0.002
Iron, dissolved	mg/l	--	0.3	8.87	--	3.92	--	9.73	6.9	18.2	--	35.1
Lead, dissolved	mg/l	0.01	--	0.0002	--	0.0002	--	0.0011	0.0002	0.0007	--	<0.0002
Magnesium, dissolved	mg/l	--	--	45.8	--	42.7	--	81.9	74.4	76.9	--	68
Manganese, dissolved	mg/l	--	0.05	1.5	--	1	--	2.2	2.76	2.16	--	2.28
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	--	0.02	--	0.01	0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	5.2	--	6	--	6.4	6.5	5.5	--	5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [7]	56.7	--	107	--	109	71.9	74.7	--	57.2
Zinc, dissolved	mg/l	--	5	0.02	--	0.01	--	0.005	0.005	0.006	--	0.011

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 23-May-2002	92-8 06-Nov-2002 [3]	92-8 30-May-2003	92-8 09-Oct-2003 [3]	92-8 14-May-2004	92-8 19-Nov-2004	92-8 24-May-2005	92-8 16-Nov-2005 [3]	92-8 25-May-2006
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	0.001	--	0.001	0.001	<0.001	--	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 19-Dec-2008
General Chemistry				
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1540
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1540
Ammonia Nitrogen	mg/l	--	--	0.35
Chemical Oxygen Demand	mg/l	--	--	214
Chloride	mg/l	--	250	280
Conductivity (Field)	uS/cm	--	--	3100
Dissolved Oxygen (Field)	mg/l	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1310
Nitrate as N	mg/l	10.0	--	0.2
Nitrogen, Total Kjeldahl	mg/l	--	--	4.19
Nitrogen, Organic	mg/l	--	--	--
pH (Field)	-	--	--	6.6
Phosphate	mg/l	--	--	--
Phosphorus	mg/l	--	--	--
Sulphate	mg/l	--	500 [6]	34
Temperature (Field)	deg c	--	15	4
Total Dissolved Solids	mg/l	--	500	2050
Total Organic Carbon	mg/l	--	--	--
Total Suspended Solids	mg/l	--	--	--
Metals				
Arsenic, dissolved	mg/l	0.01	--	0.0048
Barium, dissolved	mg/l	1	--	--
Boron, dissolved	mg/l	5	--	9.88
Cadmium, dissolved	mg/l	0.005	--	<0.00002
Calcium, dissolved	mg/l	--	--	307
Chromium, dissolved	mg/l	0.05	--	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005
Copper, dissolved	mg/l	--	1	<0.002
Iron, dissolved	mg/l	--	0.3	0.873
Lead, dissolved	mg/l	0.01	--	<0.00002
Magnesium, dissolved	mg/l	--	--	133
Manganese, dissolved	mg/l	--	0.05	5.08
Mercury, dissolved	mg/l	0.001	--	--
Molybdenum, dissolved	mg/l	--	--	--
Nickel, dissolved	mg/l	--	--	--
Potassium, dissolved	mg/l	--	--	8
Selenium, dissolved	mg/l	0.05	--	--
Sodium, dissolved	mg/l	--	200 [7]	353
Zinc, dissolved	mg/l	--	5	0.007

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 19-Dec-2008
Phenols				
Phenolics, Total Recoverable	mg/l	--	--	<0.001
Semi-VOCs				
Naphthalene	mg/l	--	--	--
Styrene	mg/l	--	--	--
VOCs				
1,1,1,2-Tetrachloroethane	mg/l	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--
1,2-Dibromoethane	mg/l	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--
1,2-Dichloroethane	mg/l	0.005	--	--
1,2-Dichloropropane	mg/l	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--
Benzene	mg/l	0.001	--	0.001
Bromodichloromethane	mg/l	--	--	--
Bromoform	mg/l	--	--	--
Bromomethane	mg/l	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--
Chlorobenzene	mg/l	0.08	0.03	--
Chloroform	mg/l	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--
Dibromochloromethane	mg/l	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003
o-Xylene	mg/l	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--
Toluene	mg/l	0.06	0.024	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--
Trichloroethene	mg/l	0.005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 09-Jun-1992	92-9 01-Nov-1992	92-9 08-Jun-1993	92-9 04-Nov-1993	92-9 15-Jun-1994	92-9 02-Nov-1994	92-9 28-Jun-1995	92-9 22-Nov-1995	92-9 12-Oct-1996	92-9 06-Nov-1997	92-9 05-Jun-1998
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	849	931	910	921	--	853	883	880	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1	1	8	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	696	763	746	755	764	710	724	734	748	780	790
Ammonia Nitrogen	mg/l	--	--	1.57	2.34	--	--	--	--	0.97	0.51	1.41	1.04	1.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	4.6	8.3	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	219	97.8	--	--	79	90	65	60	5	56	37
Chloride	mg/l	--	250	820	1003	1005	1450	1290	882	875	838	858	840	1110
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3813	3938	3580	3890	4170	3990	4130	4260	--	3900	4220
Dissolved Inorganic Carbon	mg/l	--	--	153.6	175.2	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	5.59	5.86	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	258	238	213	224	280	269	220	194	225	228	222
Nitrate as N	mg/l	10.0	--	0.54	0.24	0.3	9.1	1.3	1.51	0.1	1.7	0.7	0.1	1.9
Nitrite as N	mg/l	1.0	--	0.1	0.17	0.1	0.12	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.64	8.12	--	--	--	--	5	2.45	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.07	5.78	--	--	--	--	4.03	1.94	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.18	8.1	7.65	8.07	7.73	7.99	7.63	8.12	--	6.95	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.3	--	--	--
Phosphorus	mg/l	--	--	0.57	0.71	--	--	1	0.626	0.99	--	--	--	--
Sulphate	mg/l	--	500 [6]	46	13	8.5	13	18	21.4	15	20	13	6	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2168	2164	2248	2290	2100	2000	2070	2140	--	1960	2100
Total Organic Carbon	mg/l	--	--	25.2	23.9	--	--	21.7	--	25.2	16.9	17.9	19.6	18.3
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	93	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	--	0.25	0.423	0.01	--	0.148	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.004	--	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	0.05	0.11	--	--	--	0.037	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.99	1.05	--	--	0.97	0.92	0.83	1.23	0.86	0.98	1.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**	0.0005	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	30.15	26.3	23.6	25.9	35.1	23.15	26.2	24.3	25.7	20.1	24.4
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.014	0.01	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.01	0.01	0.0186	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.4	0.13	0.249	0.1	0.243	0.223	0.05	0.18	0.94	0.69	0.4
Lead, dissolved	mg/l	0.01	--	**0.1**	**0.17**	**0.1**	**0.105**	0.0015	**0.1**	0.0006	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	44.39	41.8	37.5	38.7	46.7	20.626	37.2	31.8	38.5	42.6	38.6
Manganese, dissolved	mg/l	--	0.05	0.13	0.05	0.057	0.053	0.06	0.044	0.04	0.03	0.1	0.06	0.05
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.023	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	22.56	28.8	30.8	26.4	34.7	17.8	--	23.9	24.4	25.6	30.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	690.1	931	762	819	669	716.5	682	880	668	653	983
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.042	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.13
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.014	0.002	0.002	0.002	0.114	0.001	0.001	--	--	--	--
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Hexanone	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 06-May-1999	92-9 24-Oct-2000	92-9 14-Jun-2001	92-9 06-Nov-2002	92-9 30-May-2003	92-9 19-Nov-2004	92-9 16-Nov-2005	92-9 15-May-2007	92-9 10-Nov-2008	92-9 26-Nov-2009 J-22	92-9 24-May-2011 [4] G-17
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	961	1050	781	910	886	1020	189	800	765	760	754
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	47	1	1	1	<5	<5	<5	<2 [6]	21
Alkalinity (Total as CaCO3)	mg/l	--	--	788	861	720	846	726	835	775	800	765	760	776
Ammonia Nitrogen	mg/l	--	--	1.24	1.33	1.59	1.86	0.62	1.74	1.82	1.78	2.01	1.59	1.78
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	--	52	70	57	66	50	82	72	60	58
Chloride	mg/l	--	250	980	950	883	844	904	929	857	923	1010	852	834
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	3960	4100
Conductivity (Field)	uS/cm	--	--	3970	3660	3500	3990	1150	4050	2900	2800	3300	3421	3488
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	229	214	219	197	208	215	195	196	159	200
Nitrate as N	mg/l	10.0	--	--	0.1	0.2	0.2	0.3	1	0.8	0.2	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	3.07	2.22	2.85	3.02	1.99	2.76	2.95	3.16	3.24	2.41	3.26
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	8.23	8.48
pH (Field)	-	--	--	7.9	8.03	7.9	7.7	6.4	7.9	--	8.2	7.8	7.79	7.92
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	1.04	0.68	0.71	0.81	0.85	0.97	--	--	0.94	1.01
Sulphate	mg/l	--	500 [5]	10	2	8	6	5	10	3	1	<1	4	<1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	12.8	9.8	7	10.5	14.4
Total Dissolved Solids	mg/l	--	500	1990	2400	2000	2220	575	2025	2230	2220	2270	2570	2660
Total Organic Carbon	mg/l	--	--	23.5	--	16.7	19	16.6	17.8	21.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	182	70	47	25	122	25	--	--	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.003	0.001	0.002	0.003	0.002	0.001	0.0058	0.0063	0.008	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.04	0.97	1.04	0.98	0.93	1.02	1.01	0.893	0.935	0.93	0.79
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	0.0003	0.00003	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	26.3	23.7	27.8	26.1	24.5	25.6	26.7	24.7	24.5	19	24
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	0.007	<0.005	0.0007	0.0007
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	<0.001	<0.001
Iron, dissolved	mg/l	--	0.3	0.44	0.2	0.05	0.03	0.46	0.279	0.473	0.047	0.035	0.79	0.32
Lead, dissolved	mg/l	0.01	--	0.0004	0.022	0.0002	0.0028	0.0007	0.002	0.001	0.00005	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	39.4	41.3	35.2	37.3	32.9	35.1	36	32.3	32.8	27	34
Manganese, dissolved	mg/l	--	0.05	0.05	0.04	0.03	0.03	0.05	0.046	0.061	0.027	0.061	0.06	0.07
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.9	24.1	20.6	24.8	24	26	28	26.1	25.1	21	24
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	865	796	768	840	683	744	832	729	721	726	810
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.005	0.007	<0.005	<0.005	<0.01	<0.01
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	--	0.003	0.102	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004
2-Hexanone	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 28-Nov-2012 92-9	92-9 29-May-2014 92-9	92-9 26-Nov-2015 92-9	92-9 24-May-2017 92-9	92-9 22-Nov-2018 92-9	92-9 21-May-2020 92-9	92-9 30-Nov-2021 92-9
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	710	710	772	785	838	737	734
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7.7	16	12	13	16	14	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	720	730	784	798	854	751	738
Ammonia Nitrogen	mg/l	--	--	2.0	1.8	2.25	0.02	2.37	2.18	1.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	63	54	221	96	74	82	86
Chloride	mg/l	--	250	790	850	855	813	853	1070	820
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3281	3349	3698	3695	3439	3566	3588
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	200	210	164	190	255	235	206
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.1	<0.1	<0.1	0.2	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.151	<0.05	<0.25 [9]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.0	2.9	3.4	1.4	3.1	3.0	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.16	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.37	--	--	--	--	--
pH (Field)	-	--	--	8.08	7.63	8.03	8.06	7.85	7.41	8.17
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.0	0.79	0.99	0.85	0.99	0.96	1.01
Sulphate	mg/l	--	500 [6]	<1	<1	<1	1	<1	<1	1
Temperature (Field)	deg c	--	15	8.1	12.5	9.6	11.6	9.4	12.3	7.7
Total Dissolved Solids	mg/l	--	500	2120	2120	2100	2080	2120	2230	2130
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.0031	0.002	0.005	0.002	0.007	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.1	1	0.926	0.804	0.949	0.997	0.755
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25	26	22.7	24	33.9	28.6	25.3
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.001	0.029	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.00063	0.0005	0.0005	0.0009	0.0007	0.0006
Copper, dissolved	mg/l	--	1	<0.001	0.0021	<0.0005	0.0015	0.0027	0.0039	0.0012
Iron, dissolved	mg/l	--	0.3	<0.1	0.31	0.507	<0.1	0.499	0.421	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.0001	<0.0001	0.0002	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	35	36	26	31.5	41.3	39.6	34.6
Manganese, dissolved	mg/l	--	0.05	0.13	0.033	0.069	0.035	0.079	0.081	0.068
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	23	23	19.4	24.4	27.1	25.3	21.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	780	670	835	795	855	728	669
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.007	<0.005	<0.005	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]	<0.001	0.007	<0.004 [11]
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
2-Hexanone	mg/l	--	--	--	--	--	--	--	<0.0100	--
Benzene	mg/l	0.001	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0025	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 09-Jun-1992	92-10 01-Nov-1992	92-10 08-Jun-1993	92-10 04-Nov-1993	92-10 15-Jun-1994	92-10 02-Nov-1994	92-10 28-Jun-1995	92-10 22-Nov-1995	92-10 12-Jun-1996
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1078	980	937	939	--	907	915	969	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	884	803	768	770	760	756	750	794	783
Ammonia Nitrogen	mg/l	--	--	0.74	0.48	--	--	--	0.28	0.16	0.1	0.24
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	1.4	2.5	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	187	64.5	--	--	54	93	60	40	29
Chloride	mg/l	--	250	221	260	170	289	600	177	120	125	145
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2250	2100	1820	2100	2110	2070	1950	2040	1830
Dissolved Inorganic Carbon	mg/l	--	--	201.6	224.4	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	8.12	6.44	--	--
Hardness, Calcium Carbonate	mg/l	--	--	793.65	515	589	600	621	615	619	229	631
Nitrate as N	mg/l	10.0	--	0.24	0.24	0.3	2.39	0.1	0.42	1.7	0.5	0.6
Nitrite as N	mg/l	1.0	--	0.1	0.1	0.1	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.68	1.21	--	--	--	--	4	1.3	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.94	0.73	--	--	--	--	3.84	1.2	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.88	7.89	6.85	7.34	6.92	7.27	7	8.09	7.12
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.1	--
Phosphorus	mg/l	--	--	0.28	0.86	--	--	1.45	0.362	1.84	--	--
Sulphate	mg/l	--	500 [6]	95	95	103	116	98	110	15	101	128
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1492	1268	1220	1180	1070	1040	980	1020	920
Total Organic Carbon	mg/l	--	--	27.7	22.4	--	--	15.6	19	14.3	12.9	13.2
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	380
Metals												
Aluminum, dissolved	mg/l	--	--	--	0.21	0.152	0.044	--	0.069	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	--	--	--	0.1	--	--	--
Barium, dissolved	mg/l	1	--	0.07	0.14	--	--	--	0.052	--	--	--
Boron, dissolved	mg/l	5	--	1.1	1.31	--	--	1.18	1.517	1.49	0.76	1.47
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.01	0.0011	0.0001	--
Calcium, dissolved	mg/l	--	--	132.9	37.9	89.2	99.7	97	92.06	107	25.4	106
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.01	0.01	0.01	0.01	0.02	0.03	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.03	0.01	0.0142	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.66	0.3	0.341	0.1	0.431	0.366	0.02	0.2	0.665
Lead, dissolved	mg/l	0.01	--	0.1	0.05	0.1	0.0235	0.0007	0.1	0.0017	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	112.1	102	88.9	85.1	91.9	71.786	84.4	39.6	87.7
Manganese, dissolved	mg/l	--	0.05	1.45	0.92	0.97	0.787	0.558	1.039	0.52	0.56	0.745
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.028	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	13.03	18.1	16.1	18.9	18.4	12.13	--	26	17.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	211.2	260	227	289	200	228.9	195	738	214
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.101	0.01	0.01	0.01	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 09-Jun-1992	92-10 01-Nov-1992	92-10 08-Jun-1993	92-10 04-Nov-1993	92-10 15-Jun-1994	92-10 02-Nov-1994	92-10 28-Jun-1995	92-10 22-Nov-1995	92-10 12-Jun-1996
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.006	0.002	0.002	0.002	0.223	0.001	0.001	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 12-Oct-1996	92-10 18-Jun-1997	92-10 06-Nov-1997	92-10 05-Jun-1998	92-10 30-Oct-1998	92-10 06-May-1999	92-10 19-Oct-1999	92-10 06-May-2000	92-10 24-Oct-2000
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	810	773	732	833	732
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	752	749	630	656	664	634	600	683	600
Ammonia Nitrogen	mg/l	--	--	0.62	0.1	0.34	0.41	0.49	0.47	0.35	0.01	0.23
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	5	27	29	44	13	26	6	11	--
Chloride	mg/l	--	250	142	139	174	214	190	210	156	59.2	232
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1790	1850	1900	1970	1860	1780	1600	1500	1590
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	3.31	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	551	735	638	528	504	477	384	358	394
Nitrate as N	mg/l	10.0	--	0.6	0.1	0.1	1.3	--	--	0.8	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	1.3	1.39	--	--	1.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.86	7.24	6.28	--	7.1	7.3	7.6	7.4	7.36
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--	0.73
Sulphate	mg/l	--	500 [6]	120	140	136	132	122	105	100	82	66
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	900	920	980	980	920	890	800	750	1030
Total Organic Carbon	mg/l	--	--	12.8	12	12.1	13.2	14.6	12.4	9.4	8.4	--
Total Suspended Solids	mg/l	--	--	1290	2170	--	--	--	--	1380	210	852
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.62	1.88	1.59	1.5	1.27	1.3	1.33	1.05	1.08
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	92.2	142	120	87.5	77.1	82.1	65.4	58.3	58.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.78	2.12	0.93	1.17	1.71	1.08	2.54	1.86	0.38
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	76.9	91.1	81	74.3	75.8	65.1	52.8	51	60.3
Manganese, dissolved	mg/l	--	0.05	0.68	1.06	0.64	0.92	0.81	0.64	0.47	0.59	0.41
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.3	10.4	15.6	17.5	19.7	12.6	15.7	5.9	12.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	214	184	213	280	247	217	285	250	235
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.12	0.01	0.01	0.1	0.17	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 12-Oct-1996	92-10 18-Jun-1997	92-10 06-Nov-1997	92-10 05-Jun-1998	92-10 30-Oct-1998	92-10 06-May-1999	92-10 19-Oct-1999	92-10 06-May-2000	92-10 24-Oct-2000
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 14-Jun-2001	92-10 23-Nov-2001	92-10 23-May-2002	92-10 06-Nov-2002	92-10 30-May-2003	92-10 09-Oct-2003	92-10 14-May-2004	92-10 19-Nov-2004	92-10 24-May-2005
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	620	588	638	659	684	--	688	732	702
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	4	12	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	518	482	543	540	561	570	564	600	575
Ammonia Nitrogen	mg/l	--	--	0.34	0.33	0.25	0.26	0.26	0.54	0.25	0.32	0.58
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	2	--	--	--
Chemical Oxygen Demand	mg/l	--	--	10	21	12	19	16	68	26	23	19
Chloride	mg/l	--	250	128	194	141	116	158	195	186	147	168
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1200	1270	1590	1550	1560	1640	1650	1670	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	127	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	413	408	445	361	395	350	338	459	410
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.2	0.4	0.3	0.2	0.3	<1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.85	1.57	0.46	0.77	0.88	1.07	0.96	0.74	1.16
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.3	6.4	6.92	7.2	6.7	7.3	7.4	7.3	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.49	1.36	0.21	0.34	0.5	0.53	0.47	0.2	0.65
Sulphate	mg/l	--	500 [6]	60	58	104	96	89	68	83	110	156
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	9.8
Total Dissolved Solids	mg/l	--	500	796	912	824	810	780	992	825	835	1080
Total Organic Carbon	mg/l	--	--	8.3	14	8	7.3	7.7	14	7.4	7	8
Total Suspended Solids	mg/l	--	--	360	832	190	460	256	280	136	526	3220
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.13	1.35	1.06	0.97	0.94	0.845	0.826	1.1	0.879
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	75.6	65.9	77.4	60	69.1	58.2	56.5	81.3	67.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.001	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.18	0.03	0.56	0.76	0.7	0.598	0.526	0.479	0.379
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0005	0.0003	0.0005	0.0006
Magnesium, dissolved	mg/l	--	--	54.4	59.2	61.2	51.4	53.9	49.7	48	62.2	58.7
Manganese, dissolved	mg/l	--	0.05	0.26	0.46	0.23	0.39	0.27	0.356	0.284	0.237	0.432
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	7.9	11.3	13.2	14.8	13.5	14.5	15.8	14.9	17.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.001
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	164	206	167	221	196	264	294	185	286
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.01	0.005	0.005	0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 14-Jun-2001	92-10 23-Nov-2001	92-10 23-May-2002	92-10 06-Nov-2002	92-10 30-May-2003	92-10 09-Oct-2003	92-10 14-May-2004	92-10 19-Nov-2004	92-10 24-May-2005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.037	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 16-Nov-2005	92-10 25-May-2006	92-10 21-Nov-2006	92-10 15-May-2007	92-10 30-Nov-2007	92-10 22-May-2008	92-10 10-Nov-2008	92-10 19-May-2009 G-7	92-10 26-Nov-2009 J-18
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	148	590	624	612	595	550	720	949 [8]	784
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<2	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	605	590	624	612	595	550	720	949	784
Ammonia Nitrogen	mg/l	--	--	0.05	0.06	0.25	0.15	0.54	0.18	0.55	0.43	0.49
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	7	11	42	59	19	38	65	53
Chloride	mg/l	--	250	172	160	126	171	190	191	192	150	229
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	2240	2180
Conductivity (Field)	uS/cm	--	--	1600	1400	1500	1300	1400	1500	1700	1700	1911
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	501	490	471	442	420	402	460	871	463
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.1	0.3	0.1	0.2	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.49	0.55	0.64	0.66	1	0.87	1.22	1.49	0.94
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	7.16	7.86
pH (Field)	-	--	--	--	7.3	6.7	7.7	8	7.3	7.1	--	6.95
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.26	--	--	--	--	--	--	0.06	0.68
Sulphate	mg/l	--	500 [6]	124	176	178	155	122	131	124	139	92
Temperature (Field)	deg c	--	15	12.6	5	10.5	10.5	9	10.5	10	10	10.9
Total Dissolved Solids	mg/l	--	500	1030	1020	1060	1080	1090	1050	1160	1460	1420
Total Organic Carbon	mg/l	--	--	9.2	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	139	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	<0.001	0.0011	0.0011	0.002	0.0014	0.0016	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.08	0.873	0.986	0.869	0.85	0.778	0.949	3.96	1.3
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	90.2	87.6	83.2	77.8	73.2	70.2	82.2	189	80
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	0.006
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0028	0.0004
Copper, dissolved	mg/l	--	1	0.004	0.009	0.002	<0.002	<0.002	<0.002	<0.002	0.003	0.001
Iron, dissolved	mg/l	--	0.3	0.057	0.029	0.531	0.201	1.38	0.479	0.466	1.91	4.74
Lead, dissolved	mg/l	0.01	--	<0.0002	0.0003	<0.0001	0.00004	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	67.1	65.9	64	60.3	57.7	55.2	61.9	97	64
Manganese, dissolved	mg/l	--	0.05	0.169	0.464	1.31	0.133	0.994	4.32	3	2.91	1.01
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.2	13.6	15.7	15.7	15.8	14.2	16	9	16
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	214	175	215	236	276	257	245	151	272
Zinc, dissolved	mg/l	--	5	0.011	0.007	0.008	<0.005	<0.005	<0.005	<0.005	<0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 16-Nov-2005	92-10 25-May-2006	92-10 21-Nov-2006	92-10 15-May-2007	92-10 30-Nov-2007	92-10 22-May-2008	92-10 10-Nov-2008	92-10 19-May-2009 G-7	92-10 26-Nov-2009 J-18
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 25-May-2010 [4] M-10	92-10 20-Oct-2010 [4] G-7	92-10 24-May-2011 G-22	92-10 29-Nov-2011 [4] 92-10	92-10 31-May-2012 92-10	92-10 28-Nov-2012 92-10	92-10 29-May-2013 [5] 92-10	92-10 26-Nov-2013 [5] GW-24	92-10 29-May-2014 92-10
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	728	720	688	688	660	650	620	650	640
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	5.7	5.8	4.7	4.7	7.8
Alkalinity (Total as CaCO3)	mg/l	--	--	728	720	688	688	660	660	630	650	640
Ammonia Nitrogen	mg/l	--	--	0.45	0.52	0.30	0.63	0.46	0.83	0.57	0.62	0.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	43	38	45	36	40	38	36	25
Chloride	mg/l	--	250	199	195	187	193	210	210	180	170	230
Conductivity	uS/cm	--	--	2080	2000	1940	2010	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2051	1991	1865	1529	1723	1807	1462	1543	1706
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	548	540	457	477	440	440	390	400	390
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.14	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.013	<0.010	0.037	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.75	1.64	0.74	0.78	1.3	1.5	1.1	1.5	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.97	7.63	8.20	8.14	7.97	--	7.90	7.89	8.11
pH (Field)	-	--	--	7.33	7.17	7.30	7.36	7.30	7.40	6.87	6.92	7.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.39	0.41	0.42	0.40	0.28	0.48	0.54	0.40	0.43
Sulphate	mg/l	--	500 [6]	96	98	103	78	69	58	74	77	55
Temperature (Field)	deg c	--	15	15.3	10.7	12.6	8.8	10.0	9.4	9.8	10.0	11.0
Total Dissolved Solids	mg/l	--	500	1350	1300	1260	1310	1140	1180	1110	1060	1090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.001	<0.01	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.6	1.5	1.0	1.4	1	1.1	0.91	0.96	0.9
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	94	96	76	84	71	70	66	68	64
Chromium, dissolved	mg/l	0.05	--	0.006	0.006	<0.005	0.007	<0.0050	<0.005	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0006	0.0006	0.0005	0.0004	0.00054	<0.0005	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.001	0.005	0.002	0.0021	0.001	0.0014	0.0026	0.0033
Iron, dissolved	mg/l	--	0.3	0.38	5.89	<0.03	0.55	0.18	1.9	<0.1	<0.1	0.29
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	76	73	65	65	63	64	56	56	56
Manganese, dissolved	mg/l	--	0.05	0.82	1.77	0.62	1.98	0.84	0.99	0.74	0.33	0.48
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17	15	16	16	16	16	16	15	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	231	251	247	243	300	280	310	220	310
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	0.01	<0.01	<0.0050	<0.005	<0.0050	0.0059	0.018

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 25-May-2010 [4] M-10	92-10 20-Oct-2010 [4] G-7	92-10 24-May-2011 G-22	92-10 29-Nov-2011 [4] 92-10	92-10 31-May-2012 92-10	92-10 28-Nov-2012 92-10	92-10 29-May-2013 [5] 92-10	92-10 26-Nov-2013 [5] GW-24	92-10 29-May-2014 92-10
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0013	<0.0013	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Nov-2014 92-10	92-10 02-Jun-2015 92-10	92-10 26-Nov-2015 92-10	92-10 26-May-2016 92-10	92-10 17-Nov-2016 92-10	92-10 24-May-2017 92-10	92-10 29-Nov-2017 92-10	92-10 24-May-2018 92-10	92-10 22-Nov-2018 92-10
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	630	660	589	660	662	678	661	725	808
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.3	<5	<5	<5	<5	<5	5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	640	664	591	664	665	682	666	729	811
Ammonia Nitrogen	mg/l	--	--	0.59	0.09	0.75	0.16	0.62	0.03	0.49	0.35	0.62
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	29	72	116	76	78	39	34	67	77
Chloride	mg/l	--	250	200	218	128	210	201	194	218	180	200
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1761	1803	1489	1732	1849	1760	1576	1827	1777
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	420	339	382	390	399	374	376	434	552
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.1	0.6	2.2	0.8	1.0	0.5	0.9	1.4	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.86	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.34	7.54	7.31	7.42	7.09	7.45	7.29	7.23	7.18
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.42	0.14	2.10	0.60	0.57	0.14	0.45	0.87	0.93
Sulphate	mg/l	--	500 [6]	67	68	112	82	82	74	80	76	70
Temperature (Field)	deg c	--	15	8.9	9.1	10.4	12.5	11.0	11.0	8.7	11.1	10.4
Total Dissolved Solids	mg/l	--	500	1040	1140	914	1080	1020	1010	970	1080	1010
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.95	0.694	0.772	0.881	1.14	0.805	0.856	0.888	1.03
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	72	39.9	49.5	66.1	69.1	68.4	63.8	77	93.5
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.007	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.0032	<0.0005	0.0012	0.0028	0.0027	0.0028	0.0018	0.0028	0.0044
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.362	<0.1	0.824
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	58	58	62.7	54.7	55	49.4	52.7	58.8	77.4
Manganese, dissolved	mg/l	--	0.05	0.26	<0.005	0.011	<0.005	1.28	<0.005	0.333	0.006	0.785
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	12.4	12.8	16.5	14.4	13.9	14.3	14.5	18.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	270	274	317	246	261	261	224	236	283
Zinc, dissolved	mg/l	--	5	<0.0050	0.008	0.007	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Nov-2014 92-10	92-10 02-Jun-2015 92-10	92-10 26-Nov-2015 92-10	92-10 26-May-2016 92-10	92-10 17-Nov-2016 92-10	92-10 24-May-2017 92-10	92-10 29-Nov-2017 92-10	92-10 24-May-2018 92-10	92-10 22-Nov-2018 92-10
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.002	<0.001	0.002	<0.001	<0.001	0.003
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Jun-2019 92-10	92-10 20-Nov-2019 92-10	92-10 21-May-2020 92-10	92-10 26-Nov-2020 92-10	92-10 26-May-2021 92-1D	92-10 30-Nov-2021 92-10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	827	774	798	804	803	801
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	<5	11	5	<5	5
Alkalinity (Total as CaCO3)	mg/l	--	--	832	779	809	809	806	807
Ammonia Nitrogen	mg/l	--	--	0.24	0.58	0.52	0.60	0.60	0.34
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	84	86	71	91	79	159
Chloride	mg/l	--	250	227	226	278	232	223	229
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1925	2040	1936	1844	2046	2026
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	589	588	538	515	550	511
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.2	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	1.2	1.4	1.3	1.3	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.26	7.18	7.69	7.51	7.24	7.27
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.15	0.66	0.82	0.60	0.25	0.18
Sulphate	mg/l	--	500 [6]	60	57	63	45	39	39
Temperature (Field)	deg c	--	15	12.2	9.6	11.7	7.7	10.8	8.5
Total Dissolved Solids	mg/l	--	500	1240	1160	1220	1180	1210	1170
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.09	0.903	0.882	0.834	0.904	0.82
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	103	101	91.1	85.6	90.3	87.8
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.004	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0005	0.0017	<0.0005	<0.0005	0.0007
Copper, dissolved	mg/l	--	1	0.0053	0.0023	0.0065	0.0026	0.0029	0.0015
Iron, dissolved	mg/l	--	0.3	<0.1	0.66	5.69	1.44	<0.1	0.781
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0016	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	80.7	81.5	75.5	73.2	78.7	70.7
Manganese, dissolved	mg/l	--	0.05	0.876	1.2	1.34	0.911	1.33	1.65
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	19.6	21.6	17.7	17.1	16.9	17.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	272	290	291	292	281	277
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.014	<0.005	<0.005	0.006

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Jun-2019 92-10	92-10 20-Nov-2019 92-10	92-10 21-May-2020 92-10	92-10 26-Nov-2020 92-10	92-10 26-May-2021 92-1D	92-10 30-Nov-2021 92-10
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	0.010	<0.004 [11]	<0.004 [11]	<0.004 [11]
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 09-Jun-1992	92-11 01-Nov-1992	92-11 15-Jun-1994	92-11 02-Nov-1994	92-11 28-Jun-1995	92-11 22-Nov-1995	92-11 12-Jun-1996	92-11 12-Oct-1996	92-11 18-Jun-1997
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	795	705	--	907	754	664	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	652	578	796	756	618	544	605	603	604
Ammonia Nitrogen	mg/l	--	--	--	--	--	3.65	4.3	0.46	2.5	1.07	0.16
Chemical Oxygen Demand	mg/l	--	--	--	--	87	128	113	65	45	33	41
Chloride	mg/l	--	250	145	93	79	35	139	55	34	43.3	88.5
Conductivity (Field)	uS/cm	--	--	2014	1937	1990	2020	1620	1890	1690	1640	1620
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	10.47	7	--	--	--	6.17
Hardness, Calcium Carbonate	mg/l	--	--	647.71	662	740	869	679	658	886	753	793
Nitrate as N	mg/l	10.0	--	--	--	1.56	5.92	0.1	1.7	1.5	1.1	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	20.3	2.5	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	16	2.04	--	--	--
pH (Field)	-	--	--	7.76	7.13	6.68	7.34	7.03	7.52	6.85	6.81	7.05
Phosphate	mg/l	--	--	--	--	--	--	--	0.5	--	--	--
Phosphorus	mg/l	--	--	--	--	0.54	0.376	14.4	--	--	--	--
Sulphate	mg/l	--	500 [6]	204	423.5	189	229	99	362	320	352	273
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1000	1010	820	940	850	820	810
Total Organic Carbon	mg/l	--	--	--	--	22.4	25.5	37.7	15.8	18.5	16.8	16.1
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	481	323	3460
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.116	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	2.74	2.339	1.92	1.31	1.54	1.85	1.96
Cadmium, dissolved	mg/l	0.005	--	--	--	--	**0.01**	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	179.4	188	202	234.6	194	225	236	204	199
Chromium, dissolved	mg/l	0.05	--	--	--	--	0.01	0.01	0.02	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0212	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.702	0.526	0.04	0.14	2.69	0.88	0.94
Lead, dissolved	mg/l	0.01	--	--	--	0.0003	**0.1**	0.0003	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	48.4	46.7	57.2	42.426	46.5	50.8	71	58.3	70.9
Manganese, dissolved	mg/l	--	0.05	--	--	2.892	3.357	2.82	0.66	2.23	2.45	2.44
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.06	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	28.2	19	31.8	22.39	--	23.2	20.8	20.2	15.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	189.9	199	110	92.17	92.5	125	110	110	106
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 09-Jun-1992	92-11 01-Nov-1992	92-11 15-Jun-1994	92-11 02-Nov-1994	92-11 28-Jun-1995	92-11 22-Nov-1995	92-11 12-Jun-1996	92-11 12-Oct-1996	92-11 18-Jun-1997
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.134	0.002	0.001	--	--	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 06-Nov-1997	92-11 05-Jun-1998	92-11 30-Oct-1998	92-11 06-May-1999	92-11 19-Oct-1999	92-11 05-May-2000	92-11 24-Oct-2000	92-11 14-Jun-2001	92-11 23-Nov-2001
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	420	380	427	388	549	421	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	390	512	344	312	350	318	450	345	227
Ammonia Nitrogen	mg/l	--	--	0.04	0.14	0.13	0.01	0.06	0.01	0.07	0.01	0.01
Chemical Oxygen Demand	mg/l	--	--	30	41	12	7	10	18	--	7	15
Chloride	mg/l	--	250	109	85.4	19.9	10.2	9.5	9	41.5	22.5	51.7
Conductivity (Field)	uS/cm	--	--	1770	1518	940	860	740	700	1320	900	1300
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	759	695	500	473	385	354	577	535	696
Nitrate as N	mg/l	10.0	--	1	1.6	--	--	0.2	0.1	0.2	0.6	0.2
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	0.73	0.36	--	--	0.68	0.5	0.51
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.27	--	6.7	7.1	7.4	6.9	6.91	6.9	6.41
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.3	0.28	0.29
Sulphate	mg/l	--	500 [6]	398	283	183	185	110	91	263	179	395
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	930	760	470	430	370	350	884	632	952
Total Organic Carbon	mg/l	--	--	12.9	12.6	12.7	6.2	4.8	4.3	--	6.6	11
Total Suspended Solids	mg/l	--	--	--	--	--	--	123	170	346	218	326
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.28	1.45	1.25	0.48	0.89	0.5	0.9	0.39	0.53
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	204	172	140	130	100	104	152	160	190
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.16	0.18	1.13	0.02	0.16	0.1	0.16	0.02	0.03
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0004	0.0002	0.0002	0.0022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	59.8	63.7	36.4	35.6	32.4	22.7	47.9	32.9	53.8
Manganese, dissolved	mg/l	--	0.05	0.1	1.04	1.05	0.1	0.03	0.02	0.16	0.01	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.3	11.2	16.5	0.7	5.7	1.1	6.2	2.4	2.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	100	118	40	36.9	50	28	58.9	36.9	91.1
Zinc, dissolved	mg/l	--	5	0.01	0.36	0.01	0.01	0.27	0.22	0.03	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 06-Nov-1997	92-11 05-Jun-1998	92-11 30-Oct-1998	92-11 06-May-1999	92-11 19-Oct-1999	92-11 05-May-2000	92-11 24-Oct-2000	92-11 14-Jun-2001	92-11 23-Nov-2001
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.001	0.026	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 23-May-2002	92-11 06-Nov-2002	92-11 30-May-2003	92-11 09-Oct-2003 [3]	92-11 14-May-2004	92-11 19-Nov-2004	92-11 24-May-2005	92-11 16-Nov-2005	92-11 25-May-2006
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	410	659	780	--	651	802	799	176	595
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	1	1	--	1	1	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	352	540	639	--	534	657	655	720	595
Ammonia Nitrogen	mg/l	--	--	0.13	0.04	0.09	--	0.04	0.5	0.35	0.39	0.14
Chemical Oxygen Demand	mg/l	--	--	3	29	14	--	24	45	34	38	17
Chloride	mg/l	--	250	52	66	80	--	95.2	34	32.8	14.5	17.2
Conductivity (Field)	uS/cm	--	--	1150	1630	1300	--	1980	1900	2150	1600	1300
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	536	554	471	--	832	667	628	663	487
Nitrate as N	mg/l	10.0	--	3.1	0.2	0.4	--	0.3	1	0.1	0.1	0.3
Nitrogen, Total Kjeldahl	mg/l	--	--	0.62	0.54	0.65	--	0.5	1.47	1.31	1.4	0.61
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.96	6.6	6.5	--	7.2	6.9	6.5	--	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.24	0.05	0.21	--	0.14	0.15	0.23	0.2	--
Sulphate	mg/l	--	500 [6]	407	323	325	--	831	350	370	220	410
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	11.4	--	4
Total Dissolved Solids	mg/l	--	500	990	1100	650	--	990	950	1210	1090	1110
Total Organic Carbon	mg/l	--	--	6	8.3	6.9	--	6.7	10.2	6.6	9	--
Total Suspended Solids	mg/l	--	--	306	137	15	--	52	118	94	94	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	--	0.001	0.008	0.002	0.002	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.73	0.99	0.7	--	0.606	0.833	0.529	0.784	0.551
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	<0.0001	<0.005
Calcium, dissolved	mg/l	--	--	138	178	133	--	219	171	159	173	119
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	--	0.001	0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	--	0.003	0.002	<0.002	<0.002	0.01
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.21	--	0.015	21.4	10.3	8.74	0.828
Lead, dissolved	mg/l	0.01	--	0.0003	0.0007	0.0002	--	0.0002	0.0008	0.0006	0.0002	<0.0002
Magnesium, dissolved	mg/l	--	--	31.1	44.1	33.8	--	69.1	58.4	55.8	56.2	45.9
Manganese, dissolved	mg/l	--	0.05	0.01	0.02	0.01	--	0.002	8.21	3.08	2.92	1.62
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	<0.00006	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01	<0.01	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	--	0.01	0.01	<0.01	<0.01	--
Potassium, dissolved	mg/l	--	--	5.5	11.8	7.9	--	10.4	10.6	9.1	11.6	6.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	0.001	<0.001	--
Sodium, dissolved	mg/l	--	200 [7]	150	164	191	--	232	185	181	186	157
Zinc, dissolved	mg/l	--	5	0.01	0.02	0.01	--	0.005	0.005	<0.005	0.008	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 23-May-2002	92-11 06-Nov-2002	92-11 30-May-2003	92-11 09-Oct-2003 [3]	92-11 14-May-2004	92-11 19-Nov-2004	92-11 24-May-2005	92-11 16-Nov-2005	92-11 25-May-2006
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	--	0.001	0.001	0.004	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 19-Dec-2008
General Chemistry				
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1590
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1590
Ammonia Nitrogen	mg/l	--	--	0.5
Chemical Oxygen Demand	mg/l	--	--	314
Chloride	mg/l	--	250	300
Conductivity (Field)	uS/cm	--	--	2700
Dissolved Oxygen (Field)	mg/l	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1230
Nitrate as N	mg/l	10.0	--	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	5.76
Nitrogen, Organic	mg/l	--	--	--
pH (Field)	-	--	--	6.1
Phosphate	mg/l	--	--	--
Phosphorus	mg/l	--	--	--
Sulphate	mg/l	--	500 [6]	92
Temperature (Field)	deg c	--	15	6
Total Dissolved Solids	mg/l	--	500	2150
Total Organic Carbon	mg/l	--	--	--
Total Suspended Solids	mg/l	--	--	--
Metals				
Arsenic, dissolved	mg/l	0.01	--	0.0032
Barium, dissolved	mg/l	1	--	--
Boron, dissolved	mg/l	5	--	10.4
Cadmium, dissolved	mg/l	0.005	--	<0.00002
Calcium, dissolved	mg/l	--	--	298
Chromium, dissolved	mg/l	0.05	--	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005
Copper, dissolved	mg/l	--	1	<0.002
Iron, dissolved	mg/l	--	0.3	0.657
Lead, dissolved	mg/l	0.01	--	<0.00002
Magnesium, dissolved	mg/l	--	--	119
Manganese, dissolved	mg/l	--	0.05	3.39
Mercury, dissolved	mg/l	0.001	--	--
Molybdenum, dissolved	mg/l	--	--	--
Nickel, dissolved	mg/l	--	--	--
Potassium, dissolved	mg/l	--	--	11.6
Selenium, dissolved	mg/l	0.05	--	--
Sodium, dissolved	mg/l	--	200 [7]	373
Zinc, dissolved	mg/l	--	5	0.007

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 19-Dec-2008
Phenols				
Phenolics, Total Recoverable	mg/l	--	--	0.004
Semi-VOCs				
Naphthalene	mg/l	--	--	--
Styrene	mg/l	--	--	--
VOCs				
1,1,1,2-Tetrachloroethane	mg/l	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--
1,2-Dibromoethane	mg/l	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--
1,2-Dichloroethane	mg/l	0.005	--	--
1,2-Dichloropropane	mg/l	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--
Benzene	mg/l	0.001	--	0.0009
Bromodichloromethane	mg/l	--	--	--
Bromoform	mg/l	--	--	--
Bromomethane	mg/l	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--
Chlorobenzene	mg/l	0.08	0.03	--
Chloroform	mg/l	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--
Dibromochloromethane	mg/l	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	0.0011
m,p-Xylenes	mg/l	--	--	0.0032
Methylene Chloride	mg/l	0.05	--	<0.0003
o-Xylene	mg/l	--	--	0.0009
Tetrachloroethylene	mg/l	0.01	--	--
Toluene	mg/l	0.06	0.024	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--
Trichloroethene	mg/l	0.005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 09-Jan-1990	94-1 02-Mar-1990	94-1 28-Mar-1990	94-1 01-Aug-1990	94-1 06-Nov-1990	94-1 29-Nov-1991	94-1 09-Jun-1992	94-1 01-Nov-1992	94-1 08-Jun-1993	94-1 04-Nov-1993	94-1 15-Jun-1994
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1210	1220	--	--	--	1205	1561	1276	1300	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	--	--	--	14.4	1	1	<1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	2256	1000	950	1014	1060	1012	1280	1046	1063	1040
Ammonia Nitrogen	mg/l	--	--	0.64	--	--	2.2	1.8	0.5	2.28	1.86	--	--	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	3	20.8	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--	94	72.8	--	--	153
Chloride	mg/l	--	250	993	978	954	950	920	746	890	1018	1020	1250	1430
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2742	--	4352	4664	4368	7500	4685	4485	3760	4380	5340
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	0.276	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	213	250.3	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	260	265	278	229	180	186	202.56	198	200	237	293
Nitrate as N	mg/l	10.0	--	18	59.6	19.5	3.83	1.88	--	0.3	1.5	0.48	10.8	0.1
Nitrite as N	mg/l	1.0	--	1.3	--	--	0.21	0.001	1.97	0.1	0.18	0.1	0.14	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	3.36	4.01	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	1.08	2.15	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.67	8.25	8.11	8.26	8.2	8.1	8.37	7.99	7.82	8.18	7.96
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	2.36	1.1	--	--	2.63
Sulphate	mg/l	--	500 [5]	34	30.3	30	20	11	1	0.35	2	1.8	4.6	64
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	2256	2412	--	--	--	2737	2915	2692	2640	2680
Total Organic Carbon	mg/l	--	--	35.5	--	--	27	22.3	--	33.8	22.5	--	--	21.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	0.58	--	--	0.1	--	0.5	--	0.14	0.102	<0.01	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.003	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	0.04	0.1	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--	1.42	1.34	--	--	1.37
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	30.3	31	34	27	21	21.8	20.6	22.1	22	29.3	40.4
Chromium, dissolved	mg/l	0.05	--	0.13	--	--	0.05	--	0.001	0.02	0.05	0.01	<0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	--	--	0.05	--	0.02	0.02	0.05	0.01	<0.01	0.0225
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--	0.2	0.1	0.1	<0.1	0.299
Lead, dissolved	mg/l	0.01	--	0.59	--	--	0.05	--	0.001	0.1	0.09	0.1	0.13	0.0018
Magnesium, dissolved	mg/l	--	--	44.9	50	52	39	31	32	36.7	34.6	35.2	39.7	46.6
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--	0.03	0.05	0.062	0.057	0.129
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.04	--	--	0.05	--	0.07	0.02	0.05	0.02	<0.02	0.02
Potassium, dissolved	mg/l	--	--	62.5	31	31	23	23	21	16.5	25.4	24	25	37.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	0.01	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	790	1357	995	1063	1157	717	1049	1110	984	1020	897
Zinc, dissolved	mg/l	--	5	0.17	--	--	0.05	--	0.01	0.02	0.05	0.031	<0.01	0.01
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.002	--	--	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.01
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 02-Nov-1994	94-1 28-Jun-1995	94-1 23-Nov-1995	94-1 12-Oct-1996	94-1 06-Nov-1997	94-1 05-Jun-1998	94-1 06-May-1999	94-1 24-Oct-2000	94-1 14-Jun-2001	94-1 06-Nov-2002	94-1 30-May-2003
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1233	1268	1370	--	--	--	1430	1540	1100	1440	1310
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	--	--	--	1	1	97	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1030	1040	1120	1140	1130	1020	1170	1260	1060	1180	1070
Ammonia Nitrogen	mg/l	--	--	1.35	1.47	0.6	2.31	1.34	1.03	1.34	0.72	1.26	2.01	0.27
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	221	100	65	43	36	55	35	--	41	94	60
Chloride	mg/l	--	250	1040	1095	1070	928	1060	1130	1190	1200	1100	1080	1100
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5070	5300	5520	5340	4980	5090	4950	5210	4800	4860	4410
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.06	6.13	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	278	191	212	215	211	208	226	219	204	196	178
Nitrate as N	mg/l	10.0	--	1.98	1.8	2.2	0.1	0.1	4.6	--	1.5	0.3	0.2	1.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	6.5	4.3	--	--	--	5.69	1.5	2.86	0.41	1.77
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	5.03	3.7	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.19	8.06	8.41	7.83	7.78	--	7.9	8.15	8	7.9	7.3
Phosphate	mg/l	--	--	--	--	0.5	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.1	2.41	--	--	--	--	--	1.02	3.15	0.58	2.17
Sulphate	mg/l	--	500 [5]	30.9	23	20	10	3	41	3	7	4	4	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2550	2570	2770	2680	2500	2550	2490	3200	2800	2810	2205
Total Organic Carbon	mg/l	--	--	25	20.3	17.9	16.4	17	16.2	23.5	--	15.1	15.3	14.6
Total Suspended Solids	mg/l	--	--	--	--	--	2310	--	--	--	1410	2700	4730	2370
Metals														
Aluminum, dissolved	mg/l	--	--	0.01	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.1	--	--	--	--	--	--	0.003	0.003	0.002	0.003
Barium, dissolved	mg/l	1	--	0.057	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.143	1.04	1.03	1.15	1.18	1.36	1.37	1.27	1.37	1.2	1.2
Cadmium, dissolved	mg/l	0.005	--	0.01	0.0001	0.0001	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	22.63	23	24	24.5	24.7	23.2	28.4	22.9	26.5	24.5	22
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.1	0.05	1.14	1.43	0.83	3.19	0.02	0.37	0.13	0.02	0.26
Lead, dissolved	mg/l	0.01	--	0.1	0.001	0.0003	0.0002	0.0002	0.0012	0.0005	0.022	0.0002	0.0094	0.0012
Magnesium, dissolved	mg/l	--	--	19.606	31.9	36.6	36.9	35.8	35.9	37.3	39.3	33.4	32.8	29.9
Manganese, dissolved	mg/l	--	0.05	0.093	0.06	0.02	0.1	0.08	0.11	0.08	0.08	0.06	0.08	0.06
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.33	--	28.9	28.1	25.4	30.8	26	26.7	21.4	24.6	25.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	95.5	864	949	1000	1010	1330	1150	1110	1060	1120	921
Zinc, dissolved	mg/l	--	5	0.011	0.01	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.02	0.01
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	--	--	--	--	--	0.001	0.001	0.001	0.001
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 19-Nov-2004	94-1 16-Nov-2005	94-1 15-May-2007	94-1 10-Nov-2008	94-1 26-Nov-2009 [25] M-1	94-1 24-May-2011 [4] G-35	94-1 28-Nov-2012 94-1	94-1 29-May-2014 94-1	94-1 26-Nov-2015 94-1	94-1 24-May-2017 94-1	94-1 22-Nov-2018 94-1
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1400	279	1120	1090	1100	1080	1100	1100	1060	1030	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	23	39	20	38	<25 [15]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1150	1150	1120	1090	1120	1120	1100	1100	1070	1050	1160
Ammonia Nitrogen	mg/l	--	--	1.83	1.81	0.76	0.58	2.49	2.50	2.6	2.6	1.04	0.02	0.36
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	60	64	151	72	110	65	65	59	542	69	231
Chloride	mg/l	--	250	1140	997	1050	1100	1090	1010	1000	1100	1110	1100	1110
Conductivity	uS/cm	--	--	--	--	--	--	5220	5250	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5320	1700	3600	4450	>3999	>3999	3972	>3999	>3999	3999	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	191	199	174	163	173	193	200	190	170	191	270
Nitrate as N	mg/l	10.0	--	1	0.2	0.2	0.8	0.49	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	0.020	0.080	<0.05	<0.25 [9]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.11	3.22	1.2	2.33	3.43	3.27	4.9	5.1	3.1	1.2	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	0.11	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	8.35	8.58	--	8.58	--	--	--
pH (Field)	-	--	--	7.9	--	8.5	7.9	7.69	8.17	8.12	7.89	8.08	8.14	8.25
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.99	1.17	--	--	3.85	2.30	4.1	2.2	3.20	1.05	2.78
Sulphate	mg/l	--	500 [6]	10	2	2	2	5	<1	1	2	<1	1	2
Temperature (Field)	deg c	--	15	--	--	9.4	10	10.3	15.4	8.8	11.7	7.3	11.6	8.6
Total Dissolved Solids	mg/l	--	500	2660	2900	2820	2820	3390	3410	2860	2850	2940	2870	2910
Total Organic Carbon	mg/l	--	--	15.6	19.4	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	99	32	--	--	--	--	--	--	--	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.0096	0.0071	<0.01	<0.01	0.002	0.0025 [20]	0.003	0.008	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.28	1.34	1.13	1.12	1.8	1.3	1.5	1.4	1.44	1.12	1.47
Cadmium, dissolved	mg/l	0.005	--	--	0.0002	0.00005	<0.00002	<0.001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	23.9	24.5	22.1	20.3	20	23	24	23	22.4	23.9	33.9
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.005	0.014	<0.005	<0.01	<0.001	0.02	<0.001
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.002	0.0007	0.0005	<0.00050	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.005	0.003	<0.01	0.005	<0.001	0.0020	<0.0005	0.0016	0.0033
Iron, dissolved	mg/l	--	0.3	0.071	0.345	0.178	0.006	<0.3	<0.03	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0009	0.0006	0.00021	<0.00002	<0.01	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	32	33.5	28.8	27.4	30	33	34	32	27.7	31.9	44.9
Manganese, dissolved	mg/l	--	0.05	0.059	0.084	0.017	0.049	<0.1	0.03	0.14	0.065	0.123	0.018	0.021
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.1	30	28.5	25.2	23	27	25	24	21.3	25.9	31
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1200	1150	1020	984	1001	1100	1100	990	1230	1130	1050
Zinc, dissolved	mg/l	--	5	0.005	0.006	0.013	<0.005	<0.1	0.02	<0.005	<0.0050	0.007	<0.005	<0.005
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.002 [10]	<0.010 [10]	<0.001
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 21-May-2020	94-1 30-Nov-2021
				94-1	94-1
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1110	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [16]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1130	1150
Ammonia Nitrogen	mg/l	--	--	2.27	2.25
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	84	92
Chloride	mg/l	--	250	1360	1050
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	>3999
Cyanide	mg/l	0.2	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	265	214
Nitrate as N	mg/l	10.0	--	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.0	3.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.22	8.14
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	1.29	1.74
Sulphate	mg/l	--	500 [6]	<1	<1
Temperature (Field)	deg c	--	15	13.7	3.8
Total Dissolved Solids	mg/l	--	500	3000	2910
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Aluminum, dissolved	mg/l	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--
Boron, dissolved	mg/l	5	--	1.43	1.4
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	32.8	25
Chromium, dissolved	mg/l	0.05	--	0.004	<0.001
Cobalt, dissolved	mg/l	--	--	0.0025	<0.0005
Copper, dissolved	mg/l	--	1	0.0013	0.0008
Iron, dissolved	mg/l	--	0.3	4.61	0.128
Lead, dissolved	mg/l	0.01	--	0.0048	<0.0001
Magnesium, dissolved	mg/l	--	--	44.4	36.7
Manganese, dissolved	mg/l	--	0.05	0.272	0.104
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	27.4	23.2
Selenium, dissolved	mg/l	0.05	--	--	--
Silver, dissolved	mg/l	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1020	909
Zinc, dissolved	mg/l	--	5	0.016	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	0.011	<0.004 [11]
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 09-Jan-1990	94-2 02-Mar-1990	94-2 20-Mar-1990	94-2 01-Aug-1990	94-2 06-Nov-1990	94-2 29-Nov-1991	94-2 09-Jun-1992	94-2 01-Nov-1992	94-2 15-Jun-1994
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	995	1000	--	--	--	927	1058	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	14.4	1	--	--	--	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1196	840	820	782	858	857	760	868	756
Ammonia Nitrogen	mg/l	--	--	0.1	--	--	1.24	0.57	0.4	0.27	1.69	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	1.9	21.3	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--	178	58.2	84
Chloride	mg/l	--	250	2070	539	549	553	513	532	505	667	530
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5180	--	3076	3290	2891	2890	3077	3120	2970
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	165.1	213.2	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	710	294	302	244	212	204	209.78	203	409
Nitrate as N	mg/l	10.0	--	68	38.9	11.5	2.81	0.52	1.02	0.66	1.35	0.3
Nitrite as N	mg/l	1.0	--	0.1	--	--	0.1	0.01	--	0.1	0.16	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	1.4	2.24	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	1.13	0.55	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.92	8.39	8.18	8.32	8.2	8	8.27	8.1	7.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.47	1.3	0.85
Sulphate	mg/l	--	500 [6]	43	35.6	42	25	27	10	19	8	127
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	1548	1628	--	--	--	1660	1884	1490
Total Organic Carbon	mg/l	--	--	--	--	--	23	18.1	--	27.4	18.9	18.4
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	0.1	--	0.5	--	0.1	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.003	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	0.04	0.1	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--	0.88	0.96	1.12
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	77.3	35	35	30	27	27.6	22.45	24.3	64.6
Chromium, dissolved	mg/l	0.05	--	--	--	--	0.05	--	0.01	0.02	0.05	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	--	0.05	--	0.002	0.02	0.05	0.0194
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--	0.2	0.07	0.421
Lead, dissolved	mg/l	0.01	--	--	--	--	0.05	--	0.001	0.1	0.05	0.0008
Magnesium, dissolved	mg/l	--	--	126	43	47	41	35	32.7	37.26	34.5	62
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--	0.02	0.13	0.725
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	0.05	--	0.05	0.02	0.05	0.02
Potassium, dissolved	mg/l	--	--	2070	539	549	553	17	14	12.56	17.3	17.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	0.01	--	--
Sodium, dissolved	mg/l	--	200 [7]	1919	800	686	693	66	532	513.4	768	415
Zinc, dissolved	mg/l	--	5	--	--	--	0.05	--	0.02	0.02	0.05	0.1

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 09-Jan-1990	94-2 02-Mar-1990	94-2 20-Mar-1990	94-2 01-Aug-1990	94-2 06-Nov-1990	94-2 29-Nov-1991	94-2 09-Jun-1992	94-2 01-Nov-1992	94-2 15-Jun-1994
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.13	0.002	0.002	0.002	0.002	0.011
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 02-Nov-1994	94-2 28-Jun-1995	94-2 23-Nov-1995	94-2 12-Jun-1996	94-2 18-Jun-1997	94-2 06-Nov-1997	94-2 05-Jun-1998	94-2 30-Oct-1998	94-2 06-May-1999
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	868	952	1030	--	--	--	--	986	1090
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	--	--	--	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	724	780	840	813	917	800	874	808	897
Ammonia Nitrogen	mg/l	--	--	0.15	0.17	0.04	0.12	0.37	0.32	0.23	0.11	0.23
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	115	65	50	38	26	38	48	9	42
Chloride	mg/l	--	250	392	430	400	455	458	520	509	470	552
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2930	2880	3060	2970	2760	2800	3020	2930	3010
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	9.09	8.7	--	--	3.88	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	323	270	268	265	261	243	241	197	244
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.3	0.1	0.1	0.1	1	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	8.8	1.11	--	--	--	--	0.94	1.19
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	8.63	1.07	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.68	7.65	8.32	8.03	7.76	7.56	--	7.6	7.6
Phosphate	mg/l	--	--	--	--	0.3	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.266	0.36	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	116	81	98	55	58	47	53	52	21
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1470	1460	1530	1490	1380	1410	1510	1480	1510
Total Organic Carbon	mg/l	--	--	19	16.1	15	15.5	13.9	13.9	14	16.4	16.6
Total Suspended Solids	mg/l	--	--	--	--	--	343	567	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	0.111	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.1	--	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	0.058	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.89	0.62	0.62	0.728	0.88	0.76	0.93	0.95	0.87
Cadmium, dissolved	mg/l	0.005	--	0.01	0.0015	0.0001	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	34.69	37.1	35.1	33.1	34.5	32.6	30.6	26.5	32.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.016	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.38	0.04	0.35	0.549	0.77	0.48	0.48	0.46	0.29
Lead, dissolved	mg/l	0.01	--	0.1	0.0051	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005
Magnesium, dissolved	mg/l	--	--	25.676	42.6	43.2	43.8	41.8	38.7	39.4	31.8	39.2
Manganese, dissolved	mg/l	--	0.05	0.359	0.4	0.32	0.339	0.25	0.22	0.32	0.27	0.24
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.8	--	14.6	19.7	12.5	16.3	15.1	16.4	5.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	514.6	492	542	586	496	495	709	599	625
Zinc, dissolved	mg/l	--	5	0.076	0.01	0.01	0.01	0.01	0.01	0.16	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 02-Nov-1994	94-2 28-Jun-1995	94-2 23-Nov-1995	94-2 12-Jun-1996	94-2 18-Jun-1997	94-2 06-Nov-1997	94-2 05-Jun-1998	94-2 30-Oct-1998	94-2 06-May-1999
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.005	0.001	--	--	--	--	--	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 19-Oct-1999	94-2 05-May-2000	94-2 24-Oct-2000	94-2 14-Jun-2001	94-2 23-Nov-2001	94-2 23-May-2002	94-2 06-Nov-2002	94-2 30-May-2003	94-2 09-Oct-2003
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	900	1161	1100	826	859	765	867	982	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	59	1	1	58	1	49	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	826	952	901	773	704	708	711	805	805
Ammonia Nitrogen	mg/l	--	--	0.22	0.05	0.03	0.06	0.02	0.06	0.06	0.07	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	1
Chemical Oxygen Demand	mg/l	--	--	33	38	--	30	25	15	32	39	35
Chloride	mg/l	--	250	532	370	453	371	362	347	383	420	421
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2800	2850	2910	2400	2360	2660	2670	2560	2700
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	185
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	240	237	248	242	240	224	221	204	201
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.3	0.1	0.2	0.3	0.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	0.64	0.95	0.66	0.54	0.6	0.78	0.68
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7.6	7.41	7.7	6.97	7.23	7.6	7	7.5
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.41	0.33	0.29	0.36	0.32	0.45	0.43
Sulphate	mg/l	--	500 [6]	40	90	67	68	86	73	59	43	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1390	1425	1530	1440	1340	1330	1500	1280	1541
Total Organic Carbon	mg/l	--	--	13.6	13.2	--	11	10	11	10.7	10.7	14
Total Suspended Solids	mg/l	--	--	208	100	55	55	137	152	44	35	56
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	0.003	0.001	0.003	0.001	0.003	0.002	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.02	0.84	0.74	0.9	0.99	0.71	0.79	0.66	0.667
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	33.9	31.9	30	36.3	33.4	33.7	29.2	28.9	26.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.003
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.004
Iron, dissolved	mg/l	--	0.3	1.15	0.51	0.28	0.08	0.03	0.02	0.11	0.2	1.33
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	0.0022	0.0002	0.0002	0.0002	0.0021	0.0008	0.0009
Magnesium, dissolved	mg/l	--	--	37.2	37.8	42	36.7	38	33.9	35.9	32.1	32.7
Manganese, dissolved	mg/l	--	0.05	0.18	0.25	0.45	0.13	0.13	0.12	0.12	0.01	0.17
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	15.9	9.4	17.7	7	7.8	13.9	12.8	12.8	13.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	700	623	645	487	509	452	468	505	524
Zinc, dissolved	mg/l	--	5	0.12	0.08	0.01	0.01	0.01	0.01	0.02	0.01	0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 19-Oct-1999	94-2 05-May-2000	94-2 24-Oct-2000	94-2 14-Jun-2001	94-2 23-Nov-2001	94-2 23-May-2002	94-2 06-Nov-2002	94-2 30-May-2003	94-2 09-Oct-2003
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.001	0.084	0.001	0.001	0.001	0.001	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 14-May-2004	94-2 19-Nov-2004	94-2 24-May-2005	94-2 16-Nov-2005	94-2 25-May-2006	94-2 21-Nov-2006	94-2 15-May-2007	94-2 30-Nov-2007	94-2 22-May-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	952	1090	1050	209	865	904	890	900	840
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	780	890	860	855	865	904	890	900	840
Ammonia Nitrogen	mg/l	--	--	0.03	0.01	0.12	0.17	0.01	0.01	<0.01	0.1	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	34	41	33	45	26	29	49	68	27
Chloride	mg/l	--	250	421	491	438	386	449	446	430	470	472
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2710	2900	3300	2400	2400	2600	1900	1300	2500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	219	213	226	228	210	194	214	215	213
Nitrate as N	mg/l	10.0	--	0.2	1	0.2	0.4	0.1	0.1	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.7	0.63	0.9	0.73	0.98	0.62	0.68	0.81	0.76
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.8	7.8	7.2	--	7.7	7.1	8.1	7.8	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.31	0.38	0.4	0.46	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	46	30	34	43	32	30	23	23	21
Temperature (Field)	deg c	--	15	--	--	10.1	--	5	10	9.3	6.5	9.5
Total Dissolved Solids	mg/l	--	500	1355	1450	1620	1670	1660	1660	1610	1830	1640
Total Organic Carbon	mg/l	--	--	9.8	11.4	11	13	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	35	28	43	33	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.002	0.002	<0.001	0.0067	0.0068	0.0054	0.0047
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.678	0.763	0.717	0.726	0.595	0.579	0.621	0.714	0.602
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	30	29.4	29	31.3	28.1	26.9	29.8	29.6	29.4
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.049	0.137	0.061	0.276	0.055	0.761	0.453	0.378	0.302
Lead, dissolved	mg/l	0.01	--	0.0007	0.0005	0.0012	0.0002	0.0004	<0.0001	0.00004	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	35.1	33.9	37.3	36.5	33.9	30.9	34	34.3	33.9
Manganese, dissolved	mg/l	--	0.05	0.3	0.151	0.135	0.396	0.175	0.346	0.331	0.184	0.289
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.7	15.1	16.2	16.5	13.6	14.1	15.1	17.5	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	<0.001	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	547	572	569	657	597	567	545	710	566
Zinc, dissolved	mg/l	--	5	0.005	0.005	<0.005	0.008	<0.005	0.008	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 14-May-2004	94-2 19-Nov-2004	94-2 24-May-2005	94-2 16-Nov-2005	94-2 25-May-2006	94-2 21-Nov-2006	94-2 15-May-2007	94-2 30-Nov-2007	94-2 22-May-2008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	<0.0007	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 10-Nov-2008	94-2 19-May-2009 G-21	94-2 26-Nov-2009 M-5	94-2 25-May-2010 [4] M-18	94-2 20-Oct-2010 [4] G-15	94-2 24-May-2011 [4] G-28	94-2 29-Nov-2011 [4] 94-2	94-2 31-May-2012 94-2	94-2 28-Nov-2012 94-2
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	880	862	877	838	860	854	859	840	840
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	27	19	12	14
Alkalinity (Total as CaCO3)	mg/l	--	--	880	862	877	838	860	881	878	850	850
Ammonia Nitrogen	mg/l	--	--	0.1	0.07	0.04	0.04	0.11	0.17	0.06	<0.050	0.18
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	31	35	35	38	45	33	35	33	43
Chloride	mg/l	--	250	500	455	478	432	471	476	458	440	420
Conductivity	uS/cm	--	--	--	2950	2990	2920	2960	3070	3000	--	--
Conductivity (Field)	uS/cm	--	--	2500	2500	2799	2876	2780	2735	2590	2530	2438
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	211	219	195	221	211	227	191	220	230
Nitrate as N	mg/l	10.0	--	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.69	0.49	0.40	0.55	0.47	0.62	0.48	1.2	0.87
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.10	8.07	8.28	8.09	8.52	8.38	8.20	--
pH (Field)	-	--	--	7.7	--	7.47	7.82	7.75	7.79	7.68	7.78	7.72
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.68	0.52	0.57	0.63	0.69	0.46	0.41	0.49
Sulphate	mg/l	--	500 [6]	14	14	15	17	12	10	11	<20	13
Temperature (Field)	deg c	--	15	9	10	10.5	22.3	14.9	15.6	9.7	11.1	9.7
Total Dissolved Solids	mg/l	--	500	1660	1920	1940	1900	1920	2000	1950	1610	1680
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0047	0.006	0.006	<0.01	<0.01	<0.01	<0.01	0.0026	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.606	0.74	0.90	0.68	0.58	0.7	0.59	0.63	0.7
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	29.3	30	27	29	30	30	27	30	31
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0004	0.0004	0.0005	0.0005	0.0005	0.0003	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.002	0.001	0.002	0.001	0.004	0.002	0.0025	0.002
Iron, dissolved	mg/l	--	0.3	<0.005	<0.03	0.95	0.34	0.73	<0.03	0.08	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	33.4	35	31	36	33	37	30	35	37
Manganese, dissolved	mg/l	--	0.05	0.036	<0.01	0.25	0.20	0.25	0.03	0.02	0.0029	<0.002
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.2	13	12	14	12	15	12	13	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	543	542	569	536	592	564	543	550	590
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.0050	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 10-Nov-2008	94-2 19-May-2009 G-21	94-2 26-Nov-2009 M-5	94-2 25-May-2010 [4] M-18	94-2 20-Oct-2010 [4] G-15	94-2 24-May-2011 [4] G-28	94-2 29-Nov-2011 [4] 94-2	94-2 31-May-2012 94-2	94-2 28-Nov-2012 94-2
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	<0.0006	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-May-2013 [5] 94-2	94-2 26-Nov-2013 GW-9	94-2 29-May-2014 94-2	94-2 19-Nov-2014 [5] 94-2	94-2 02-Jun-2015 94-2	94-2 26-Nov-2015 94-2	94-2 26-May-2016 94-2	94-2 17-Nov-2016 94-2	94-2 24-May-2017 94-2
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	840	860	830	870	902	885	922	925	949
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	13	15	12	13	9	9	9	11
Alkalinity (Total as CaCO3)	mg/l	--	--	850	880	850	880	915	894	931	934	960
Ammonia Nitrogen	mg/l	--	--	0.31	0.28	0.20	0.14	0.33	0.32	0.28	0.43	0.92
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	41	33	39	42	56	44	44	58
Chloride	mg/l	--	250	500	510	460	560	564	527	559	584	596
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2460	2399	2515	2674	2864	2895	2853	3019	3060
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	240	200	250	230	185	219	245	244	228
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.25 [9]
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.0	1.1	0.75	0.9	1.1	0.9	0.9	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.17	8.22	8.29	8.16	--	--	--	--	--
pH (Field)	-	--	--	7.60	7.61	7.90	7.82	7.80	7.74	8.11	7.94	7.82
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.56	0.61	0.42	0.54	0.40	0.61	0.48	0.55	0.73
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	6	7	6	4	4
Temperature (Field)	deg c	--	15	11.4	8.5	10.8	6.5	11.3	8.0	15.1	11.1	13.1
Total Dissolved Solids	mg/l	--	500	1810	1700	1670	1680	1760	1700	1870	1810	1840
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0017	0.0026	0.0019	0.0020	0.001	0.002	0.002	0.005	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.72	0.55	0.79	0.61	0.549	0.539	0.663	0.862	0.63
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	33	29	33	31	28.9	28.3	34.2	33.2	32.3
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.012	0.011
Cobalt, dissolved	mg/l	--	--	<0.00050	0.00051	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0017	0.0014	0.0021	<0.0020	<0.0005	<0.0005	0.0009	0.0008	0.0016
Iron, dissolved	mg/l	--	0.3	<0.1	0.19	0.51	0.62	<0.1	0.5	0.135	0.382	<0.1
Lead, dissolved	mg/l	0.01	--	0.00057	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	38	32	40	36	27.4	36.1	38.8	39.1	35.9
Manganese, dissolved	mg/l	--	0.05	0.22	0.33	0.2	0.34	0.036	0.259	0.092	0.408	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	13	15	14	12.3	11.4	15	13.6	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	550	550	580	600	611	632	542	639	629
Zinc, dissolved	mg/l	--	5	<0.0050	0.027	0.039	<0.0050	<0.005	0.008	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-May-2013 [5] 94-2	94-2 26-Nov-2013 GW-9	94-2 29-May-2014 94-2	94-2 19-Nov-2014 [5] 94-2	94-2 02-Jun-2015 94-2	94-2 26-Nov-2015 94-2	94-2 26-May-2016 94-2	94-2 17-Nov-2016 94-2	94-2 24-May-2017 94-2
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]	0.008	0.004	<0.004 [10]
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	0.00043	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-Nov-2017 94-2	94-2 24-May-2018 94-2	94-2 22-Nov-2018 94-2	94-2 19-Jun-2019 [26] 94-2	94-2 20-Nov-2019 94-2	94-2 21-May-2020 94-2	94-2 26-Nov-2020 94-2	94-2 26-May-2021 94-2	94-2 30-Nov-2021 94-2
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	941	959	981	--	873	871	878	900	866
Alkalinity, Carbonate as CaCO3	mg/l	--	--	13	12	12	--	16	22	20	11	13
Alkalinity (Total as CaCO3)	mg/l	--	--	954	971	993	--	889	893	898	912	879
Ammonia Nitrogen	mg/l	--	--	0.37	0.25	0.51	--	0.35	0.09	0.30	0.11	0.11
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	60	61	76	--	54	57	80	36	83
Chloride	mg/l	--	250	629	548	544	--	588	612	495	485	457
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2593	2981	2725	--	3010	2793	2576	2894	2818
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	210	245	280	--	295	266	269	292	224
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.0	1.8	--	0.8	0.9	1.1	0.6	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.68	7.58	8.09	--	7.94	8.11	8.07	7.64	7.68
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.60	0.51	1.52	--	0.68	0.60	0.83	0.46	0.70
Sulphate	mg/l	--	500 [6]	6	6	9	--	5	11	5	5	9
Temperature (Field)	deg c	--	15	8.6	14.9	5.9	--	8.5	12.1	7.1	14.5	7.0
Total Dissolved Solids	mg/l	--	500	1820	1850	1730	--	1780	1680	1680	1770	1670
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.003	--	0.003	0.001	0.002	0.002	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.6	0.655	0.604	--	0.433	0.491	0.445	0.494	0.36
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29.9	35.2	38.5	--	40.7	37.1	36.6	37.1	33.6
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0008	--	0.0006	<0.0005	<0.0005	0.0006	0.0005
Copper, dissolved	mg/l	--	1	0.0007	0.0010	0.0037	--	0.0014	0.0053	0.0012	0.0011	0.0011
Iron, dissolved	mg/l	--	0.3	0.612	0.222	0.178	--	0.462	<0.1	0.536	0.113	0.397
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	--	0.0001	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	33	38.1	44.6	--	47	42.1	43	48.4	34.1
Manganese, dissolved	mg/l	--	0.05	0.42	0.258	0.544	--	0.354	0.026	0.377	0.605	0.599
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	14.1	16.3	--	20.4	16	14.5	14.7	12.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	598	565	641	--	636	599	587	515	555
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	--	0.005	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-Nov-2017 94-2	94-2 24-May-2018 94-2	94-2 22-Nov-2018 94-2	94-2 19-Jun-2019 [26] 94-2	94-2 20-Nov-2019 94-2	94-2 21-May-2020 94-2	94-2 26-Nov-2020 94-2	94-2 26-May-2021 94-2	94-2 30-Nov-2021 94-2
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	--	0.003	0.004	<0.004 [11]	<0.004 [11]	<0.004 [11]
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 15-Jun-1994	94-3 02-Nov-1994	94-3 28-Jun-1995	94-3 23-Nov-1995	94-3 12-Jun-1996	94-3 12-Oct-1996	94-3 18-Jun-1997	94-3 06-Nov-1997	94-3 05-Jun-1998
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	907	453	850	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	940	756	372	697	466	533	511	620	530
Ammonia Nitrogen	mg/l	--	--	--	2.23	1.2	1.38	0.94	1.39	0.73	0.82	0.29
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	260	158	85	78	33	30	16	46	39
Chloride	mg/l	--	250	360	132	223	274	132	138	86.6	212	145
Conductivity (Field)	uS/cm	--	--	3070	2270	1960	2650	1680	1960	1370	1900	1700
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	10.19	8.2	--	--	--	2.47	--	--
Hardness, Calcium Carbonate	mg/l	--	--	878	783	787	853	588	514	445	492	435
Nitrate as N	mg/l	10.0	--	0.1	4.38	1.7	2	0.6	0.1	0.1	0.1	1.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	6.4	4.6	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	5.2	3.22	--	--	--	--	--
pH (Field)	-	--	--	6.69	7.08	7.55	7.52	7.06	6.68	7.25	6.55	--
Phosphate	mg/l	--	--	--	--	--	0.4	--	--	--	--	--
Phosphorus	mg/l	--	--	2.25	0.392	1.08	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	369	359	355	272	279	234	190	137	234
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1550	1140	999	1330	840	980	680	1010	842
Total Organic Carbon	mg/l	--	--	42.2	--	29	23.7	16.1	16.4	8.9	17.8	14.5
Total Suspended Solids	mg/l	--	--	--	--	--	--	853	396	1590	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	0.097	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.1	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.104	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	5.41	3.981	0.68	0.76	1.06	1.36	1.43	1.63	1.71
Cadmium, dissolved	mg/l	0.005	--	--	0.001	0.0004	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	170	165.1	198	212	133	117	102	103	97
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0233	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Iron, dissolved	mg/l	--	0.3	0.691	0.435	0.46	6.46	5.73	4.67	2.44	4.05	3.24
Lead, dissolved	mg/l	0.01	--	0.0007	0.1	0.0007	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	110	61.336	70.2	77.6	61.6	53.3	45.7	56.3	46.1
Manganese, dissolved	mg/l	--	0.05	1.708	1.313	1.05	1.69	1.47	1.22	1.04	0.89	0.67
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.04
Potassium, dissolved	mg/l	--	--	48	22.77	--	20.4	15.9	15.9	9.5	16.4	16.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	285	172.1	107	219	217	214	173	251	268
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.71
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.048	--	0.001	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 29-Oct-1998	94-3 06-May-1999	94-3 19-Oct-1999	94-3 05-May-2000	94-3 24-Oct-2000	94-3 14-Jun-2001	94-3 23-Nov-2001	94-3 23-May-2002	94-3 06-Nov-2002
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	556	588	650	708	732	476	405	412	754
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	10	1	1	1	1	15	1
Alkalinity (Total as CaCO3)	mg/l	--	--	456	482	549	580	600	390	332	362	618
Ammonia Nitrogen	mg/l	--	--	0.19	0.12	0.18	0.01	0.02	0.03	0.02	0.17	0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	10	92	11	--	10	12	13	18
Chloride	mg/l	--	250	62.9	71	226	39	127	51.1	45.9	43.6	56.5
Conductivity (Field)	uS/cm	--	--	1571	1450	1800	1400	1900	1130	1240	980	1380
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	363	527	456	570	404	408	531	374	515
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.2	0.4	0.1	0.2	0.2	1.9
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.75	0.94	--	--	0.75	0.45	0.68	0.52	0.5
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.6	6.7	7.6	6.8	6.81	6.9	6.19	6.77	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.24	0.26	0.29	0.21	0.17
Sulphate	mg/l	--	500 [6]	203	280	163	300	203	195	209	128	147
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	788	720	900	700	1000	782	770	564	868
Total Organic Carbon	mg/l	--	--	12.5	8.8	14.9	7.8	--	6.1	9	5	6.1
Total Suspended Solids	mg/l	--	--	--	--	2020	182	376	172	414	224	153
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.7	1.01	1.67	0.96	1.53	1.12	1.1	0.48	0.98
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	87.5	128	96.5	141	78.2	98.2	132	94.6	126
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.3	0.21	6.74	0.16	0.07	0.02	0.03	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0005	0.0002	0.0002	0.0022	0.0002	0.0002	0.0002	0.0007
Magnesium, dissolved	mg/l	--	--	35.2	49.6	51.6	52.1	50.7	39.5	48.9	33.4	48.6
Manganese, dissolved	mg/l	--	0.05	0.92	0.66	1	0.1	0.31	0.08	0.03	0.34	0.09
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	7.9	1.2	10.9	0.6	8.6	0.4	5.5	5	7.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	161	152	307	135	224	147	120	77.3	122
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.25	0.2	0.01	0.01	0.01	0.02	0.02
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.034	0.001	0.001	0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 30-May-2003	94-3 09-Oct-2003	94-3 14-May-2004	94-3 19-Nov-2004	94-3 24-May-2005	94-3 16-Nov-2005	94-3 25-May-2006	94-3 19-Dec-2008	94-3 19-Jun-2019 94-3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	671	--	776	824	781	179	660	770	930
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	550	579	636	675	640	735	660	770	934
Ammonia Nitrogen	mg/l	--	--	0.16	0.38	0.31	0.16	0.28	<0.01	0.2	0.08	0.31
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	2	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	17	21	23	28	20	15	24	<5	81
Chloride	mg/l	--	250	27.9	97.8	41.2	58	54.4	63.9	39.7	49.7	49
Conductivity (Field)	uS/cm	--	--	1240	1500	1490	1760	1950	1700	1325	1600	1556
Dissolved Inorganic Carbon	mg/l	--	--	--	129	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	529	434	553	530	589	659	662	756	708
Nitrate as N	mg/l	10.0	--	2.7	0.1	0.3	1	0.2	0.3	0.2	0.4	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.92	1.04	0.81	0.9	0.79	0.44	0.98	0.52	0.8
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.5	7	6.9	7	6.8	--	7.9	7.3	6.96
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.23	0.64	0.21	0.57	0.14	0.16	--	--	0.11
Sulphate	mg/l	--	500 [6]	161	138	179	170	186	200	330	270	64
Temperature (Field)	deg c	--	15	--	--	--	--	9	--	5.5	4	13.1
Total Dissolved Solids	mg/l	--	500	620	958	745	680	989	1120	1150	1250	1020
Total Organic Carbon	mg/l	--	--	6.9	11	6.2	7.5	6.7	9.2	--	--	--
Total Suspended Solids	mg/l	--	--	188	519	108	17	99	90	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	0.002	<0.001	0.0006	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.64	1.24	0.797	1.16	0.95	1.51	0.773	1.1	0.59
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.005	<0.00002	0.0001
Calcium, dissolved	mg/l	--	--	139	98.9	137	131	140	159	156	176	145
Chromium, dissolved	mg/l	0.05	--	0.01	0.001	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005	0.0006
Copper, dissolved	mg/l	--	1	0.01	0.003	0.003	0.002	<0.002	0.006	<0.002	0.003	0.0020
Iron, dissolved	mg/l	--	0.3	0.27	0.126	0.03	0.05	0.533	0.013	0.014	0.024	0.424
Lead, dissolved	mg/l	0.01	--	0.0002	0.0003	0.0003	0.0002	0.0009	0.0003	<0.0002	<0.00002	<0.0001
Magnesium, dissolved	mg/l	--	--	44.1	45.4	51.3	49.2	58.3	63.8	66.1	77.1	83.8
Manganese, dissolved	mg/l	--	0.05	0.55	0.501	0.544	0.259	1.3	0.019	0.777	0.392	3.43
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	7.6	10.6	8.8	8.6	8.8	11.4	8.4	11	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	0.001	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	104	219	159	172	164	200	157	200	116
Zinc, dissolved	mg/l	--	5	0.01	0.009	0.005	0.005	<0.005	0.009	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0005
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--	<0.001	<0.001	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--	<0.0003	<0.0003	<0.0050
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--	<0.0002	<0.0002	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 05-May-2000	MW-C 24-Oct-2000	MW-C 14-Jun-2001	MW-C 23-Nov-2001	MW-C 23-May-2002	MW-C 06-Nov-2002	MW-C 30-May-2003	MW-C 09-Oct-2003	MW-C 14-May-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	454	628	366	381	412	666	403	--	523
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	10	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	372	515	300	312	395	546	330	528	429
Ammonia Nitrogen	mg/l	--	--	0.12	0.37	0.33	0.01	0.35	0.65	0.14	0.59	0.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	3	--
Chemical Oxygen Demand	mg/l	--	--	--	--	8	77	56	120	70	59	89
Chloride	mg/l	--	250	103	212	122	206	117	279	201	171	123
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1150	1660	1100	1670	1410	1900	1500	1880	1790
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	122	--
Hardness, Calcium Carbonate	mg/l	--	--	212	182	224	331	344	147	372	125	402
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	0.3	1	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	15.5	2.66	3.43	2.26	3.26	4.9	2.79	3.77
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	7.5	7.1	6.94	6.94	7.8	6.8	7.4	7.5
Phosphorus	mg/l	--	--	--	7.27	5.4	5.15	2.81	8.71	3.01	2.15	2.87
Sulphate	mg/l	--	500 [6]	155	77	156	315	220	56	335	64	320
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	575	890	706	958	876	1100	750	950	895
Total Organic Carbon	mg/l	--	--	--	--	13.5	21	14	18.1	16.2	15	15.7
Total Suspended Solids	mg/l	--	--	22300	37000	5930	9420	3440	6550	5900	1130	4360
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.004	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.99	0.75	1.06	1.36	1.34	0.72	1.12	0.716	1.25
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	40.5	28.5	42.2	57	62.9	22.7	67.1	19.4	71.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.016	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.012	0.007
Iron, dissolved	mg/l	--	0.3	0.09	6.35	0.04	0.04	0.03	0.05	0.33	0.42	1.13
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0019	0.0002	0.0007	0.0003
Magnesium, dissolved	mg/l	--	--	26.5	27	28.8	45.8	45.4	21.9	49.7	18.7	54.1
Manganese, dissolved	mg/l	--	0.05	0.46	0.63	0.22	0.14	0.2	0.2	0.25	0.401	0.47
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	4.7	9.2	2.2	3.2	6.2	7.6	4.8	8.6	4.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	200	353	161	294	216	347	266	351	274
Zinc, dissolved	mg/l	--	5	0.03	0.04	0.01	0.01	0.02	0.04	0.01	0.027	0.006

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 05-May-2000	MW-C 24-Oct-2000	MW-C 14-Jun-2001	MW-C 23-Nov-2001	MW-C 23-May-2002	MW-C 06-Nov-2002	MW-C 30-May-2003	MW-C 09-Oct-2003	MW-C 14-May-2004
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.03	0.001	0.001	0.001	0.001	0.001	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-Nov-2004	MW-C 24-May-2005	MW-C 16-Nov-2005	MW-C 25-May-2006	MW-C 21-Nov-2006	MW-C 15-May-2007	MW-C 30-Nov-2007	MW-C 22-May-2008	MW-C 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	695	539	256	448	458	507	447	410	570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	570	442	420	448	458	507	447	410	570
Ammonia Nitrogen	mg/l	--	--	0.08	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	43	70	59	20	27	120	80	<5	31
Chloride	mg/l	--	250	153	67.2	235	159	76.9	62.9	197	99.8	157
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1820	1700	2000	1450	1200	800	1425	1350	1400
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	454	423	594	395	351	433	459	396	454
Nitrate as N	mg/l	10.0	--	1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.94	2.19	1.37	1.47	0.9	1.4	1.72	0.8	0.63
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.3	6.9	--	7.6	8.1	7.9	7.8	7.3	7.1
Phosphorus	mg/l	--	--	1.09	2.12	2.06	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	290	167	420	360	182	139	370	250	240
Temperature (Field)	deg c	--	15	--	10	--	6.5	6.5	9.2	6.5	14.5	6
Total Dissolved Solids	mg/l	--	500	910	804	1450	1220	864	772	1320	957	1150
Total Organic Carbon	mg/l	--	--	11.8	10.2	19.4	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1010	233	1430	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	0.0016	0.0024	0.0016	0.0015	0.0008
Boron, dissolved	mg/l	5	--	1.38	1.18	1.24	1.15	1.1	0.778	0.932	1.06	1.22
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	86.2	74	116	69.5	61.4	81.4	82.4	71.6	83.9
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.346	1.93	0.76	1.86	2.64	3.31	0.879	0.778	0.086
Lead, dissolved	mg/l	0.01	--	0.0007	0.0003	0.0002	<0.0002	<0.0001	0.00005	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	58.1	57.8	74.1	53.8	48.1	55.8	61.5	52.8	59.5
Manganese, dissolved	mg/l	--	0.05	1.1	0.591	0.329	0.254	0.373	0.517	0.434	0.188	0.078
Mercury, dissolved	mg/l	0.001	--	--	0.00014	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	3.9	7	5.5	5	3.6	6.5	4.8	6.2
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	288	170	351	306	212	121	335	227	268
Zinc, dissolved	mg/l	--	5	0.005	0.008	0.008	0.018	0.007	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-Nov-2004	MW-C 24-May-2005	MW-C 16-Nov-2005	MW-C 25-May-2006	MW-C 21-Nov-2006	MW-C 15-May-2007	MW-C 30-Nov-2007	MW-C 22-May-2008	MW-C 10-Nov-2008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-May-2009 G-16	MW-C 26-Nov-2009 J-8	MW-C 25-May-2010 M-20	MW-C 20-Oct-2010 G-19	MW-C 24-May-2011 G-27	MW-C 29-Nov-2011 [4] MW-C	MW-C 31-May-2012 MW-C	MW-C 28-Nov-2012 MW-C	MW-C 29-May-2013 [27] MW-C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	511	546	390	434	384	580	350	510	390
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	1.8	2.4	2.7
Alkalinity (Total as CaCO3)	mg/l	--	--	511	546	390	434	384	580	350	520	400
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	0.04	0.02	<0.02	0.52	<0.050	0.16	0.20
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	23	40	23	40	25	50	31	35	87
Chloride	mg/l	--	250	86	108	53	121	47	269	120	190	63
Conductivity	uS/cm	--	--	1420	1600	1080	1570	1060	2060	--	--	--
Conductivity (Field)	uS/cm	--	--	1150	1457	917	1527	1202	1863	1633	1949	1090
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	380	411	334	390	329	195	420	470	340
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.32	0.23	0.41	0.35	0.16	1.18	0.87	1.3	2.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10
pH	-	--	--	7.66	7.82	7.96	7.69	8.28	8.15	7.74	--	7.86
pH (Field)	-	--	--	--	6.29	7.18	7.1	7.11	7.65	7.39	7.23	7.36
Phosphorus	mg/l	--	--	0.71	0.90	0.85	0.87	0.35	2.17	0.40	0.83	4.8
Sulphate	mg/l	--	500 [6]	133	160	102	222	116	103	370	350	220
Temperature (Field)	deg c	--	15	7	8	20.2	11.8	12.4	8.5	10.6	6.3	10.7
Total Dissolved Solids	mg/l	--	500	923	1040	702	1020	689	1340	1130	1410	900
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	<0.01	0.0011	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	0.94	0.9	0.69	1.1	0.86	0.80	1.1	1.2	0.9
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	68	79	66	72	69	32	85	81	67
Chromium, dissolved	mg/l	0.05	--	0.004	0.004	0.004	0.005	0.004	0.009	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0003	0.0002	0.0003	0.0003	0.0003	<0.00050	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	0.001	0.002	<0.001	0.0019	<0.001	<0.0010
Iron, dissolved	mg/l	--	0.3	0.39	0.83	0.78	0.39	1.62	0.72	0.19	0.39	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	51	52	41	51	38	28	50	64	41
Manganese, dissolved	mg/l	--	0.05	0.06	0.29	0.09	0.58	0.11	0.42	0.44	0.97	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	4	4	7	4	8	6.4	8.7	5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	160	193	105	223	114	355	220	330	180
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.0050	<0.005	<0.0050

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-May-2009 G-16	MW-C 26-Nov-2009 J-8	MW-C 25-May-2010 M-20	MW-C 20-Oct-2010 G-19	MW-C 24-May-2011 G-27	MW-C 29-Nov-2011 [4] MW-C	MW-C 31-May-2012 MW-C	MW-C 28-Nov-2012 MW-C	MW-C 29-May-2013 [27] MW-C
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0054	0.015
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00050

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 26-Nov-2013 [28] GW-2	MW-C 29-May-2014 MW-C	MW-C 19-Nov-2014 MW-C	MW-C 02-Jun-2015 MW-C	MW-C 26-Nov-2015 MW-C	MW-C 26-May-2016 MW-C	MW-C 17-Nov-2016 MW-C	MW-C 24-May-2017 MW-C	MW-C 29-Nov-2017 MW-C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	540	350	510	431	580	303	574	332	472
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6.7	3.0	3.0	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	550	350	510	433	583	304	577	333	475
Ammonia Nitrogen	mg/l	--	--	0.33	0.11	0.080	0.13	0.64	0.13	0.54	0.04	0.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	52	25	38	45	217	131	83	55	40
Chloride	mg/l	--	250	240	100	140	89	322	65	269	134	102
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1711	1420	1776	1464	1997	1203	2136	1829	1375
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	280	340	340	382	276	283	216	396	343
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1	0.2	<0.1	0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.021	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.2	2.2	1.2	0.6	3.0	1.2	1.7	0.8	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	--	--	--	--	--	--
pH	-	--	--	8.12	7.96	7.79	--	--	--	--	--	--
pH (Field)	-	--	--	7.54	7.61	7.39	7.18	7.74	7.89	8.07	7.75	7.98
Phosphorus	mg/l	--	--	1.6	1.3	1.6	0.55	3.70	1.41	1.41	0.64	1.64
Sulphate	mg/l	--	500 [6]	160	350	250	342	140	263	165	473	339
Temperature (Field)	deg c	--	15	6.7	11.6	6.4	10.4	7.2	11.5	10.3	10.8	5.7
Total Dissolved Solids	mg/l	--	500	1250	1040	1060	978	1220	802	1180	1270	958
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.78	0.92	0.9	0.728	0.833	0.429	0.94	0.482	0.665
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	47	63	61	60.8	32.3	62.3	36.9	83.6	60.8
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	0.001	<0.001	0.008	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	0.00052	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0010	0.0035	<0.0020	<0.0005	<0.0005	0.0011	0.0015	0.0061	0.0016
Iron, dissolved	mg/l	--	0.3	0.2	0.17	<0.1	0.396	0.408	0.134	0.11	0.124	0.349
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0001
Magnesium, dissolved	mg/l	--	--	39	43	46	55.9	47.3	30.9	30.2	45.5	46.4
Manganese, dissolved	mg/l	--	0.05	0.62	0.14	0.42	0.158	0.814	0.066	0.202	0.119	0.607
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.2	5.5	7.4	4.55	7.9	4.72	7.87	5.25	6.53
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	400	210	310	195	509	101	414	172	235
Zinc, dissolved	mg/l	--	5	0.0052	<0.0050	0.034	<0.005	0.01	0.006	<0.005	0.006	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 26-Nov-2013 [28] GW-2	MW-C 29-May-2014 MW-C	MW-C 19-Nov-2014 MW-C	MW-C 02-Jun-2015 MW-C	MW-C 26-Nov-2015 MW-C	MW-C 26-May-2016 MW-C	MW-C 17-Nov-2016 MW-C	MW-C 24-May-2017 MW-C	MW-C 29-Nov-2017 MW-C
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.0012	<0.0010	<0.0010	<0.001	<0.001	0.003	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	0.00073	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 24-May-2018	MW-C 22-Nov-2018	MW-C 19-Jun-2019	MW-C 20-Nov-2019	MW-C 21-May-2020	MW-C 26-Nov-2020	MW-C 26-May-2021	MW-C 30-Nov-2021
				MW-C	MW-C	MW-C	MW-C	MW-C	MW-C	MW-C	MW-C
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	518	573	457	565	357	593	516	306
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	10	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	520	576	460	570	362	603	520	310
Ammonia Nitrogen	mg/l	--	--	0.07	0.06	0.16	0.31	0.04	0.52	0.16	0.06
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	107	105	140	127	63	91	61	163
Chloride	mg/l	--	250	57	201	68	283	151	282	217	71
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1248	1649	1351	2040	1616	1942	2072	1282
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	326	430	427	298	562	259	431	357
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	1.5	1.2	1.7	1.0	1.2	1.2	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.29	7.75	7.32	7.69	7.83	7.88	7.35	7.64
Phosphorus	mg/l	--	--	1.18	1.69	1.39	1.78	0.40	0.79	0.86	1.45
Sulphate	mg/l	--	500 [6]	186	197	317	165	146	154	315	266
Temperature (Field)	deg c	--	15	10.9	5.8	13	7.9	10.5	7.3	11.9	4.8
Total Dissolved Solids	mg/l	--	500	818	1090	986	1220	1250	1240	1310	770
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.002	0.001	0.001	0.002	0.002
Boron, dissolved	mg/l	5	--	0.407	0.781	0.392	0.633	0.403	0.582	0.363	0.251
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	68.9	85.3	86.8	48.7	114	41	91.4	86.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.004	0.004	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0015	0.0012	0.0005	<0.0005	0.0006	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0010	0.0087	0.0050	0.0028	0.0031	0.0016	0.0020	0.0058
Iron, dissolved	mg/l	--	0.3	0.312	1.77	1.56	0.223	0.734	0.622	0.455	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0009	0.0010	<0.0001	0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	37.3	52.7	51.1	42.9	67.1	37.9	49.2	34.2
Manganese, dissolved	mg/l	--	0.05	0.054	0.076	0.168	0.426	0.165	0.545	0.107	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.5	9.27	6.44	10.5	7.38	9.26	6.17	4.95
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	94.5	298	141	376	196	402	165	112
Zinc, dissolved	mg/l	--	5	<0.005	0.008	0.009	<0.005	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 24-May-2018 MW-C	MW-C 22-Nov-2018 MW-C	MW-C 19-Jun-2019 MW-C	MW-C 20-Nov-2019 MW-C	MW-C 21-May-2020 MW-C	MW-C 26-Nov-2020 MW-C	MW-C 26-May-2021 MW-C	MW-C 30-Nov-2021 MW-C
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	<0.001	0.002	0.004	<0.001	0.002	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 05-May-2000	MW-E 24-Oct-2000	MW-E 14-Jun-2001	MW-E 23-Nov-2001	MW-E 23-May-2002	MW-E 06-Nov-2002	MW-E 30-May-2003	MW-E 09-Oct-2003 [3]	MW-E 14-May-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	388	668	390	400	338	615	244	--	490
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	7	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	318	548	320	328	289	504	200	--	402
Ammonia Nitrogen	mg/l	--	--	0.16	0.29	0.36	0.02	0.37	0.09	0.08	--	0.17
Chemical Oxygen Demand	mg/l	--	--	--	--	61	84	184	87	38	--	62
Chloride	mg/l	--	250	32.8	154	130	59	53.9	143	22.7	--	47.4
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	850	1770	1500	1230	570	--	980	--	1510
Hardness, Calcium Carbonate	mg/l	--	--	295	607	483	628	304	667	264	--	602
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.2	0.1	0.1	0.2	0.1	--	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.12	2.94	3.27	4.31	1.99	1.27	--	2.13
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	7.07	7	6.22	7.26	--	6.8	--	7.2
Phosphorus	mg/l	--	--	--	2.45	2.25	3.81	5.09	2.7	0.69	--	1.12
Sulphate	mg/l	--	500 [6]	102	320	354	340	163	420	95	--	273
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	1152	1070	942	636	1320	382	--	755
Total Organic Carbon	mg/l	--	--	--	--	22.5	31	27	19.1	13.6	--	14.5
Total Suspended Solids	mg/l	--	--	452	3890	2140	2740	4670	1910	628	--	700
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.001	0.001	--	0.001
Boron, dissolved	mg/l	5	--	0.99	1.47	1.41	2.26	0.94	1.63	0.8	--	1.16
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	70.1	111	108	120	67.7	133	67.5	--	156
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	--	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	--	0.002
Iron, dissolved	mg/l	--	0.3	0.2	0.7	0.71	0.47	0.31	0.16	0.58	--	0.305
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0025	0.0003	--	0.0002
Magnesium, dissolved	mg/l	--	--	28.8	80	51.7	49.5	32.7	81.3	23.2	--	51.7
Manganese, dissolved	mg/l	--	0.05	0.54	2.23	1.51	0.61	0.01	0.13	0.26	--	0.52
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	--	0.01
Potassium, dissolved	mg/l	--	--	4.8	11.8	4.7	4	4.7	12.5	3.1	--	4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	87.5	180	135	119	97.8	186	64.3	--	107
Zinc, dissolved	mg/l	--	5	0.04	0.01	0.01	0.01	0.02	0.02	0.01	--	0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 05-May-2000	MW-E 24-Oct-2000	MW-E 14-Jun-2001	MW-E 23-Nov-2001	MW-E 23-May-2002	MW-E 06-Nov-2002	MW-E 30-May-2003	MW-E 09-Oct-2003 [3]	MW-E 14-May-2004
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.016	0.001	0.001	0.001	0.001	--	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-Nov-2004	MW-E 24-May-2005	MW-E 16-Nov-2005	MW-E 25-May-2006	MW-E 21-Nov-2006	MW-E 15-May-2007	MW-E 30-Nov-2007	MW-E 22-May-2008	MW-E 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	527	398	131	242	308	380	567	222	290
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	432	326	531	242	308	380	567	222	290
Ammonia Nitrogen	mg/l	--	--	0.08	<0.01	<0.01	0.06	<0.01	<0.01	0.02	<0.01	0.08
Chemical Oxygen Demand	mg/l	--	--	49	49	35	38	33	74	71	35	30
Chloride	mg/l	--	250	65	21.5	94.6	21.5	22	23.3	120	25.5	69
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1360	1650	1600	525	650	700	1200	450	1000
Hardness, Calcium Carbonate	mg/l	--	--	549	330	511	261	339	338	549	170	397
Nitrate as N	mg/l	10.0	--	1	0.1	0.1	<0.1	<0.1	0.1	0.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.38	1.46	0.98	0.85	0.92	0.81	0.91	0.84	0.74
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	6.9	--	7.6	8	7.9	7.8	7.1	7.2
Phosphorus	mg/l	--	--	0.85	0.66	0.31	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	300	98	250	75	127	71	270	66	167
Temperature (Field)	deg c	--	15	--	7.8	--	7	6	10.4	4.5	10.5	6
Total Dissolved Solids	mg/l	--	500	680	477	989	394	513	484	1130	332	661
Total Organic Carbon	mg/l	--	--	15.4	15.1	15.1	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	304	516	232	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	<0.001	0.0007	0.0005	0.0007	0.0006	0.0004
Boron, dissolved	mg/l	5	--	1.4	0.804	1.33	0.732	0.807	0.683	1.32	0.535	0.84
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	148	84.9	134	64.9	91.9	93.3	117	43	97.5
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.005	0.002	0.005	<0.002	0.003	<0.002	0.003	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.071	0.364	0.057	0.153	0.042	0.12	0.039	0.387	0.069
Lead, dissolved	mg/l	0.01	--	0.0003	0.0007	<0.0002	<0.0002	<0.0001	0.00006	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	43.5	28.6	42.6	24.1	26.7	25.5	62.3	15.3	37.2
Manganese, dissolved	mg/l	--	0.05	0.086	0.728	0.077	0.383	0.158	0.119	0.029	0.272	0.037
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.1	2.1	4.8	3.7	3.1	1.9	12.1	2.3	6.5
Selenium, dissolved	mg/l	0.05	--	--	<0.001	0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	119	47.6	149	62.9	57.6	39.7	213	45.2	110
Zinc, dissolved	mg/l	--	5	0.005	0.007	0.008	0.005	0.007	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-Nov-2004	MW-E 24-May-2005	MW-E 16-Nov-2005	MW-E 25-May-2006	MW-E 21-Nov-2006	MW-E 15-May-2007	MW-E 30-Nov-2007	MW-E 22-May-2008	MW-E 10-Nov-2008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-May-2009 G-11	MW-E 26-Nov-2009 J-6	MW-E 25-May-2010 M-23	MW-E 20-Oct-2010 G-20	MW-E 24-May-2011 G-34	MW-E 29-Nov-2011 MW-E	MW-E 31-May-2012 [29] MW-E	MW-E 28-Nov-2012 MW-E	MW-E 29-May-2013 MW-E
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	336	361	464	316	243	485	310	270	280
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	1.6	2.0	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	336	361	464	316	243	485	310	270	280
Ammonia Nitrogen	mg/l	--	--	0.05	0.08	0.21	<0.02	0.03	0.05	<0.050	0.092	0.11
Chemical Oxygen Demand	mg/l	--	--	43	88	43	50	20	50	30	30	58
Chloride	mg/l	--	250	61	50	84	66	30	126	46	48	32
Conductivity	uS/cm	--	--	1050	1040	1430	1050	629	1590	--	--	--
Conductivity (Field)	uS/cm	--	--	550	1140	1070	1012	470	1538	918	1194	630
Hardness, Calcium Carbonate	mg/l	--	--	327	379	426	436	252	443	260	420	300
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.59	0.49	0.71	0.47	0.23	0.83	0.74	0.88	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10
pH	-	--	--	7.64	7.99	7.89	7.76	8.10	8.12	7.73	--	7.76
pH (Field)	-	--	--	--	6.69	7.36	7.4	7.07	7.32	7.16	7.46	7.19
Phosphorus	mg/l	--	--	1.00	0.26	0.30	0.24	0.12	0.06	0.16	0.18	1.7
Sulphate	mg/l	--	500 [6]	125	125	163	152	44	205	150	260	99
Temperature (Field)	deg c	--	15	8	7.8	21.1	11.4	12.5	8.0	12.6	5.7	11.2
Total Dissolved Solids	mg/l	--	500	683	676	930	683	409	1030	760	832	554
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	0.55	0.9	0.73	0.61	0.31	0.97	0.37	0.53	0.38
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	78	99	88	122	68	95	68	110	82
Chromium, dissolved	mg/l	0.05	--	0.002	0.003	0.003	0.003	0.003	0.004	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0003	0.0006	0.0006	0.0003	0.0008	0.0003	<0.00050	<0.0005	0.00082
Copper, dissolved	mg/l	--	1	0.003	0.003	0.004	0.003	0.004	0.005	0.0033	0.003	0.0025
Iron, dissolved	mg/l	--	0.3	0.59	0.17	1.59	0.33	0.59	0.07	0.22	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	32	32	50	32	20	50	21	32	23
Manganese, dissolved	mg/l	--	0.05	0.14	0.36	0.27	0.09	0.37	0.02	0.14	0.023	0.36
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5	8	9	3	3	9	2.7	3.2	1.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	86	77	137	74	36	167	63	86	47
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.0050	<0.005	<0.0050

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-May-2009 G-11	MW-E 26-Nov-2009 J-6	MW-E 25-May-2010 M-23	MW-E 20-Oct-2010 G-20	MW-E 24-May-2011 G-34	MW-E 29-Nov-2011 MW-E	MW-E 31-May-2012 [29] MW-E	MW-E 28-Nov-2012 MW-E	MW-E 29-May-2013 MW-E
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 26-Nov-2013 GW-14	MW-E 29-May-2014 [22] MW-E	MW-E 19-Nov-2014 [19] MW-E	MW-E 02-Jun-2015 MW-E	MW-E 26-Nov-2015 MW-E	MW-E 26-May-2016 MW-E	MW-E 17-Nov-2016 MW-E	MW-E 24-May-2017 MW-E	MW-E 29-Nov-2017 MW-E
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	460	240	460	509	621	529	374	393	469
Alkalinity, Carbonate as CaCO3	mg/l	--	--	2.9	1.3	2.5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	460	240	460	511	623	531	375	384	471
Ammonia Nitrogen	mg/l	--	--	0.12	0.13	0.073	0.21	0.09	0.29	0.07	0.09	0.10
Chemical Oxygen Demand	mg/l	--	--	120	60	72	14	105	73	49	50	47
Chloride	mg/l	--	250	120	54	41	114	124	120	111	82	88
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1455	601	1192	1293	1692	1472	1728	1080	1221
Hardness, Calcium Carbonate	mg/l	--	--	570	210	660	404	718	395	830	533	609
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	6.4	7.0	2.8	0.7	1.6	1.2	0.8	0.9	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	--	--	--	--	--	--
pH	-	--	--	7.83	7.77	7.76	--	--	--	--	--	--
pH (Field)	-	--	--	7.41	7.61	7.34	7.12	7.40	7.64	7.81	7.46	7.67
Phosphorus	mg/l	--	--	3.1	1.2	2.2	0.17	0.95	0.45	0.21	0.43	0.24
Sulphate	mg/l	--	500 [6]	320	120	240	227	225	241	436	272	393
Temperature (Field)	deg c	--	15	7.0	11.6	5.3	11.0	7.6	11.3	9.7	10.8	5.6
Total Dissolved Solids	mg/l	--	500	1110	588	850	922	1090	1070	1120	908	1090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1	0.25	0.79	0.39	1.42	0.503	1.24	0.457	0.448
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	130	56	180	103	139	104	214	128	163
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.006	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0027	0.0048	0.0033	<0.0005	<0.0005	0.0017	0.0034	0.0024	0.0026
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	60	16	49	35.5	90	32.9	71.5	52.2	49.1
Manganese, dissolved	mg/l	--	0.05	0.023	<0.0020	0.02	<0.005	0.035	0.032	<0.005	0.031	0.012
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	1.5	3.4	3.43	10.6	3.55	8.2	3.35	4.21
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	200	31	100	71	218	65.5	173	122	87.7
Zinc, dissolved	mg/l	--	5	0.02	<0.0050	<0.0050	<0.005	0.009	0.005	<0.005	0.006	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 26-Nov-2013 GW-14	MW-E 29-May-2014 [22] MW-E	MW-E 19-Nov-2014 [19] MW-E	MW-E 02-Jun-2015 MW-E	MW-E 26-Nov-2015 MW-E	MW-E 26-May-2016 MW-E	MW-E 17-Nov-2016 MW-E	MW-E 24-May-2017 MW-E	MW-E 29-Nov-2017 MW-E
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	0.002	<0.001	0.004	0.002	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 24-May-2018	MW-E 22-Nov-2018	MW-E 19-Jun-2019	MW-E 20-Nov-2019	MW-E 21-May-2020	MW-E 26-Nov-2020	MW-E 26-May-2021	MW-E 30-Nov-2021
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	492	416	366	472	244	521	375	239
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	10	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	494	418	368	476	245	531	377	241
Ammonia Nitrogen	mg/l	--	--	0.10	0.06	0.26	0.05	0.02	0.03	0.08	0.05
Chemical Oxygen Demand	mg/l	--	--	59	113	103	102	44	56	23	73
Chloride	mg/l	--	250	71	140	70	124	33	135	94	80
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1183	1298	935	1887	631	1783	1474	1044
Hardness, Calcium Carbonate	mg/l	--	--	371	798	388	627	267	739	284	370
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	2.2	1.6	1.5	0.8	0.8	0.7	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.19	7.72	7.12	7.78	7.79	7.98	7.07	7.40
Phosphorus	mg/l	--	--	0.36	1.39	0.93	1.32	0.25	0.19	0.19	0.31
Sulphate	mg/l	--	500 [6]	289	407	138	60	86	451	300	271
Temperature (Field)	deg c	--	15	10.9	4.9	13.9	7.4	11.6	6.7	11.9	4.7
Total Dissolved Solids	mg/l	--	500	1030	1160	662	1360	400	1300	868	772
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.255	1.12	0.235	0.854	0.217	0.871	0.245	0.343
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	104	187	100	150	73.3	168	77.7	100
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0017	0.0046	0.0034	0.0035	0.0070	0.0045	0.0024	0.0039
Iron, dissolved	mg/l	--	0.3	<0.1	0.157	<0.1	0.151	0.924	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	27.2	80.1	33.5	61.2	20.3	77.6	21.9	29.1
Manganese, dissolved	mg/l	--	0.05	0.639	0.11	0.342	<0.005	0.142	0.046	0.006	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	1.59	13.2	4.77	10.4	1.59	12.4	1.6	1.74
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	37.9	198	76.4	152	35.5	191	47.7	75.9
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 24-May-2018	MW-E 22-Nov-2018	MW-E 19-Jun-2019	MW-E 20-Nov-2019	MW-E 21-May-2020	MW-E 26-Nov-2020	MW-E 26-May-2021	MW-E 30-Nov-2021
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Monitoring location was dry during this sampling event. No sample was collected.
(4)	Arsenic MRL elevated due to matrix interference.
(5)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(6)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(7)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(8)	pH < 8.3. Calculations not available.
(9)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(10)	Elevated Reporting Limit due to matrix interference.
(11)	GEN02 Elevated Reporting Limit due to matrix interference.
(12)	REV 1 Revision 1 - This report now includes data for Xylenes
(13)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(14)	Field Parameters were not measured
(15)	Elevated detection limit due to dilution required because of high target analyte concentration.
(16)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(17)	Nitrite/Nitrate: Due to the colour interferences, sample required dilution. Detection limits were adjusted accordingly.
(18)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(19)	VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(20)	Detection Limit was raised due to matrix interferences.
(21)	pH Parameter was not measured.
(22)	Elevated ion balance was confirmed by re-analysis.
(23)	TKN results may be biased low due to elevated dissolved salt content.
(24)	REV 1 Revision 1 - Data updated with corrected dilution factor
(25)	Metals MRL elevated due to matrix interference.
(26)	Inadvertently, no sample was collected at this location.
(27)	VOC Analysis: Due to high concentrations of non-target analytes, sample required dilution. Detection limits were adjusted accordingly.
(28)	VOC Analysis: Due to high concentrations of non- target analytes, sample required dilution. Detection limits were adjusted accordingly.
(29)	Elevated ion balance result was confirmed by re-analysis.

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1A 12-Feb-2010 [3] A	09-1A 26-Jan-2011 [3] 09-1A	09-1A 18-Jan-2012 [3] 1A	09-1A 12-Feb-2013 [3] 09-1A	09-1A 27-Aug-2014 MW 09-1A	09-1A 25-Aug-2015 MW09-1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	–	--	--	–	820	853
Alkalinity, Carbonate as CaCO3	mg/l	–	--	–	--	--	–	22	26
Alkalinity (Total as CaCO3)	mg/l	–	--	–	--	--	–	840	880
Ammonia Nitrogen	mg/l	–	--	–	--	--	–	1.4	1.26
Chemical Oxygen Demand	mg/l	–	--	–	--	--	–	39	27
Chloride	mg/l	–	250	–	--	--	–	410	433
Conductivity (Field)	uS/cm	–	--	–	--	--	–	2658	2694
Hardness, Calcium Carbonate	mg/l	–	--	–	--	--	–	36	33.7
Nitrate as N	mg/l	10.0	--	–	--	--	–	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	–	--	--	–	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	--	–	--	--	–	4.7	1.8
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	<0.10	--
pH	-	–	--	–	--	--	–	8.45	--
pH (Field)	-	–	--	–	--	--	–	8.6	9.48
Phosphorus	mg/l	–	--	–	--	--	–	0.56	0.14
Sulphate	mg/l	–	500 [6]	–	--	--	–	2	<1
Temperature (Field)	deg c	–	15	–	--	--	–	10.0	10.3
Total Dissolved Solids	mg/l	–	500	–	--	--	–	1640	1710
Metals									
Arsenic, dissolved	mg/l	0.01	--	–	--	--	–	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	–	--	--	–	1.1	1.01
Cadmium, dissolved	mg/l	0.005	--	–	--	--	–	<0.00010	<0.0001
Calcium, dissolved	mg/l	–	--	–	--	--	–	3.2	1.89
Chromium, dissolved	mg/l	0.05	--	–	--	--	–	<0.0050	<0.001
Cobalt, dissolved	mg/l	–	--	–	--	--	–	<0.00050	<0.0005
Copper, dissolved	mg/l	–	1	–	--	--	–	<0.0050	<0.0005
Iron, dissolved	mg/l	–	0.3	–	--	--	–	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	–	--	--	–	<0.00050	<0.0001
Magnesium, dissolved	mg/l	–	--	–	--	--	–	6.8	7.03
Manganese, dissolved	mg/l	–	0.05	–	--	--	–	0.0059	0.006
Potassium, dissolved	mg/l	–	--	–	--	--	–	9.9	11.4
Sodium, dissolved	mg/l	–	200 [7]	–	--	--	–	640	628
Zinc, dissolved	mg/l	–	5	–	--	--	–	0.0063	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	–	--	--	–	<0.0010	0.002
VOCs									
1,1-Dichloroethane	mg/l	–	--	–	--	--	–	<0.00010	<0.0005
Benzene	mg/l	0.001	--	–	--	--	–	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	–	--	--	–	<0.00010	<0.0005
m,p-Xylenes	mg/l	–	--	–	--	--	–	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	–	--	--	–	<0.00050	<0.0050
o-Xylene	mg/l	–	--	–	--	--	–	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	–	--	--	–	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	–	--	--	–	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1A 18-Aug-2016 09-1A	09-1A 28-Aug-2017 [4] 09-1A	09-1A 29-Nov-2017 [3] 09-1A	09-1A 30-Aug-2018 09-1A	09-1A 28-Aug-2019 [5] 1A	09-1A 24-Aug-2021 09-1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	865	--	--	911	--	838
Alkalinity, Carbonate as CaCO3	mg/l	–	--	17	--	--	19	--	28
Alkalinity (Total as CaCO3)	mg/l	–	--	882	--	--	930	--	867
Ammonia Nitrogen	mg/l	–	--	1.26	--	--	1.47	--	1.47
Chemical Oxygen Demand	mg/l	–	--	67	--	--	38	--	36
Chloride	mg/l	–	250	438	--	--	445	--	403
Conductivity (Field)	uS/cm	–	--	2649	--	--	2630	--	2674
Hardness, Calcium Carbonate	mg/l	–	--	34	--	--	47	--	44.8
Nitrate as N	mg/l	10.0	--	<0.1	--	--	<0.1	--	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	--	--	<0.05	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	--	1.9	--	--	2.1	--	1.8
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	--	--
pH	-	–	--	–	--	--	–	--	--
pH (Field)	-	–	--	8.59	--	--	8.44	--	8.20
Phosphorus	mg/l	–	--	0.34	--	--	0.13	--	0.07
Sulphate	mg/l	–	500 [6]	<1	--	--	3	--	<1
Temperature (Field)	deg c	–	15	11.8	--	--	10.1	--	16.4
Total Dissolved Solids	mg/l	–	500	1630	--	--	1560	--	1590
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	--	--	<0.001	--	<0.001
Boron, dissolved	mg/l	5	--	1.08	--	--	0.942	--	0.79
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	--	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	–	--	2.59	--	--	6.04	--	4.6
Chromium, dissolved	mg/l	0.05	--	<0.001	--	--	<0.001	--	<0.001
Cobalt, dissolved	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Copper, dissolved	mg/l	–	1	<0.0005	--	--	0.0008	--	<0.0005
Iron, dissolved	mg/l	–	0.3	<0.1	--	--	<0.1	--	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	--	--	<0.0001	--	<0.0001
Magnesium, dissolved	mg/l	–	--	6.67	--	--	7.8	--	8.08
Manganese, dissolved	mg/l	–	0.05	0.006	--	--	0.011	--	0.006
Potassium, dissolved	mg/l	–	--	11.6	--	--	11.5	--	11.3
Sodium, dissolved	mg/l	–	200 [7]	597	--	--	647	--	552
Zinc, dissolved	mg/l	–	5	<0.005	--	--	0.006	--	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	<0.001	--	--	<0.001	--	<0.001
VOCs									
1,1-Dichloroethane	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Benzene	mg/l	0.001	--	<0.0005	--	--	<0.0005	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	--	--	<0.0050	--	<0.0050
o-Xylene	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	--	--	<0.0005	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	--	<0.0005	--	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1B 12-Feb-2010 [8] 1B	09-1B 26-Jan-2011 [3] 09-1B	09-1B 18-Jan-2012 [3] 1B	09-1B 12-Feb-2013 [3] 091B	09-1B 27-Aug-2014 MW 09-1B	09-1B 25-Aug-2015 MW09-1B	09-1B 18-Aug-2016 09-1B
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1270	--	--	--	1200	1170	1100
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	--	--	--	19	<25	10
Alkalinity (Total as CaCO3)	mg/l	--	--	1270	--	--	--	1300	1180	1110
Ammonia Nitrogen	mg/l	--	--	4.01	--	--	--	4.2	3.94	4.47
Chemical Oxygen Demand	mg/l	--	--	110	--	--	--	81	136	152
Chloride	mg/l	--	250	1350	--	--	--	1500	1420	1540
Conductivity	uS/cm	--	--	6500	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>5000	--	--	--	>3999	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	296	--	--	--	290	276	283
Nitrate as N	mg/l	10.0	--	<0.10	--	--	--	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	--	--	--	0.041	<0.05	<0.50 [11]
Nitrogen, Total Kjeldahl	mg/l	--	--	4.85	--	--	--	8.9	6.2	7.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--	--
pH	-	--	--	8.13	--	--	--	8.20	--	--
pH (Field)	-	--	--	8.29	--	--	--	7.95	9.66	9.06
Phosphorus	mg/l	--	--	2.72	--	--	--	3.3	4.00	6.45
Sulphate	mg/l	--	500 [6]	23	--	--	--	<1	6	5
Temperature (Field)	deg c	--	15	3.1	--	--	--	10.9	11.6	11.3
Total Dissolved Solids	mg/l	--	500	4220	--	--	--	3530	3580	3740
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.02	--	--	--	0.0064	0.007	0.005
Boron, dissolved	mg/l	5	--	1.7	--	--	--	1.8	1.82	1.82
Cadmium, dissolved	mg/l	0.005	--	<0.001	--	--	--	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31	--	--	--	32	28.7	29.7
Chromium, dissolved	mg/l	0.05	--	<0.005	--	--	--	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.002	--	--	--	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.01	--	--	--	<0.0050	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	2.2	--	--	--	0.93	0.763	<0.1
Lead, dissolved	mg/l	0.01	--	<0.01	--	--	--	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	53	--	--	--	50	49.5	50.7
Manganese, dissolved	mg/l	--	0.05	0.2	--	--	--	0.076	0.079	0.063
Potassium, dissolved	mg/l	--	--	32	--	--	--	32	30.2	32.6
Sodium, dissolved	mg/l	--	200 [7]	1340	--	--	--	1400	1170	1280
Zinc, dissolved	mg/l	--	5	<0.1	--	--	--	0.0084	0.023	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--	--	<0.0010	<0.020 [10]	0.004
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0004	--	--	--	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	--	--	--	0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	--	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	--	--	--	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	--	--	--	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	--	--	--	<0.00010	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	--	--	--	<0.00020	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	--	--	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1B 28-Aug-2017 [4] 09-1B	09-1B 29-Nov-2017 09-1B	09-1B 30-Aug-2018 09-1B	09-1B 28-Aug-2019 [5] 1B	09-1B 20-Nov-2019 09-1B	09-1B 26-Nov-2020 09-1B	09-1B 24-Aug-2021 09-1B
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1120	1070	--	1260	1300	1360
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<25 [11]	<25 [11]	--	<25	25	26
Alkalinity (Total as CaCO3)	mg/l	--	--	--	1130	1090	--	1270	1320	1390
Ammonia Nitrogen	mg/l	--	--	--	4.58	4.46	--	3.97	4.52	4.43
Chemical Oxygen Demand	mg/l	--	--	--	101	122	--	88	88	108
Chloride	mg/l	--	250	--	1620	1500	--	1570	1470	1370
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	3999	>3999	--	6430	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	--	308	363	--	363	401	453
Nitrate as N	mg/l	10.0	--	--	<0.1	<0.1	--	<0.1	<0.5 [12]	<0.5 [12]
Nitrite as N	mg/l	1.0	--	--	<0.05	<0.05	--	<0.05	<1.00 [13]	<0.25 [13]
Nitrogen, Total Kjeldahl	mg/l	--	--	--	7.8	6.0	--	4.6	4.9	4.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	8.06	8.04	--	8.18	8.47	7.86
Phosphorus	mg/l	--	--	--	8.13	2.79	--	2.19	3.01	2.06
Sulphate	mg/l	--	500 [6]	--	1	6	--	2	<1	2
Temperature (Field)	deg c	--	15	--	6.3	9.5	--	6.6	6.2	13.4
Total Dissolved Solids	mg/l	--	500	--	3740	3550	--	3690	3610	3680
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	0.005	0.003	--	0.004	0.004	0.003
Boron, dissolved	mg/l	5	--	--	1.87	1.3	--	1.78	1.75	1.77
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	--	37.4	42	--	41	38.1	43.3
Chromium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	--	0.0013	<0.0005	--	0.0011	0.0010	0.0005
Copper, dissolved	mg/l	--	1	--	0.0029	0.0010	--	0.0011	0.0039	0.0017
Iron, dissolved	mg/l	--	0.3	--	<0.1	0.743	--	0.486	0.207	0.802
Lead, dissolved	mg/l	0.01	--	--	<0.0001	<0.0001	--	<0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	--	52.2	62.7	--	63.2	74.3	83.6
Manganese, dissolved	mg/l	--	0.05	--	0.066	0.082	--	0.09	0.07	0.096
Potassium, dissolved	mg/l	--	--	--	34.9	33.8	--	36.8	33.5	34.5
Sodium, dissolved	mg/l	--	200 [7]	--	1320	1340	--	1220	1270	1120
Zinc, dissolved	mg/l	--	5	--	<0.005	0.009	--	<0.005	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	<0.002 [10]	<0.001	--	<0.004 [10]	<0.004 [12]	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005 [14]	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005 [14]	<0.0005
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1C 12-Feb-2010 1C	09-1C 26-Jan-2011 [15] S-2	09-1C 18-Jan-2012 [3] 1C	09-1C 12-Feb-2013 [3] 09-1C	09-1C 27-Aug-2014 MW 09-1C	09-1C 25-Aug-2015 MW09-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	804	914	--	--	880	892
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	--	--	9.8	9
Alkalinity (Total as CaCO3)	mg/l	--	--	804	914	--	--	890	901
Ammonia Nitrogen	mg/l	--	--	2.15	1.54	--	--	2.7	2.14
Chemical Oxygen Demand	mg/l	--	--	43	150	--	--	280	221
Chloride	mg/l	--	250	624	710	--	--	780	799
Conductivity	uS/cm	--	--	3570	3910	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3240	3000	--	--	3545	3931
Hardness, Calcium Carbonate	mg/l	--	--	271	275	--	--	260	232
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	--	--	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	--	--	0.044	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.59	2.47	--	--	27	6.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--
pH	-	--	--	7.97	7.88	--	--	8.07	--
pH (Field)	-	--	--	7.99	6.28	--	--	7.66	9.42
Phosphorus	mg/l	--	--	18.6	14.2	--	--	19	8.92
Sulphate	mg/l	--	500 [6]	41	20	--	--	<1	8
Temperature (Field)	deg c	--	15	3.5	4.2	--	--	9.8	10.7
Total Dissolved Solids	mg/l	--	500	2320	2540	--	--	1960	1980
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.006	<0.01	--	--	0.0036	0.004
Boron, dissolved	mg/l	5	--	0.70	0.91	--	--	0.8	0.755
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	--	--	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	41	41	--	--	37	30
Chromium, dissolved	mg/l	0.05	--	<0.005	0.020	--	--	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0014	0.0014	--	--	0.00082	0.0008
Copper, dissolved	mg/l	--	1	0.002	0.002	--	--	<0.0050	<0.0005
Iron, dissolved	mg/l	--	0.3	0.70	1.52	--	--	0.23	0.181
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	41	42	--	--	40	38.2
Manganese, dissolved	mg/l	--	0.05	0.77	0.92	--	--	0.71	0.971
Potassium, dissolved	mg/l	--	--	15	13	--	--	13	11.5
Sodium, dissolved	mg/l	--	200 [7]	657	810	--	--	670	552
Zinc, dissolved	mg/l	--	5	0.02	0.02	--	--	0.0062	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	--	--	<0.0010	0.005
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0008	--	--	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.001	--	--	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.001	--	--	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0020	--	--	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0080	--	--	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.001	--	--	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.001	--	--	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0004	--	--	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1C 18-Aug-2016 09-1C	09-1C 28-Aug-2017 [4] 09-1C	09-1C 29-Nov-2017 09-1C	09-1C 30-Aug-2018 09-1C	09-1C 28-Aug-2019 [5] 1C	09-1C 20-Nov-2019 09-1C	09-1C 26-Nov-2020 [16] 09-1C
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	979	--	1010	1000	--	937	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5	--	18	9	--	10	--
Alkalinity (Total as CaCO3)	mg/l	--	--	984	--	1030	1010	--	947	--
Ammonia Nitrogen	mg/l	--	--	2.47	--	2.15	1.55	--	1.49	--
Chemical Oxygen Demand	mg/l	--	--	414	--	103	277	--	80	--
Chloride	mg/l	--	250	875	--	900	830	--	788	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3268	--	3394	3639	--	3730	--
Hardness, Calcium Carbonate	mg/l	--	--	265	--	278	257	--	375	--
Nitrate as N	mg/l	10.0	--	<0.1	--	<0.1	<0.1	--	0.6	--
Nitrite as N	mg/l	1.0	--	<0.50 [11]	--	<0.05	<0.05	--	0.25	--
Nitrogen, Total Kjeldahl	mg/l	--	--	8.0	--	4.2	3.8	--	2.5	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.22	--	7.97	7.96	--	7.9	--
Phosphorus	mg/l	--	--	11.8	--	7.18	2.82	--	1.64	--
Sulphate	mg/l	--	500 [6]	6	--	5	5	--	2	--
Temperature (Field)	deg c	--	15	12.1	--	6.4	9.4	--	7.1	--
Total Dissolved Solids	mg/l	--	500	2330	--	2290	2230	--	2250	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	--	0.004	0.003	--	0.003	--
Boron, dissolved	mg/l	5	--	0.748	--	0.785	0.629	--	0.672	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	<0.0001	<0.0001	--	<0.0001	--
Calcium, dissolved	mg/l	--	--	36.4	--	39.7	38.1	--	52.3	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--	<0.001	<0.001	--	<0.001	--
Cobalt, dissolved	mg/l	--	--	0.0007	--	0.0007	0.0008	--	0.0010	--
Copper, dissolved	mg/l	--	1	<0.0005	--	0.0018	0.0042	--	0.0061	--
Iron, dissolved	mg/l	--	0.3	0.262	--	0.118	0.115	--	<0.1	--
Lead, dissolved	mg/l	0.01	--	<0.0001	--	<0.0001	0.0002	--	0.0002	--
Magnesium, dissolved	mg/l	--	--	42.2	--	43.4	39.4	--	59.3	--
Manganese, dissolved	mg/l	--	0.05	0.746	--	0.437	0.828	--	0.837	--
Potassium, dissolved	mg/l	--	--	14.8	--	13.9	12.8	--	20.1	--
Sodium, dissolved	mg/l	--	200 [7]	623	--	654	577	--	717	--
Zinc, dissolved	mg/l	--	5	<0.005	--	<0.005	0.01	--	<0.005	--
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	--	<0.002 [10]	<0.001	--	0.004	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--	<0.0050	<0.0050	--	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1C 26-Nov-2020 09-1C	09-1C 24-Aug-2021 09-1C
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	901	873
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25	11
Alkalinity (Total as CaCO3)	mg/l	--	--	913	884
Ammonia Nitrogen	mg/l	--	--	1.80	2.22
Chemical Oxygen Demand	mg/l	--	--	105	125
Chloride	mg/l	--	250	736	677
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3035	3668
Hardness, Calcium Carbonate	mg/l	--	--	294	268
Nitrate as N	mg/l	10.0	--	<0.5 [12]	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [13]
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	8.13	7.63
Phosphorus	mg/l	--	--	1.39	3.28
Sulphate	mg/l	--	500 [6]	3	3
Temperature (Field)	deg c	--	15	6.0	13.2
Total Dissolved Solids	mg/l	--	500	2050	2050
Metals					
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003
Boron, dissolved	mg/l	5	--	0.609	0.53
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	40.7	37
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0009	0.0007
Copper, dissolved	mg/l	--	1	0.0037	0.0011
Iron, dissolved	mg/l	--	0.3	<0.1	0.351
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	46.8	42.7
Manganese, dissolved	mg/l	--	0.05	0.832	0.835
Potassium, dissolved	mg/l	--	--	12.8	12
Sodium, dissolved	mg/l	--	200 [7]	619	501
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.004 [12]	<0.001
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005 [14]	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005 [14]	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-Jun-1994	94-4 01-Nov-1994	94-4 28-Jun-1995	94-4 22-Nov-1995	94-4 12-Oct-1996	94-4 06-Nov-1997	94-4 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1347	1442	1030	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1092	1123	1182	840	1280	1270	1220
Ammonia Nitrogen	mg/l	--	--	--	2.77	4.6	3.75	3.47	4.84	3.84
Chemical Oxygen Demand	mg/l	--	--	437	283	188	100	70	62	64
Chloride	mg/l	--	250	1900	1530	1685	1610	1570	1730	1580
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6150	6900	7000	7440	7120	6190	6720
Dissolved Oxygen (Field)	mg/l	--	--	--	6.64	3.08	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	570	598	436	461	421	476	431
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	1.2	0.1	0.1	1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	11.3	5.75	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	6.7	2	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.77	8.08	7.89	8.36	7.69	8.5	--
Phosphate	mg/l	--	--	--	--	--	1.6	--	--	--
Phosphorus	mg/l	--	--	39.6	0.797	6.5	--	--	--	--
Sulphate	mg/l	--	500 [6]	27.4	13.8	5	32	15	3	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3090	3460	3510	3720	3570	3470	3350
Total Organic Carbon	mg/l	--	--	19	25.9	22.5	17.5	19.2	18.5	18.4
Total Suspended Solids	mg/l	--	--	--	--	--	--	4520	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	0.02	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.124	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.34	1.465	1.3	1.19	1.43	1.47	1.65
Cadmium, dissolved	mg/l	0.005	--	--	**0.01**	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	69	39.34	45.3	45.9	41.3	50	42.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.04	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0201	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.409	0.1	0.03	1.31	1.07	0.92	2.15
Lead, dissolved	mg/l	0.01	--	0.002	**0.1**	0.0009	0.0002	0.0002	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	96.6	58.416	77.4	83.1	76.3	84.2	78.1
Manganese, dissolved	mg/l	--	0.05	0.116	0.153	0.18	0.2	0.17	0.18	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.025	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	54.9	25.61	--	37.7	33.2	37.7	39.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1040	1327	1045	1150	1330	1210	1660
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.12

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-Jun-1994	94-4 01-Nov-1994	94-4 28-Jun-1995	94-4 22-Nov-1995	94-4 12-Oct-1996	94-4 06-Nov-1997	94-4 05-Jun-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.049	--	0.001	--	--	--	--
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 06-May-1999	94-4 24-Oct-2000	94-4 14-Jun-2001	94-4 06-Nov-2002	94-4 30-May-2003	94-4 19-Nov-2004	94-4 16-Nov-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1600	1730	1300	1720	1480	1610	160
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	90	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1310	1420	1210	1410	1220	1320	1310
Ammonia Nitrogen	mg/l	--	--	3.92	3.47	4.48	4.05	3.62	3.66	3.94
Chemical Oxygen Demand	mg/l	--	--	64	--	61	76	66	69	99
Chloride	mg/l	--	250	1690	1760	1500	1680	1650	1700	1600
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6540	6790	5000	6700	5400	7110	5500
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	456	474	449	439	397	412	430
Nitrate as N	mg/l	10.0	--	--	0.1	0.1	0.1	0.1	1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	5.4	5.32	5.28	5.8	5.84	4.97	6.08
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.8	8.22	8	7.8	6.9	8	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	2.03	2.21	2.59	2.42	1.25	3.18
Sulphate	mg/l	--	500 [6]	1	1	6	2	1	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3280	3850	3860	4040	2700	3555	3990
Total Organic Carbon	mg/l	--	--	24	--	17.3	17.5	17.1	17.1	21.1
Total Suspended Solids	mg/l	--	--	--	932	1560	1110	720	184	43
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.004	0.003	0.001	0.003	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.67	1.61	1.75	1.58	1.48	1.58	1.61
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	46.1	41.4	49.6	43.4	42.4	42.8	45.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	1.03	0.66	0.41	0.32	1.05	0.266	0.57
Lead, dissolved	mg/l	0.01	--	0.0005	**0.022**	0.0002	0.004	0.0009	0.0016	0.0004
Magnesium, dissolved	mg/l	--	--	81.8	90.1	79	80.2	70.8	74.2	76.7
Manganese, dissolved	mg/l	--	0.05	0.17	0.14	0.11	0.14	0.12	0.117	0.125
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	34.3	29.2	33.2	34	35.2	37.3	40.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	1400	1410	1350	1430	1150	1590	1470
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.02	0.01	0.005	0.006

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 06-May-1999	94-4 24-Oct-2000	94-4 14-Jun-2001	94-4 06-Nov-2002	94-4 30-May-2003	94-4 19-Nov-2004	94-4 16-Nov-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	0.003	0.054	0.001	0.001	0.001	<0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-May-2007	94-4 10-Nov-2008	94-4 26-Nov-2009 [24] J-2	94-4 24-May-2011 [25] G-25	94-4 29-Nov-2012 [26] 94-4	94-4 29-May-2014 [27] 94-4	94-4 26-Nov-2015 94-4
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1320	1230	1320	1260	1300	1300	1240
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [9]	39	25	29	<25 [28]
Alkalinity (Total as CaCO3)	mg/l	--	--	1320	1230	1320	1300	1300	1300	1240
Ammonia Nitrogen	mg/l	--	--	3.56	4	3.93	3.60	4.2	4.1	4.03
Chemical Oxygen Demand	mg/l	--	--	114	76	68	60	65	70	99
Chloride	mg/l	--	250	1750	1690	1630	1620	1500	1700	1710
Conductivity	uS/cm	--	--	--	--	7080	7310	--	--	--
Conductivity (Field)	uS/cm	--	--	4100	>5000	799	>3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	393	342	405	414	400	410	378
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	5.51	5.22	4.59	5.60	5.3	5.3	5.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.21	8.52	8.32	8.39	--
pH (Field)	-	--	--	8.4	7.9	6.89	7.94	8.02	7.29	8.04
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	1.20	1.50	1.6	1.4	1.60
Sulphate	mg/l	--	500 [6]	1	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	8.8	5	7.8	11.1	6.7	10.0	9.0
Total Dissolved Solids	mg/l	--	500	4200	3770	4600	4750	3860	3600	3860
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.009	0.0057	<0.01	<0.01	0.0062	<0.0050	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.37	1.39	1.6	1.8	1.6	1.6	1.47
Cadmium, dissolved	mg/l	0.005	--	0.00005	<0.00002	<0.001	<0.0001	<0.00050	<0.00050	<0.0001
Calcium, dissolved	mg/l	--	--	41.8	33.6	42	42	43	41	26.1
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.025	<0.025	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.002	0.0008	<0.0025	<0.0025	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.01	0.003	<0.0050	0.0058	<0.0005
Iron, dissolved	mg/l	--	0.3	0.465	0.265	<0.3	0.34	<0.5	<0.5	<0.1
Lead, dissolved	mg/l	0.01	--	0.00012	<0.00002	<0.01	<0.001	<0.0025	<0.0025	<0.0001
Magnesium, dissolved	mg/l	--	--	70.3	62.8	73	75	72	73	75.9
Manganese, dissolved	mg/l	--	0.05	0.105	0.06	0.1	0.11	0.12	0.12	0.089
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	38.1	34.2	32	37	31	31	27
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1500	1200	1390	1430	1400	1300	1350
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.1	0.01	<0.025	<0.025	0.009

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-May-2007	94-4 10-Nov-2008	94-4 26-Nov-2009 [24] J-2	94-4 24-May-2011 [25] G-25	94-4 29-Nov-2012 [26] 94-4	94-4 29-May-2014 [27] 94-4	94-4 26-Nov-2015 94-4
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.002 [10]
Semi-VOCs										
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.004	<0.00020	<0.00020	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.005	<0.00020	<0.00020	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.005	<0.00020	<0.00020	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.01	<0.00020	<0.00020	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.04	<0.0010	<0.0010	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.005	<0.00020	<0.00020	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.005	<0.00040	<0.00040	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.002	<0.00040	<0.00040	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 24-May-2017	94-4 22-Nov-2018	94-4 19-Jun-2019	94-4 21-May-2020	94-4 30-Nov-2021
				94-4	94-4	94-4	94-4	94-4
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1320	1310	1070	1280	1330
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [11]	<25 [11]	<25 [11]	<25 [13]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1330	1330	1080	1300	1340
Ammonia Nitrogen	mg/l	--	--	5.16 [29]	4.05	4.36	4.15	4.34
Chemical Oxygen Demand	mg/l	--	--	107	102	84	121	195
Chloride	mg/l	--	250	1690	1810	1640	1980	1630
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3999	>3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	373	589	443	537	451
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.50 [11]	<1.00 [11]	<0.50 [11]	<0.05	<1.00 [13]
Nitrogen, Total Kjeldahl	mg/l	--	--	4.9	5.9	5.0	4.4	7.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.00	8.03	7.98	7.45	8.2
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.11	1.95	1.41	1.47	5.57
Sulphate	mg/l	--	500 [6]	<1	1	<1	<1	<1
Temperature (Field)	deg c	--	15	10.6	5.7	11.2	10.4	6.3
Total Dissolved Solids	mg/l	--	500	4040	3960	3690	4020	3970
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.01	0.003	0.003	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.17	1.58	0.14	1.64	1.57
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	41.7	61.8	48.2	52.2	44.8
Chromium, dissolved	mg/l	0.05	--	0.021	<0.001	<0.001	0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0009	0.0006	0.0007	0.0005
Copper, dissolved	mg/l	--	1	0.0012	0.0033	0.0012	0.0028	0.0011
Iron, dissolved	mg/l	--	0.3	<0.1	0.208	0.21	1.21	0.101
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	65.3	105	78.4	98.7	82.3
Manganese, dissolved	mg/l	--	0.05	0.089	0.138	0.112	0.13	0.105
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	32.5	42.5	32.5	37	29.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1360	1290	1060	1300	1090
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.007	0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 24-May-2017 94-4	94-4 22-Nov-2018 94-4	94-4 19-Jun-2019 94-4	94-4 21-May-2020 94-4	94-4 30-Nov-2021 94-4
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.010 [10]	<0.001	<0.001	0.012	<0.004 [12]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1D 12-Feb-2010 [17] 1D	09-1D 26-Jan-2011 [18] S-1	09-1D 18-Jan-2012 [19] 09-1B	09-1D 12-Feb-2013 [20] 09-1B	09-1D 27-Aug-2014 [21] 09-1D	09-1D 25-Aug-2015 MW09-1D	09-1D 18-Aug-2016 [21] 91D
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	155	86	105	90	--	64	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	<1.0	--	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	155	86	105	90	--	64	--
Ammonia Nitrogen	mg/l	--	--	1.15	0.97	1.26	1.4	--	1.46	--
Chemical Oxygen Demand	mg/l	--	--	1980	1020	85	140	--	232	--
Chloride	mg/l	--	250	99	83	97	84	--	70	--
Conductivity	uS/cm	--	--	619	437	517	--	--	--	--
Conductivity (Field)	uS/cm	--	--	325	-- [22]	745	586	--	519	--
Hardness, Calcium Carbonate	mg/l	--	--	96	42	46	27	--	24.8	--
Nitrate as N	mg/l	10.0	--	<1	<0.10	<1.0	<1.0	--	<0.1	--
Nitrite as N	mg/l	1.0	--	<1	<0.10	<1.0	<0.10	--	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.81	4.80	2.55	4.6	--	7.8	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<1.0	--	--	--
pH	-	--	--	7.32	7.06	6.89	7.12	--	--	--
pH (Field)	-	--	--	7.68	-- [22]	7.51	7.20	--	7.55	--
Phosphorus	mg/l	--	--	0.19	0.45	0.03	<0.40 [23]	--	0.86	--
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	--	<1	--
Temperature (Field)	deg c	--	15	0.4	-- [22]	0.4	2.8	--	18.6	--
Total Dissolved Solids	mg/l	--	500	402	284	336	320	--	196	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	--
Boron, dissolved	mg/l	5	--	0.07	0.06	0.06	0.027	--	0.037	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	--
Calcium, dissolved	mg/l	--	--	22	7	7	4.8	--	4.07	--
Chromium, dissolved	mg/l	0.05	--	0.004	0.004	0.002	<0.005	--	<0.001	--
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0005	<0.0005	--	<0.0005	--
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	0.003	--	<0.0005	--
Iron, dissolved	mg/l	--	0.3	0.86	1.29	1.24	0.65	--	0.682	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.0005	--	<0.0001	--
Magnesium, dissolved	mg/l	--	--	10	6	7	3.7	--	3.55	--
Manganese, dissolved	mg/l	--	0.05	0.19	0.14	0.15	0.091	--	0.089	--
Potassium, dissolved	mg/l	--	--	4	2	2	1.5	--	1.6	--
Sodium, dissolved	mg/l	--	200 [7]	101	67	86	41	--	40.8	--
Zinc, dissolved	mg/l	--	5	0.02	<0.01	0.02	0.015	--	0.024	--
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	<0.001	<0.0010	--	0.005	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0008	<0.0004	<0.00010	--	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0020	<0.0005	<0.00010	--	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0080	<0.0040	<0.00050	--	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005	--
Toluene	mg/l	0.06	0.024	0.0007	<0.001	<0.0005	<0.00020	--	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0004	<0.0002	<0.00020	--	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1D 28-Aug-2017 09-1D	09-1D 30-Aug-2018 [21] 09-1D	09-1D 28-Aug-2019 [5] 1D	09-1D 21-Nov-2019 09-1D	09-1D 26-Nov-2020 09-1D	09-1D 24-Aug-2021 [21] 09-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	50	--	--	72	103	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	--	--	<5	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	50	--	--	72	103	--
Ammonia Nitrogen	mg/l	--	--	0.94	--	--	1.19	1.35	--
Chemical Oxygen Demand	mg/l	--	--	441	--	--	1400	187	--
Chloride	mg/l	--	250	62	--	--	74	107	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	313	--	--	506	505	--
Hardness, Calcium Carbonate	mg/l	--	--	42	--	--	35.4	46.7	--
Nitrate as N	mg/l	10.0	--	<0.1	--	--	<0.1	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.05	--	--	<0.05	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.2	--	--	12.5	3.3	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.80	--	--	6.82	6.92	--
Phosphorus	mg/l	--	--	0.23	--	--	0.62	0.11	--
Sulphate	mg/l	--	500 [6]	<1	--	--	2	<1	--
Temperature (Field)	deg c	--	15	18.1	--	--	4.9	5.3	--
Total Dissolved Solids	mg/l	--	500	212	--	--	238	328	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	--	--	<0.001	<0.001	--
Boron, dissolved	mg/l	5	--	0.064	--	--	0.044	0.058	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	--	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	6.48	--	--	5.97	7.29	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--	--	<0.001	<0.001	--
Cobalt, dissolved	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005	--
Copper, dissolved	mg/l	--	1	<0.0005	--	--	0.0014	0.0030	--
Iron, dissolved	mg/l	--	0.3	0.984	--	--	0.679	1.32	--
Lead, dissolved	mg/l	0.01	--	0.0001	--	--	0.0002	0.0002	--
Magnesium, dissolved	mg/l	--	--	6.31	--	--	4.97	6.91	--
Manganese, dissolved	mg/l	--	0.05	0.14	--	--	0.098	0.187	--
Potassium, dissolved	mg/l	--	--	2.2	--	--	2.86	2.29	--
Sodium, dissolved	mg/l	--	200 [7]	71.4	--	--	63.2	76.3	--
Zinc, dissolved	mg/l	--	5	<0.005	--	--	<0.005	0.007	--
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--	0.008	<0.002 [12]	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--	--	<0.0005	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005 [14]	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--	--	<0.0050	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005 [14]	--
Toluene	mg/l	0.06	0.024	<0.0005	--	--	<0.0005	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	--	<0.0005	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 15-Jun-1994	94-5 02-Nov-1994	94-5 28-Jun-1995	94-5 22-Nov-1995	94-5 12-Jun-1996	94-5 12-Oct-1996	94-5 18-Jun-1997
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	841	929	81	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	622	701	762	804	796	840	871
Ammonia Nitrogen	mg/l	--	--	--	0.66	0.86	0.5	0.85	1.14	0.85
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	171	150	275	63	33	26	13
Chloride	mg/l	--	250	1400	795	880	915	900	870	881
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3550	4050	4060	4480	3850	4450	3900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	7.95	7.27	--	--	--	2.34
Hardness, Calcium Carbonate	mg/l	--	--	448	474	425	444	449	419	499
Nitrate as N	mg/l	10.0	--	0.1	--	0.1	1.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	15.5	3.25	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	14.64	2.75	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.17	7.66	7.4	8.22	8.03	7.25	7.54
Phosphate	mg/l	--	--	--	--	--	0.8	--	--	--
Phosphorus	mg/l	--	--	6.7	0.391	7.22	--	--	--	--
Sulphate	mg/l	--	500 [6]	32.5	17.1	5	4	5	4	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1790	2040	2060	2240	2070	2230	1830
Total Organic Carbon	mg/l	--	--	12	16.5	22	9.1	12.2	11	9.9
Total Suspended Solids	mg/l	--	--	--	--	--	--	2940	1070	1880
Metals										
Aluminum, dissolved	mg/l	--	--	--	0.062	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.061	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.44	0.601	0.45	0.4	0.48	0.61	0.69
Cadmium, dissolved	mg/l	0.005	--	--	**0.01**	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	66.6	48.11	57.2	57	56.6	53	69
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0173	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.39	0.175	0.02	0.9	1.2	0.55	0.53
Lead, dissolved	mg/l	0.01	--	0.0011	**0.1**	0.0005	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	68.5	44.206	67.8	72.4	73.8	68.7	78.3
Manganese, dissolved	mg/l	--	0.05	0.78	0.933	1.29	1.37	1.47	1.22	1.56
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.9	8.244	--	15.2	17.7	13.2	14.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	508	651.7	630	711	694	658	608
Zinc, dissolved	mg/l	--	5	0.01	0.012	0.01	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 15-Jun-1994	94-5 02-Nov-1994	94-5 28-Jun-1995	94-5 22-Nov-1995	94-5 12-Jun-1996	94-5 12-Oct-1996	94-5 18-Jun-1997
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.12	0.005	0.001	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 06-Nov-1997	94-5 05-Jun-1998	94-5 30-Oct-1998	94-5 06-May-1999	94-5 19-Oct-1999	94-5 05-May-2000	94-5 24-Oct-2000
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	996	1040	983	1220	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	26	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	276	869	816	852	850	1000	935
Ammonia Nitrogen	mg/l	--	--	0.68	0.56	0.79	0.36	0.97	0.01	0.27
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	42	24	30	12	40	--
Chloride	mg/l	--	250	812	1020	910	970	951	845	1010
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3930	4280	4350	4030	3800	4025	4250
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	468	440	361	457	443	463	475
Nitrate as N	mg/l	10.0	--	0.6	1.8	--	--	--	0.2	0.8
Nitrite as N	mg/l	1.0	--	--	--	--	--	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	2.14	2.08	--	--	1.02
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.88	--	7.2	7.2	7.4	7.5	7.67
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.68
Sulphate	mg/l	--	500 [6]	98	37	2	2	2	2	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1990	2150	2180	2020	1900	4910	2260
Total Organic Carbon	mg/l	--	--	11.6	11.5	11.4	12.2	11.2	12.1	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	1320	--	556
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.62	0.64	0.75	0.6	0.84	0.78	0.66
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	65	55.8	49.4	59.4	61.2	60.1	56.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.44	1.69	0.2	0.93	1.53	4.96	0.22
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	**0.022**
Magnesium, dissolved	mg/l	--	--	73.4	72.1	57.6	74	69.5	75.1	81.1
Manganese, dissolved	mg/l	--	0.05	1.68	1.85	1.8	1.93	1.58	1.62	1.88
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.6	13.4	16.2	17.4	16	11.1	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	613	893	762	765	876	770	763
Zinc, dissolved	mg/l	--	5	0.01	0.14	0.01	0.01	0.11	0.21	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 06-Nov-1997	94-5 05-Jun-1998	94-5 30-Oct-1998	94-5 06-May-1999	94-5 19-Oct-1999	94-5 05-May-2000	94-5 24-Oct-2000
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 14-Jun-2001	94-5 23-Nov-2001	94-5 23-May-2002	94-5 06-Nov-2002	94-5 30-May-2003	94-5 09-Oct-2003	94-5 14-May-2004
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	826	991	888	1140	915	--	939
Alkalinity, Carbonate as CaCO3	mg/l	--	--	39	1	38	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	741	812	791	936	750	845	770
Ammonia Nitrogen	mg/l	--	--	0.98	0.84	0.91	0.26	0.92	1.01	0.85
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	5	--
Chemical Oxygen Demand	mg/l	--	--	28	37	15	34	25	25	38
Chloride	mg/l	--	250	910	898	925	855	840	798	950
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3750	3560	770	4000	3280	3980	3950
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	189	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	458	465	455	435	419	395	444
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.1	0.9	0.2	0.4	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2	1.94	1.68	1.17	2.16	2.09	2.31
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.22	6.74	7.4	6.8	7.4	7.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.37	1.31	0.85	0.64	1.18	1.21	1.4
Sulphate	mg/l	--	500 [6]	2	3	3	5	3	3	4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2160	2260	2000	2300	1640	2118	1975
Total Organic Carbon	mg/l	--	--	10.3	16	12	11.4	11.1	24	9.2
Total Suspended Solids	mg/l	--	--	1120	1130	792	454	708	580	648
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.002	0.003	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.64	0.8	0.61	0.7	0.5	0.617	0.548
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	65.8	59.6	61.5	64.1	57.6	53.4	59.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.85	0.11	0.87	0.33	3.09	0.541	0.898
Lead, dissolved	mg/l	0.01	--	0.0032	0.0002	0.0002	0.006	0.0015	0.001	0.0015
Magnesium, dissolved	mg/l	--	--	71.3	76.9	73.1	71.1	66.9	63.7	71.8
Manganese, dissolved	mg/l	--	0.05	2.03	1.95	2.17	1.7	1.99	1.53	2.07
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.03	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	5.2	7.3	13.8	13.3	12.3	13.3	13.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	714	811	657	731	626	677	686
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.02	0.005	0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 14-Jun-2001	94-5 23-Nov-2001	94-5 23-May-2002	94-5 06-Nov-2002	94-5 30-May-2003	94-5 09-Oct-2003	94-5 14-May-2004
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.113	0.001	0.001	0.001	0.001	0.001	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Nov-2004	94-5 24-May-2005	94-5 16-Nov-2005	94-5 25-May-2006	94-5 21-Nov-2006	94-5 15-May-2007	94-5 30-Nov-2007
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1070	1040	220	860	892	880	895
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	875	850	900	860	892	880	895
Ammonia Nitrogen	mg/l	--	--	0.32	0.92	0.04	0.98	0.54	0.94	0.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	34	25	25	25	49	89	75
Chloride	mg/l	--	250	943	853	886	942	906	928	939
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4370	4200	3000	3300	3450	2600	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	415	437	417	425	396	404	408
Nitrate as N	mg/l	10.0	--	1	0.2	0.7	0.2	0.3	0.1	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.22	1.97	0.97	1.89	2.2	2	1.72
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7.2	--	7.6	7.2	8.1	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.78	1.86	--	--	--	--
Sulphate	mg/l	--	500 [6]	10	5	4	5	4	5	4
Temperature (Field)	deg c	--	15	--	8.4	--	4.5	7.5	7.3	5
Total Dissolved Solids	mg/l	--	500	2185	2170	2340	2370	2290	2240	2490
Total Organic Carbon	mg/l	--	--	10	9.2	11.2	--	--	--	--
Total Suspended Solids	mg/l	--	--	1450	852	436	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	0.0035	0.0056	0.0038
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.651	0.534	0.671	0.586	0.629	0.487	0.619
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	<0.00002
Calcium, dissolved	mg/l	--	--	56.9	57.5	58.3	56.7	52.6	54.7	57
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	0.007	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.676	0.226	0.149	1.93	0.759	1.35	0.076
Lead, dissolved	mg/l	0.01	--	0.0017	0.0017	0.0004	<0.0002	<0.0001	0.00004	<0.00002
Magnesium, dissolved	mg/l	--	--	66.5	71.3	66.1	69	64.4	65.1	64.5
Manganese, dissolved	mg/l	--	0.05	1.86	2.04	1.9	1.56	1.41	1.88	1.66
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.7	14.1	15.4	15	14.6	13	16.8
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	712	672	779	775	709	646	870
Zinc, dissolved	mg/l	--	5	0.005	0.008	0.008	<0.005	0.008	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Nov-2004	94-5 24-May-2005	94-5 16-Nov-2005	94-5 25-May-2006	94-5 21-Nov-2006	94-5 15-May-2007	94-5 30-Nov-2007
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 22-May-2008	94-5 10-Nov-2008	94-5 19-May-2009 G-13	94-5 26-Nov-2009 J-5	94-5 20-Oct-2010 [30] G-24	94-5 24-May-2011 [30] G-38	94-5 29-Nov-2011 [30] 94-5
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	820	860	832	869	863	853	852
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [9]	<2 [9]	<2 [9]	20	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	820	860	832	869	863	873	852
Ammonia Nitrogen	mg/l	--	--	0.57	0.78	0.82	0.66	0.76	0.90	0.61
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	7	33	38	55	50	60	45
Chloride	mg/l	--	250	866	879	822	868	872	798	823
Conductivity	uS/cm	--	--	--	--	4010	4170	4120	4080	4050
Conductivity (Field)	uS/cm	--	--	3950	3500	3400	3511	3808	2603	3657
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	407	379	385	363	411	352	398
Nitrate as N	mg/l	10.0	--	0.2	0.3	0.19	0.12	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.1	1.64	1.47	1.12	1.37	1.67	1.05
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	7.94	8.17	8.04	8.40	7.95
pH (Field)	-	--	--	7.6	7.4	--	7.12	7.67	7.41	7.57
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	7.56	1.44	2.58	1.65	1.09
Sulphate	mg/l	--	500 [6]	5	4	5	7	6	5	5
Temperature (Field)	deg c	--	15	12	7	10	3.0	10.8	19.1	7.6
Total Dissolved Solids	mg/l	--	500	2220	2190	2610	2710	2680	2650	2630
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0052	0.0033	0.003	0.005	<0.01	<0.01	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.543	0.584	0.60	0.73	0.62	0.42	0.63
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	55.1	51	52	48	54	47	54
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	0.009	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0009	0.0011	0.0009	0.0010	0.0009
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002	0.002	0.001	0.003	0.002
Iron, dissolved	mg/l	--	0.3	1.55	0.022	<0.03	0.34	0.75	0.43	0.17
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	65.6	61.1	62	59	67	57	64
Manganese, dissolved	mg/l	--	0.05	1.63	1.42	1.74	1.60	1.67	1.53	1.87
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13.7	13.3	11	13	12	10	12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	718	664	680	780	720	698	684
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01	0.01	<0.01	0.02	<0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 22-May-2008	94-5 10-Nov-2008	94-5 19-May-2009 G-13	94-5 26-Nov-2009 J-5	94-5 20-Oct-2010 [30] G-24	94-5 24-May-2011 [30] G-38	94-5 29-Nov-2011 [30] 94-5
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	<0.0006	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 31-May-2012 [31] 94-5	94-5 29-Nov-2012 94-5	94-5 29-May-2013 [32] 94-5	94-5 26-Nov-2013 GW-16	94-5 29-May-2014 94-5	94-5 19-Nov-2014 94-5	94-5 02-Jun-2015 94-5
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	810	830	820	870	810	840	756
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7.6	11	7.3	9.2	10	7.9	8
Alkalinity (Total as CaCO3)	mg/l	--	--	820	840	830	880	820	850	765
Ammonia Nitrogen	mg/l	--	--	0.97	0.78	1.5	0.81	1.3	1.0	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	40	70	47	38	76	122
Chloride	mg/l	--	250	750	770	890	860	840	860	754
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3337	3227	3096	3225	3227	3726	3707
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	310	390	430	410	370	410	305
Nitrate as N	mg/l	10.0	--	<0.10	0.14	0.68	0.22	<0.10	0.18	<0.1
Nitrite as N	mg/l	1.0	--	0.12	<0.010	0.10	0.023	0.095	0.059	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.8	2.6	4.5	5.6	4.9	4.3	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.13	0.14	0.78	0.24	0.12	0.24	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.00	8.16	7.98	8.05	8.13	8.00	--
pH (Field)	-	--	--	7.48	7.66	6.95	7.54	6.60	7.59	7.43
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.8	2.1	8.7	4.0	3.4	10	1.27
Sulphate	mg/l	--	500 [6]	<1	1	<1	<1	<1	<1	8
Temperature (Field)	deg c	--	15	10.5	6.2	9.8	6.3	9.5	7.8	7.7
Total Dissolved Solids	mg/l	--	500	2050	2190	2370	2220	2100	2170	1910
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0015	0.0028	<0.0010	<0.0010	0.0013	0.0014	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.46	0.67	0.6	0.64	0.52	0.72	0.223
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	44	51	60	54	49	58	40.9
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.01 [34]	<0.001
Cobalt, dissolved	mg/l	--	--	0.00080	0.00075	0.0011	0.0011	0.00085	0.0010	0.0006
Copper, dissolved	mg/l	--	1	0.0023	0.0012	0.0020	0.0019	0.0023	0.0011	<0.0005
Iron, dissolved	mg/l	--	0.3	0.7	0.27	<0.1	<0.1	0.48	0.48	<0.1
Lead, dissolved	mg/l	0.01	--	0.0018	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	49	64	68	67	61	66	49.3
Manganese, dissolved	mg/l	--	0.05	1.6	2.1	2.2	1.5	1.7	1.9	1.78
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.1	12	12	13	10	13	6.72
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	520	720	650	660	580	740	507
Zinc, dissolved	mg/l	--	5	0.0061	<0.0050	<0.0050	0.0065	<0.0050	<0.0050	0.007

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 31-May-2012 [31] 94-5	94-5 29-Nov-2012 94-5	94-5 29-May-2013 [32] 94-5	94-5 26-Nov-2013 GW-16	94-5 29-May-2014 94-5	94-5 19-Nov-2014 94-5	94-5 02-Jun-2015 94-5
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 26-Nov-2015	94-5 26-May-2016	94-5 17-Nov-2016	94-5 24-May-2017	94-5 29-Nov-2017	94-5 24-May-2018	94-5 22-Nov-2018
				94-5	94-5	94-5	94-5	94-5	94-5	94-5
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	871	878	912	905	902	929	977
Alkalinity, Carbonate as CaCO3	mg/l	--	--	9	7	7	7	10	9	10
Alkalinity (Total as CaCO3)	mg/l	--	--	880	885	918	912	912	938	987
Ammonia Nitrogen	mg/l	--	--	0.64	1.38	1.14	0.68	0.74	1.43	0.71
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	233	114	88	205	98	391	89
Chloride	mg/l	--	250	874	871	909	882	892	855	886
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3815	3748	3999	3702	3308	3860	3411
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	381	324	377	459	368	334	497
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.25 [11]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	2.1	2.8	2.3	1.6	4.8	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.58	7.39	7.89	7.48	7.08	7.44	7.64
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.56	1.32	4.88	3.83	3.42	6.74	2.34
Sulphate	mg/l	--	500 [6]	10	7	7	8	13	8	11
Temperature (Field)	deg c	--	15	8.5	9.8	9.7	11.7	7.5	9.5	6.3
Total Dissolved Solids	mg/l	--	500	2210	2260	2270	2180	2080	2250	1560
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.004	0.003	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.627	0.457	0.775	0.396	0.601	0.455	1.12
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	37.6	45.2	51.6	55	51	50.8	65
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.012	0.008	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0008	0.0007	0.0007	0.0006	0.0009	0.0007	0.0013
Copper, dissolved	mg/l	--	1	<0.0005	0.0007	0.0010	0.0024	0.0011	<0.0005	0.0040
Iron, dissolved	mg/l	--	0.3	0.221	0.293	0.23	0.246	0.214	0.741	0.155
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	69.6	51.3	60.3	78.2	58.4	50.3	81.4
Manganese, dissolved	mg/l	--	0.05	1.62	1.67	2.17	1.78	2	1.82	1.52
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.2	10.4	10.7	8.18	11.7	8.73	16.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	731	498	699	807	675	507	795
Zinc, dissolved	mg/l	--	5	0.008	0.008	<0.005	0.006	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 26-Nov-2015	94-5 26-May-2016	94-5 17-Nov-2016	94-5 24-May-2017	94-5 29-Nov-2017	94-5 24-May-2018	94-5 22-Nov-2018
				94-5	94-5	94-5	94-5	94-5	94-5	94-5
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	0.004	<0.002 [10]	<0.002 [12]	<0.002 [10]	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Jun-2019 [33]	94-5 20-Nov-2019	94-5 21-May-2020	94-5 26-Nov-2020	94-5 26-May-2021	94-5 30-Nov-2021
				94-5	94-5	94-5	94-5	94-5	94-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	848	819	838	867	857
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	12	9	<25	8	13
Alkalinity (Total as CaCO3)	mg/l	--	--	--	860	828	848	875	870
Ammonia Nitrogen	mg/l	--	--	--	0.94	0.97	0.68	0.91	0.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	159	104	91	60	91
Chloride	mg/l	--	250	--	995	1000	776	721	779
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	3810	2660	3270	3668	3761
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	471	426	416	409	369
Nitrate as N	mg/l	10.0	--	--	0.8	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.1	2.0	1.4	1.4	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.61	8.23	7.86	7.45	7.76
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	4.76	3.96	0.72	1.14	0.83
Sulphate	mg/l	--	500 [6]	--	10	18	13	13	15
Temperature (Field)	deg c	--	15	--	7.7	7.7	6.6	10.4	6.7
Total Dissolved Solids	mg/l	--	500	--	2220	2120	2080	2130	2120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	0.387	0.432	0.463	0.381	0.473
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	--	63.8	57.1	55.3	53.9	49.9
Chromium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	--	0.0008	0.0009	0.0009	0.0008	0.0009
Copper, dissolved	mg/l	--	1	--	0.0014	0.0031	0.0030	0.0011	0.0025
Iron, dissolved	mg/l	--	0.3	--	0.297	1.19	0.292	0.423	<0.1
Lead, dissolved	mg/l	0.01	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	--	75.6	68.7	67.5	66.6	59.2
Manganese, dissolved	mg/l	--	0.05	--	1.81	1.94	2.04	2.32	2.36
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	19	11.9	11.7	9.62	11.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	745	665	665	551	581
Zinc, dissolved	mg/l	--	5	--	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Jun-2019 [33]	94-5 20-Nov-2019	94-5 21-May-2020	94-5 26-Nov-2020	94-5 26-May-2021	94-5 30-Nov-2021
				94-5	94-5	94-5	94-5	94-5	94-5
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.005	<0.002 [12]	<0.010 [12]	<0.004 [12]
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 15-Jun-1994	94-6 02-Nov-1994	94-6 28-Jun-1995	94-6 22-Nov-1995	94-6 12-Jun-1996	94-6 12-Oct-1996	94-6 18-Jun-1997
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	322	529	610	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	276	268	434	500	412	420	430
Ammonia Nitrogen	mg/l	--	--	--	0.11	0.01	0.03	0.1	0.04	0.2
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	141	105	80	70	35	33	14
Chloride	mg/l	--	250	245	266	275	236	216	248	347
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1280	1710	1850	1840	1730	2030	1880
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	9.02	6.31	--	--	--	5.05
Hardness, Calcium Carbonate	mg/l	--	--	180	290	254	234	248	191	309
Nitrate as N	mg/l	10.0	--	1.6	0.1	2.7	0.1	0.1	0.3	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	3.3	2.45	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	3.29	2.42	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.2	7.17	6.78	7.29	7.03	6.82	7.02
Phosphate	mg/l	--	--	--	--	--	0.8	--	--	--
Phosphorus	mg/l	--	--	4.39	0.196	1.68	--	--	--	--
Sulphate	mg/l	--	500 [6]	87	105	88	81	76	91	74
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	660	860	930	910	870	1020	930
Total Organic Carbon	mg/l	--	--	15.8	15.9	13.7	13.9	15.8	13	9
Total Suspended Solids	mg/l	--	--	--	--	--	--	1780	1430	953
Metals										
Aluminum, dissolved	mg/l	--	--	--	0.056	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.042	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.15	0.169	0.14	0.02	0.158	0.18	0.22
Cadmium, dissolved	mg/l	0.005	--	--	**0.01**	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	38.4	47.33	51.7	40.4	39.8	31.7	52.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0095	0.01	0.02	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.291	0.14	0.03	0.54	0.811	0.4	0.47
Lead, dissolved	mg/l	0.01	--	0.0006	**0.1**	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	20.4	16.666	30	32	35.5	26.7	42.5
Manganese, dissolved	mg/l	--	0.05	0.108	0.176	0.32	0.24	1.41	0.7	1.57
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.5	0.864	--	6	6.15	6.5	5.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	171	236.1	284	294	353	312	315
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 15-Jun-1994	94-6 02-Nov-1994	94-6 28-Jun-1995	94-6 22-Nov-1995	94-6 12-Jun-1996	94-6 12-Oct-1996	94-6 18-Jun-1997
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.15	0.001	0.001	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 06-Nov-1997	94-6 05-Jun-1998	94-6 29-Oct-1998	94-6 06-May-1999	94-6 19-Oct-1999	94-6 05-May-2000	94-6 24-Oct-2000
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	454	506	366	536	617
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	534	336	372	415	300	439	506
Ammonia Nitrogen	mg/l	--	--	0.88	0.07	0.19	0.09	0.13	0.01	0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	47	37	4	29	92	39	--
Chloride	mg/l	--	250	176	307	260	326	193	315	427
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1870	1720	2080	1770	1240	1750	2520
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.05	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	142	160	161	215	204	304	433
Nitrate as N	mg/l	10.0	--	0.1	1.1	--	--	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	1.58	1.29	--	--	1.16
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.41	--	6.7	6.7	7.8	6.9	6.85
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.63
Sulphate	mg/l	--	500 [6]	2.1	95	80	71	93	131	300
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1030	859	1030	890	620	875	1490
Total Organic Carbon	mg/l	--	--	15.1	11.8	13.5	13.1	27.5	14	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	416	1090	508
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.14	0.21	0.24	0.15	0.27	0.27	0.37
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	25.8	26.7	32.6	37.8	42.1	55.1	61.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.66	0.52	0.31	1.72	1.82	1.43	1.88
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0006	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	18.6	22.3	19.4	29	23.7	40	67.5
Manganese, dissolved	mg/l	--	0.05	0.22	0.21	0.93	0.69	0.55	1.43	0.83
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	2.9	6.4	5.1	1.7	4.5	0.4	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	260	337	287	312	220	371	510
Zinc, dissolved	mg/l	--	5	0.01	0.23	0.01	0.01	0.16	0.24	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 06-Nov-1997	94-6 05-Jun-1998	94-6 29-Oct-1998	94-6 06-May-1999	94-6 19-Oct-1999	94-6 05-May-2000	94-6 24-Oct-2000
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.002
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 14-Jun-2001	94-6 23-Nov-2001	94-6 23-May-2002	94-6 06-Nov-2002	94-6 30-May-2003	94-6 09-Oct-2003	94-6 14-May-2004
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	453	373	462	340	337	--	545
Alkalinity, Carbonate as CaCO3	mg/l	--	--	39	1	17	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	435	306	407	279	276	408	447
Ammonia Nitrogen	mg/l	--	--	0.11	0.08	0.08	0.06	0.06	0.3	0.14
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	7	--
Chemical Oxygen Demand	mg/l	--	--	40	60	46	56	58	92	64
Chloride	mg/l	--	250	268	182	95.8	330	205	357	167
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1850	1290	1060	2140	1440	2150	1560
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	109	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	308	224	205	233	206	259	258
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	0.2	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.61	1.62	1.47	1.33	1.79	2.37	1.83
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	6.91	6.87	7.6	7	7.1	7
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.94	0.59	0.68	0.45	0.39	1.93	0.81
Sulphate	mg/l	--	500 [6]	170	92	30	190	127	146	109
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1130	860	596	1110	720	1221	780
Total Organic Carbon	mg/l	--	--	17.3	28	20	19.4	19.6	18	18.8
Total Suspended Solids	mg/l	--	--	700	716	394	348	442	3610	656
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.2	0.11	0.1	0.3	0.14	0.477	0.394
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	66.8	58.1	54.2	52.3	49.6	43.2	48
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.001	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.007
Iron, dissolved	mg/l	--	0.3	0.46	0.03	0.58	0.02	0.13	0.846	0.022
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0007	0.0013	0.0002	0.0007	0.0008
Magnesium, dissolved	mg/l	--	--	34.2	19.1	16.9	24.9	19.9	36.7	33.7
Manganese, dissolved	mg/l	--	0.05	1.52	0.13	0.57	0.02	0.02	1.41	0.117
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	0.4	0.4	2.8	1.1	2.3	6.2	3.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	301	218	150	299	237	385	267
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.005	0.006

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 14-Jun-2001	94-6 23-Nov-2001	94-6 23-May-2002	94-6 06-Nov-2002	94-6 30-May-2003	94-6 09-Oct-2003	94-6 14-May-2004
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.077	0.001	0.001	0.001	0.001	0.001	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 19-Nov-2004	94-6 24-May-2005	94-6 16-Nov-2005	94-6 25-May-2006	94-6 21-Nov-2006	94-6 15-May-2007	94-6 30-Nov-2007 [21]
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	512	598	259	340	492	452	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	420	490	420	340	492	452	--
Ammonia Nitrogen	mg/l	--	--	0.22	<0.01	<0.01	0.04	<0.01	<0.01	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	54	71	49	52	59	107	--
Chloride	mg/l	--	250	179	149	238	113	155	207	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1670	2200	620	800	1150	950	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	302	287	186	172	275	262	--
Nitrate as N	mg/l	10.0	--	1	0.2	0.1	<0.1	<0.1	0.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.64	1.62	1.49	1.19	1.14	1.99	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7	--	7.5	7.7	7.6	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.68	0.65	0.67	--	--	--	--
Sulphate	mg/l	--	500 [6]	150	75	77	62	53	83	--
Temperature (Field)	deg c	--	15	--	8	--	5	6	7.9	--
Total Dissolved Solids	mg/l	--	500	835	863	820	593	828	881	--
Total Organic Carbon	mg/l	--	--	15	23.8	10.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	434	392	352	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.001	0.0012	0.0014	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.517	0.284	0.15	0.107	0.25	0.22	--
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	--
Calcium, dissolved	mg/l	--	--	55.6	49.2	41.2	39.4	57.4	50.3	--
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	--
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.013	--
Copper, dissolved	mg/l	--	1	0.006	0.002	0.005	0.004	0.004	<0.002	--
Iron, dissolved	mg/l	--	0.3	0.013	0.029	0.012	0.037	0.057	0.051	--
Lead, dissolved	mg/l	0.01	--	0.0003	0.0006	0.0003	0.0002	<0.0001	0.00006	--
Magnesium, dissolved	mg/l	--	--	39.6	39.9	20.2	17.8	31.9	33.1	--
Manganese, dissolved	mg/l	--	0.05	0.081	0.62	0.071	0.368	0.99	0.332	--
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	2.9	3.8	14.6	14.9	13.3	10.5	--
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	242	255	190	156	222	225	--
Zinc, dissolved	mg/l	--	5	0.005	0.01	0.009	0.009	0.021	<0.005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 19-Nov-2004	94-6 24-May-2005	94-6 16-Nov-2005	94-6 25-May-2006	94-6 21-Nov-2006	94-6 15-May-2007	94-6 30-Nov-2007 [21]
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	--
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	0.0008	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 22-May-2008	94-6 10-Nov-2008	94-6 19-May-2009 G-17	94-6 26-Nov-2009 J-3	94-6 25-May-2010 [30] M-22	94-6 20-Oct-2010 [30] G-25	94-6 24-May-2011 [30] G-37
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	309	430	453	501	432	538	490
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [9]	<2 [9]	<2 [9]	<2 [9]	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	309	430	453	501	432	538	490
Ammonia Nitrogen	mg/l	--	--	0.02	<0.01	0.04	0.05	0.04	0.03	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	65	64	45	55	40	80	60
Chloride	mg/l	--	250	71.1	220	190	195	161	124	160
Conductivity	uS/cm	--	--	--	--	1590	1610	1470	1420	1500
Conductivity (Field)	uS/cm	--	--	625	1400	1200	1144	1400	1363	1319
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	105	246	271	282	271	336	332
Nitrate as N	mg/l	10.0	--	0.1	0.2	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	3.09	1.79	0.95	0.65	0.61	0.92	1.34
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	7.34	7.69	7.40	7.53	8.03
pH (Field)	-	--	--	7.4	6.6	--	4.87	6.61	7.67	6.46
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.00	0.55	0.58	0.97	0.59
Sulphate	mg/l	--	500 [6]	26	120	77	56	56	35	42
Temperature (Field)	deg c	--	15	13	5	7	6.7	27.1	11.8	15.0
Total Dissolved Solids	mg/l	--	500	458	960	1030	1050	956	923	975
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0017	0.0016	0.001	0.001	<0.01	<0.001	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.138	0.378	0.35	0.20	0.27	0.23	0.27
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25.2	44.6	54	62	49	77	57
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	0.006	0.004	0.006	0.008	0.009
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0022	0.0010	0.0023	0.0005	0.0027
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.003	0.003	0.002	0.003	0.004
Iron, dissolved	mg/l	--	0.3	0.942	0.423	<0.03	0.06	0.62	0.03	1.12
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	10.3	32.8	33	31	36	35	46
Manganese, dissolved	mg/l	--	0.05	1.64	0.245	1.17	0.75	1.73	0.09	1.88
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.2	11.3	10	15	9	14	7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	108	271	234	208	198	166	224
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.01	0.01	<0.01	0.01	0.02

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 22-May-2008	94-6 10-Nov-2008	94-6 19-May-2009 G-17	94-6 26-Nov-2009 J-3	94-6 25-May-2010 [30] M-22	94-6 20-Oct-2010 [30] G-25	94-6 24-May-2011 [30] G-37
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	<0.0006	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2011 [30] 94-6	94-6 31-May-2012 94-6	94-6 29-Nov-2012 [31] 94-6	94-6 29-May-2013 [35] 94-6	94-6 26-Nov-2013 GW-11	94-6 29-May-2014 94-6	94-6 19-Nov-2014 [36] 94-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	475	370	360	380	360	310	420
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<1.0	<1.0	1.3	<1.0	<1.0	<1.0
Alkalinity (Total as CaCO3)	mg/l	--	--	475	370	360	380	360	310	420
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.050	0.14	0.25	<0.050	0.099	0.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	76	58	140	39	50	70
Chloride	mg/l	--	250	236	150	160	270	200	140	260
Conductivity	uS/cm	--	--	1740	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1373	1246	1258	1149	1303	960	1311
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	291	280	340	310	330	270	320
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	1.17	1.7	2.6	5.7	2.4	4.7	<2.0 [23]
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.63	7.42	7.44	7.56	7.31	7.36	7.33
pH (Field)	-	--	--	6.62	6.86	6.91	7.49	7.32	6.77	6.74
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.25	0.80	0.96	9.1	0.59	0.55	2.0
Sulphate	mg/l	--	500 [6]	89	120	130	130	150	55	62
Temperature (Field)	deg c	--	15	6.5	11.8	4.1	11.6	5.5	12.1	5.6
Total Dissolved Solids	mg/l	--	500	1130	896	936	934	902	624	1060
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.40	0.29	0.35	0.27	0.31	0.15	0.32
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	54	47	59	52	56	53	58
Chromium, dissolved	mg/l	0.05	--	0.006	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0009	0.00052	0.00073	0.0012	0.00063	0.00050	0.0014
Copper, dissolved	mg/l	--	1	0.002	0.0025	0.0020	0.0020	0.0015	0.0041	0.0010
Iron, dissolved	mg/l	--	0.3	0.90	<0.1	1	0.13	<0.1	<0.1	1.3
Lead, dissolved	mg/l	0.01	--	<0.001	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	38	40	46	43	46	34	43
Manganese, dissolved	mg/l	--	0.05	2.25	0.64	2.3	0.67	1.2	0.61	2.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6	4.7	7.1	4.1	5.7	4.4	6.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	244	240	330	180	290	160	330
Zinc, dissolved	mg/l	--	5	<0.01	<0.0050	0.0055	<0.0050	0.011	0.0065	0.0054

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2011 [30] 94-6	94-6 31-May-2012 94-6	94-6 29-Nov-2012 [31] 94-6	94-6 29-May-2013 [35] 94-6	94-6 26-Nov-2013 GW-11	94-6 29-May-2014 94-6	94-6 19-Nov-2014 [36] 94-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	0.0072	<0.0010	<0.0010	0.0011
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0025	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.0010	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.0010	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 02-Jun-2015	94-6 26-Nov-2015	94-6 26-May-2016	94-6 17-Nov-2016	94-6 24-May-2017	94-6 29-Nov-2017	94-6 24-May-2018
				94-6	94-6	94-6	94-6	94-6	94-6	94-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	483	521	578	547	436	513	551
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	484	522	579	548	424	514	552
Ammonia Nitrogen	mg/l	--	--	0.52	0.58	0.37	0.27	0.38	0.15	0.43
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	73	156	101	63	58	91	100
Chloride	mg/l	--	250	332	372	459	428	306	396	382
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1405	1598	1517	1736	1574	1555	1737
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	218	276	317	261	364	255	323
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.3	5.3	1.3	0.9	2.3	1.1	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.70	6.91	7.19	7.74	7.03	7.39	6.72
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.35	6.20	0.56	0.35	0.38	0.46	0.43
Sulphate	mg/l	--	500 [6]	64	81	70	81	102	101	87
Temperature (Field)	deg c	--	15	10.0	7.2	12.6	9.2	11.6	5.7	11.7
Total Dissolved Solids	mg/l	--	500	1050	1210	1380	1280	1050	1160	1260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.142	0.202	0.154	0.332	0.185	0.201	0.241
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	39.2	47.8	65.7	51.9	70.2	53.2	67
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.006	0.005	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0015	0.0009	0.0027	<0.0005	0.0007	<0.0005	0.0021
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0018	0.0037	0.0040	0.0019	0.0010
Iron, dissolved	mg/l	--	0.3	0.214	0.131	0.168	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	29.1	38	37.3	31.9	45.7	29.6	37.7
Manganese, dissolved	mg/l	--	0.05	1.28	1.29	1.7	0.148	1.4	0.18	2.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.46	3.72	4.51	3.83	4.03	4.02	4.29
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	147	212	160	182	292	166	202
Zinc, dissolved	mg/l	--	5	0.006	0.012	0.008	0.006	0.006	<0.005	0.007

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 02-Jun-2015	94-6 26-Nov-2015	94-6 26-May-2016	94-6 17-Nov-2016	94-6 24-May-2017	94-6 29-Nov-2017	94-6 24-May-2018
				94-6	94-6	94-6	94-6	94-6	94-6	94-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.004 [10]	0.003	<0.001	<0.002 [10]	<0.002 [10]	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2018	94-6 19-Jun-2019	94-6 20-Nov-2019	94-6 21-May-2020	94-6 26-Nov-2020	94-6 26-May-2021	94-6 30-Nov-2021
				94-6	94-6	94-6	94-6	94-6	94-6	94-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	448	461	516	338	364	344	315
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	449	463	518	339	364	345	316
Ammonia Nitrogen	mg/l	--	--	0.04	0.32	0.19	0.06	0.16	0.07	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	62	86	80	52	58	34	63
Chloride	mg/l	--	250	240	263	460	292	276	224	245
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1451	1427	1531	1616	1372	1696	1777
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	394	411	390	331	256	323	349
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	1.8	1.1	0.9	0.7	0.8	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.58	7.22	6.91	7.62	6.93	6.80	7.13
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.77	0.66	0.88	0.39	0.24	0.40	0.40
Sulphate	mg/l	--	500 [6]	150	149	112	271	231	226	325
Temperature (Field)	deg c	--	15	4.3	15.2	6.3	8.9	5.5	12.0	4.3
Total Dissolved Solids	mg/l	--	500	948	1070	1400	1010	1070	972	1170
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.42	0.147	0.262	0.201	0.174	0.157	0.274
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	78.4	96.6	66.3	64.8	51.3	77.9	70.9
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0010	0.0008	0.0007	0.0011	<0.0005	0.0027	<0.0005
Copper, dissolved	mg/l	--	1	0.0018	0.0052	0.0076	0.0047	0.0035	0.0020	0.0022
Iron, dissolved	mg/l	--	0.3	0.918	<0.1	0.64	1.01	0.117	0.329	0.248
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0015	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	48.1	41.2	54.4	41	31	31.2	41.7
Manganese, dissolved	mg/l	--	0.05	0.899	1.11	1.45	1.08	0.368	2.14	0.871
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.01	7.68	9.81	4.6	3.7	5.54	5.09
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	316	218	411	212	151	156	263
Zinc, dissolved	mg/l	--	5	<0.005	0.007	0.006	0.008	0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2018	94-6 19-Jun-2019	94-6 20-Nov-2019	94-6 21-May-2020	94-6 26-Nov-2020	94-6 26-May-2021	94-6 30-Nov-2021
				94-6	94-6	94-6	94-6	94-6	94-6	94-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.001	<0.001	0.006	<0.001	0.002	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 28-Jun-1995	95-1 23-Nov-1995	95-1 12-Oct-1996	95-1 06-Nov-1997	95-1 05-Jun-1998	95-1 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1076	1260	--	--	--	1570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	116	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	882	1220	1280	1060	1050	1290
Ammonia Nitrogen	mg/l	--	--	1.27	7.5	9.15	4.42	6.05	2.83
Chemical Oxygen Demand	mg/l	--	--	700	250	115	56	392	1740
Chloride	mg/l	--	250	615	853	836	784	998	925
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3660	4460	4000	4380	4250	4320
Dissolved Oxygen (Field)	mg/l	--	--	2.66	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	175	194	165	185	170	178
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.4	0.1	3.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	19.5	28.8	--	--	--	24.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	18.23	21.3	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.4	8.77	7.96	8.84	--	8.1
Phosphate	mg/l	--	--	--	54.2	--	--	--	--
Phosphorus	mg/l	--	--	2.86	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	10	19	6	1	162	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1830	2250	2000	2200	2110	2170
Total Organic Carbon	mg/l	--	--	31.8	24.5	20.1	23.9	28	26.5
Total Suspended Solids	mg/l	--	--	--	--	106	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.07	1.22	1.19	1.34	1.59	1.52
Cadmium, dissolved	mg/l	0.005	--	0.0009	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.4	24.3	20.2	22.8	20.5	22.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.04	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	4.05	4.96	5.67	3.58	1.39
Lead, dissolved	mg/l	0.01	--	0.0008	0.0013	0.0002	0.0003	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	26.2	31.8	27.4	30.8	26.5	28.8
Manganese, dissolved	mg/l	--	0.05	0.17	0.18	0.18	0.21	0.15	0.11
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	23.9	21.4	26.1	29.3	29.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	639	871	977	896	1200	1080
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.09	0.04
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 28-Jun-1995	95-1 23-Nov-1995	95-1 12-Oct-1996	95-1 06-Nov-1997	95-1 05-Jun-1998	95-1 06-May-1999
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 24-Oct-2000	95-1 14-Jun-2001	95-1 06-Nov-2002	95-1 30-May-2003	95-1 19-Nov-2004	95-1 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1690	1300	1780	1500	1560	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	102	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1390	1240	1460	1230	1280	1140
Ammonia Nitrogen	mg/l	--	--	1.33	3.15	2.4	2.53	2.33	2.14
Chemical Oxygen Demand	mg/l	--	--	--	56	72	71	81	65
Chloride	mg/l	--	250	890	880	820	879	864	731
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4660	4200	4430	4110	4540	3100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	182	170	211	157	158	170
Nitrate as N	mg/l	10.0	--	0.3	0.1	0.2	1	1	0.7
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.49	3.75	4.17	4.3	3.7	3.88
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.26	8.3	8.1	7.2	8.1	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.81	2.29	0.79	2.43	2.78	1.96
Sulphate	mg/l	--	500 [6]	4.5	1	2	1	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2600	2520	2720	2055	2270	2540
Total Organic Carbon	mg/l	--	--	--	19.8	19.6	19.1	16.2	21.8
Total Suspended Solids	mg/l	--	--	1210	127	184	168	380	35
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	0.003	0.001	0.001
Boron, dissolved	mg/l	5	--	1.5	1.59	1.51	1.42	1.47	1.5
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0002
Calcium, dissolved	mg/l	--	--	20.3	23.2	23.8	20.4	20.6	22.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.33	0.23	0.27	2	0.186	0.251
Lead, dissolved	mg/l	0.01	--	0.022	0.0002	0.0063	0.0004	0.0028	0.0007
Magnesium, dissolved	mg/l	--	--	31.9	27.2	28.5	25.7	26	27.9
Manganese, dissolved	mg/l	--	0.05	0.09	0.08	0.08	0.1	0.066	0.072
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	17.2	16.2	23	24.2	24.2	27.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	0.001
Sodium, dissolved	mg/l	--	200 [7]	1030	997	978	876	1130	1070
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.009
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.024	0.001	0.001	0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 24-Oct-2000	95-1 14-Jun-2001	95-1 06-Nov-2002	95-1 30-May-2003	95-1 19-Nov-2004	95-1 16-Nov-2005
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 15-May-2007	95-1 10-Nov-2008	95-1 26-Nov-2009 [37] M-10	95-1 24-May-2011 [30] G-13	95-1 28-Nov-2012 95-1	95-1 29-May-2014 [36] 95-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1370	1200	1260	1150	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	27	42	19	38
Alkalinity (Total as CaCO3)	mg/l	--	--	1370	1200	1290	1190	1300	1200
Ammonia Nitrogen	mg/l	--	--	2.15	1.07	2.35	1.35	2.7	2.6
Chemical Oxygen Demand	mg/l	--	--	108	47	70	43	73	67
Chloride	mg/l	--	250	782	650	827	626	810	770
Conductivity	uS/cm	--	--	--	--	4690	3970	–	--
Conductivity (Field)	uS/cm	--	--	2500	3300	3930	2624	3795	3830
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	–	--
Hardness, Calcium Carbonate	mg/l	--	--	161	205	142	227	160	130
Nitrate as N	mg/l	10.0	--	<0.1	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	0.047
Nitrogen, Total Kjeldahl	mg/l	--	--	4	2.25	3.40	2.42	3.5	4.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	–	--
pH	-	--	--	--	--	8.35	8.59	–	8.53
pH (Field)	-	--	--	8.5	8	7.8	8.10	8.29	8.03
Phosphate	mg/l	--	--	--	--	--	--	–	--
Phosphorus	mg/l	--	--	--	--	2.13	0.85	2.7	2.0
Sulphate	mg/l	--	500 [6]	1	1	4	1	<1	1
Temperature (Field)	deg c	--	15	8.4	6	8.9	13.3	6.5	9.3
Total Dissolved Solids	mg/l	--	500	2660	2200	3050	2580	2690	2650
Total Organic Carbon	mg/l	--	--	--	--	--	--	–	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	–	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0074	0.0033	0.008	<0.01	0.002	0.0024
Boron, dissolved	mg/l	5	--	1.41	1.03	1.6	0.92	1.6	1.2
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	21.4	25.3	19	30	20	16
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.01	<0.005	0.0004	0.0005	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.001	0.003	0.001	0.0028
Iron, dissolved	mg/l	--	0.3	0.361	0.014	0.15	0.28	0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00017	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	26.3	34.4	23	37	26	20
Manganese, dissolved	mg/l	--	0.05	0.078	0.004	0.06	0.06	0.047	0.035
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	–	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	–	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	–	--
Potassium, dissolved	mg/l	--	--	27.1	17.5	23	14	22	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	–	--
Sodium, dissolved	mg/l	--	200 [7]	979	754	1140	873	1000	720
Zinc, dissolved	mg/l	--	5	0.006	<0.005	<0.01	0.02	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 15-May-2007	95-1 10-Nov-2008	95-1 26-Nov-2009 [37] M-10	95-1 24-May-2011 [30] G-13	95-1 28-Nov-2012 95-1	95-1 29-May-2014 [36] 95-1
Semi-VOCs									
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 26-Nov-2015 95-1	95-1 24-May-2017 95-1	95-1 22-Nov-2018 95-1	95-1 21-May-2020 95-1	95-1 30-Nov-2021 [3] 95-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1210	1270	1150	1270	–
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [28]	<25 [11]	<25 [11]	27	–
Alkalinity (Total as CaCO3)	mg/l	--	--	1230	1280	1170	1300	–
Ammonia Nitrogen	mg/l	--	--	3.78	3.13	3.58	2.46	–
Chemical Oxygen Demand	mg/l	--	--	284	97	306	94	–
Chloride	mg/l	--	250	863	873	760	1050	–
Conductivity	uS/cm	--	--	--	--	--	--	–
Conductivity (Field)	uS/cm	--	--	>3999	3999	3179	>3999	–
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	–
Hardness, Calcium Carbonate	mg/l	--	--	139	163	215	195	–
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1	–
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [11]	<0.05	<0.05	–
Nitrogen, Total Kjeldahl	mg/l	--	--	9.9	4.5	7.7	3.3	–
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	–
Nitrogen, Organic	mg/l	--	--	--	--	--	--	–
pH	-	--	--	--	--	--	--	–
pH (Field)	-	--	--	8.25	8.21	8.58	7.96	–
Phosphate	mg/l	--	--	--	--	--	--	–
Phosphorus	mg/l	--	--	12.3	4.02	9.90	1.94	–
Sulphate	mg/l	--	500 [6]	1	<1	1	<1	–
Temperature (Field)	deg c	--	15	6.7	11.6	4.8	15.0	–
Total Dissolved Solids	mg/l	--	500	2880	2700	2440	2790	–
Total Organic Carbon	mg/l	--	--	--	--	--	--	–
Total Suspended Solids	mg/l	--	--	--	--	--	--	–
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.002	0.005	0.002	0.002	–
Boron, dissolved	mg/l	5	--	1.55	0.994	1.53	1.58	–
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	–
Calcium, dissolved	mg/l	--	--	18.5	15.4	33.1	24.6	–
Chromium, dissolved	mg/l	0.05	--	<0.001	0.014	<0.001	<0.001	–
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0006	<0.0005	–
Copper, dissolved	mg/l	--	1	<0.0005	0.0008	0.0011	0.0014	–
Iron, dissolved	mg/l	--	0.3	0.138	<0.1	0.2	0.223	–
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	–
Magnesium, dissolved	mg/l	--	--	22.6	30.2	32	32.4	–
Manganese, dissolved	mg/l	--	0.05	0.053	0.028	0.066	0.063	–
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	–
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	–
Nickel, dissolved	mg/l	--	--	--	--	--	--	–
Potassium, dissolved	mg/l	--	--	20	15.7	27	24.5	–
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	–
Sodium, dissolved	mg/l	--	200 [7]	1050	1010	1010	963	–
Zinc, dissolved	mg/l	--	5	0.01	<0.005	<0.005	<0.005	–
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.004 [10]	<0.001	0.004	–

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 26-Nov-2015 95-1	95-1 24-May-2017 95-1	95-1 22-Nov-2018 95-1	95-1 21-May-2020 95-1	95-1 30-Nov-2021 [3] 95-1
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Jun-1995	95-2 23-Nov-1995	95-2 12-Jun-1996	95-2 12-Oct-1996	95-2 18-Jun-1997	95-2 06-Nov-1997	95-2 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1139	1400	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	15	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	934	1180	1240	1200	1280	1190	1080
Ammonia Nitrogen	mg/l	--	--	0.88	0.63	1.18	1.49	0.01	0.77	0.68
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	50	18	30	19	62	50
Chloride	mg/l	--	250	528	628	636	656	629	632	615
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3480	4170	4000	4180	3850	3900	3720
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.2	--	--	--	2.36	--	--
Hardness, Calcium Carbonate	mg/l	--	--	214	244	247	231	264	265	239
Nitrate as N	mg/l	10.0	--	0.1	1.7	0.1	0.1	0.1	0.1	2.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.3	4	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.42	3.37	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	8.48	8.08	7.8	8.22	8.5	--
Phosphate	mg/l	--	--	--	1	--	--	--	--	--
Phosphorus	mg/l	--	--	4.39	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	26	8	4	6	3	1	10
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1750	2090	1940	2100	1930	1960	1840
Total Organic Carbon	mg/l	--	--	12.1	14.8	15.5	14.5	16.5	16.7	16.6
Total Suspended Solids	mg/l	--	--	--	--	1480	780	1910	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.79	0.92	0.965	1.01	1.27	1.07	1.17
Cadmium, dissolved	mg/l	0.005	--	0.0009	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	32.4	30.2	30.1	29	34.4	34.1	28.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.09	0.2	0.545	0.62	0.62	0.41	0.96
Lead, dissolved	mg/l	0.01	--	0.0012	0.0002	0.0005	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	32	40.5	41.3	38	42.8	43.1	40.2
Manganese, dissolved	mg/l	--	0.05	0.13	0.09	0.138	0.14	0.16	0.11	0.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	19.4	23	19.3	18.5	19.3	18.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	608	754	777	867	662	789	1000
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.06
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Jun-1995	95-2 23-Nov-1995	95-2 12-Jun-1996	95-2 12-Oct-1996	95-2 18-Jun-1997	95-2 06-Nov-1997	95-2 05-Jun-1998
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 29-Oct-1998	95-2 06-May-1999	95-2 19-Oct-1999	95-2 05-May-2000	95-2 24-Oct-2000	95-2 14-Jun-2001	95-2 23-Nov-2001
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1340	1430	1160	1577	1550	1230	1420
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	91	1	1	67	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1100	1170	1100	1293	1273	1120	1160
Ammonia Nitrogen	mg/l	--	--	0.8	0.12	1.21	0.07	0.2	1.23	0.88
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	36	38	37	47	--	37	31
Chloride	mg/l	--	250	660	690	695	645	703	671	682
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3980	3720	3860	3750	3970	3600	3620
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	195	250	239	227	255	232	254
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.2	0.9	0.3	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.14	2.67	--	--	1.32	2.3	2.51
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.7	7.9	8.1	7.9	8.1	8.1	7.55
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.85	0.95	0.94
Sulphate	mg/l	--	500 [6]	3	1	6	3	4	3	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2000	1870	1130	1875	2230	2060	2200
Total Organic Carbon	mg/l	--	--	17.1	19.4	16.8	16.6	--	14.9	18
Total Suspended Solids	mg/l	--	--	--	--	492	180	90	51	43
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	1.25	1.18	1.29	1.19	1.15	1.11	1.38
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	24.3	32.2	32.6	30	28.6	32.6	30.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.45	0.45	1.1	2.3	0.17	0.08	0.11
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0005	0.0002	0.022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	32.6	40.7	37.9	36.5	44.6	36.5	43.1
Manganese, dissolved	mg/l	--	0.05	0.12	0.11	0.11	0.13	0.11	0.09	0.1
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	20.8	13.6	18	11.2	19.8	9.1	12.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	842	902	926	798	831	782	898
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.1	0.06	0.01	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.054	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 29-Oct-1998	95-2 06-May-1999	95-2 19-Oct-1999	95-2 05-May-2000	95-2 24-Oct-2000	95-2 14-Jun-2001	95-2 23-Nov-2001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 23-May-2002	95-2 06-Nov-2002	95-2 30-May-2003	95-2 09-Oct-2003	95-2 14-May-2004	95-2 19-Nov-2004	95-2 24-May-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1240	1600	1400	--	1379	1410	1450
Alkalinity, Carbonate as CaCO3	mg/l	--	--	110	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1310	1150	1160	1130	1160	1190
Ammonia Nitrogen	mg/l	--	--	1.2	1.33	1.34	1.45	1.23	1.04	1.38
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	5	--	--	--
Chemical Oxygen Demand	mg/l	--	--	43	55	50	52	56	75	51
Chloride	mg/l	--	250	675	646	657	639	687	658	619
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3100	3690	2630	3550	3503	3730	3800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	280	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	242	233	215	214	220	216	228
Nitrate as N	mg/l	10.0	--	0.1	0.3	0.3	0.1	0.2	2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.23	2.47	2.67	2.48	2.69	2.57	2.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.41	8	7.1	7.8	8.2	8	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.89	0.82	1.18	0.89	0.92	2.07	1.34
Sulphate	mg/l	--	500 [6]	2	2	2	--	3	10	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	10
Total Dissolved Solids	mg/l	--	500	2170	2160	1315	2203	1750	1865	2200
Total Organic Carbon	mg/l	--	--	18	16.1	1.2	20	14.1	12.9	15.3
Total Suspended Solids	mg/l	--	--	51	36	164	46	42	40	431
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.001	0.002	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	1.18	1.18	1.03	1.05	1.06	1.11	1.1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	32.3	28.9	28.7	27.4	29	28.9	28.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.001	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.31	0.31	0.49	0.552	0.3	0.391	0.633
Lead, dissolved	mg/l	0.01	--	0.0002	0.0035	0.0005	0.0012	0.0013	0.0005	0.0015
Magnesium, dissolved	mg/l	--	--	39.2	39.1	34.7	35.5	36	35.1	38
Manganese, dissolved	mg/l	--	0.05	0.12	0.1	0.09	0.076	0.097	0.099	0.089
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	18.4	17.2	16.9	17	17.9	18.7	19.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	0.001
Sodium, dissolved	mg/l	--	200 [7]	802	809	719	785	761	770	791
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.005	0.005	0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 23-May-2002	95-2 06-Nov-2002	95-2 30-May-2003	95-2 09-Oct-2003	95-2 14-May-2004	95-2 19-Nov-2004	95-2 24-May-2005
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 16-Nov-2005	95-2 25-May-2006	95-2 21-Nov-2006	95-2 15-May-2007	95-2 30-Nov-2007	95-2 22-May-2008	95-2 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	281	1220	1260	1290	1230	1180	1220
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1150	1220	1260	1290	1230	1180	1215
Ammonia Nitrogen	mg/l	--	--	1.22	1.18	1.24	1.25	1.12	1.05	2.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	68	50	51	54	80	52	67
Chloride	mg/l	--	250	587	689	673	601	679	678	812
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3640	3300	3500	2000	3000	3350	4100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	213	215	197	220	214	143
Nitrate as N	mg/l	10.0	--	1.4	0.2	0.1	0.1	0.2	0.1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.6	2.34	2.42	2.53	2.27	2.52	3.77
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	8	7.4	8.5	8.3	8.1	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.26	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	3	1	1	1	1	<1	<1
Temperature (Field)	deg c	--	15	--	4.5	6.5	6.7	7	12	6
Total Dissolved Solids	mg/l	--	500	2220	2290	2310	2160	2460	2290	2480
Total Organic Carbon	mg/l	--	--	15.8	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	7	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.0035	0.0047	0.0043	0.0039	0.0047
Boron, dissolved	mg/l	5	--	1.14	0.984	1.07	0.962	1.07	1.03	1.18
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	30.3	27.9	26.6	26.6	29.9	28.4	18.9
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.138	0.253	0.304	0.223	0.061	0.317	0.706
Lead, dissolved	mg/l	0.01	--	0.0011	0.0006	<0.0001	0.00009	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	37.4	35	36.1	31.8	35.4	34.8	23.3
Manganese, dissolved	mg/l	--	0.05	0.099	0.092	0.057	0.088	0.101	0.087	0.044
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	20.1	17.4	18.3	17.3	20.2	17.8	29.1
Selenium, dissolved	mg/l	0.05	--	0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	860	801	794	707	963	817	861
Zinc, dissolved	mg/l	--	5	0.01	0.006	0.007	0.006	<0.005	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 16-Nov-2005	95-2 25-May-2006	95-2 21-Nov-2006	95-2 15-May-2007	95-2 30-Nov-2007	95-2 22-May-2008	95-2 10-Nov-2008
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 19-May-2009 G-22	95-2 26-Nov-2009 M-13	95-2 25-May-2010 M-17	95-2 20-Oct-2010 [30] G-16	95-2 24-May-2011 [30] G-20	95-2 29-Nov-2011 [30] 95-2	95-2 31-May-2012 95-2
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1130	1190	1040	1170	1260	1150	1100
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	29	22	<2 [9]	50	<2 [9]	24
Alkalinity (Total as CaCO3)	mg/l	--	--	1130	1220	1060	1170	1309	1150	1100
Ammonia Nitrogen	mg/l	--	--	1.25	0.61	1.40	1.14	2.18	1.27	1.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	73	45	48	50	50	50	50
Chloride	mg/l	--	250	598	652	529	607	797	602	550
Conductivity	uS/cm	--	--	3800	4080	3660	3890	4840	3800	--
Conductivity (Field)	uS/cm	--	--	3300	3370	3920	3857	1476	3506	3330
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	201	176	218	234	166	214	180
Nitrate as N	mg/l	10.0	--	0.19	0.30	<0.10	<0.10	<0.10	<0.10	0.22
Nitrite as N	mg/l	1.0	--	<0.10	0.14	<0.10	<0.10	<0.10	<0.10	0.41
Nitrogen, Total Kjeldahl	mg/l	--	--	2.26	1.47	1.91	2.35	3.32	1.59	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	0.63
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.25	8.41	8.36	8.28	8.63	8.25	8.36
pH (Field)	-	--	--	--	7.47	8.05	8.18	8.06	8.11	8.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.89	0.81	0.99	0.88	2.17	0.84	0.72
Sulphate	mg/l	--	500 [6]	3	4	5	1	<1	2	<1
Temperature (Field)	deg c	--	15	8	8.6	19.7	11.5	20.0	7.7	9.9
Total Dissolved Solids	mg/l	--	500	2470	2650	2380	2530	3150	2470	2230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	0.005	<0.01	<0.01	<0.01	<0.01	0.0019
Boron, dissolved	mg/l	5	--	1.33	1.1	1.6	1.3	1.4	1.12	0.99
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	26	21	28	31	22	28	22
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0003	0.0004	0.0005	0.0004	0.0006	0.0004	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	<0.001	0.003	<0.001	<0.0010
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	0.23	0.27	0.16	0.09	0.27
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	33	30	36	38	27	35	29
Manganese, dissolved	mg/l	--	0.05	0.06	0.02	0.10	0.09	0.05	0.11	0.061
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	16	18	17	23	16	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	791	801	750	842	1110	804	690
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.0050
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 19-May-2009 G-22	95-2 26-Nov-2009 M-13	95-2 25-May-2010 M-17	95-2 20-Oct-2010 [30] G-16	95-2 24-May-2011 [30] G-20	95-2 29-Nov-2011 [30] 95-2	95-2 31-May-2012 95-2
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Nov-2012 95-2	95-2 29-May-2013 [32] 95-2	95-2 26-Nov-2013 GW-8	95-2 29-May-2014 95-2	95-2 19-Nov-2014 95-2	95-2 02-Jun-2015 95-2	95-2 26-Nov-2015 95-2
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1200	1100	1200	1200	1200	934	1130
Alkalinity, Carbonate as CaCO3	mg/l	--	--	18	19	26	31	25	<50	<25 [28]
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1200	1200	1200	1200	947	1150
Ammonia Nitrogen	mg/l	--	--	1.3	1.6	1.3	1.7	1.7	1.66	1.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	54	56	58	53	93	104	99
Chloride	mg/l	--	250	600	650	660	670	640	627	676
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3229	3121	3074	3215	3648	3632	3679
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	230	220	220	250	148	166
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.043	0.57	0.33	0.176	0.055	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.4	2.6	5.1	3.3	4.9	2.9	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.66	0.40	0.23	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.25	8.37	8.46	8.37	--	--
pH (Field)	-	--	--	8.15	7.95	8.14	7.79	8.22	8.16	8.23
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.79	1.1	1.4	1.5	5.2	1.75	1.59
Sulphate	mg/l	--	500 [6]	<10 [38]	<1	<1	<1	<1	2	3
Temperature (Field)	deg c	--	15	6.5	8.9	7.1	8.8	7.3	9.6	7.2
Total Dissolved Solids	mg/l	--	500	2270	2300	2290	2180	2260	2220	2440
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.0012	0.0024	0.0018	0.0022	0.001	0.002
Boron, dissolved	mg/l	5	--	1.3	1.2	1	1.1	1.2	0.782	1.21
Cadmium, dissolved	mg/l	0.005	--	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29	30	27	29	32	20.8	25.1
Chromium, dissolved	mg/l	0.05	--	<0.05	<0.0050	0.0051	0.0057	0.0055	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	0.00053	0.00053	<0.00050	<0.00050	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	<0.01	0.0017	0.0013	0.0035	0.0018	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<1	<0.1	<0.1	<0.1	0.13	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.005	0.00056	<0.00050	<0.00050	<0.00050	0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	39	37	36	37	40	23.2	32.5
Manganese, dissolved	mg/l	--	0.05	0.094	0.092	0.031	0.015	0.11	0.048	0.083
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18	17	16	17	19	11.9	14.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	900	760	750	740	830	716	83.2
Zinc, dissolved	mg/l	--	5	<0.05	0.0065	0.0063	<0.0050	0.0066	0.035	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	0.0018	0.0013	0.0022	0.0022	<0.004 [10]	<0.004 [10]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Nov-2012 95-2	95-2 29-May-2013 [32] 95-2	95-2 26-Nov-2013 GW-8	95-2 29-May-2014 95-2	95-2 19-Nov-2014 95-2	95-2 02-Jun-2015 95-2	95-2 26-Nov-2015 95-2
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	0.00070	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 26-May-2016	95-2 17-Nov-2016	95-2 24-May-2017	95-2 29-Nov-2017	95-2 24-May-2018	95-2 22-Nov-2018	95-2 19-Jun-2019
				95-2	95-2	95-2	95-2	95-2	95-2	95-2
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1020	1090	1120	1040	1050	1220	1060
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [11]	<25 [11]	<25 [11]	<25 [11]	<25 [11]	<25 [11]	<25 [11]
Alkalinity (Total as CaCO3)	mg/l	--	--	1030	1100	1140	1050	1060	1240	1070
Ammonia Nitrogen	mg/l	--	--	2.10	1.68	2.61	1.48	1.81	1.39	2.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	108	89	119	78	97	119	97
Chloride	mg/l	--	250	685	672	644	719	658	699	587
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3727	3843	3661	3404	3905	3391	3560
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	184	204	190	215	203	281	245
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.25 [11]	0.33	0.05	<0.05	0.36
Nitrogen, Total Kjeldahl	mg/l	--	--	3.2	2.7	3.2	2.9	2.8	2.7	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.28	7.86	8.14	8.16	8.10	8.39	8.02
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.17	2.30	3.53	2.74	2.16	1.78	2.57
Sulphate	mg/l	--	500 [6]	3	4	5	4	6	4	3
Temperature (Field)	deg c	--	15	10.7	9.2	10.0	7.3	10.4	6.3	11.4
Total Dissolved Solids	mg/l	--	500	2430	2360	2200	2300	2290	2330	2090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.004	0.005	0.002	0.002	0.002	0.001
Boron, dissolved	mg/l	5	--	0.962	1.35	0.919	1.06	1.03	1.16	0.842
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	24.5	26.1	25.7	27.4	28.2	36	32.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.014	0.012	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005
Copper, dissolved	mg/l	--	1	0.0008	0.0006	0.0008	0.0013	0.0013	0.0050	0.0025
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	0.106	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	29.8	33.8	30.5	35.5	32.3	46.5	39.7
Manganese, dissolved	mg/l	--	0.05	0.081	0.068	0.06	0.049	0.05	0.014	0.048
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.8	15.7	15.2	17.2	16.2	20.4	17.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	627	767	772	806	718	871	720
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	0.006
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.011	<0.002 [10]	<0.004 [10]	<0.002 [10]	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 26-May-2016	95-2 17-Nov-2016	95-2 24-May-2017	95-2 29-Nov-2017	95-2 24-May-2018	95-2 22-Nov-2018	95-2 19-Jun-2019
				95-2	95-2	95-2	95-2	95-2	95-2	95-2
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 20-Nov-2019 95-2	95-2 21-May-2020 95-2	95-2 26-Nov-2020 95-2	95-2 26-May-2021 95-2	95-2 30-Nov-2021 95-2
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1130	1110	1110	1140	1190
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25	26	32	<25	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1150	1140	1140	1160	1200
Ammonia Nitrogen	mg/l	--	--	1.59	1.35	1.34	1.67	1.20
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	132	76	101	70	82
Chloride	mg/l	--	250	720	748	627	574	631
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3810	3269	3288	3668	3545
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	290	269	266	259	227
Nitrate as N	mg/l	10.0	--	0.7	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.07	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.0	2.3	2.2	2.1	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.31	7.97	8.54	8.03	8.07
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.86	0.95	1.17	1.05	0.92
Sulphate	mg/l	--	500 [6]	6	8	3	2	2
Temperature (Field)	deg c	--	15	7.6	12.6	6.6	10.9	5.3
Total Dissolved Solids	mg/l	--	500	2470	2210	2150	2240	2230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.002	0.002	0.001
Boron, dissolved	mg/l	5	--	0.864	0.852	0.849	0.851	0.799
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.4	35.5	31.3	30.2	28.6
Chromium, dissolved	mg/l	0.05	--	<0.001	0.003	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0018	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0016	0.0008	0.0021	0.0016	0.0009
Iron, dissolved	mg/l	--	0.3	0.261	3.11	0.101	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	0.0018	0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	47.1	43.7	45.6	44.7	37.8
Manganese, dissolved	mg/l	--	0.05	0.062	0.183	0.066	0.089	0.041
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.2	18.3	17.1	17.2	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	851	748	813	731	641
Zinc, dissolved	mg/l	--	5	<0.005	0.012	0.006	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.004 [10]	0.007	<0.004 [12]	<0.010 [12]	<0.004 [12]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 20-Nov-2019	95-2 21-May-2020	95-2 26-Nov-2020	95-2 26-May-2021	95-2 30-Nov-2021
				95-2	95-2	95-2	95-2	95-2
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Jun-1995	95-3 23-Nov-1995	95-3 12-Jun-1996	95-3 12-Oct-1996	95-3 18-Jun-1997	95-3 06-Nov-1997	95-3 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	700	797	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	574	653	634	651	644	660	650
Ammonia Nitrogen	mg/l	--	--	0.14	0.09	0.19	0.57	0.79	0.07	0.18
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	90	25	23	15	9	17	30
Chloride	mg/l	--	250	269	261	294	272	266	262	248
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2170	2340	2150	4000	2200	2130	2080
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	7.36	--	--	--	2.36	--	--
Hardness, Calcium Carbonate	mg/l	--	--	220	264	221	202	262	239	225
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	0.1	1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	8.5	0.8	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	8.36	0.71	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.03	7.45	7.1	7.96	7.29	7.94	--
Phosphate	mg/l	--	--	--	0.4	--	--	--	--	--
Phosphorus	mg/l	--	--	5.86	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	55	128	119	114	100	52	118
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1090	1170	1080	1120	1110	1070	1019
Total Organic Carbon	mg/l	--	--	19.2	7	7.5	6.8	6.9	7	6.8
Total Suspended Solids	mg/l	--	--	--	--	5070	5530	5010	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.61	0.61	0.618	0.77	0.8	0.74	0.85
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.6	36	30.2	28.6	35.5	34	29.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.05	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.05	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.03	19.9	0.132	0.25	0.16	0.14	1.46
Lead, dissolved	mg/l	0.01	--	0.0048	0.0059	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	31.5	41.7	34.8	31.4	38.1	37	36.2
Manganese, dissolved	mg/l	--	0.05	0.34	0.74	0.477	0.43	0.53	0.5	0.54
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	15.2	11.3	7.8	7.6	12.9	10.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	375	422	428	384	347	362	468
Zinc, dissolved	mg/l	--	5	0.01	0.05	0.01	0.01	0.01	0.01	0.32

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Jun-1995	95-3 23-Nov-1995	95-3 12-Jun-1996	95-3 12-Oct-1996	95-3 18-Jun-1997	95-3 06-Nov-1997	95-3 05-Jun-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 29-Oct-1998	95-3 06-May-1999	95-3 19-Oct-1999	95-3 05-May-2000	95-3 24-Oct-2000	95-3 14-Jun-2001	95-3 23-Nov-2001
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	756	810	813	953	927	753	828
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	25	1
Alkalinity (Total as CaCO3)	mg/l	--	--	620	664	666	781	760	659	679
Ammonia Nitrogen	mg/l	--	--	0.22	0.16	0.25	0.03	0.1	0.23	0.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	–	--	--
Chemical Oxygen Demand	mg/l	--	--	3	8	20	11	–	13	13
Chloride	mg/l	--	250	260	285	287	245	303	251	279
Conductivity	uS/cm	--	--	--	--	--	--	–	--	--
Conductivity (Field)	uS/cm	--	--	2120	2050	2370	2000	2310	1900	2100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	–	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	--	--	186	218	223	240	237	236	243
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.2	0.3	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	–	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.06	1.19	--	--	1.22	0.62	0.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	–	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	–	--	--
pH	-	--	--	--	--	--	--	–	--	--
pH (Field)	-	--	--	6.7	6.8	7.8	7	7.01	7	6.68
Phosphate	mg/l	--	--	--	--	--	--	–	--	--
Phosphorus	mg/l	--	--	--	--	--	--	3.39	0.46	0.67
Sulphate	mg/l	--	500 [6]	117	104	101	101	130	112	110
Temperature (Field)	deg c	--	15	--	--	--	--	–	--	--
Total Dissolved Solids	mg/l	--	500	1070	1040	1130	1000	1240	1180	1260
Total Organic Carbon	mg/l	--	--	9.6	7	6.5	6.1	–	5.8	7
Total Suspended Solids	mg/l	--	--	--	--	3000	1210	6230	1580	2100
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.95	0.68	1.02	0.77	0.84	0.76	1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	–	--	--
Calcium, dissolved	mg/l	--	--	26.7	29.1	33.8	34	30	36.1	33
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	–	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.38	0.28	1.2	2.45	0.08	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0021	0.0002	0.0002	0.0022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	28.9	34.8	33.2	37.1	39.3	35.3	39
Manganese, dissolved	mg/l	--	0.05	0.56	0.52	0.35	0.54	0.4	0.57	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	–	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	–	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.8	2.2	11.1	4.3	12.6	4.3	7.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	–	--	--
Sodium, dissolved	mg/l	--	200 [7]	414	437	439	432	550	402	448
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.17	0.26	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 29-Oct-1998	95-3 06-May-1999	95-3 19-Oct-1999	95-3 05-May-2000	95-3 24-Oct-2000	95-3 14-Jun-2001	95-3 23-Nov-2001
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.051	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 23-May-2002	95-3 06-Nov-2002	95-3 30-May-2003	95-3 09-Oct-2003	95-3 14-May-2004	95-3 19-Nov-2004	95-3 24-May-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	837	1050	487	--	802	854	824
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	686	864	399	537	657	700	675
Ammonia Nitrogen	mg/l	--	--	0.27	0.16	0.45	0.12	0.15	0.17	0.06
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	2	–	--	--
Chemical Oxygen Demand	mg/l	--	--	10	22	25	42	57	32	26
Chloride	mg/l	--	250	281	262	256	180	242	215	204
Conductivity	uS/cm	--	--	--	--	--	--	–	--	--
Conductivity (Field)	uS/cm	--	--	2030	2260	1740	1930	2010	2160	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	147	–	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	--	--	248	248	225	170	225	213	228
Nitrate as N	mg/l	10.0	--	0.1	0.3	0.3	0.2	0.2	1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	–	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.47	0.8	1.69	0.57	1.51	0.57	0.49
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	–	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	–	--	--
pH	-	--	--	--	--	--	--	–	--	--
pH (Field)	-	--	--	6.8	7	6.6	7.3	7.2	7.4	7.1
Phosphate	mg/l	--	--	--	--	--	--	–	--	--
Phosphorus	mg/l	--	--	0.47	0.14	3.24	1.56	3.21	2.34	1.16
Sulphate	mg/l	--	500 [6]	111	114	97	131	115	130	126
Temperature (Field)	deg c	--	15	--	--	--	--	–	--	13.5
Total Dissolved Solids	mg/l	--	500	1260	1290	870	1073	1005	1080	1180
Total Organic Carbon	mg/l	--	--	6	5.6	6	12	4.5	5.3	4.6
Total Suspended Solids	mg/l	--	--	1600	4150	9680	8180	5720	2200	2810
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	0.72	0.87	0.62	0.9	0.681	0.867	0.66
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	–	--	<0.0001
Calcium, dissolved	mg/l	--	--	35.8	36.5	32.1	26.3	32.5	32	32.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.008	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	–	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.21	0.35	0.016	0.005	0.027
Lead, dissolved	mg/l	0.01	--	0.001	0.0013	0.0005	0.0005	0.0008	0.0013	0.0012
Magnesium, dissolved	mg/l	--	--	38.4	38	35.2	25.4	34.9	32.4	35.7
Manganese, dissolved	mg/l	--	0.05	0.62	0.17	0.55	0.377	0.63	0.487	0.605
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	–	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	–	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	6.9	9.7	8.4	7.9	8.6	8.4	8.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	–	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	395	441	406	379	412	410	376
Zinc, dissolved	mg/l	--	5	0.02	0.02	0.01	0.014	0.005	0.005	0.006

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 23-May-2002	95-3 06-Nov-2002	95-3 30-May-2003	95-3 09-Oct-2003	95-3 14-May-2004	95-3 19-Nov-2004	95-3 24-May-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 16-Nov-2005	95-3 25-May-2006	95-3 21-Nov-2006	95-3 15-May-2007	95-3 30-Nov-2007	95-3 22-May-2008	95-3 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	172	725	738	687	750	680	725
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	705	725	738	687	750	680	725
Ammonia Nitrogen	mg/l	--	--	<0.01	0.18	<0.01	0.05	0.03	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	32	15	12	63	67	18	<5
Chloride	mg/l	--	250	190	216	203	211	174	187	177
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1900	1700	1800	1400	1000	1750	1650
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	223	211	213	229	200	206	188
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.2	0.1	1.1	0.2	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.28	1.76	0.28	0.58	0.67	0.61	0.48
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.3	7.7	8	7.7	7.1	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.09	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	136	132	134	122	125	122	123
Temperature (Field)	deg c	--	15	--	4	6	5.8	5	8	8
Total Dissolved Solids	mg/l	--	500	1290	1260	1280	1220	1300	1210	1210
Total Organic Carbon	mg/l	--	--	6	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	460	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001	0.001	0.0008	0.0012	0.0005
Boron, dissolved	mg/l	5	--	0.933	0.711	0.881	0.679	0.942	0.736	0.967
Cadmium, dissolved	mg/l	0.005	--	0.0001	<0.005	0.0002	0.00024	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	33.9	30.3	31.6	34.7	30.9	31	28.4
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.046	<0.005	0.014	0.072	0.01	0.011	<0.005
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	<0.0001	0.00012	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	33.7	32.9	32.5	34.7	29.8	31.2	28.5
Manganese, dissolved	mg/l	--	0.05	0.298	0.408	0.282	0.686	0.107	0.331	0.195
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.1	8.1	9.2	8.3	8.8	8.3	8.8
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	470	417	426	396	472	424	409
Zinc, dissolved	mg/l	--	5	0.012	<0.005	0.008	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 16-Nov-2005	95-3 25-May-2006	95-3 21-Nov-2006	95-3 15-May-2007	95-3 30-Nov-2007	95-3 22-May-2008	95-3 10-Nov-2008
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 19-May-2009 G-23	95-3 26-Nov-2009 M-14	95-3 25-May-2010 M-27	95-3 20-Oct-2010 G-17	95-3 24-May-2011 [39] G-32	95-3 29-Nov-2011 [40] 95-3	95-3 31-May-2012 95-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	724	740	707	737	748	739	710
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	<2 [9]	<2 [9]	<2 [9]	2.8
Alkalinity (Total as CaCO3)	mg/l	--	--	724	740	707	737	748	739	720
Ammonia Nitrogen	mg/l	--	--	0.07	0.02	0.11	0.08	0.08	<0.02	<0.050
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	–	--	--
Chemical Oxygen Demand	mg/l	--	--	15	27	20	25	20	15	30
Chloride	mg/l	--	250	173	174	155	158	169	159	140
Conductivity	uS/cm	--	--	2020	2040	1990	1990	2030	1940	--
Conductivity (Field)	uS/cm	--	--	1700	1777	1756	1972	1533	1798	1745
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	–	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	--	--	192	183	201	197	207	177	190
Nitrate as N	mg/l	10.0	--	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.29	0.15	0.42	1.08	0.19	3.57	0.89
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	–	--	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	–	--	--
pH	-	--	--	7.61	7.70	7.93	7.77	8.24	8.06	7.61
pH (Field)	-	--	--	--	6.85	6.98	7.22	7.03	7.12	7.32
Phosphate	mg/l	--	--	--	--	--	--	–	--	--
Phosphorus	mg/l	--	--	0.51	0.26	0.87	1.20	0.68	0.23	0.61
Sulphate	mg/l	--	500 [6]	103	101	99	102	96	89	86
Temperature (Field)	deg c	--	15	7	8.3	26.1	11.3	19.5	7.9	9.1
Total Dissolved Solids	mg/l	--	500	1310	1330	1290	1290	1320	1260	1120
Total Organic Carbon	mg/l	--	--	--	--	--	--	–	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	–	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	1.21	1.0	0.93	1.3	0.79	1.2	0.87
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	29	27	31	31	27	28	29
Chromium, dissolved	mg/l	0.05	--	0.009	0.007	<0.005	0.005	0.008	0.006	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.0002	<0.0002	0.0005	0.0003	0.0004	0.0004	<0.00050
Copper, dissolved	mg/l	--	1	0.004	0.003	0.003	0.003	0.003	0.002	0.0041
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	29	28	30	29	34	26	30
Manganese, dissolved	mg/l	--	0.05	0.02	0.03	1.16	0.30	0.49	0.51	0.17
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	–	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	–	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	–	--	--
Potassium, dissolved	mg/l	--	--	7	8	7	8	7	8	7.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	–	--	--
Sodium, dissolved	mg/l	--	200 [7]	351	380	368	373	395	358	380
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	<0.01	0.01	<0.01	0.0060

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3	95-3	95-3	95-3	95-3	95-3	95-3
				19-May-2009	26-Nov-2009	25-May-2010	20-Oct-2010	24-May-2011 [39]	29-Nov-2011 [40]	31-May-2012
				G-23	M-14	M-27	G-17	G-32	95-3	95-3
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.004	<0.0008	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.01	<0.001	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.04	<0.0080	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.0004	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Nov-2012 95-3	95-3 29-May-2013 MW-W	95-3 26-Nov-2013 GW-7	95-3 29-May-2014 95-3	95-3 19-Nov-2014 [41] MW-W	95-3 02-Jun-2015 95-3	95-3 26-Nov-2015 95-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	720	710	720	720	740	743	747
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5.4	3.7	4.4	5.4	4.4	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	730	710	730	720	740	747	750
Ammonia Nitrogen	mg/l	--	--	0.19	0.35	0.12	0.22	0.33	0.31	0.33
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	–	--	--
Chemical Oxygen Demand	mg/l	--	--	31	81	57	35	150	188	348
Chloride	mg/l	--	250	140	160	140	150	160	173	162
Conductivity	uS/cm	--	--	--	--	--	--	–	--	--
Conductivity (Field)	uS/cm	--	--	1753	1617	1615	1686	1842	1824	1803
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	–	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	--	--	200	210	180	190	200	151	154
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.93	3.5	3.6	6.4	4.6	2.8	5.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	–	--	--
pH	-	--	--	--	7.75	7.81	7.90	7.80	--	--
pH (Field)	-	--	--	7.10	7.62	7.79	7.43	7.19	7.25	7.35
Phosphate	mg/l	--	--	--	--	--	--	–	--	--
Phosphorus	mg/l	--	--	1.4	8.0	3.0	3.0	13	4.47	9.07
Sulphate	mg/l	--	500 [6]	78	83	79	71	83	81	87
Temperature (Field)	deg c	--	15	6.5	9.5	6.5	9.6	6.8	7.9	6.2
Total Dissolved Solids	mg/l	--	500	1150	1160	1150	1140	1140	1010	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	–	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	–	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1.2	0.85	1	1.1	1.1	0.616	1.19
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29	31	28	28	30	22.6	24.1
Chromium, dissolved	mg/l	0.05	--	<0.005	0.0065	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.00066	0.00066	<0.00050	<0.00050	0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.002	0.0025	0.0023	0.0034	<0.0020	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31	31	27	29	29	22.9	22.6
Manganese, dissolved	mg/l	--	0.05	0.27	0.88	0.45	0.55	0.59	0.637	0.536
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	–	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	–	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	–	--	--
Potassium, dissolved	mg/l	--	--	8.5	7.1	7.6	7.2	8.1	5.43	6.83
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	–	--	--
Sodium, dissolved	mg/l	--	200 [7]	410	380	370	370	410	325	426
Zinc, dissolved	mg/l	--	5	0.008	<0.0050	0.036	<0.0050	<0.0050	<0.005	0.013

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Nov-2012 95-3	95-3 29-May-2013 MW-W	95-3 26-Nov-2013 GW-7	95-3 29-May-2014 95-3	95-3 19-Nov-2014 [41] MW-W	95-3 02-Jun-2015 95-3	95-3 26-Nov-2015 95-3
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	0.00088	<0.00020	<0.00040	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 26-May-2016	95-3 17-Nov-2016	95-3 24-May-2017	95-3 29-Nov-2017	95-3 24-May-2018	95-3 22-Nov-2018	95-3 19-Jun-2019
				95-3	95-3	95-3	95-3	95-3	95-3	95-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	768	753	785	1030	805	807	750
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	7
Alkalinity (Total as CaCO3)	mg/l	--	--	770	756	789	1040	810	810	757
Ammonia Nitrogen	mg/l	--	--	0.51	0.35	0.31	0.26	0.27	0.10	0.29
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	184	59	289	25	312	183	105
Chloride	mg/l	--	250	187	162	181	65	191	172	189
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1892	1917	1962	1609	1988	1662	1763
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	160	185	178	634	140	232	232
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	2.1	3.4	0.8	1.8	3.1	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.87	7.94	7.45	6.84	7.42	7.74	7.55
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	6.33	4.88	7.14	0.44	3.13	5.58	2.92
Sulphate	mg/l	--	500 [6]	87	89	82	128	84	86	85
Temperature (Field)	deg c	--	15	10.6	9.4	9.2	8.1	8.6	6.1	10.8
Total Dissolved Solids	mg/l	--	500	1170	1080	1140	1140	1190	1050	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.761	1.43	0.826	0.931	0.634	1.12	0.831
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25.2	28.5	27	125	24.4	34.4	36.3
Chromium, dissolved	mg/l	0.05	--	<0.001	0.008	0.006	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0011	0.0025	0.0014	0.0010	0.0037	0.0050	0.0014
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	1.3	0.171	0.123	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	23.7	27.7	26.8	78.2	19.1	35.4	34.3
Manganese, dissolved	mg/l	--	0.05	0.573	0.294	0.658	0.884	0.727	3.41	0.599
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.54	7.96	6.93	12.3	4.98	9.36	8.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	276	399	345	231	249	455	375
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 26-May-2016	95-3 17-Nov-2016	95-3 24-May-2017	95-3 29-Nov-2017	95-3 24-May-2018	95-3 22-Nov-2018	95-3 19-Jun-2019
				95-3	95-3	95-3	95-3	95-3	95-3	95-3
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.002 [10]	<0.001	<0.001	0.003	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 20-Nov-2019 95-3	95-3 21-May-2020 95-3	95-3 26-Nov-2020 95-3	95-3 26-May-2021 95-3	95-3 30-Nov-2021 95-3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	698	659	691	696	604
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	6	9	<5	8
Alkalinity (Total as CaCO3)	mg/l	--	--	703	665	699	699	612
Ammonia Nitrogen	mg/l	--	--	0.11	0.11	0.04	0.17	0.21
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	–
Chemical Oxygen Demand	mg/l	--	--	111	37	89	137	96
Chloride	mg/l	--	250	164	184	163	158	150
Conductivity	uS/cm	--	--	--	--	--	--	–
Conductivity (Field)	uS/cm	--	--	1815	1713	1601	1731	1642
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	–
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	–
Hardness, Calcium Carbonate	mg/l	--	--	237	225	179	176	159
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.6	0.7	0.8	1.5	5.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	–
Nitrogen, Organic	mg/l	--	--	--	--	--	--	–
pH	-	--	--	--	--	--	--	–
pH (Field)	-	--	--	7.21	8.26	7.49	6.97	7.14
Phosphate	mg/l	--	--	--	--	--	--	–
Phosphorus	mg/l	--	--	2.97	0.66	0.67	1.70	16.1
Sulphate	mg/l	--	500 [6]	88	89	90	81	101
Temperature (Field)	deg c	--	15	7.1	10.3	6.2	11.3	4.5
Total Dissolved Solids	mg/l	--	500	1090	998	1000	1090	1000
Total Organic Carbon	mg/l	--	--	--	--	--	--	–
Total Suspended Solids	mg/l	--	--	--	--	--	--	–
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.904	0.745	0.889	0.705	0.819
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	36.5	34.9	28.1	26.7	25.2
Chromium, dissolved	mg/l	0.05	--	<0.001	0.002	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0020	<0.0005	0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0016	0.0021	0.0034	0.0011	0.0014
Iron, dissolved	mg/l	--	0.3	<0.1	2.7	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0040	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	35.5	33.5	26.5	26.4	23.2
Manganese, dissolved	mg/l	--	0.05	0.444	0.921	0.069	0.639	0.195
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	–
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	–
Nickel, dissolved	mg/l	--	--	--	--	--	--	–
Potassium, dissolved	mg/l	--	--	11.1	7.71	7.25	5.79	6.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	–
Sodium, dissolved	mg/l	--	200 [7]	374	377	345	281	320
Zinc, dissolved	mg/l	--	5	<0.005	0.01	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 20-Nov-2019 95-3	95-3 21-May-2020 95-3	95-3 26-Nov-2020 95-3	95-3 26-May-2021 95-3	95-3 30-Nov-2021 95-3
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.003	<0.001	<0.004 [12]	<0.001
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 28-Jun-1995	95-5 22-Nov-1995	95-5 12-Oct-1996	95-5 06-Nov-1997	95-5 05-Jun-1998	95-5 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	1181	1420	--	–	--	1610
Alkalinity, Carbonate as CaCO3	mg/l	–	--	1	1	--	–	--	1
Alkalinity (Total as CaCO3)	mg/l	–	--	968	1160	1250	1250	875	1320
Ammonia Nitrogen	mg/l	–	--	1.59	7.5	4.64	4.65	7.51	4.42
Chemical Oxygen Demand	mg/l	–	--	400	260	148	96	288	61
Chloride	mg/l	–	250	703	1430	1370	1340	1390	1510
Conductivity	uS/cm	–	--	–	--	--	–	--	--
Conductivity (Field)	uS/cm	–	--	5340	6120	2830	6020	5370	5220
Dissolved Oxygen (Field)	mg/l	–	--	3	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	–	--	315	467	337	424	347	369
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	1	--
Nitrite as N	mg/l	1.0	--	–	--	--	–	--	--
Nitrogen, Total Kjeldahl	mg/l	–	--	13.8	19.3	--	–	--	37.1
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	--	--
Nitrogen, Organic	mg/l	–	--	12.21	11.8	--	–	--	--
pH	-	–	--	–	--	--	–	--	--
pH (Field)	-	–	--	7.94	8.33	7.87	8.16	--	7.9
Phosphate	mg/l	–	--	–	41	--	–	--	--
Phosphorus	mg/l	–	--	21	--	--	–	--	--
Sulphate	mg/l	–	500 [6]	14	10	3	9	73	2
Temperature (Field)	deg c	–	15	–	--	--	–	--	--
Total Dissolved Solids	mg/l	–	500	268	320	2830	3020	2670	2710
Total Organic Carbon	mg/l	–	--	26.1	19.9	31.8	20.2	27.7	24.5
Total Suspended Solids	mg/l	–	--	–	--	58.8	–	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	–	--	--	–	--	--
Boron, dissolved	mg/l	5	--	1.02	1.13	1.28	1.41	1.52	1.62
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	–	--	--
Calcium, dissolved	mg/l	–	--	40.4	48.7	35	46.5	35.1	38.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.1	0.01	0.02	0.01	0.01
Cobalt, dissolved	mg/l	–	--	–	--	--	–	--	--
Copper, dissolved	mg/l	–	1	0.02	0.04	0.01	0.01	0.03	0.01
Iron, dissolved	mg/l	–	0.3	0.04	58.1	0.7	13.3	6.37	0.56
Lead, dissolved	mg/l	0.01	--	0.0008	0.007	0.0002	0.001	0.001	0.0002
Magnesium, dissolved	mg/l	–	--	51.2	82.8	59.8	73.8	62.1	65.3
Manganese, dissolved	mg/l	–	0.05	0.31	1.21	0.18	0.4	0.23	0.13
Mercury, dissolved	mg/l	0.001	--	–	--	--	–	--	--
Molybdenum, dissolved	mg/l	–	--	–	--	--	–	--	--
Nickel, dissolved	mg/l	–	--	0.02	0.07	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	–	--	–	41.4	32.1	39.3	36.4	41.1
Selenium, dissolved	mg/l	0.05	--	–	--	--	–	--	--
Sodium, dissolved	mg/l	–	200 [7]	832	1050	1230	1140	1370	1340
Zinc, dissolved	mg/l	–	5	0.01	0.11	0.01	0.04	0.22	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 28-Jun-1995	95-5 22-Nov-1995	95-5 12-Oct-1996	95-5 06-Nov-1997	95-5 05-Jun-1998	95-5 06-May-1999
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	0.001	--	--	–	--	--
Semi-VOCs									
Styrene	mg/l	–	--	–	--	--	–	--	--
VOCs									
1,1-Dichloroethane	mg/l	–	--	–	--	--	–	--	--
Benzene	mg/l	0.001	--	–	--	--	–	--	--
Ethylbenzene	mg/l	0.14	0.0016	–	--	--	–	--	--
m,p-Xylenes	mg/l	–	--	–	--	--	–	--	--
Methylene Chloride	mg/l	0.05	--	–	--	--	–	--	--
o-Xylene	mg/l	–	--	–	--	--	–	--	--
Toluene	mg/l	0.06	0.024	–	--	--	–	--	--
Vinyl Chloride	mg/l	0.001	--	–	--	--	–	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 24-Oct-2000	95-5 14-Jun-2001	95-5 06-Nov-2002	95-5 30-May-2003	95-5 19-Nov-2004	95-5 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	1620	1290	1680	1460	1550	292
Alkalinity, Carbonate as CaCO3	mg/l	–	--	1	85	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	–	--	1320	1200	1380	1200	1270	1200
Ammonia Nitrogen	mg/l	–	--	2.12	4.14	3.95	3.71	3.89	3.62
Chemical Oxygen Demand	mg/l	–	--	–	52	150	81	315	78
Chloride	mg/l	–	250	1520	1480	1430	1470	1500	1300
Conductivity	uS/cm	–	--	–	--	--	–	--	--
Conductivity (Field)	uS/cm	–	--	6090	5000	5890	5040	6200	4200
Dissolved Oxygen (Field)	mg/l	–	--	–	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	–	--	417	370	357	327	340	356
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	1	0.4
Nitrite as N	mg/l	1.0	--	–	--	--	–	--	--
Nitrogen, Total Kjeldahl	mg/l	–	--	4.76	5.13	7.66	5.94	4.82	5.18
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	--	--
Nitrogen, Organic	mg/l	–	--	–	--	--	–	--	--
pH	-	–	--	–	--	--	–	--	--
pH (Field)	-	–	--	8.26	8.1	8	7.2	7.9	--
Phosphate	mg/l	–	--	–	--	--	–	--	--
Phosphorus	mg/l	–	--	3.58	1.6	15.3	3.17	9.54	2.19
Sulphate	mg/l	–	500 [6]	1	1	2	1	10	1
Temperature (Field)	deg c	–	15	–	--	--	–	--	--
Total Dissolved Solids	mg/l	–	500	3450	3250	3390	3330	3100	3470
Total Organic Carbon	mg/l	–	--	–	17.7	18.1	18.9	16.9	19.7
Total Suspended Solids	mg/l	–	--	1830	323	7160	2590	2850	128
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	0.003	0.001	0.002
Boron, dissolved	mg/l	5	--	1.56	1.69	1.52	1.47	1.53	1.6
Cadmium, dissolved	mg/l	0.005	--	–	--	--	–	--	<0.0001
Calcium, dissolved	mg/l	–	--	38.4	43.2	37.1	36.4	37.3	39.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	–	--	–	--	--	–	--	<0.005
Copper, dissolved	mg/l	–	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	–	0.3	0.45	0.4	0.45	0.97	0.324	0.385
Lead, dissolved	mg/l	0.01	--	**0.022**	0.0002	**0.0121**	0.0007	0.0022	0.0017
Magnesium, dissolved	mg/l	–	--	77.9	63.6	64.3	57.3	60.1	62.5
Manganese, dissolved	mg/l	–	0.05	0.12	0.12	0.12	0.1	0.104	0.107
Mercury, dissolved	mg/l	0.001	--	–	--	--	–	--	<0.00006
Molybdenum, dissolved	mg/l	–	--	–	--	--	–	--	<0.01
Nickel, dissolved	mg/l	–	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	–	--	30.8	26.7	31.4	33	34.4	38.4
Selenium, dissolved	mg/l	0.05	--	–	--	--	–	--	<0.001
Sodium, dissolved	mg/l	–	200 [7]	1270	1240	1320	1060	1470	1350
Zinc, dissolved	mg/l	–	5	0.01	0.01	0.02	0.01	0.019	0.007

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 24-Oct-2000	95-5 14-Jun-2001	95-5 06-Nov-2002	95-5 30-May-2003	95-5 19-Nov-2004	95-5 16-Nov-2005
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	0.004	0.029	0.001	0.001	0.001	<0.001
Semi-VOCs									
Styrene	mg/l	–	--	–	--	--	–	--	--
VOCs									
1,1-Dichloroethane	mg/l	–	--	–	--	--	–	--	--
Benzene	mg/l	0.001	--	–	--	--	–	--	--
Ethylbenzene	mg/l	0.14	0.0016	–	--	--	–	--	--
m,p-Xylenes	mg/l	–	--	–	--	--	–	--	--
Methylene Chloride	mg/l	0.05	--	–	--	--	–	--	--
o-Xylene	mg/l	–	--	–	--	--	–	--	--
Toluene	mg/l	0.06	0.024	–	--	--	–	--	--
Vinyl Chloride	mg/l	0.001	--	–	--	--	–	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 15-May-2007	95-5 10-Nov-2008	95-5 26-Nov-2009 [8] M-3	95-5 24-May-2011 [30] G-33	95-5 28-Nov-2012 95-5	95-5 29-May-2014 [32] 95-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	1270	1320	1280	1230	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	–	--	<5	<5	30	43	14	30
Alkalinity (Total as CaCO3)	mg/l	–	--	1270	1320	1310	1270	1200	1300
Ammonia Nitrogen	mg/l	–	--	3.55	3.52	3.72	3.60	3.9	3.9
Chemical Oxygen Demand	mg/l	–	--	181	84	93	70	77	70
Chloride	mg/l	–	250	1410	1510	1690	1390	1300	1500
Conductivity	uS/cm	–	--	–	--	6570	6570	--	--
Conductivity (Field)	uS/cm	–	--	4400	>5000	>3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	–	--	–	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	–	--	326	320	361	365	360	310
Nitrate as N	mg/l	10.0	--	0.1	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	–	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	–	--	5.99	5.37	4.84	4.32	90	9.9
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	<0.10	<0.10
Nitrogen, Organic	mg/l	–	--	–	--	--	–	--	--
pH	-	–	--	–	--	8.39	8.57	--	8.42
pH (Field)	-	–	--	8.5	8	7.42	8.05	8.12	7.51
Phosphate	mg/l	–	--	–	--	--	–	--	--
Phosphorus	mg/l	–	--	–	--	2.78	1.68	2.0	1.7
Sulphate	mg/l	–	500 [6]	2	1	4	<1	<1	<1
Temperature (Field)	deg c	–	15	10.8	7	9.1	19.2	6.8	9.5
Total Dissolved Solids	mg/l	–	500	3470	3590	4270	4270	3460	3460
Total Organic Carbon	mg/l	–	--	–	--	--	–	--	--
Total Suspended Solids	mg/l	–	--	–	--	--	–	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0089	0.0073	<0.01	<0.01	0.002	0.0023 [38]
Boron, dissolved	mg/l	5	--	1.42	1.47	2.1	1.9	1.8	1.5
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	–	--	36.7	35.7	39	39	38	33
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.01
Cobalt, dissolved	mg/l	–	--	<0.005	<0.005	<0.002	0.0008	0.0006	0.00054
Copper, dissolved	mg/l	–	1	<0.002	<0.002	<0.01	0.002	0.001	0.0014
Iron, dissolved	mg/l	–	0.3	0.893	0.225	<0.3	0.36	0.2	0.27
Lead, dissolved	mg/l	0.01	--	0.00019	<0.00002	<0.01	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	–	--	57	56.2	64	65	64	55
Manganese, dissolved	mg/l	–	0.05	0.107	0.09	<0.1	0.09	0.087	0.085
Mercury, dissolved	mg/l	0.001	--	–	--	--	–	--	--
Molybdenum, dissolved	mg/l	–	--	–	--	--	–	--	--
Nickel, dissolved	mg/l	–	--	–	--	--	–	--	--
Potassium, dissolved	mg/l	–	--	37.1	34.4	33	36	33	29
Selenium, dissolved	mg/l	0.05	--	–	--	--	–	--	--
Sodium, dissolved	mg/l	–	200 [7]	1160	1160	1345	1160	1300	1200
Zinc, dissolved	mg/l	–	5	<0.005	<0.005	<0.1	0.02	<0.005	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 15-May-2007	95-5 10-Nov-2008	95-5 26-Nov-2009 [8] M-3	95-5 24-May-2011 [30] G-33	95-5 28-Nov-2012 95-5	95-5 29-May-2014 [32] 95-5
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0011
Semi-VOCs									
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00020
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	0.00011	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00020
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	0.00018	<0.00020
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.0010
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00020
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00040
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00040

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 26-Nov-2015 95-5	95-5 24-May-2017 95-5	95-5 22-Nov-2018 [42] 95-5	95-5 21-May-2020 95-5	95-5 30-Nov-2021 95-5
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1170	1210	1230	1250	1250
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [28]	<25 [11]	38	<25 [13]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1190	1230	1270	1280	1250
Ammonia Nitrogen	mg/l	--	--	4.98	5.58	--	3.97	3.60
Chemical Oxygen Demand	mg/l	--	--	277	237	--	126	129
Chloride	mg/l	--	250	1490	1430	1430	1740	1420
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	--	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	317	282	456	410	355
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.50 [11]	<0.05	<0.05	<1.00 [13]
Nitrogen, Total Kjeldahl	mg/l	--	--	9.1	11.0	--	4.4	5.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.14	8.05	--	8.10	8.18
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	7.23	12.2	--	1.63	1.67
Sulphate	mg/l	--	500 [6]	<1	1	6	<1	2
Temperature (Field)	deg c	--	15	7.1	11.9	--	14.5	5.1
Total Dissolved Solids	mg/l	--	500	3420	3630	3600	3700	3580
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.002	0.008	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	1.46	1.18	1.59	1.59	1.62
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31.3	33.2	52.4	42.4	37.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.021	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0008	0.0007	0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0010	0.0023	0.0023	0.0011
Iron, dissolved	mg/l	--	0.3	0.126	<0.1	0.195	0.263	0.151
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	58	48.4	79	73.9	63.4
Manganese, dissolved	mg/l	--	0.05	0.068	0.065	0.098	0.093	0.077
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.6	30	40.7	34.2	28.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1110	1140	1140	1170	963
Zinc, dissolved	mg/l	--	5	0.014	<0.005	<0.005	0.009	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 26-Nov-2015 95-5	95-5 24-May-2017 95-5	95-5 22-Nov-2018 [42] 95-5	95-5 21-May-2020 95-5	95-5 30-Nov-2021 95-5
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.010 [12]	--	0.010	<0.004 [12]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Jun-1995	95-6 22-Nov-1995	95-6 12-Jun-1996	95-6 12-Oct-1996	95-6 18-Jun-1997	95-6 06-Nov-1997	95-6 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	832	1070	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	8	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	682	886	901	905	914	966	840
Ammonia Nitrogen	mg/l	--	--	1.14	0.89	1.37	1.46	0.01	0.87	0.79
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	115	48	29	25	34	42	64
Chloride	mg/l	--	250	389	825	839	816	783	952	861
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3380	4350	4020	4380	3230	4040	4290
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.45	--	--	--	1.97	--	--
Hardness, Calcium Carbonate	mg/l	--	--	255	338	349	320	387	374	336
Nitrate as N	mg/l	10.0	--	0.1	0.8	0.1	0.1	0.1	0.1	2.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.3	3.5	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.16	2.61	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.89	8.09	7.95	7.56	8.02	7.98	--
Phosphate	mg/l	--	--	--	0.3	--	--	--	--	--
Phosphorus	mg/l	--	--	6.1	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	21	11	9	8	5	3	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1700	2190	2010	2190	1630	2030	2140
Total Organic Carbon	mg/l	--	--	14.1	13.5	14.4	14	15.1	14.6	14
Total Suspended Solids	mg/l	--	--	--	--	2910	1490	1320	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.53	0.59	0.678	0.71	0.91	0.79	0.84
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	38.1	43.6	43.3	40.8	52.4	50.3	41.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	3.06	0.5	0.44	0.39	0.28	0.45
Lead, dissolved	mg/l	0.01	--	0.0008	0.0001	0.0002	0.0002	0.0002	0.0002	0.0018
Magnesium, dissolved	mg/l	--	--	38.4	54.8	57.7	52.2	61.4	59.6	55.7
Manganese, dissolved	mg/l	--	0.05	0.33	0.27	0.213	0.18	0.19	0.19	0.18
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	20.7	25.4	19.7	19.3	21.9	20.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	566	721	753	668	643	788	967
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.16

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Jun-1995	95-6 22-Nov-1995	95-6 12-Jun-1996	95-6 12-Oct-1996	95-6 18-Jun-1997	95-6 06-Nov-1997	95-6 05-Jun-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 30-Oct-1998	95-6 06-May-1999	95-6 19-Oct-1999	95-6 05-May-2000	95-6 24-Oct-2000	95-6 14-Jun-2001	95-6 23-Nov-2001
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1090	1130	936	1369	1280	923	1050
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	55	1	1	62	1
Alkalinity (Total as CaCO3)	mg/l	--	--	892	930	859	1122	1050	861	860
Ammonia Nitrogen	mg/l	--	--	0.99	0.97	1.23	0.05	0.66	1.62	1.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	–	--	--
Chemical Oxygen Demand	mg/l	--	--	39	50	45	36	–	41	37
Chloride	mg/l	--	250	850	890	920	855	900	836	859
Conductivity	uS/cm	--	--	--	--	--	--	–	--	--
Conductivity (Field)	uS/cm	--	--	4060	3800	3600	3775	4020	3800	3610
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	–	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	--	--	278	338	312	337	353	320	344
Nitrate as N	mg/l	10.0	--	--	--	0.1	--	0.4	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	–	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.82	2.06	--	0.2	1.83	2.57	2.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	–	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	–	--	--
pH	-	--	--	--	--	--	--	–	--	--
pH (Field)	-	--	--	7.6	7.6	7.8	8	8.01	8	7.55
Phosphate	mg/l	--	--	--	--	--	--	–	--	--
Phosphorus	mg/l	--	--	--	--	--	--	2.01	0.8	0.34
Sulphate	mg/l	--	500 [6]	4	3	1	3	3	3	3
Temperature (Field)	deg c	--	15	--	--	--	--	–	--	--
Total Dissolved Solids	mg/l	--	500	2040	2040	1780	1888	2250	2060	2110
Total Organic Carbon	mg/l	--	--	16.8	18.2	17.7	16.2	–	14	20
Total Suspended Solids	mg/l	--	--	--	--	520	360	3200	186	174
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.002
Boron, dissolved	mg/l	5	--	0.94	0.84	0.92	0.93	0.82	0.8	0.99
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	–	--	--
Calcium, dissolved	mg/l	--	--	38	41.7	43.8	44.2	41.4	46.5	43.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	–	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.22	0.21	0.68	1.14	0.06	0.26	0.19
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0003	0.0002	0.022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	44.5	56.1	48.5	54.3	60.6	49.4	57.4
Manganese, dissolved	mg/l	--	0.05	0.2	0.19	0.17	0.19	0.21	0.2	0.23
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	–	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	–	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	21.9	22.1	19	13.8	19	12.6	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	–	--	--
Sodium, dissolved	mg/l	--	200 [7]	803	835	926	810	790	750	850
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.06	0.09	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 30-Oct-1998	95-6 06-May-1999	95-6 19-Oct-1999	95-6 05-May-2000	95-6 24-Oct-2000	95-6 14-Jun-2001	95-6 23-Nov-2001
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.024	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 23-May-2002	95-6 06-Nov-2002	95-6 30-May-2003	95-6 09-Oct-2003	95-6 14-May-2004	95-6 19-Nov-2004	95-6 24-May-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	983	1210	1110	--	1000	1060	1110
Alkalinity, Carbonate as CaCO3	mg/l	--	--	73	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	928	990	910	915	820	870	910
Ammonia Nitrogen	mg/l	--	--	1.24	1.37	2.13	1.91	1.38	1.5	1.58
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	3	–	--	--
Chemical Oxygen Demand	mg/l	--	--	58	54	79	53	52	51	48
Chloride	mg/l	--	250	870	801	895	876	831	826	793
Conductivity	uS/cm	--	--	--	--	--	--	–	--	--
Conductivity (Field)	uS/cm	--	--	3520	3990	3600	3900	3750	4310	3400
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	205	–	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	--	--	337	320	302	311	289	270	325
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	0.1	0.3	1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	–	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.43	2.57	4.34	2.76	2.53	2.26	2.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	–	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	–	--	--
pH	-	--	--	--	--	--	--	–	--	--
pH (Field)	-	--	--	7.35	7.8	7.2	7.6	8	7.9	7.3
Phosphate	mg/l	--	--	--	--	--	--	–	--	--
Phosphorus	mg/l	--	--	0.51	0.56	2.95	0.57	0.67	0.48	0.33
Sulphate	mg/l	--	500 [6]	2	3	2	2	2	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	–	--	10.2
Total Dissolved Solids	mg/l	--	500	2190	2220	2200	2348	1875	2155	2180
Total Organic Carbon	mg/l	--	--	16	14	14.5	30	13.9	14.1	14
Total Suspended Solids	mg/l	--	--	50	228	2670	228	176	950	97
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.003	0.004	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.85	0.85	0.73	0.784	0.692	0.754	0.763
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	–	--	<0.0001
Calcium, dissolved	mg/l	--	--	45.1	41.6	41.7	41.8	40	38	43.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.001	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	–	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.3	0.21	0.79	0.386	0.245	0.268	0.696
Lead, dissolved	mg/l	0.01	--	0.0002	0.0018	0.0009	0.0009	0.001	0.0008	0.0024
Magnesium, dissolved	mg/l	--	--	54.6	52.6	48	50.2	45.9	42.6	52.8
Manganese, dissolved	mg/l	--	0.05	0.22	0.2	0.19	0.146	0.22	0.22	0.207
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	–	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	–	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	18.4	18.6	17.9	19.6	17.9	18.5	20.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	–	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	728	760	688	809	689	690	738
Zinc, dissolved	mg/l	--	5	0.01	0.02	0.01	0.005	0.005	0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 23-May-2002	95-6 06-Nov-2002	95-6 30-May-2003	95-6 09-Oct-2003	95-6 14-May-2004	95-6 19-Nov-2004	95-6 24-May-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 16-Nov-2005	95-6 25-May-2006	95-6 21-Nov-2006	95-6 15-May-2007	95-6 30-Nov-2007	95-6 22-May-2008	95-6 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	222	925	940	980	985	950	1010
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	910	925	940	980	985	950	1010
Ammonia Nitrogen	mg/l	--	--	1.3	1.43	1.63	1.52	1.6	1.22	1.54
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	52	36	69	64	81	50	53
Chloride	mg/l	--	250	808	874	896	804	855	919	927
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3200	3400	3600	2900	3200	3700	3600
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	309	293	288	303	315	292	302
Nitrate as N	mg/l	10.0	--	0.7	0.2	0.2	<0.1	<0.1	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.19	2.3	3.15	2.71	2.55	1.32	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.9	7	8.5	8.4	7.9	7.9
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.33	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	2	1	2	1	<1	1	<1
Temperature (Field)	deg c	--	15	--	6	7	8.9	7.5	9.5	8
Total Dissolved Solids	mg/l	--	500	2260	2260	2280	2210	2500	2360	2380
Total Organic Carbon	mg/l	--	--	38.6	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	244	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.0049	0.0058	0.0049	0.0049	0.0043
Boron, dissolved	mg/l	5	--	0.829	0.673	0.72	0.707	0.794	0.747	0.739
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.005	<0.0001	0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	43.4	40.3	39.1	41.7	44.7	39.6	41.1
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.004	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.024	0.181	0.037	0.46	0.175	0.529	0.006
Lead, dissolved	mg/l	0.01	--	0.0012	0.0002	0.0001	0.00004	<0.00002	0.00012	<0.00002
Magnesium, dissolved	mg/l	--	--	48.8	46.9	46.2	48.4	49.4	47	48.4
Manganese, dissolved	mg/l	--	0.05	0.19	0.168	0.14	0.204	0.194	0.159	0.162
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	21.6	18.5	18.6	18.7	21.9	18.4	18.6
Selenium, dissolved	mg/l	0.05	--	0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	810	745	715	704	934	761	732
Zinc, dissolved	mg/l	--	5	0.01	<0.005	0.012	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 16-Nov-2005	95-6 25-May-2006	95-6 21-Nov-2006	95-6 15-May-2007	95-6 30-Nov-2007	95-6 22-May-2008	95-6 10-Nov-2008
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 19-May-2009 G-27	95-6 26-Nov-2009 [37] J-7	95-6 25-May-2010 [30] M-25	95-6 20-Oct-2010 [30] G-22	95-6 24-May-2011 [30] G-31	95-6 29-Nov-2011 [30] 95-6	95-6 31-May-2012 95-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	927	947	920	935	926	957	880
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	<2 [9]	30	<2 [9]	14
Alkalinity (Total as CaCO3)	mg/l	--	--	927	947	920	935	956	957	900
Ammonia Nitrogen	mg/l	--	--	1.87	1.48	1.55	1.53	1.52	1.49	1.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	55	45	55	45	5	53
Chloride	mg/l	--	250	833	814	773	844	826	854	750
Conductivity	uS/cm	--	--	4190	4230	4210	4200	4300	4270	--
Conductivity (Field)	uS/cm	--	--	3600	3647	3944	7400	3216	3681	3499
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	298	353	331	300	326	304	290
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.16
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.31
Nitrogen, Total Kjeldahl	mg/l	--	--	2.33	2.11	2.17	2.35	2.26	1.86	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	0.47
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.17	8.18	8.27	8.23	8.54	8.16	8.23
pH (Field)	-	--	--	--	7.16	7.92	8.32	7.98	7.92	7.89
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.55	0.48	0.51	0.76	0.57	0.47	0.42
Sulphate	mg/l	--	500 [6]	2	4	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	9	9.0	21.9	9.5	15.4	8.6	12.2
Total Dissolved Solids	mg/l	--	500	2720	2750	2740	2730	2800	2780	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.005	0.007	<0.01	<0.01	<0.01	<0.01	0.0017
Boron, dissolved	mg/l	5	--	0.96	0.95	0.81	1.1	0.80	0.87	0.82
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	40	44	42	41	45	41	40
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0006	0.0008	0.0007	0.0007	0.0007	0.0007	<0.00050
Copper, dissolved	mg/l	--	1	0.001	0.001	<0.001	<0.001	0.002	0.003	<0.0010
Iron, dissolved	mg/l	--	0.3	0.52	0.38	0.36	0.40	0.22	0.26	0.52
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	48	59	55	48	52	49	47
Manganese, dissolved	mg/l	--	0.05	0.16	0.17	0.16	0.19	0.16	0.18	0.14
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16	23	21	17	16	18	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	819	702	800	781	882	746	720
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 19-May-2009 G-27	95-6 26-Nov-2009 [37] J-7	95-6 25-May-2010 [30] M-25	95-6 20-Oct-2010 [30] G-22	95-6 24-May-2011 [30] G-31	95-6 29-Nov-2011 [30] 95-6	95-6 31-May-2012 95-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Nov-2012 95-6	95-6 29-May-2013 [32] 95-6	95-6 26-Nov-2013 GW-5	95-6 29-May-2014 [36] 95-6	95-6 19-Nov-2014 95-6	95-6 02-Jun-2015 95-6	95-6 26-Nov-2015 95-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	910	910	940	870	890	871	936
Alkalinity, Carbonate as CaCO3	mg/l	--	--	13	13	18	21	16	17	16
Alkalinity (Total as CaCO3)	mg/l	--	--	920	920	960	890	910	888	952
Ammonia Nitrogen	mg/l	--	--	1.6	2.0	1.9	2.2	1.9	2.15	2.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	57	65	80	68	77	108	126
Chloride	mg/l	--	250	810	850	860	830	870	790	875
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3493	3061	3154	3272	3749	3819	3954
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	350	340	270	300	320	276	309
Nitrate as N	mg/l	10.0	--	<0.10	0.25	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.41	0.035	0.050	0.032	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.3	3.1	7.6	9.9	3.2	3.4	4.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.65	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.19	8.31	8.41	8.27	--	--
pH (Field)	-	--	--	8.01	7.60	7.67	7.90	8.09	7.87	8.03
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.56	2.0	2.7	4.6	3.7	2.20	3.85
Sulphate	mg/l	--	500 [6]	<1	<1	<1	7	<1	2	1
Temperature (Field)	deg c	--	15	6.2	10.7	6.4	9.9	5.0	10.0	7.8
Total Dissolved Solids	mg/l	--	500	2400	2310	2340	2180	2200	2000	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0016	0.0030	0.0018	0.0025	0.001	0.001
Boron, dissolved	mg/l	5	--	1	0.91	0.69	0.86	0.95	0.563	0.848
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	45	46	36	40	42	34.2	27.1
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	0.0057	0.0065	<0.01 [34]	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.00068	0.00073	0.00054	0.00058	0.0005	0.0006
Copper, dissolved	mg/l	--	1	<0.001	<0.0010	0.0013	0.0024	0.0016	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	0.19	<0.1	<0.1	<0.1	0.16	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	0.00059	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	57	55	45	48	53	46.4	58.5
Manganese, dissolved	mg/l	--	0.05	0.16	0.2	0.14	0.15	0.22	0.125	0.152
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	20	19	17	18	19	13.8	16.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	840	780	750	630	810	686	865
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.0075	<0.0050	0.0070	<0.005	0.009

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Nov-2012 95-6	95-6 29-May-2013 [32] 95-6	95-6 26-Nov-2013 GW-5	95-6 29-May-2014 [36] 95-6	95-6 19-Nov-2014 95-6	95-6 02-Jun-2015 95-6	95-6 26-Nov-2015 95-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 26-May-2016	95-6 17-Nov-2016	95-6 24-May-2017	95-6 29-Nov-2017	95-6 24-May-2018	95-6 22-Nov-2018	95-6 19-Jun-2019
				95-6	95-6	95-6	95-6	95-6	95-6	95-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	940	983	932	1030	1060	1030	931
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	14	15	19	20	<25 [11]	11
Alkalinity (Total as CaCO3)	mg/l	--	--	944	997	948	1050	1070	1040	943
Ammonia Nitrogen	mg/l	--	--	2.80	2.08	2.30	1.99	2.53	2.09	1.48
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	131	89	106	69	86	154	75
Chloride	mg/l	--	250	846	902	860	974	899	968	902
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	3836	3566	>3999	3677	3757
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	276	305	261	223	315	399	299
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.25 [11]	0.25	<0.05	<0.05	0.07
Nitrogen, Total Kjeldahl	mg/l	--	--	3.9	2.3	3.3	3.1	3.9	3.1	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.03	7.81	7.99	7.94	7.97	7.92	7.76
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.26	3.02	2.57	2.46	3.22	3.10	0.52
Sulphate	mg/l	--	500 [6]	2	1	1	1	2	1	1
Temperature (Field)	deg c	--	15	11.6	9.5	10.0	5.9	10.2	6.6	10.8
Total Dissolved Solids	mg/l	--	500	2260	2330	2200	2340	2450	2390	2370
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.005	0.005	0.001	0.001	0.002	0.001
Boron, dissolved	mg/l	5	--	0.754	1.06	0.657	0.634	0.843	0.844	0.686
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.5	41.3	38.3	29	45.4	51.5	40.6
Chromium, dissolved	mg/l	0.05	--	<0.001	0.015	0.012	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	<0.0005	<0.0005	0.0005	0.0011	0.0006
Copper, dissolved	mg/l	--	1	0.0017	0.0007	0.0017	0.0010	0.0014	0.0054	0.0023
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.176	0.108
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	43.8	49	40.2	36.4	49.1	65.7	47.9
Manganese, dissolved	mg/l	--	0.05	0.089	0.26	0.096	0.129	0.12	0.132	0.111
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18.9	18.8	15.8	14.4	19	24	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	646	790	733	597	752	839	591
Zinc, dissolved	mg/l	--	5	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 26-May-2016 95-6	95-6 17-Nov-2016 95-6	95-6 24-May-2017 95-6	95-6 29-Nov-2017 95-6	95-6 24-May-2018 95-6	95-6 22-Nov-2018 95-6	95-6 19-Jun-2019 95-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.007	<0.002 [10]	<0.002 [10]	<0.002 [10]	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 20-Nov-2019 95-6	95-6 21-May-2020 95-6	95-6 26-Nov-2020 95-6	95-6 26-May-2021 95-6	95-6 30-Nov-2021 95-6
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	924	880	941	942	950
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25	15	<25	13	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	932	894	963	955	955
Ammonia Nitrogen	mg/l	--	--	2.13	1.59	1.71	1.98	1.47
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	179	66	90	46	72
Chloride	mg/l	--	250	994	1020	862	763	846
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4170	3352	3416	3915	3915
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	409	356	358	405	326
Nitrate as N	mg/l	10.0	--	0.4	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.25 [13]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.9	2.3	2.3	2.2	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.22	8.00	8.47	7.96	8.16
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	5.46	0.95	0.95	0.67	0.54
Sulphate	mg/l	--	500 [6]	2	<1	2	<1	<1
Temperature (Field)	deg c	--	15	6.0	14.9	6.4	11.9	6.0
Total Dissolved Solids	mg/l	--	500	2620	2190	2410	2190	2270
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.614	0.608	0.599	0.684	0.65
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	54.5	47.1	45.1	48.3	43.6
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0007	0.0005	0.0006	0.0007	0.0006
Copper, dissolved	mg/l	--	1	0.0011	0.0030	0.0029	0.0013	0.0010
Iron, dissolved	mg/l	--	0.3	0.124	<0.1	<0.1	0.258	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	66.2	57.9	59.6	69.1	52.7
Manganese, dissolved	mg/l	--	0.05	0.201	0.22	0.206	0.19	0.187
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.8	19.6	18.7	20.3	17.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	882	724	747	764	685
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 20-Nov-2019 95-6	95-6 21-May-2020 95-6	95-6 26-Nov-2020 95-6	95-6 26-May-2021 95-6	95-6 30-Nov-2021 95-6
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	0.004	<0.002 [12]	<0.010 [12]	<0.004 [12]
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 28-Jun-1995	95-7 22-Nov-1995	95-7 13-Oct-1996	95-7 18-Jun-1997	95-7 06-Nov-1997	95-7 05-Jun-1998	95-7 29-Oct-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	583	649	--	--	--	--	644
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	478	538	536	537	440	530	528
Ammonia Nitrogen	mg/l	--	--	0.58	0.38	0.55	0.52	0.35	0.43	0.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	100	55	39	23	29	40	15
Chloride	mg/l	--	250	402	413	420	407	384	399	420
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2210	2380	--	2330	1900	2160	2130
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.42	--	--	2.72	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	202	231	192	243	208	211	172
Nitrate as N	mg/l	10.0	--	0.1	0.7	0.1	0.1	0.1	1.4	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	16.8	5.95	--	--	--	--	1.12
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	16.22	5.57	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.34	7.65	--	7.75	7.81	--	7.1
Phosphate	mg/l	--	--	--	0.5	--	--	--	--	--
Phosphorus	mg/l	--	--	3.21	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	4	3	7	5	12	41	9
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1110	1280	--	1170	950	1080	1070
Total Organic Carbon	mg/l	--	--	14	13.6	14.5	12.3	13.2	13	16.2
Total Suspended Solids	mg/l	--	--	--	--	656	993	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.34	0.31	0.42	0.44	0.42	0.44	0.57
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	31.3	33.6	28.7	37.2	31.6	29.8	26.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.28	0.63	1.09	0.65	1.33	0.52
Lead, dissolved	mg/l	0.01	--	0.0007	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	29.7	35.2	28.9	36	30.6	32.8	25.6
Manganese, dissolved	mg/l	--	0.05	1.86	2.21	1.82	2.14	1.98	2	2.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	10.4	6.5	8.5	7.2	15.3	10.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	366	426	366	338	335	454	400
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.16	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 28-Jun-1995	95-7 22-Nov-1995	95-7 13-Oct-1996	95-7 18-Jun-1997	95-7 06-Nov-1997	95-7 05-Jun-1998	95-7 29-Oct-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-May-1999	95-7 19-Oct-1999	95-7 05-May-2000	95-7 24-Oct-2000	95-7 14-Jun-2001	95-7 23-Nov-2001	95-7 23-May-2002
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	610	732	684	573	540	584	488
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	32	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	500	600	561	552	497	479	400
Ammonia Nitrogen	mg/l	--	--	0.12	0.52	0.01	0.14	0.63	0.27	0.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	26	25	26	--	27	37	20
Chloride	mg/l	--	250	432	314	365	440	420	398	382
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2040	2040	2000	2220	1900	1930	1940
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	222	204	240	199	206	202	207
Nitrate as N	mg/l	10.0	--	--	2.5	0.3	0.5	0.4	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.23	--	--	0.95	1.45	1.52	0.84
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	7.5	7.4	7.44	7.3	7.02	6.97
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.87	0.67	1.94	0.4
Sulphate	mg/l	--	500 [6]	6	14	11	15	13	21	16
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1010	1020	1000	1120	1160	1190	1020
Total Organic Carbon	mg/l	--	--	14.2	15.1	12.7	--	12.8	19	13
Total Suspended Solids	mg/l	--	--	--	624	536	916	528	928	348
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.003	0.001	0.001	0.002
Boron, dissolved	mg/l	5	--	0.38	0.59	0.45	0.47	0.42	0.57	0.4
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	31.6	32.9	36.6	28.3	34.1	29.6	32.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.11	2.82	5.2	0.24	0.39	0.07	0.76
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0022	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	34.3	29.3	35.6	31.2	29.3	31	30.6
Manganese, dissolved	mg/l	--	0.05	2.15	1.78	2	2.07	2.19	2.18	2.26
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	4.1	11.1	6.1	9.7	5.2	5.6	8.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	393	417	410	486	377	402	357
Zinc, dissolved	mg/l	--	5	0.01	0.11	0.17	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-May-1999	95-7 19-Oct-1999	95-7 05-May-2000	95-7 24-Oct-2000	95-7 14-Jun-2001	95-7 23-Nov-2001	95-7 23-May-2002
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.011	0.001	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-Nov-2002	95-7 30-May-2003	95-7 09-Oct-2003	95-7 14-May-2004	95-7 19-Nov-2004	95-7 24-May-2005	95-7 16-Nov-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	662	586	--	531	655	593	132
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	543	480	324	435	537	486	540
Ammonia Nitrogen	mg/l	--	--	0.66	0.47	0.33	0.57	0.65	0.46	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	2	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	2	58	59	351	7	58
Chloride	mg/l	--	250	428	382	298	413	448	369	364
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2240	1970	1620	2090	2290	2500	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	71	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	194	195	176	198	209	230	211
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.2	0.3	1	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.43	1.06	1.49	2.02	1.44	1.63	1.26
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	6.9	7.2	7.3	7.8	7.3	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.66	0.36	0.51	0.91	4.95	0.5	1.86
Sulphate	mg/l	--	500 [6]	17	17	31	13	20	10	28
Temperature (Field)	deg c	--	15	--	--	--	--	--	9.9	--
Total Dissolved Solids	mg/l	--	500	1260	1150	859	1045	1145	1120	1220
Total Organic Carbon	mg/l	--	--	14	13.4	31	17.4	23.5	20.2	23.8
Total Suspended Solids	mg/l	--	--	460	188	417	276	1250	233	319
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003	0.001	0.001	0.001	<0.001	0.001
Boron, dissolved	mg/l	5	--	0.51	0.36	0.512	0.362	0.449	0.363	0.478
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	33.1	30.2	29.9	31.5	32.9	34.9	33.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.016	0.002	0.002	<0.002	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.011	0.006	0.005	<0.002	0.008
Iron, dissolved	mg/l	--	0.3	0.08	0.79	5.78	0.048	0.072	0.097	0.068
Lead, dissolved	mg/l	0.01	--	0.0012	0.0003	0.0007	0.0007	0.0006	0.0011	0.0007
Magnesium, dissolved	mg/l	--	--	29	29	24.6	29	30.8	34.8	31
Manganese, dissolved	mg/l	--	0.05	1.92	2.21	1.13	1.48	1.38	1.59	1.4
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	7.6	7.8	9.2	7.4	8.2	8.4	9.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001	0.001
Sodium, dissolved	mg/l	--	200 [7]	425	368	265	379	405	379	441
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.016	0.005	0.005	0.007	0.008

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-Nov-2002	95-7 30-May-2003	95-7 09-Oct-2003	95-7 14-May-2004	95-7 19-Nov-2004	95-7 24-May-2005	95-7 16-Nov-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	<0.0007	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 25-May-2006	95-7 21-Nov-2006	95-7 15-May-2007	95-7 30-Nov-2007	95-7 22-May-2008	95-7 10-Nov-2008	95-7 19-May-2009 G-19
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	545	615	573	603	540	615	560
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	545	615	573	603	540	615	560
Ammonia Nitrogen	mg/l	--	--	0.52	<0.01	0.15	<0.01	0.23	<0.01	0.21
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	54	91	127	59	45	45
Chloride	mg/l	--	250	430	456	362	439	413	483	397
Conductivity	uS/cm	--	--	--	--	--	--	--	--	2320
Conductivity (Field)	uS/cm	--	--	1800	2150	1600	1750	1300	2100	1900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	211	233	230	221	214	225	221
Nitrate as N	mg/l	10.0	--	0.3	0.5	0.2	0.5	0.1	0.5	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.12	0.93	1.28	2.24	1.93	0.85	0.81
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	7.89
pH (Field)	-	--	--	7.9	7.6	8.2	7.9	7.5	7.6	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.87
Sulphate	mg/l	--	500 [6]	21	9	11	19	21	10	15
Temperature (Field)	deg c	--	15	12.5	7	9.7	4.5	9.5	6	9
Total Dissolved Solids	mg/l	--	500	1250	1370	1190	1420	1250	1400	1510
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0027	0.0033	0.0069	0.0038	0.0044	0.003
Boron, dissolved	mg/l	5	--	0.352	0.466	0.352	0.46	0.37	0.476	0.49
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00006	<0.00002	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	32.3	36.2	35.6	35.3	33.6	35.8	34
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.008	<0.005	<0.005	<0.005	0.0005
Copper, dissolved	mg/l	--	1	0.003	0.005	0.003	0.004	<0.002	0.003	0.006
Iron, dissolved	mg/l	--	0.3	0.089	0.067	0.18	0.084	0.717	0.205	0.11
Lead, dissolved	mg/l	0.01	--	0.0004	<0.0001	0.00011	<0.00002	<0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	31.6	34.7	34.2	32.4	31.8	33	33
Manganese, dissolved	mg/l	--	0.05	1.72	1.56	2	1.6	2.25	0.938	0.63
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.8	9.5	8	10	7.8	9.6	7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	401	452	388	519	417	460	373
Zinc, dissolved	mg/l	--	5	0.012	0.009	<0.005	<0.005	0.008	<0.005	<0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 25-May-2006	95-7 21-Nov-2006	95-7 15-May-2007	95-7 30-Nov-2007	95-7 22-May-2008	95-7 10-Nov-2008	95-7 19-May-2009 G-19
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	<0.0006	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 26-Nov-2009 J-12	95-7 25-May-2010 [30] M-19	95-7 20-Oct-2010 [30] G-21	95-7 24-May-2011 [30] G-29	95-7 29-Nov-2011 [43] 95-7	95-7 31-May-2012 [31] 95-7	95-7 28-Nov-2012 95-7
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	599	552	593	575	579	570	580
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	14	11	4.9	7.0
Alkalinity (Total as CaCO3)	mg/l	--	--	599	552	593	589	590	570	590
Ammonia Nitrogen	mg/l	--	--	0.07	0.52	<0.02	0.28	<0.02	0.33	0.10
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	55	55	50	60	50	59
Chloride	mg/l	--	250	447	383	450	400	430	390	410
Conductivity	uS/cm	--	--	2490	2350	2460	2420	2430	--	--
Conductivity (Field)	uS/cm	--	--	2149	2310	2405	2191	2272	2020	2146
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	214	234	235	258	219	180	240
Nitrate as N	mg/l	10.0	--	0.37	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	0.036	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.64	1.14	0.96	0.76	0.82	1.4	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.20	8.12	8.07	8.42	8.31	7.96	--
pH (Field)	-	--	--	7.21	7.51	7.66	7.40	7.68	7.62	7.71
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.71	3.58	1.19	0.67	1.06	0.66	0.88
Sulphate	mg/l	--	500 [6]	16	15	8	10	9	<1	<1
Temperature (Field)	deg c	--	15	8.5	15.7	12.3	13.5	7.9	12.0	6.2
Total Dissolved Solids	mg/l	--	500	1620	1530	1600	1570	1580	1280	1360
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	<0.01	<0.001	<0.01	<0.01	0.0028	0.001
Boron, dissolved	mg/l	5	--	0.49	0.46	0.56	0.48	0.52	0.36	0.58
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	33	36	38	39	35	28	36
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	0.009	<0.005	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0006	0.0008	0.0009	0.0010	0.0006	0.0012	0.0011
Copper, dissolved	mg/l	--	1	0.004	0.003	0.002	0.003	0.003	0.0026	0.002
Iron, dissolved	mg/l	--	0.3	<0.03	0.52	0.12	0.38	<0.03	0.86	0.15
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	0.00090	<0.0005
Magnesium, dissolved	mg/l	--	--	32	35	34	39	32	26	35
Manganese, dissolved	mg/l	--	0.05	0.31	2.16	1.89	2.15	0.83	5.2	2.8
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	9	9	9	8	6.3	9.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	420	368	445	361	392	320	470
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.01	0.01	<0.01	<0.0050	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 26-Nov-2009 J-12	95-7 25-May-2010 [30] M-19	95-7 20-Oct-2010 [30] G-21	95-7 24-May-2011 [30] G-29	95-7 29-Nov-2011 [43] 95-7	95-7 31-May-2012 [31] 95-7	95-7 28-Nov-2012 95-7
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0080	0.00070	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7	95-7	95-7	95-7	95-7	95-7	95-7
				29-May-2013 [32]	26-Nov-2013	29-May-2014	19-Nov-2014	02-Jun-2015	26-Nov-2015	26-May-2016
				95-7	GW-3	95-7	95-7	95-7	95-7	95-7
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	560	570	560	570	609	593	614
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.3	8.1	6.8	6.4	5	5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	560	580	570	580	614	598	617
Ammonia Nitrogen	mg/l	--	--	0.59	<0.050	0.53	0.084	0.46	0.02	0.75
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	64	55	66	57	93	83	94
Chloride	mg/l	--	250	420	430	420	460	463	433	463
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1975	2066	2046	2362	2292	2362	2385
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	240	230	200	240	158	210	160
Nitrate as N	mg/l	10.0	--	0.12	<0.10	<0.10	0.22	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.092	<0.010	0.019	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.9	1.3	1.7	1.4	1.4	0.9	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.21	<0.10	<0.10	0.22	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.92	8.18	8.11	8.08	--	--	--
pH (Field)	-	--	--	7.75	7.77	7.29	7.67	7.61	7.75	7.86
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.8	2.0	1.5	2.2	1.08	0.73	1.17
Sulphate	mg/l	--	500 [6]	1	2	1	1	10	10	11
Temperature (Field)	deg c	--	15	11.0	6.6	10.2	6.7	10.4	7.4	11.1
Total Dissolved Solids	mg/l	--	500	1340	1370	1300	1310	1330	1350	1400
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.0011	0.0018	0.0013	0.0018	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.45	0.49	0.4	0.52	0.172	0.504	0.305
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	37	35	31	36	24.8	24.7	25
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.00088	0.00096	<0.00050	0.00074	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0041	0.0040	0.0051	0.0036	0.0005	0.0016	0.0020
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.2	<0.1	0.509	<0.1	0.376
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	35	34	30	36	23.4	36	23.8
Manganese, dissolved	mg/l	--	0.05	2.2	1.8	1.3	1.6	1.05	0.117	0.951
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.9	9	6.7	9.1	4.81	7.45	5.96
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	410	450	360	470	322	500	266
Zinc, dissolved	mg/l	--	5	<0.0050	0.039	0.015	<0.0050	<0.005	0.008	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 29-May-2013 [32] 95-7	95-7 26-Nov-2013 GW-3	95-7 29-May-2014 95-7	95-7 19-Nov-2014 95-7	95-7 02-Jun-2015 95-7	95-7 26-Nov-2015 95-7	95-7 26-May-2016 95-7
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	0.005
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	0.00078	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 17-Nov-2016	95-7 24-May-2017	95-7 29-Nov-2017	95-7 24-May-2018	95-7 22-Nov-2018	95-7 19-Jun-2019	95-7 20-Nov-2019
				95-7	95-7	95-7	95-7	95-7	95-7	95-7
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	618	643	626	657	667	610	588
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	7	5	6	8	9
Alkalinity (Total as CaCO3)	mg/l	--	--	622	646	633	662	673	618	597
Ammonia Nitrogen	mg/l	--	--	0.11	0.60	0.07	0.63	0.10	0.75	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	72	61	82	96	105	73	85
Chloride	mg/l	--	250	463	480	498	462	460	458	483
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1257	2322	2145	2436	2112	2213	2390
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	228	255	192	167	287	268	292
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.3	0.1	0.5
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.4	1.0	1.7	1.8	1.3	1.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.05	7.48	8.03	7.64	8.2	7.34	7.82
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.07	0.88	1.12	1.30	1.44	0.86	1.59
Sulphate	mg/l	--	500 [6]	8	9	11	10	8	10	13
Temperature (Field)	deg c	--	15	9.6	12.4	6.7	10.1	5.4	13.2	7.1
Total Dissolved Solids	mg/l	--	500	1340	1400	1330	1410	1340	1410	1340
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.002	0.002	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.644	0.361	0.459	0.316	0.558	0.303	0.432
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	35.7	33.9	29.6	28	42.9	41.5	44.7
Chromium, dissolved	mg/l	0.05	--	0.008	0.006	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0006	<0.0005	0.0007	0.0008	0.0006
Copper, dissolved	mg/l	--	1	0.0021	0.0018	0.0026	0.0030	0.0106	0.0023	0.0075
Iron, dissolved	mg/l	--	0.3	<0.1	0.442	<0.1	0.555	<0.1	0.321	0.383
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	33.7	41.3	28.8	23.6	43.8	39.9	43.8
Manganese, dissolved	mg/l	--	0.05	1.75	2.23	2.1	1.65	0.567	4.25	0.626
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.24	6.42	7.89	5.98	11.6	9.46	13
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	473	464	387	304	536	457	455
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.015	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 17-Nov-2016	95-7 24-May-2017	95-7 29-Nov-2017	95-7 24-May-2018	95-7 22-Nov-2018	95-7 19-Jun-2019	95-7 20-Nov-2019
				95-7	95-7	95-7	95-7	95-7	95-7	95-7
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.002 [10]	<0.001	<0.001	0.007	<0.001	0.002
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 21-May-2020 95-7	95-7 26-Nov-2020 95-7	95-7 26-May-2021 95-7	95-7 30-Nov-2021 95-7
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	527	619	623	612
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5	<25	6	10
Alkalinity (Total as CaCO3)	mg/l	--	--	532	627	629	622
Ammonia Nitrogen	mg/l	--	--	0.35	0.08	0.42	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	66	79	43	80
Chloride	mg/l	--	250	505	459	416	452
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2018	2170	2246	2425
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	246	255	234	231
Nitrate as N	mg/l	10.0	--	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	0.9	1.0	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.53	8.13	7.56	7.98
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.30	0.50	0.24	0.40
Sulphate	mg/l	--	500 [6]	22	11	13	8
Temperature (Field)	deg c	--	15	10.4	6.8	12.6	6.1
Total Dissolved Solids	mg/l	--	500	1200	1290	1350	1440
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.002	0.001
Boron, dissolved	mg/l	5	--	0.357	0.427	0.353	0.401
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.1	38.4	34.1	36.2
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0008	<0.0005	0.0007	<0.0005
Copper, dissolved	mg/l	--	1	0.0060	0.0055	0.0022	0.0033
Iron, dissolved	mg/l	--	0.3	0.18	<0.1	0.46	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	36.6	38.7	36.2	34.1
Manganese, dissolved	mg/l	--	0.05	2.54	1.05	1.89	0.808
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.31	10	7.71	9.28
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	421	466	372	408
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 21-May-2020 95-7	95-7 26-Nov-2020 95-7	95-7 26-May-2021 95-7	95-7 30-Nov-2021 95-7
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.002 [12]	<0.004 [12]	<0.001
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 28-Jun-1995	95-9 22-Nov-1995	95-9 12-Oct-1996	95-9 06-Nov-1997	95-9 05-Jun-1998	95-9 06-May-1999	95-9 24-Oct-2000
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	834	912	--	--	–	862	1080
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	23	--	--	–	54	1
Alkalinity (Total as CaCO3)	mg/l	--	--	716	785	--	770	663	796	887
Ammonia Nitrogen	mg/l	--	--	1.6	5	--	0.86	0.9	2	1.16
Chemical Oxygen Demand	mg/l	--	--	850	850	--	23	42	15	--
Chloride	mg/l	--	250	380	405	--	358	366	382	442
Conductivity	uS/cm	--	--	--	--	--	--	–	--	--
Conductivity (Field)	uS/cm	--	--	2440	2600	2650	2540	2430	2600	2550
Dissolved Oxygen (Field)	mg/l	--	--	1.26	1.26	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	--	--	59	71	--	55	57	47	48
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	0.1	1	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	–	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	30.3	50	--	--	–	13.8	1.12
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	–	--	--
Nitrogen, Organic	mg/l	--	--	28.7	45	--	--	–	--	--
pH	-	--	--	--	--	--	--	–	--	--
pH (Field)	-	--	--	8.51	8.81	8.38	8.9	–	8.4	8.66
Phosphate	mg/l	--	--	--	2.4	--	--	–	--	--
Phosphorus	mg/l	--	--	1.63	--	--	--	–	--	5.86
Sulphate	mg/l	--	500 [6]	5	10	--	1	44	1	1
Temperature (Field)	deg c	--	15	--	--	--	--	–	--	--
Total Dissolved Solids	mg/l	--	500	1230	1230	1330	1270	1192	1360	1440
Total Organic Carbon	mg/l	--	--	37.1	37.1	--	10.5	8.9	11.6	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	–	--	4940
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	–	--	0.001
Boron, dissolved	mg/l	5	--	0.91	0.91	--	1.02	1.1	1.13	1.16
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	–	--	--
Calcium, dissolved	mg/l	--	--	7.97	7.7	--	5.73	7.38	4.65	4.28
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	--	0.01	0.01	0.01	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	–	--	--
Copper, dissolved	mg/l	--	1	0.03	0.03	--	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.06	0.06	--	3.05	3.25	1	0.16
Lead, dissolved	mg/l	0.01	--	0.0009	0.0009	--	0.0002	0.0002	0.0017	0.022
Magnesium, dissolved	mg/l	--	--	9.3	12.4	--	9.66	9.24	8.46	9.05
Manganese, dissolved	mg/l	--	0.05	0.03	0.03	--	0.06	0.06	0.03	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	–	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	–	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	0.02	0.03	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	18.6	--	14.4	22.4	20.1	18.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	–	--	--
Sodium, dissolved	mg/l	--	200 [7]	484	556	--	478	644	573	634
Zinc, dissolved	mg/l	--	5	0.01	0.01	--	0.01	0.04	0.02	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 28-Jun-1995	95-9 22-Nov-1995	95-9 12-Oct-1996	95-9 06-Nov-1997	95-9 05-Jun-1998	95-9 06-May-1999	95-9 24-Oct-2000
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	--	--	--	--	0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 14-Jun-2001	95-9 06-Nov-2002	95-9 30-May-2003	95-9 19-Nov-2004	95-9 16-Nov-2005	95-9 15-May-2007	95-9 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	837	1040	897	1030	200	815	820
Alkalinity, Carbonate as CaCO3	mg/l	--	--	40	1	1	1	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	753	855	735	845	820	815	820
Ammonia Nitrogen	mg/l	--	--	1.94	1.7	1.5	1.59	1.61	1.78	1.6
Chemical Oxygen Demand	mg/l	--	--	23	49	41	30	43	94	28
Chloride	mg/l	--	250	373	355	305	410	320	355	397
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2250	2280	2000	2870	2100	1800	2100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	36	39	130	44	48	39	40
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	<1	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.65	2.33	2.57	2.03	2.43	2.78	2.47
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.7	8.6	7.6	8.4	--	8.8	8.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	7.94	2.11	3.05	0.98	2.84	--	--
Sulphate	mg/l	--	500 [6]	1	2	1	10	<1	<1	<1
Temperature (Field)	deg c	--	15	--	--	--	--	--	11.4	7
Total Dissolved Solids	mg/l	--	500	1420	1410	1310	1435	1500	1390	1470
Total Organic Carbon	mg/l	--	--	9.3	8.6	10.4	9.3	9.3	--	--
Total Suspended Solids	mg/l	--	--	5210	1900	2990	4200	1460	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	0.0015	0.0012
Boron, dissolved	mg/l	5	--	1.05	1.02	0.98	1.13	1.12	0.988	1.01
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	2.76	4.77	31.2	3.62	4.4	2.92	3.25
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.06	0.06	5.07	0.144	0.1	0.173	0.044
Lead, dissolved	mg/l	0.01	--	0.0002	0.0021	0.0029	0.0006	0.0017	0.00013	0.00012
Magnesium, dissolved	mg/l	--	--	7.13	7.67	12.6	8.45	9.08	7.61	7.82
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.18	0.006	0.005	0.005	0.003
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	7.5	13.3	13.8	14.8	16.6	14.3	14.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [7]	535	577	494	567	672	519	548
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.005	0.007	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 14-Jun-2001	95-9 06-Nov-2002	95-9 30-May-2003	95-9 19-Nov-2004	95-9 16-Nov-2005	95-9 15-May-2007	95-9 10-Nov-2008
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.063	0.001	0.001	0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 26-Nov-2009 J-9	95-9 24-May-2011 [30] G-30	95-9 28-Nov-2012 95-9	95-9 29-May-2014 [36] 95-9	95-9 26-Nov-2015 95-9	95-9 24-May-2017 95-9	95-9 22-Nov-2018 95-9
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	760	756	760	770	798	802	824
Alkalinity, Carbonate as CaCO3	mg/l	--	--	29	46	22	36	23	21	25
Alkalinity (Total as CaCO3)	mg/l	--	--	789	802	780	800	821	823	849
Ammonia Nitrogen	mg/l	--	--	1.52	1.59	2.0	2.1	2.03	1.85	1.51
Chemical Oxygen Demand	mg/l	--	--	38	30	35	39	53	78	39
Chloride	mg/l	--	250	337	344	410	490	502	406	429
Conductivity	uS/cm	--	--	2490	2620	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2294	2266	2245	2276	2670	2770	2238
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	34	43	52	44	37.3	43	66
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.78	1.98	2.9	3.4	2.5	2.9	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	<0.10	<0.10	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.61	8.81	--	8.70	--	--	--
pH (Field)	-	--	--	8.25	8.67	8.74	8.47	8.78	8.62	8.81
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.36	1.54	1.6	1.6	0.72	1.21	0.71
Sulphate	mg/l	--	500 [6]	<1	<1	1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	8.8	19.3	6.7	10.4	7.4	11.9	6.4
Total Dissolved Solids	mg/l	--	500	1620	1700	1720	1560	1670	1490	1560
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	<0.01	<0.001	<0.0010	<0.001	0.002	<0.001
Boron, dissolved	mg/l	5	--	0.99	1.3	1.2	1.2	1.09	1.15	1.19
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	2	4	5	3.8	3.32	3.39	10.6
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.0050	<0.001	0.011	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0003	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.001	0.002	<0.001	0.0020	<0.0005	<0.0005	0.0021
Iron, dissolved	mg/l	--	0.3	0.04	0.04	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	7	8	9.6	8.5	7.04	8.42	9.58
Manganese, dissolved	mg/l	--	0.05	<0.01	<0.01	0.005	0.0033	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11	14	15	14	12.3	14.4	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	501	596	700	490	637	584	614
Zinc, dissolved	mg/l	--	5	0.01	0.01	<0.005	<0.0050	0.009	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 26-Nov-2009 J-9	95-9 24-May-2011 [30] G-30	95-9 28-Nov-2012 95-9	95-9 29-May-2014 [36] 95-9	95-9 26-Nov-2015 95-9	95-9 24-May-2017 95-9	95-9 22-Nov-2018 95-9
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	0.002	<0.002 [10]	<0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	0.00015	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	0.00031	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 21-May-2020	95-9 30-Nov-2021 [3]
				95-9	95-9
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	723	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	32	--
Alkalinity (Total as CaCO3)	mg/l	--	--	755	--
Ammonia Nitrogen	mg/l	--	--	1.84	--
Chemical Oxygen Demand	mg/l	--	--	35	--
Chloride	mg/l	--	250	523	--
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2480	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	102	--
Nitrate as N	mg/l	10.0	--	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.0	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.71	--
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	0.79	--
Sulphate	mg/l	--	500 [6]	<1	--
Temperature (Field)	deg c	--	15	12.7	--
Total Dissolved Solids	mg/l	--	500	1520	--
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	<0.001	--
Boron, dissolved	mg/l	5	--	0.857	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--
Calcium, dissolved	mg/l	--	--	18.4	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--
Cobalt, dissolved	mg/l	--	--	0.0008	--
Copper, dissolved	mg/l	--	1	0.0015	--
Iron, dissolved	mg/l	--	0.3	1.88	--
Lead, dissolved	mg/l	0.01	--	0.0023	--
Magnesium, dissolved	mg/l	--	--	13.7	--
Manganese, dissolved	mg/l	--	0.05	0.072	--
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.4	--
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	627	--
Zinc, dissolved	mg/l	--	5	0.009	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 21-May-2020 95-9	95-9 30-Nov-2021 [3] 95-9
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	0.002	--
Semi-VOCs					
Styrene	mg/l	--	--	--	--
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--

Footnotes:

	Tables should be read in conjunction with the accompanying document
<	Indicates parameter not detected above laboratory method detection limit
>	Indicates parameter detected above equipment analytical range
--	Chemical not analyzed or criteria not defined
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020)
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Monitoring location was frozen during this sampling event. No sample was collected
(4)	Monitoring location could not be located during this sampling event
(5)	Monitoring location was not monitored due to dry conditions observed in the area
(6)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L
(7)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(8)	Metals MRL elevated due to matrix interference.
(9)	pH < 8.3. Calculations not available.
(10)	Elevated Reporting Limit due to matrix interference.
(11)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes
(12)	GEN02 Elevated Reporting Limit due to matrix interference
(13)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes
(14)	REV 1 Revision 1 - This report now includes data for Xylenes
(15)	Due to matrix interference 2 X dilution factor required for VOCs. Arsenic MRL elevated due to matrix interference
(16)	Waterra tubing could not be extracted from well. No sample was collected
(17)	N-NO2,N-NO3 MRL elevated due to matrix interference.
(18)	Due to matrix interference 2 X dilution factor required for VOCs. TP MRL elevated due to insufficient sample volume
(19)	N-NO2,N-NO3 MRL elevated due to matrix interference. Sediment was not included in Metals Analysis
(20)	Nitrite/Nitrate: Due to colour interferences, sample required dilution. Detection limits were adjusted accordingly
(21)	Monitoring location was dry during this sampling event. No sample was collected
(22)	Insufficient sample volume was collected for analysis
(23)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(24)	TKN MRL elevated due to matrix interference. Metals MRL elevated due to matrix interference
(25)	Arsenic MRL elevated due to matrix interference. Due to matrix interference 10x dilution factor required for VOCs
(26)	Metal Analysis: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(27)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(28)	Elevated detection limit due to dilution required because of high target analyte concentration
(29)	INOG6 Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions
(30)	Arsenic MRL elevated due to matrix interference.
(31)	Elevated ion balance result was confirmed by re-analysis
(32)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly
(33)	Inadvertently, no sample was collected at this location
(34)	Metal Analysis: Detection Limit was raised due to matrix interferences
(35)	VOC Analysis: Due to high concentrations of non-target analytes, sample required dilution. Detection limits were adjusted accordingly
(36)	Elevated ion balance was confirmed by re-analysis
(37)	TKN results may be biased low due to elevated dissolved salt content
(38)	Detection Limit was raised due to matrix interferences
(39)	Due to matrix interference 10x dilution factor required for VOCs
(40)	Due to matrix interference 2x dilution factor required for VOCs.
(41)	VOC Analysis: Due to high sediment in vials resulting in smaller amounts of sample available for analysis, the sample required dilution. The detection limits were adjusted accordingly
(42)	Insufficient sample volume was collected for analysis. Field Parameters were not measured
(43)	Due to matrix interference 2x dilution factor required for VOCs. Arsenic MRL elevated due to matrix interference

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 18-Sep-1992	L5 19-Oct-1992	L5 11-Nov-1992	L5 08-Jun-1993	L5 15-Nov-1993	L5 15-Jun-1994	L5 02-Nov-1994	L5 28-Jun-1995	L5 24-Nov-1995	L5 12-Jun-1996
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	185	1696	1677	1140	1565	1680	1650	2000
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	0.1	--	0.83	22.6	26.51	19.1	12.38	20	25	31
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	9.6	10.3	3.8	70	81	1.6	31.7	16	15	173
Chemical Oxygen Demand	mg/l	--	--	220	--	69.2	370	331	158	321	202	270	600
Chloride	mg/l	--	250	410	379	76.5	342	533	370	378	312	342	393
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	669	3520	3970	3830	4350	3850	4540	4650
Cyanide	mg/l	0.2	--	0.078	0.012	0.014	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	455	--	--	376	--	16	233
Dissolved Organic Carbon	mg/l	--	5	--	--	17.5	--	107	76	107	74.1	114	131
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	1.6	0.1	2.07	5.77	9.47	--	0.29
Fluoride	mg/l	1.5	--	1.56	1.66	0.84	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	227	1320	1340	858	1256	1167	1640	2090
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	6.9	0.1	7.18	0.1	0.1	0.1	0.1	--
Nitrite as N	mg/l	1.0	--	--	--	0.15	0.1	0.1	--	0.1	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	37.7	28.7	2.1	32	31.92	23.5	28	25.5	30	38.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	37.6	--	1.27	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.79	7.51	7.65	6.74	7.52	6.99	--	7.25	7.66	6.26
Phosphorus	mg/l	--	--	0.28	0.17	0.26	0.3	0.37	0.11	0.45	0.44	0.43	0.66
Sulphate	mg/l	--	500 [16]	207.3	164	60.7	42.2	83	109	61	247	199	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	--	2572	2344	1920	2120	1930	2270	2330
Total Organic Carbon	mg/l	--	--	--	--	17.5	--	107	76	107	74.1	114	131
Total Suspended Solids	mg/l	--	--	79	25	130	--	--	30	12	39	85	59
Metals													
Aluminum	mg/l	--	--	4.61	0.1	1.79	--	0.293	--	0.37	--	--	--
Antimony	mg/l	0.006	--	0.001	0.001	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.001	0.001	--	--	--	--	--	--	--
Barium	mg/l	1	--	1.78	--	0.1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	0.31	0.1	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	11.9	--	0.37	11.4	10.4	8.454	6.797	9	12	14.3
Cadmium	mg/l	0.005	--	0.051	0.008	0.005	--	--	0.0001	0.0001	0.0001	0.0001	--
Calcium	mg/l	--	--	--	--	63	344	345	177	295	290.6	370	415
Chromium	mg/l	0.05	--	0.31	0.05	0.05	0.064	0.023	0.01	0.01	0.03	0.02	--
Cobalt	mg/l	--	--	0.05	0.05	--	--	--	--	--	--	--	--
Copper	mg/l	--	1	0.05	0.05	0.05	0.004	0.01	0.0131	0.0036	--	0.0016	0.005
Iron	mg/l	--	0.3	1.92	7.16	1.55	0.003	8.036	1.918	2.44	2.25	2.67	1.66
Lead	mg/l	0.01	--	0.05	0.05	0.05	0.0104	0.1	0.0021	0.0127	0.0008	0.0012	0.0024
Magnesium	mg/l	--	--	--	--	17	112	116	101	126	105.8	171	252
Manganese	mg/l	--	0.05	8.58	1.71	0.13	1.813	1.637	0.688	1.011	1.06	1.08	0.845
Mercury	mg/l	0.001	--	0.21	0.1	0.16	--	--	--	0.0001	--	--	--
Molybdenum	mg/l	--	--	0.05	0.05	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	0.17	0.06	0.05	0.029	0.02	0.02	0.02	0.03	0.02	0.02
Potassium	mg/l	--	--	--	--	11.8	76	68	62	80	67.2	80.4	97.5
Selenium	mg/l	0.05	--	0.001	0.001	--	--	--	--	0.005	--	--	--
Silver	mg/l	--	--	0.05	0.05	--	--	--	--	0.0073	--	--	--
Sodium	mg/l	--	200 [17]	--	--	53.9	367	394	343	372	324.7	476	481
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	0.2	0.7	0.1	--	--	--	--	--	--	--
Titanium	mg/l	--	--	0.1	0.07	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	0.1	0.1	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	L5 18-Sep-1992	L5 19-Oct-1992	L5 11-Nov-1992	L5 08-Jun-1993	L5 15-Nov-1993	L5 15-Jun-1994	L5 02-Nov-1994	L5 28-Jun-1995	L5 24-Nov-1995	L5 12-Jun-1996
Zinc	mg/l	--	5	0.13	0.05	0.05	0.032	0.022	0.031	0.01	0.02	0.01	0.011
Phenols													
Phenolics, Total Recoverable	mg/l	--	--	0.012	0.005	0.003	0.06	0.098	0.055	0.03	0.001	--	0.296
Semi-VOCs													
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 12-Oct-1996	L5 17-Jun-1997	L5 05-Nov-1997	L5 05-Jun-1998	L5 26-Aug-1998	L5 29-Oct-1998	L5 27-Nov-1998	L5 30-Jun-1999	L5 18-Oct-1999	L5 03-May-2000
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1970	2210	1610	1960	1330	1820	1980	1610	1800	1850
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	0.05	0.01	--	--	--
Ammonia Nitrogen	mg/l	--	--	27	5.14	31.4	32.5	18.6	25.8	1.26	30.3	19	28.5
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	27	95	37	40	13	15	14	24	23	38
Chemical Oxygen Demand	mg/l	--	--	350	495	388	328	212	316	270	324	170	240
Chloride	mg/l	--	250	492	525	540	471	281	440	470	529	473	360
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4750	4890	4680	4610	3360	4210	--	4390	3970	4070
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	433	132	407	392	197	308	611	95	469	340
Dissolved Organic Carbon	mg/l	--	5	125	140	111	82	72	90.6	97.2	101	87.2	85.2
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	0.36	1.71	2.85	3.39	2.98	5.49	--	3.59	4.98	2.2
Fluoride	mg/l	1.5	--	--	0.5	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1890	1790	1580	1560	1030	1590	1460	1310	1430	1340
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	0.37	0.06	--	0.34	0.02	--	--
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	--	--	--	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	39.4	34.7	38	33.9	20.7	28.6	17.2	37.8	19.8	28.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.6	6.93	6.75	--	7.39	6.9	--	7.1	6.9	6.67
Phosphorus	mg/l	--	--	0.45	0.8	0.35	0.34	0.3	0.34	0.34	0.31	0.39	0.31
Sulphate	mg/l	--	500 [16]	--	340	--	84	--	--	--	--	--	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2390	2460	--	2310	1690	2100	--	2200	2050	--
Total Organic Carbon	mg/l	--	--	125	--	111	82	72	90.6	97.2	101	87.2	85.2
Total Suspended Solids	mg/l	--	--	2	13	44	23	73	28	19	48	42	54
Metals													
Aluminum	mg/l	--	--	--	0.17	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	0.003	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	--	**0.017**	--	--	--	--	--	--	--	--
Barium	mg/l	1	--	--	0.396	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	14.9	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**16.9**	**14.9**	**14.3**	**14.3**	**9.6**	**14**	**14.9**	**13.3**	**14.5**	**11.6**
Cadmium	mg/l	0.005	--	--	0.0001	--	--	--	--	--	--	--	--
Calcium	mg/l	--	--	383	399	295	290	240	304	297	270	298	267
Chromium	mg/l	0.05	--	--	0.01	--	--	--	--	--	--	--	--
Cobalt	mg/l	--	--	--	0.01	--	--	--	--	--	--	--	--
Copper	mg/l	--	1	0.004	0.02	0.0071	0.0281	0.0051	0.008	0.0005	0.003	0.0042	0.0085
Iron	mg/l	--	0.3	1.21	0.31	2.07	2.07	9.31	9.83	5.57	7.05	7.47	8.27
Lead	mg/l	0.01	--	0.0002	0.0002	0.0019	0.0002	0.0002	0.0002	0.0002	0.0006	0.0002	0.0002
Magnesium	mg/l	--	--	224	189	203	200	104	199	171	153	165	161
Manganese	mg/l	--	0.05	0.84	0.85	1.11	1.39	1.24	1.74	1.33	1.37	1.54	1.56
Mercury	mg/l	0.001	--	--	0.0003	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	0.11	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium	mg/l	--	--	99.2	91.4	96.8	89.4	66.7	79.3	85.6	88.6	83.4	77.9
Selenium	mg/l	0.05	--	--	0.015	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	0.02	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	514	498	486	452	312	532	543	578	520	471
Sulfur	mg/l	--	--	--	--	--	--	0.08	0.02	--	--	0.02	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	0.02	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	0.013	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 12-Oct-1996	L5 17-Jun-1997	L5 05-Nov-1997	L5 05-Jun-1998	L5 26-Aug-1998	L5 29-Oct-1998	L5 27-Nov-1998	L5 30-Jun-1999	L5 18-Oct-1999	L5 03-May-2000
Zinc	mg/l	--	5	0.01	0.08	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.07
Phenols													
Phenolics, Total Recoverable	mg/l	--	--	--	0.94	0.016	0.049	0.001	0.001	0.035	0.001	0.001	0.039
Semi-VOCs													
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 25-Oct-2000	L5 13-Jun-2001	L5 20-Sep-2001	L5 21-Nov-2001	L5 22-May-2002	L5 08-Nov-2002	L5 31-May-2003	L5 23-Jul-2003	L5 21-Oct-2003	L5 17-May-2004
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	2180	1900	--	1890	1820	2190	1890	1820	2120	2080
Ammonia, unionized	mg/l	--	--	--	0.07	--	<0.02	--	--	--	--	--	0.26
Ammonia Nitrogen	mg/l	--	--	29.6	33.6	--	38.3	1.53	35	31.5	37.4	39.4	30.2
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	319	207	15	49	507	84	58	53	346
Chemical Oxygen Demand	mg/l	--	--	--	728	490	292	335	986	390	371	416	669
Chloride	mg/l	--	250	516	530	515	500	404	458	419	470	477	439
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4430	4300	4080	4710	3500	4900	--	3570	4630	--
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	312	--	265	344	550	440	566	525	137
Dissolved Organic Carbon	mg/l	--	5	--	--	--	139	66	524	141	231	188	203
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	3.14	--	--	3.6	3.16	4.1	--	2.73	--	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1392	1716	--	1461	1470	1744	1309	1350	1380	1460
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	0.44	24.9	11.7	5.7	4.94	5.6
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	36.3	40	40.2	48.2	31.5	41.1	43.3	41.2	48.9	40.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.97	6.7	7.18	6.53	6.68	--	--	6.83	7	--
Phosphorus	mg/l	--	--	--	0.58	0.41	0.21	0.35	0.68	0.42	0.55	0.47	0.42
Sulphate	mg/l	--	500 [16]	22	357	58	25	107	55	43	30	12	71
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2820	3080	--	2730	10300	--	2260	3130	2864	--
Total Organic Carbon	mg/l	--	--	--	249	--	139	66	524	141	231	--	--
Total Suspended Solids	mg/l	--	--	60	80	124	76	58	46	30	11	33	30
Metals													
Aluminum	mg/l	--	--	--	--	1.24	--	--	--	--	--	--	0.241
Antimony	mg/l	0.006	--	--	--	0.006	--	--	--	--	--	--	0.001
Arsenic	mg/l	0.01	--	0.001	0.001	--	0.001	0.001	0.003	0.003	0.004	0.007	0.002
Barium	mg/l	1	--	--	--	0.615	--	--	--	--	--	--	0.832
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**18.2**	**13.6**	**14.6**	**17.1**	**13.9**	**13.2**	**12.4**	**15.3**	**15.5**	**12.9**
Cadmium	mg/l	0.005	--	0.0001	0.0001	**0.01**	0.0001	**0.01**	0.0001	0.0001	0.0003	0.0001	<0.005
Calcium	mg/l	--	--	292	387	--	275	300	413	285	285	293	323
Chromium	mg/l	0.05	--	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.006	0.01
Cobalt	mg/l	--	--	0.0352	0.147	0.01	0.0267	0.01	0.0384	0.002	0.0018	0.005	<0.005
Copper	mg/l	--	1	0.0077	0.009	0.01	0.114	0.01	0.0161	0.004	0.254	0.002	0.002
Iron	mg/l	--	0.3	15.2	18.2	8.22	8.61	7.76	11.6	0.02	6.46	0.64	9.84
Lead	mg/l	0.01	--	0.0002	0.0024	**0.1**	0.0041	**0.1**	0.0047	0.0005	0.0031	0.0006	**0.02**
Magnesium	mg/l	--	--	161	182	--	188	175	173	145	154	158	158
Manganese	mg/l	--	0.05	2.38	1.9	1.54	1.43	1.59	1.94	1.24	1.14	1.01	1.22
Mercury	mg/l	0.001	--	0.0001	0.0001	--	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	--
Molybdenum	mg/l	--	--	0.002	0.041	0.02	0.005	0.02	0.042	0.0006	0.0002	0.01	--
Nickel	mg/l	--	--	0.07	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01	0.02
Potassium	mg/l	--	--	77.6	116	--	95.6	82.3	88.2	86.6	95.2	104	93.6
Selenium	mg/l	0.05	--	0.001	0.001	--	0.001	0.001	0.005	0.001	0.006	0.006	0.001
Silver	mg/l	--	--	--	--	0.01	--	--	--	--	--	--	<0.005
Sodium	mg/l	--	200 [17]	590	525	--	542	469	494	463	507	546	505
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	0.2	--	--	--	--	--	--	<0.005
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	0.005	--	--	--	--	--	--	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 25-Oct-2000	L5 13-Jun-2001	L5 20-Sep-2001	L5 21-Nov-2001	L5 22-May-2002	L5 08-Nov-2002	L5 31-May-2003	L5 23-Jul-2003	L5 21-Oct-2003	L5 17-May-2004
Zinc	mg/l	--	5	0.01	0.2	0.06	0.19	0.17	0.34	0.02	0.369	0.23	0.48
Phenols													
Phenolics, Total Recoverable	mg/l	--	--	0.045	0.283	0.197	0.012	0.033	0.638	0.162	0.009	0.066	0.419
Semi-VOCs													
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--	--	--	0.002
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	L5 23-Aug-2004	L5 18-Nov-2004	L5 25-May-2005	L5 09-Sep-2005	L5 28-Nov-2005	L5 25-May-2006	L5 15-Aug-2006	L5 16-Nov-2006	L5 17-May-2007	L5 29-Aug-2007
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	2560	2710	2500	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	<1	<5	<5	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	2190	2330	2100	2220	2050	1940	2150	1820	2180	2210
Ammonia, unionized	mg/l	--	--	--	0.49	0.15	0.16	0.14	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	29.4	37.5	34.3	37.7	32.4	31.3	34.6	26	37.2	36.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	198	237	32	24	45	132	86	40	41	182
Chemical Oxygen Demand	mg/l	--	--	631	698	377	382	342	1170	442	239	309	560
Chloride	mg/l	--	250	386	499	360	454	380	329	348	262	380	546
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3530	2000	4400	3750	--	3690	3600	2800	3400	2200
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	701.2	369	651	710	595	640	538	395	632	553
Dissolved Organic Carbon	mg/l	--	5	29.8	401.1	108.8	202.5	91.8	122	201	135	95.7	165.1
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	4	--	--	2.8	--	--	1.1	2.97	--	1.19
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1550	1690	1630	1370	1370	1390	1340	1130	1320	1500
Hydrogen Sulfide	mg/l	--	0.05	--	6.8	1	1	4	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	<1	0.3	<0.1	0.1	0.1	0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	37.3	45.5	41	51.4	38.9	35.2	43.3	35.6	45.2	46.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.2	6.6	6.9	--	--	6.9	--	7.1	6.7
Phosphorus	mg/l	--	--	0.57	0.46	0.42	0.36	0.38	0.83	0.34	0.33	0.31	0.27
Sulphate	mg/l	--	500[16]	96	40	30	19	74	97	28	40	47	98
Temperature (Field)	deg c	--	15	--	--	17.8	17	--	--	15.5	13.1	13.5	15.2
Total Dissolved Solids	mg/l	--	500	2940	--	2790	2930	2760	2550	2660	2290	2820	3140
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	45	67	54	16	17	1190	21	66	20	35
Metals													
Aluminum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.001	0.001	0.003	0.003	0.002	0.005	0.003	0.0053	0.005
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**11.5**	**14.9**	**16.3**	**15.1**	**13.2**	**10.9**	**13.3**	**11**	**13.8**	**11.6**
Cadmium	mg/l	0.005	--	<0.0006	<0.001	0.0001	0.0001	0.0003	0.0002	<0.001	<0.001	0.00014	<0.0002
Calcium	mg/l	--	--	369	379	349	288	282	325	296	241	280	311
Chromium	mg/l	0.05	--	0.008	0.012	0.012	0.008	0.005	0.014	0.006	0.008	0.006	0.009
Cobalt	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/l	--	1	<0.002	0.042	0.008	<0.002	<0.002	0.042	<0.002	0.002	<0.002	<0.002
Iron	mg/l	--	0.3	13.4	11.2	11.9	7.62	0.793	27.5	5.54	10.5	6.38	10.2
Lead	mg/l	0.01	--	0.0021	0.0029	0.0065	0.001	<0.001	0.0097	<0.001	<0.001	<0.00002	<0.0002
Magnesium	mg/l	--	--	152	181	185	159	163	139	145	129	151	175
Manganese	mg/l	--	0.05	1.55	1.35	1.62	1.27	0.649	1.52	0.964	1.4	0.957	0.654
Mercury	mg/l	0.001	--	<0.0001	<0.0001	<0.00006	<0.00005	0.00006	--	--	--	--	--
Molybdenum	mg/l	--	--	<0.01	<0.01	<0.01	<0.01	0.02	--	--	--	--	--
Nickel	mg/l	--	--	0.01	0.02	0.01	<0.01	<0.01	--	--	--	--	--
Potassium	mg/l	--	--	88.9	109	106	102	98.6	77.2	89.2	76.1	91.5	90.1
Selenium	mg/l	0.05	--	0.001	<0.001	<0.001	0.001	<0.001	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	<0.005	--	--	--	--	--	--
Sodium	mg/l	--	200[17]	566	589	549	624	592	428	499	408	505	579
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 23-Aug-2004	L5 18-Nov-2004	L5 25-May-2005	L5 09-Sep-2005	L5 28-Nov-2005	L5 25-May-2006	L5 15-Aug-2006	L5 16-Nov-2006	L5 17-May-2007	L5 29-Aug-2007
Zinc	mg/l	--	5	0.12	0.149	0.045	<0.005	<0.005	--	--	--	0.007	0.008
Phenols													
Phenolics, Total Recoverable	mg/l	--	--	0.237	0.31	0.03	0.021	0.08	0.028	0.11	0.007	0.015	0.16
Semi-VOCs													
Naphthalene	mg/l	--	--	--	--	0.001	<0.0007	0.007	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	<0.0006	<0.006	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	<0.0004	<0.004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	0.0001	0.0004	<0.001	<0.005	0.0003	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	<0.0002	<0.002	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	0.0001	0.0002	<0.001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	0.0015	0.0016	<0.002	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	**0.0013**	**0.004**	<0.005	<0.03	**0.0021**	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	<0.002	<0.02	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	<0.0002	<0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	0.0039	0.0049	<0.002	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	<0.0003	<0.003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	0.001	0.0115	0.006	<0.03	0.0075	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	0.0015	0.0175	<0.01	<0.05	0.0108	--	--	--
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	0.0007	0.0027	<0.003	<0.02	0.0021	--	--	--
o-Xylene	mg/l	--	--	--	--	0.0006	0.0082	<0.005	<0.03	0.0037	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	<0.0002	<0.002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	0.0027	0.0115	0.014	<0.03	0.0143	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.002	<0.01	**0.0014**	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 20-Nov-2007	L5 23-May-2008	L5 13-Aug-2008	L5 10-Nov-2008	L5 19-May-2009 [3] L-1	L5 25-Aug-2009 [4] L-1	L5 23-Sep-2009 L-1	L5 30-Nov-2009 [4] L-1	L5 25-May-2010 [4] L-1	L5 18-Aug-2010 [5] L-1
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	2150	1900	2280	1990	1867	2063	--	1960	1906	2079
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	37.9	39.7	44	44.7	56.4	50.1	--	41.8	47.6	40.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	<20	447	484	154	662	320	--	10	13	22
Chemical Oxygen Demand	mg/l	--	--	332	863	1120	595	1010	782	--	275	300	250
Chloride	mg/l	--	250	437	448	538	562	569	538	--	397	366	351
Conductivity	uS/cm	--	--	--	--	--	--	5050	5210	--	4410	4190	4080
Conductivity (Field)	uS/cm	--	--	1600	4500	5000	4400	--	>4000	--	>2999	>3999	3366
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	602	494	499	498	445	462	--	460	352	417
Dissolved Organic Carbon	mg/l	--	5	83.4	226	354	147.2	273	247	--	106	91.6	85.6
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	2.46	--	--	--	--	--	--	--	--	7.34
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1260	1300	1790	1410	1070	1290	--	1310	1230	1080
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.20	<0.10	--	<0.10	0.11	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	--	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	47.9	51.5	58.2	50.5	68.5	59.2	--	43.1	48.4	43.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.9	7.8	8.3	7.7	--	7.29	--	8.5	7.28	7.65
Phosphorus	mg/l	--	--	0.36	0.43	0.54	0.32	0.10	0.34	--	0.24	0.34	0.25
Sulphate	mg/l	--	500 [16]	135	260	72	61	99	108	--	45	16	59
Temperature (Field)	deg c	--	15	6.9	16.5	18	10	--	18.4	--	9	18.2	18.3
Total Dissolved Solids	mg/l	--	500	2930	2930	3310	3040	3260	3390	--	2870	2720	2650
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	124	308	254	152	496	332	--	222	367	366
Metals													
Aluminum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.004	0.0079	0.0065	0.0042	**0.02**	<0.05	--	<0.05	<0.05	<0.01
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**14**	**12.2**	**14.5**	**14.8**	**14**	**15**	--	**14**	**18**	**17**
Cadmium	mg/l	0.005	--	<0.0002	<0.005	<0.005	<0.0001	<0.001	<0.01	--	<0.01	<0.01	<0.0001
Calcium	mg/l	--	--	261	252	438	316	184	228	--	269	242	192
Chromium	mg/l	0.05	--	0.007	0.011	0.012	0.01	0.015	<0.05	--	<0.02	<0.05	<0.005
Cobalt	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.003	<0.01	--	0.005	<0.01	0.0053
Copper	mg/l	--	1	<0.002	0.002	<0.002	0.015	<0.01	0.01	--	<0.01	<0.01	0.002
Iron	mg/l	--	0.3	14.2	6.71	5.48	7.48	7.5	32.4	--	32.7	20.1	25.8
Lead	mg/l	0.01	--	<0.0002	<0.02	<0.02	<0.0001	<0.01	<0.01	--	<0.01	<0.01	<0.001
Magnesium	mg/l	--	--	148	163	168	150	148	175	--	155	152	147
Manganese	mg/l	--	0.05	0.924	1.35	1.07	0.592	0.5	0.91	--	1.65	1.80	1.53
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	94.7	94.8	105	102	87	99	--	87	86	80
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	500	529	556	591	555	601	--	533	474	486
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 20-Nov-2007	L5 23-May-2008	L5 13-Aug-2008	L5 10-Nov-2008	L5 19-May-2009 [3] L-1	L5 25-Aug-2009 [4] L-1	L5 23-Sep-2009 L-1	L5 30-Nov-2009 [4] L-1	L5 25-May-2010 [4] L-1	L5 18-Aug-2010 [5] L-1
Zinc	mg/l	--	5	0.037	0.12	0.105	0.023	<0.1	0.09	--	<0.05	<0.05	<0.01
Phenols													
Phenolics, Total Recoverable	mg/l	--	--	0.006	0.33	0.438	0.24	0.688	0.469	--	<0.001	<0.001	0.002
Semi-VOCs													
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	0.0004	<0.0001	<0.0004	--	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	**0.0012**	**0.0017**	**0.0017**	**0.0080**	--	**0.0013**	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	0.0021	0.0038	0.0034	0.0009	--	0.0011	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	0.0053	0.0086	0.0069	0.0024	--	0.0034	<0.0010	<0.0010	<0.0010
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	0.0052	0.0051	0.0009	<0.0040	--	0.0049	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	0.0023	0.0033	0.0028	0.0019	--	0.0016	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	0.0127	0.0188	0.0103	0.0047	--	0.0067	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 14-Oct-2010 L-1	L5 24-May-2011 [6] L-1	L5 16-Aug-2011 [7] L-1	L5 30-Nov-2011 L5	L5 04-Jun-2012 [8] L5	L5 22-Aug-2012 [8] L - 5	L5 29-Nov-2012 [9] L5	L5 29-May-2013 [10] L5	L5 15-Aug-2013 [10] L-1	L5 26-Nov-2013 [10] LEACHATE
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1914	1940	2052	2200	1700	1800	2300	1800	1900	1500
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	39.6	45.5	63.2	53.7	57	58	73	72 [20]	70	45
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	18	60	64	45	32	43	45	25	29	13
Chemical Oxygen Demand	mg/l	--	--	275	450	475	275	370	420	480	410	420	230
Chloride	mg/l	--	250	320	421	543	553	470	520	620	510	680	380
Conductivity	uS/cm	--	--	4000	4180	4910	4920	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2256	>3999	>4000	>3999	3787	3655	>3999	3659	>3999	2974
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	458	453	2.2	79.8	440	450	460	390	420	360
Dissolved Organic Carbon	mg/l	--	5	80.2	112	1.5	103	130	130	150	120	130	74
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	10.4
Dissolved Oxygen (Field)	mg/l	--	--	--	--	1.21	4.45	_ [18]	5.98	1.24	--	8.71	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1250	1080	1010	1180	980	920	1100	940	840	830
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	0.20	0.30
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<1.0	<0.10	0.021	<0.010	<0.010	0.014	0.018	0.037
Nitrogen, Total Kjeldahl	mg/l	--	--	43.3	47.5	69.4	59.9	64	62	81	71 [20]	76	47
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	0.21	0.34
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.64	7.75	8.31	7.64	8.08	8.25	6.93	8.11	7.26	8.37
Phosphorus	mg/l	--	--	0.30	0.27	0.28	0.28	<0.10 [19]	0.28	0.33	0.28	<0.20 [19]	0.17
Sulphate	mg/l	--	500 [16]	25	102	57	42	99	<1	<1	3	<1	21
Temperature (Field)	deg c	--	15	14.6	16.6	28.5	11.9	16.3	19.4	14.2	17.5	19.7	8.9
Total Dissolved Solids	mg/l	--	500	2600	2720	3190	3200	2670	2940	3400	2810	3030	2220
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	204	310	188	60	96	84	18	100	<2	45
Metals													
Aluminum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	<0.05	<0.05	<0.05	<0.01	0.0079	0.0090	**0.013**	0.0096	0.0080	0.0021
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**14**	**15**	**16**	**16**	**18**	**23**	**23**	**21**	**25**	**17**
Cadmium	mg/l	0.005	--	<0.01	<0.01	<0.01	<0.001	<0.00010	<0.00010	<0.00020	<0.00010	<0.00010	<0.00010
Calcium	mg/l	--	--	263	142	152	229	140	120	220	170	140	100
Chromium	mg/l	0.05	--	<0.05	<0.05	<0.05	0.008	0.0089	0.011	0.016	0.01	0.012	<0.0050
Cobalt	mg/l	--	--	<0.01	<0.01	<0.01	0.003	0.0028	0.0029	0.0034	0.0033	0.0038	0.0025
Copper	mg/l	--	1	<0.01	<0.01	<0.01	<0.01	0.0017	0.0012	<0.0020	<0.0010	<0.0010	<0.0010
Iron	mg/l	--	0.3	12.1	14.3	7.5	9.3	0.5	6.3	6.7	8.3	5.4	3.6
Lead	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00050
Magnesium	mg/l	--	--	143	177	152	148	180	200	200	170	180	150
Manganese	mg/l	--	0.05	1.18	1.00	0.62	1.1	0.29	0.25	0.87	0.52	0.38	0.27
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	75	85	94	90	100	110	120	100	120	84
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	435	542	790	673	650	760	850	610	760	530
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 14-Oct-2010 L-1	L5 24-May-2011 [6] L-1	L5 16-Aug-2011 [7] L-1	L5 30-Nov-2011 L5	L5 04-Jun-2012 [8] L5	L5 22-Aug-2012 [8] L - 5	L5 29-Nov-2012 [9] L5	L5 29-May-2013 [10] L5	L5 15-Aug-2013 [10] L-1	L5 26-Nov-2013 [10] LEACHATE
Zinc	mg/l	--	5	<0.05	<0.05	<0.05	<0.1	0.0088	0.0053	<0.01	0.013	0.0055	0.01
Phenols													
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.082	0.049	0.003	0.034	0.094	0.11	0.016	0.0037	0.0069
Semi-VOCs													
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.002	<0.0008	<0.0004	<0.0020	<0.0010	<0.00050	<0.0025	<0.0010	<0.0025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.002	<0.001	0.0010	<0.0020	<0.0010	0.0065	<0.0025	<0.0010	<0.0025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.002	0.001	0.0019	<0.0020	<0.0010	0.011	<0.0025	<0.0010	<0.0025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0050	<0.0020	0.0040	<0.0020	<0.0010	0.014	<0.0025	<0.0010	<0.0025
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.02	<0.0080	<0.0040	<0.01	<0.0050	<0.0025	<0.013	<0.0050	<0.013
o-Xylene	mg/l	--	--	<0.0005	<0.002	0.001	0.0015	<0.0020	<0.0010	0.0033	<0.0025	<0.0010	<0.0025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.002	0.002	<0.0005	<0.0040	<0.0020	0.0055	<0.0050	<0.0020	<0.0050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.001	<0.0004	<0.0002	<0.0040	<0.0020	<0.0010	<0.0050	<0.0020	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-May-2014 [11]	L5 27-Aug-2014 [12]	L5 13-Nov-2014 [13]	L5 27-May-2015	L5 25-Aug-2015	L5 25-Nov-2015	L5 24-May-2016	L5 18-Aug-2016	L5 16-Nov-2016	L5 18-May-2017
				L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1800	1900	2000	1710	1850	1250	1500	1520	1870	1850
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	66	82 [20]	70	66.3	52.3	37.4	73.2	64.9	87.1	101
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	23	29	15	<60 [22]	134	25	210	42	58	495
Chemical Oxygen Demand	mg/l	--	--	360	430	370	378	384	242	647	368	427	1240
Chloride	mg/l	--	250	500	630	550	553	1000	393	854	523	614	689
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3765	>3999	3616	>3999	>3999	3742	>3999	>3999	>3999	3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	380	460	430	372	317	253	262	110	285	158
Dissolved Organic Carbon	mg/l	--	5	120	130	120	134	111	73.1	194	356	125	335
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	8.25	--	7.44	7.56	7.09	5.10	9.70	8.46	9.02	6.85
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	890	970	990	172	980	1250	1220	929	1030	1220
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.50	<0.50	0.26	<0.1	<0.1	0.7	<0.1	1.3	<0.1	<0.5 [23]
Nitrite as N	mg/l	1.0	--	<0.050	<0.050	0.042	<0.05	<0.05	<0.05	<0.05	<0.25 [24]	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	71	81 [20]	77	69.5	53.9	45.7	139	83.8	94.3	127
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.50	<0.50	0.30	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.00	8.03	7.55	7.58	8.60	7.87	8.36	8.26	8.00	7.88
Phosphorus	mg/l	--	--	<0.10 [21]	0.33	0.31	0.39	0.25	0.16	0.41	0.33	0.34	0.48
Sulphate	mg/l	--	500 [16]	2	2	<1	41	34	403	124	43	24	76
Temperature (Field)	deg c	--	15	15.7	19.0	12.2	20.4	17.3	7.8	19.5	20	14.5	21.0
Total Dissolved Solids	mg/l	--	500	2980	3230	2920	2850	2820	2310	3290	2620	3130	3930
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	110	63	70	88	130	41	279	13	57	162
Metals													
Aluminum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	<0.01	<0.02	**0.011**	0.001	0.007	0.003	0.009	0.005	0.004	**0.017**
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**20**	**26**	**22**	4.27	**22.1**	**13.2**	**25.5**	**20.2**	**29.3**	**24.7**
Cadmium	mg/l	0.005	--	<0.0010	<0.0020	<0.0010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	--	--	170	180	160	25.3	154	254	196	139	145	229
Chromium	mg/l	0.05	--	<0.05	<0.1	<0.05	0.002	0.009	0.006	0.012	0.009	0.011	0.024
Cobalt	mg/l	--	--	<0.0050	<0.01	<0.0050	0.0006	0.0032	0.0073	0.0147	0.0034	0.0043	0.0040
Copper	mg/l	--	1	<0.01	<0.02	<0.01	<0.0005	<0.0005	<0.0005	0.0020	<0.0005	<0.0005	0.0060
Iron	mg/l	--	0.3	7.1	7.8	5.4	0.852	7.81	3.47	5.57	7.9	5.9	2.52
Lead	mg/l	0.01	--	<0.0050	<0.01	<0.0050	<0.0001	<0.0001	0.0003	0.0013	<0.0001	<0.0001	0.0005
Magnesium	mg/l	--	--	160	180	160	26.4	145	148	179	141	161	158
Manganese	mg/l	--	0.05	0.61	0.64	0.51	0.084	0.606	0.491	0.948	0.541	0.397	1.21
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	100	110	110	17.9	94.7	62.9	108	76.2	123	109
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	640	750	700	110	571	577	812	576	717	666
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-May-2014 [11]	L5 27-Aug-2014 [12]	L5 13-Nov-2014 [13]	L5 27-May-2015	L5 25-Aug-2015	L5 25-Nov-2015	L5 24-May-2016	L5 18-Aug-2016	L5 16-Nov-2016	L5 18-May-2017
				L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5
Zinc	mg/l	--	5	<0.05	<0.1	<0.05	<0.005	0.015	0.012	0.01	<0.005	0.009	0.029
Phenols													
Phenolics, Total Recoverable	mg/l	--	--	0.012	0.0058	0.072	0.011	0.032	<0.004 [23]	0.142	0.052	0.025	0.360
Semi-VOCs													
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0019
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.01	<0.0020	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.01	<0.0020	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-Aug-2017 L-5	L5 28-Nov-2017 L-5	L5 23-May-2018 L-5	L5 30-Aug-2018 L-5	L5 11-Nov-2018 [14] L5	L5 19-Dec-2018 [15] L-5	L5 20-Jun-2019 L-5	L5 28-Aug-2019 L-5	L5 21-Nov-2019 L-5	L5 14-May-2020 L-5
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1660	2050	1430	975	--	2040	2250	2080	1940	1580
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	45.6 [25]	80.1	81.7	74.2	--	90.0	112	69.1 [25]	89.4	45.3 [25]
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	<60 [26]	652	43	27	--	22	178	86	35	24
Chemical Oxygen Demand	mg/l	--	--	269	1210	448	330	--	441	497	414	428	253
Chloride	mg/l	--	250	374	640	572	504	--	662	619	536	658	423
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3234	3999	>3999	>3999	--	>3999	>3999	>3999	5640	3883
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	299	130	302	158	--	368	2.80	818	10.1	310
Dissolved Organic Carbon	mg/l	--	5	82.4	407	123	99.8	--	131	125	129	122	113
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	7.47	7.69	10.12	8.71	--	7.31	7.86	7.74	7.7	6.67
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1300	1750	1200	976	--	1150	1200	1420	1510	1180
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.5 [23]	<0.5 [23]	1.1	0.3	--	<0.5 [23]	<0.1	0.2	<0.1	0.6
Nitrite as N	mg/l	1.0	--	<0.25 [24]	<0.05	<0.05	0.12	--	<0.25 [23]	<0.05	0.09	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	34.4	94.4	93.7	81.6	--	118	115	68.0	92.6	43.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.79	7.70	7.91	8.45	--	8.26	7.82	7.26	8.24	7.83
Phosphorus	mg/l	--	--	0.14	0.36	0.29	0.18	--	0.58	0.36	0.34	0.25	0.22
Sulphate	mg/l	--	500 [16]	19	41	374	312	--	58	87	135	143	123
Temperature (Field)	deg c	--	15	16.1	10.5	17.6	18.5	--	10.9	17.8	17.2	11.4	16.5
Total Dissolved Solids	mg/l	--	500	2590	3090	3030	2620	--	3040	3120	3020	3320	2240
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	140	96	32	40	--	95	5	48	47	87
Metals													
Aluminum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	**0.014**	**0.012**	**0.011**	--	0.004	0.007	**0.019**	0.006	0.001
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**14.2**	**13.4**	**16.2**	**10.3**	--	**20.9**	**25.6**	**13.2**	**24.6**	**15.8**
Cadmium	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	--	--	254	382	240	129	--	196	208	287	320	205
Chromium	mg/l	0.05	--	0.006	0.019	0.014	0.011	--	0.011	0.015	0.021	0.019	0.005
Cobalt	mg/l	--	--	0.0028	0.0030	0.0091	0.0051	--	0.0043	0.0055	0.0033	0.0063	0.0020
Copper	mg/l	--	1	<0.0005	0.0018	0.0082	0.0025	--	<0.0005	0.0006	0.0013	0.0005	<0.0005
Iron	mg/l	--	0.3	8.56	2.44	3.44	9.53	--	2.39	1.33	11.2	5.73	10.8
Lead	mg/l	0.01	--	<0.0001	0.0017	0.0019	0.0014	--	0.0001	<0.0001	0.0005	0.0003	0.0002
Magnesium	mg/l	--	--	161	193	147	159	--	161	166	171	172	163
Manganese	mg/l	--	0.05	0.704	1.6	0.541	0.066	--	0.308	0.315	13.2	0.776	0.592
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	94.7	118	104	96.3	--	123	123	102	132	88.2
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	490	622	542	512	--	589	666	503	714	497
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-Aug-2017 L-5	L5 28-Nov-2017 L-5	L5 23-May-2018 L-5	L5 30-Aug-2018 L-5	L5 11-Nov-2018 [14] L5	L5 19-Dec-2018 [15] L-5	L5 20-Jun-2019 L-5	L5 28-Aug-2019 L-5	L5 21-Nov-2019 L-5	L5 14-May-2020 L-5
Zinc	mg/l	--	5	0.01	0.031	0.016	<0.005	--	<0.005	0.015	0.01	0.006	0.014
Phenols													
Phenolics, Total Recoverable	mg/l	--	--	<0.004 [23]	0.629	0.016	0.009	--	<0.010 [23]	0.008	0.033	0.008	0.006
Semi-VOCs													
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0006	0.0009	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0014	<0.0005	<0.0005
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0008	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	0.0268	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0032	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health[1]	ODWQS-AO[2]	L5 27-Aug-2020 L-5	L5 25-Nov-2020 L-5	L5 27-May-2021 L-5	L5 24-Aug-2021 L-5	L5 24-Nov-2021 L-5
				--	--	--	--	--
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	916	2440	2220	1980	1750
Ammonia, unionized	mg/l	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	33.6	76.9 [25]	90.8 [25]	91.6 [25]	74.4 [25]
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	23	27	37	<60 [26]	30
Chemical Oxygen Demand	mg/l	--	--	236	405	416	392	330
Chloride	mg/l	--	250	648	544	561	542	441
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	>3999	>3999	>3999	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	180	359	484	468	402
Dissolved Organic Carbon	mg/l	--	5	54.0	119	122	103	94.2
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	9.44	9.95	6.32	7.74	10.01
Fluoride	mg/l	1.5	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1530	404	1280	1110	1260
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.2	<1.0 [27]	<0.5 [27]	<0.5 [27]	<0.1
Nitrite as N	mg/l	1.0	--	0.27	<0.50	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	38.0	72.6	85.5	86.7	73.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.97	8.37	7.91	7.90	8.53
Phosphorus	mg/l	--	--	0.38	0.19	0.33	0.23	0.35
Sulphate	mg/l	--	500 [16]	128	47	35	28	74
Temperature (Field)	deg c	--	15	17.5	10.1	18.1	22.1	9.9
Total Dissolved Solids	mg/l	--	500	2330	2770	2950	2880	2530
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	185	59	106	75	219
Metals								
Aluminum	mg/l	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.004	0.003	0.002	0.003
Barium	mg/l	1	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--
Boron	mg/l	5	--	**8.42**	**17.3**	**25.6**	**16.4**	**17.5**
Cadmium	mg/l	0.005	--	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	--	--	384	162	221	161	261
Chromium	mg/l	0.05	--	**0.075**	0.011	0.016	0.012	0.009
Cobalt	mg/l	--	--	0.0085	0.0044	0.0057	0.0048	0.0031
Copper	mg/l	--	1	0.0124	<0.0005	0.0010	<0.0005	0.0014
Iron	mg/l	--	0.3	17.2	3.89	9.37	3.82	1.38
Lead	mg/l	0.01	--	0.0033	<0.0001	0.0002	<0.0001	0.0004
Magnesium	mg/l	--	--	138	171	176	172	149
Manganese	mg/l	--	0.05	2.27	0.296	0.732	0.278	0.538
Mercury	mg/l	0.001	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--
Potassium	mg/l	--	--	81.4	106	119	115	106
Selenium	mg/l	0.05	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	410	643	687	645	559
Sulfur	mg/l	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 27-Aug-2020 L-5	L5 25-Nov-2020 L-5	L5 27-May-2021 L-5	L5 24-Aug-2021 L-5	L5 24-Nov-2021 L-5
Zinc	mg/l	--	5	4.54	<0.005	0.009	<0.005	0.015
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.018	0.082	0.009	<0.010 [27]	0.050
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Metals and TP MRL elevated due to matrix interference.
(4)	Metals analysis performed on aqua-regia digest of sample material.
(5)	Arsenic MRL elevated due to matrix interference.
(6)	Metals analysis performed on aqua-regia digest of sample material due to solids present in sample, except for Boron. MRLs may be elevated. TP MRL elevated due to matrix interference. Due to matrix interference 5x dilution factor required for VOCs. TKN and N-NH3 were analysed at SGS Lakefield.
(7)	N-NO2,N-NO3 and TP MRL elevated due to matrix interference. VOC MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.
(8)	VOC Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly
(9)	Metal analysis: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(10)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(11)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Metal Analysis: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly. Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(12)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Nitrite/Nitrate: Due to the colour interferences, some sample required dilution. Detection limits were adjusted accordingly. Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(13)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Nitrite/Nitrate: Due to the sample matrix, some sample required dilution. Detection limits were adjusted accordingly. Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(14)	Leachate pump was not working. No sample could be collected.
(15)	Clarity: slight turbidity, sediments: none, colour: light greyish brownish tint, odour: leachate-like odou
(16)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(17)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(18)	The dissolved oxygen reading was missed during this monitoring session.
(19)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(20)	TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.
(21)	Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly
(22)	Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(23)	Elevated Reporting Limit due to matrix interference.
(24)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(25)	INOG6 Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions
(26)	BOD01 Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(27)	GEN02 Elevated Reporting Limit due to matrix interference.

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1 01-Apr-1984	S1 01-May-1987	S1 01-Oct-1987	S1 19-Jun-1990	S1 27-Jun-1990	S1 04-Oct-1990	S1 06-Nov-1990	S1 27-Nov-1990	S1 24-Apr-1991
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	192000	194000	184000	134000	114000	132000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	80	220	150	100	750	180	750	240
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	2000	5000	1000	1000	3000	3000
Chemical Oxygen Demand	ug/l	--	--	--	--	39000	135000	135000	73000	95000	116000
Chloride	ug/l	--	--	173800	158500	57000	326000	113000	45000	46000	114000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	300	996	895	590	1152	849	431	663	622
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	980	74000	74000	33000	27000	31000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	6850	6850	9400	12300	9300
Hardness, Calcium Carbonate	ug/l	--	--	--	--	231000	335000	282000	157000	156000	169000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	1140	940	770	6800
Nitrite as N	ug/l	--	--	--	--	--	--	100	20	1	160
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	980	4000	1460	740	1560	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	330	330	710	560	810	1360
pH (Field)	-	6.5 - 8.5	--	7.34	7.59	7.96	8.06	8.16	8.11	7.9	8.03
Phosphate	ug/l	--	--	--	--	100	430	170	100	100	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	67900	59300	1600	52000	62000	36000	30000	72000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	150000	500000	450000	295000	575000	425000	216000	332000	311000
Total Organic Carbon	ug/l	--	--	--	--	1100	19000	19000	18000	9000	19000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	100	20	20	50	50	50	50	60
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	--	84700	77900	71000	105000	93000	48000	51000	48000
Chromium	ug/l	-- [13]	--	**100**	**10**	--	--	**50**	**50**	**50**	**50**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	--	**1800**	**500**	**430**	**2390**	**210**	**630**	**2550**	**800**
Iron	ug/l	300	--	40	30	30	70	50	50	50	50
Lead	ug/l	-- [14]	--	200	130	**100**	**320**	**90**	**180**	**290**	**180**
Magnesium	ug/l	--	--	19200	16100	13000	17000	12000	9000	7000	12000
Manganese	ug/l	--	--	100	20	--	--	50	50	50	50
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	**50**	**70**	**40**	**50**	**80**	**50**	**80**	**50**
Potassium	ug/l	--	--	--	--	5000	13000	23000	7000	6000	5000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	--	--	31000	157000	102000	32000	78000	55000
Zinc	ug/l	30 [11]	--	--	--	--	--	--	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	--	**2**	**2**	**18**	**5**

Parameter	Unit	PWQO [1]	S1 06-Sep-1992	S1 08-Jun-1993	S1 04-Nov-1993	S1 15-Jun-1994	S1 02-Nov-1994	S1 28-Jun-1995	S1 14-Nov-1995	S1 12-Jun-1996	S1 12-Oct-1996
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	134000	115000	134000	202000	51000	280000	144000	195000	193000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	<100	100	100	100	130	50	110	40	70
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	2000	2100	1800	4000	1000	2000	4000	1000
Chemical Oxygen Demand	ug/l	--	265000	17000	62200	35000	69000	496000	38000	18000	30000
Chloride	ug/l	--	107000	102000	85000	128000	40000	195000	71500	139000	89000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	744	350	651	908	423	1118	690	850	750
Cyanide	ug/l	5 [6]	<5	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	27300	32200	37400	--	12000	100000	33100	39800	38200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	15900	--	10100	8030	12010	8080	13340	6790	10880
Hardness, Calcium Carbonate	ug/l	--	231650	179000	207000	242000	117000	749000	205000	241000	255000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	2900	7840	960	4500	100	1600	--	--
Nitrite as N	ug/l	--	<100	100	<100	--	100	100	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	840	560	1490	5320	6160	670	1660	650	990
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	740	460	1390	5220	6030	620	1550	610	--
pH (Field)	-	6.5 - 8.5	7.51	8.38	7.67	7.67	7.8	6.88	7.7	7.18	7.36
Phosphate	ug/l	--	260	80	260	10	440	200	110	100	120
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	55000	52900	57000	48000	52000	74000	60000	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	440000	425000	356000	456000	212000	714000	350000	430000	370000
Total Organic Carbon	ug/l	--	10300	8800	13700	16200	15300	11800	14700	9000	12400
Total Suspended Solids	ug/l	--	--	--	--	--	64000	38000	37000	35000	3000
Metals											
Arsenic	ug/l	100 [11]	<1	--	--	--	--	100	--	--	--
Barium	ug/l	--	5	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	**380**	53	30	32	30
Cadmium	ug/l	0.2 [11]	--	--	--	--	0.1	0.1	0.1	--	--
Calcium	ug/l	--	67800	49000	60000	73900	32000	102000	58800	68700	73600
Chromium	ug/l	-- [13]	**<20**	**74**	**<10**	**15**	**10**	**12**	**10**	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**<10**	**12**	3	**6.8**	4.1	**7**	2.6	**50.8**	1.7
Iron	ug/l	300	**1000**	**4906**	**793**	**835**	**1402**	**400**	**1220**	**1220**	**700**
Lead	ug/l	-- [14]	**10**	4.7	**6.6**	1	1.2	2	0.4	0.4	0.2
Magnesium	ug/l	--	15100	14000	14000	14000	8900	23800	14000	16600	16900
Manganese	ug/l	--	50	114	89	124	75	446	90	100	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	<20	20	<20	20	20	20	20	20	20
Potassium	ug/l	--	4300	11000	8100	6300	9900	13000	12200	9930	13900
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	66300	51000	45000	78000	23000	78900	61800	93600	58300
Zinc	ug/l	30 [11]	30	30	**36**	**37**	18	16	20	10	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	**2**	**3**	**5**	1	1	--	1	--

Parameter	Unit	PWQO [1]	S1 17-Jun-1997	S1 05-Nov-1997	S1 05-Jun-1998	S1 26-Aug-1998	S1 30-Oct-1998	S1 30-Jun-1999	S1 19-Oct-1999	S1 03-May-2000	S1 25-Oct-2000
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	179000	216000	208000	100000	168000	208000	324000	195000	267000
Ammonia, unionized	ug/l	20	--	--	--	--	10	--	--	10	--
Ammonia Nitrogen	ug/l	--	10	60	20	50	50	10	170	70	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	1000	3000	2000	1000	6000	1000	1000	--
Chemical Oxygen Demand	ug/l	--	28000	17000	10000	36000	42000	81000	23000	30000	--
Chloride	ug/l	--	137000	242000	138000	38100	82200	201000	143000	240000	295000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	815	1200	900	360	643	1080	1300	1250	1540
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	33700	40600	39100	17400	39200	27100	84900	31400	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6010	9830	10430	7560	9560	13110	7650	11330	7560
Hardness, Calcium Carbonate	ug/l	--	279000	294000	249000	147000	229000	271000	581000	309000	407000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--	--	--	10
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	1900
Nitrogen, Total Kjeldahl	ug/l	--	900	1050	3120	1240	940	800	570	890	660
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.07	7.8	--	7.69	7.3	8.3	7.2	7.22	7.22
Phosphate	ug/l	--	90	90	40	320	80	60	50	20	130
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--	--	--	103000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	409000	600000	451000	180000	323000	540000	640000	625000	858000
Total Organic Carbon	ug/l	--	11100	10000	5900	11000	14000	13600	8900	9200	--
Total Suspended Solids	ug/l	--	17000	45000	21000	55000	9000	24000	22000	24000	113000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	70	60	30	60	50	30	110	40	**730**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	89500	92600	75700	47500	64600	89200	174000	94600	116000
Chromium	ug/l	-- [13]	--	--	--	--	--	--	--	--	**20**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	0.5	**12.4**	3.2	3.3	2.6	2.5	2	**8.4**	**13.2**
Iron	ug/l	300	**1320**	**1310**	**590**	**1810**	**800**	**390**	**3010**	**350**	**5620**
Lead	ug/l	-- [14]	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	13200	15100	14500	6870	16300	11400	35100	17400	28500
Manganese	ug/l	--	330	220	80	70	80	50	1100	330	440
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	**40**
Potassium	ug/l	--	3800	5600	1200	5200	9100	2800	8700	4900	5700
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	73900	97200	89700	26400	55400	114000	91800	131000	149000
Zinc	ug/l	30 [11]	10	30	20	**250**	10	20	**340**	**240**	**330**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**4**	**2**	1	**19**	1	1	1	**5**	**2**

Parameter	Unit	PWQO [1]	S1 13-Jun-2001	S1 27-Sep-2001	S1 21-Nov-2001	S1 22-May-2002	S1 08-Nov-2002	S1 31-May-2003	S1 03-Jul-2003	S1 22-Oct-2003	S1 17-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	196000	239000	169000	130000	234000	152000	158000	143000	228000
Ammonia, unionized	ug/l	20	<20	<20	<20	--	--	--	--	--	<10
Ammonia Nitrogen	ug/l	--	50	30	30	50	10	150	70	50	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	1000	1000	1000	1000	2000	2000	3000
Chemical Oxygen Demand	ug/l	--	31000	14000	30000	40000	32000	49000	56000	68000	42000
Chloride	ug/l	--	347000	280000	116000	144000	361000	105000	308000	97300	312000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1250	1290	670	780	1400	740	1310	760	1370
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	30200	52900	23700	26000	64000	39000	58000	34000	38300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10900	9180	11380	9450	11600	7160	5030	10500	9000
Hardness, Calcium Carbonate	ug/l	--	318000	403000	241000	273000	384000	209000	324000	--	340000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	700	1000	700	1200	900	22700	1300	400
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	770	520	690	670	620	1040	1460	5650	2680
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	7.94	6.63	6.75	7	7.6	7.37	7.73	7.4
Phosphate	ug/l	--	70	50	40	50	60	40	430	500	80
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	76000	126000	76000	49000	102000	43000	70000	74000	63000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	846000	868000	496000	492000	700000	397000	1000000	412000	685000
Total Organic Carbon	ug/l	--	11800	8300	15000	9000	10000	22000	13000	16000	9700
Total Suspended Solids	ug/l	--	37000	18000	10000	6000	18000	3000	218000	60000	24000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	2
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	110	50	40	50	60	30	54	47	48
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	92900	124000	72100	59000	123000	63100	103000	69500	107000
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	**10**	3	**12**	2
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**5.5**	3.6	2.3	<1	3.1	3	2	**20**	**16**
Iron	ug/l	300	**1780**	**1280**	**460**	**670**	**1360**	**460**	**4020**	**3460**	**1760**
Lead	ug/l	-- [14]	1.2	0.2	0.2	<1	1.3	0.5	3.7	5.4	0.5
Magnesium	ug/l	--	20900	22600	14900	15300	18700	12400	16300	12100	17400
Manganese	ug/l	--	470	130	60	150	190	50	251	152	358
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	10	10	20
Potassium	ug/l	--	4500	7100	7600	8700	11000	5000	7500	8700	7000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	187000	149000	68700	88700	194000	67400	184000	64000	190000
Zinc	ug/l	30 [11]	**130**	**100**	30	**70**	**150**	20	**270**	**122**	**129**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**15**	1	1	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S1 21-Aug-2004	S1 18-Nov-2004	S1 25-May-2005	S1 09-Sep-2005	S1 09-Nov-2005	S1 24-May-2006	S1 15-Aug-2006	S1 16-Nov-2006	S1 08-May-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	268000	334000	273000	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	<5000	<5000	<5000	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	282000	230000	220000	274000	224000	153000	219000	110000	208000
Ammonia, unionized	ug/l	20	<10	<10	<10	<10	<10	<10	<10	--	<10
Ammonia Nitrogen	ug/l	--	60	110	30	40	30	10	<10	80	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	<3000	<3000	6000	<3000	<3000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	32000	29000	35000	27000	23000	40000	38000	45000	35000
Chloride	ug/l	--	281000	195000	167000	273000	195000	121000	284000	28700	228000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1270	1180	1200	1500	730	485	1370	260	900
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	36200	25300	57200	68500	48600	40200	52600	28600	52000
Dissolved Organic Carbon	ug/l	--	--	--	10800	79400	9800	17800	12100	14600	9200
Dissolved Oxygen (Field)	ug/l	-- [7]	7000	6800	6380	6400	10900	9660	**1200**	8280	10340
Hardness, Calcium Carbonate	ug/l	--	351000	306000	298000	390000	342000	207000	295000	86000	273000
Hydrogen Sulfide	ug/l	2 [8]	--	--	<10	<10	<10	--	--	--	--
Nitrate as N	ug/l	--	300	1200	600	200	1800	900	200	1000	600
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	570	720	750	490	820	850	470	1140	570
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	6.9	7.3	7.6	7.7	7.8	7.7	--	8.1
Phosphate	ug/l	--	30	30	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	**40**	20	**70**	**40**	**60**	**210**	**40**
Sulphate	ug/l	--	83000	80000	62000	93000	97000	47000	82000	33000	67000
Temperature (Field)	deg c	-- [10]	--	--	16.8	17.2	1	9	20	8.2	17.2
Total Dissolved Solids	ug/l	--	635000	590000	580000	863000	696000	413000	790000	201000	683000
Total Organic Carbon	ug/l	--	9400	8700	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	5000	<3000	3000	25000	3000	21000	57000	5000
Metals											
Arsenic	ug/l	100 [11]	1	1	<1	1	<1	<1	1.2	1	1.2
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	84	45	61	85	56	31	64	39	55
Cadmium	ug/l	0.2 [11]	--	--	<0.3	<0.1	<0.5	<0.1	<0.1	**<0.5**	<0.1
Calcium	ug/l	--	111000	95000	90400	126000	107000	63100	90600	23900	83300
Chromium	ug/l	-- [13]	1	2	<2	2	4	<2	2	**12**	<2
Cobalt	ug/l	0.9	--	--	**30**	**1.1**	0.6	0.3	0.6	0.9	<0.5
Copper	ug/l	5	2	2	<2	<2	4	<2	4	**40**	**22**
Iron	ug/l	300	**455**	**375**	**543**	**1360**	**1650**	**384**	**978**	**613**	**646**
Lead	ug/l	-- [14]	3.5	0.6	<0.6	<0.5	1	0.6	0.8	3	0.3
Magnesium	ug/l	--	17500	16600	17600	17900	18400	11800	16600	6420	15600
Manganese	ug/l	--	162	135	137	191	129	69	79	102	143
Mercury, dissolved	ug/l	0.2 [15]	--	--	<0.05	<0.06	<0.06	--	--	--	--
Molybdenum	ug/l	40	--	--	5.1	1.4	<5	--	--	--	--
Nickel	ug/l	25	10	10	<10	<10	<10	--	--	--	--
Potassium	ug/l	--	6900	7500	6200	8200	9000	4800	6500	4800	6600
Selenium	ug/l	100	--	--	<1	<1	<1	--	--	--	--
Sodium	ug/l	--	196000	124000	109000	186000	137000	73700	183000	32700	154000
Zinc	ug/l	30 [11]	**70**	**40**	**39**	**82**	**79**	17	28	**36**	29
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	<1	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S1 22-Aug-2007	S1 20-Nov-2007	S1 23-May-2008	S1 12-Aug-2008	S1 06-Nov-2008	S1 13-May-2009 S-3	S1 25-Aug-2009 A-8	S1 27-Nov-2009 S-11	S1 18-May-2010 S-8
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	190000	160000	220000	218000	172000	197000	306000	303000
Ammonia, unionized	ug/l	20	<10	<10	<20	<20	<20	2	4.06	7.67	<0.37
Ammonia Nitrogen	ug/l	--	<10	90	<10	<10	10	50	200	130	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	4000	<3000	<3000	<3000	<1000	1000	2000	<1000
Chemical Oxygen Demand	ug/l	--	45000	42000	48000	29000	19000	48000	48000	38000	30000
Chloride	ug/l	--	340000	203000	127000	335000	163000	130000	258000	234000	254000
Conductivity	uS/cm	--	--	--	--	--	--	900	2010	1980	1860
Conductivity (Field)	uS/cm	--	1250	750	650	1500	900	750	1596	958	1948
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	58700	51300	39500	55200	52400	41400	47100	74400	66800
Dissolved Organic Carbon	ug/l	--	9400	12000	12500	9600	6600	17600	11200	13600	12600
Dissolved Oxygen (Field)	ug/l	-- [7]	6140	9690	11500	7320	9880	9940	9350	12430	**4210**
Hardness, Calcium Carbonate	ug/l	--	283000	277000	178000	265000	294000	230000	525000	598000	559000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	1400	500	200	1200	650	140	1260	<100
Nitrite as N	ug/l	--	--	--	--	--	--	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1060	880	950	520	610	1050	700	840	440
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.4	8.2	8	**8.7**	8	8	7.69	**8.67**	7.74
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**200**	**100**	**50**	20	**40**	**140**	**50**	**90**	20
Sulphate	ug/l	--	70000	87000	33000	73000	98000	63000	420000	397000	296000
Temperature (Field)	deg c	-- [10]	16.4	1.6	13.8	21.3	9.8	20.7	20.9	5.9	18.2
Total Dissolved Solids	ug/l	--	878000	649000	408000	935000	619000	585000	1410000	1390000	1210000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	99000	34000	<3000	3000	4000	32000	15000	18000	5000
Metals											
Arsenic	ug/l	100 [11]	2.5	1.3	2.1	1.6	<0.5	1	2	1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	63	43	24	50	39	40	190	160	120
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	84900	89300	54100	83100	92400	69000	174000	180000	171000
Chromium	ug/l	-- [13]	3	4	<2	<2	<2	5	6	6	6
Cobalt	ug/l	0.9	**1**	**1.2**	<0.5	<0.5	<0.5	0.5	**1.1**	**1.5**	**1.0**
Copper	ug/l	5	5	4	<2	**7**	3	3	2	5	2
Iron	ug/l	300	**1720**	**1840**	**499**	274	**374**	**710**	**1050**	**560**	**420**
Lead	ug/l	-- [14]	1.7	2.8	<0.1	1.2	<0.1	2	<1	<1	<1
Magnesium	ug/l	--	17100	13200	10500	14000	15300	14000	22000	36000	32000
Manganese	ug/l	--	145	140	64	423	87	110	460	320	320
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8200	8400	4300	9700	7900	6000	28000	23000	14000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	214000	123000	80300	285000	106000	96000	208000	199000	182000
Zinc	ug/l	30 [11]	**76**	**75**	8	30	**31**	**60**	20	20	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	<1	**2**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1 18-Aug-2010 [2] S-9	S1 14-Oct-2010 S-9	S1 19-May-2011 [2] W-11	S1 16-Aug-2011 [2] N-9	S1 30-Nov-2011 [3] S1	S1 30-May-2012 S 1	S1 22-Aug-2012 S-'	S1 29-Nov-2012 [4] S-1	S1 28-May-2013 S1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	316000	331000	270000	372000	198000	310000	360000	360000	320000
Ammonia, unionized	ug/l	20	<0.08	0.37	1.16	1.13	1.38	<1.38	<2.2	0.96	0.69
Ammonia Nitrogen	ug/l	--	<20	30	50	30	130	<50	<50	110	92
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	1000	2000	<1000	6000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	30000	35000	55000	35000	65000	53000	47000	39000	38000
Chloride	ug/l	--	202000	174000	231000	270000	106000	280000	240000	250000	260000
Conductivity	uS/cm	--	1860	1660	1670	1860	1160	--	--	--	--
Conductivity (Field)	uS/cm	--	1680	1357	1562	1482	1062	1699	1526	1769	1732
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	66400	74700	63400	88300	25900	76000	60000	82000	71000
Dissolved Organic Carbon	ug/l	--	14100	14300	12300	14000	7100	17000	86000	14000	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	7560	14300	7270	5960	10950	7310	8160	13250	**3060**
Hardness, Calcium Carbonate	ug/l	--	620000	516000	547000	477000	385000	520000	520000	550000	670000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	830	<100	<100	170	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<10	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	570	430	1180	550	1010	1100	1000	1200	810
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	<100	<100	170	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.96	7.73	7.89	7.92	7.93	7.71	7.93	8.02	7.29
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	**40**	**120**	30	**470**	**85**	**120**	**50**	**53**
Sulphate	ug/l	--	370000	275000	243000	197000	201000	220000	220000	270000	310000
Temperature (Field)	deg c	-- [10]	20.6	12.8	16.5	22.4	5.1	24.6	24.3	0.2	19.8
Total Dissolved Solids	ug/l	--	1300000	1080000	1090000	1210000	754000	1170000	1170000	1250000	1350000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	6000	76000	8000	372000	19000	14000	23000	8000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<10	<10	<50	1.4	1.0	<1.0	1.0
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**230**	140	150	130	100	190	200	150	160
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	0.1	<0.1	**<10**	**0.21**	<0.10	<0.10	<0.10
Calcium	ug/l	--	197000	157000	163000	148000	103000	170000	160000	200000	210000
Chromium	ug/l	-- [13]	7	7	**9**	**9**	**<50**	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.8	0.8	**1.5**	0.5	<10	**1.3**	0.63	<0.50	0.59
Copper	ug/l	5	3	2	**8**	2	**30**	**6.6**	3.0	2.7	2.6
Iron	ug/l	300	**380**	**660**	**1480**	**380**	**13200**	**1500**	**1000**	<100	**450**
Lead	ug/l	-- [14]	<1	<1	5	<1	**30**	0.89	0.61	<0.50	<0.50
Magnesium	ug/l	--	31000	30000	34000	26000	31000	36000	31000	37000	40000
Manganese	ug/l	--	280	430	370	200	570	670	320	120	200
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	14000	14000	14000	10000	15000	18000	18000	19000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	175000	146000	160000	184000	90000	210000	220000	230000	210000
Zinc	ug/l	30 [11]	<10	<10	**40**	<10	**140**	21	16	14	9.6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	**1.2**	<1.0	<1.0	<1.0

Parameter	Unit	PWQO [1]	S1 15-Aug-2013 S-1	S1 21-Nov-2013 SA-1	S1 28-May-2014 S1	S1 26-Aug-2014 S1	S1 13-Nov-2014 S-1	S1 27-May-2015 S-1	S1 25-Aug-2015 S-'	S1 25-Nov-2015 S-1	S1 24-May-2016 S-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	350000	370000	340000	390000	370000	373000	364000	418000	364000
Ammonia, unionized	ug/l	20	1.84	<0.32	<0.75	2.68	0.26	0.99	4.29	0.73	1.32
Ammonia Nitrogen	ug/l	--	50	<50	<50	120	95	190	30	100	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	2000	<2000	<2000	<2000	5000	15000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	38000	36000	36000	46000	38000	61000	29000	41000	37000
Chloride	ug/l	--	250000	200000	310000	270000	210000	266000	254000	260000	344000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1739	1581	1785	1992	1407	1752	1630	1824	1784
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	83000	92000	78000	98000	88000	76000	79900	83800	76000
Dissolved Organic Carbon	ug/l	--	16000	13000	14000	14000	13000	16400	14800	12600	13200
Dissolved Oxygen (Field)	ug/l	-- [7]	**150**	10580	14290	**360**	9660	7740	**4380**	11330	5570
Hardness, Calcium Carbonate	ug/l	--	550000	580000	650000	590000	560000	579000	408000	838000	582000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	190	<100	<100	100	<100	<100	100	<100
Nitrite as N	ug/l	--	<10	<10	<10	<10	12	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	690	860	950	1900	9800	500	900	700
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	190	<100	<100	110	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.93	7.78	7.68	7.72	7.35	7.10	**8.66**	7.93	7.88
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**48**	28	24	**57**	**88**	**1690**	**50**	**80**	30
Sulphate	ug/l	--	230000	270000	270000	250000	220000	224000	211000	221000	200000
Temperature (Field)	deg c	-- [10]	21.7	3.1	17.1	21.3	4.9	20.7	18.9	0.6	18.6
Total Dissolved Solids	ug/l	--	1280000	1210000	1440000	1320000	1070000	1110000	1060000	1080000	1240000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<1000	7000	12000	7000	88000	266000	9000	38000	30000
Metals											
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	2	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**210**	160	180	200	160	**201**	199	149	146
Cadmium	ug/l	0.2 [11]	<0.10	**1.8**	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	180000	180000	200000	180000	170000	174000	120000	253000	168000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	2	<1	3	1
Cobalt	ug/l	0.9	<0.50	<0.50	0.50	<0.50	0.69	**1.4**	0.5	0.7	<0.5
Copper	ug/l	5	2.6	2.5	1.9	1.7	2.9	3.1	<0.5	0.9	2.4
Iron	ug/l	300	**380**	230	**320**	210	**460**	**3480**	234	**965**	200
Lead	ug/l	-- [14]	0.64	0.52	0.51	<0.50	1.6	**9.0**	<0.1	1.1	0.3
Magnesium	ug/l	--	30000	40000	42000	32000	34000	35100	26500	50000	39200
Manganese	ug/l	--	83	93	120	210	140	638	206	153	42
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	16000	15000	17000	16000	13000	13800	12500	12200	12500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	200000	170000	210000	220000	160000	154000	148000	228000	198000
Zinc	ug/l	30 [11]	6.5	15	16	9.6	30	**33**	13	23	9
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	**1.4**	<1.0	<1.0	**1.7**	<1	**2**	<1	**8**

Parameter	Unit	PWQO [1]	S1 18-Aug-2016 S-1	S1 16-Nov-2016 S-1	S1 18-May-2017 S-1	S1 28-Aug-2017 S-1	S1 28-Nov-2017 S-1	S1 23-May-2018 S-1	S1 30-Aug-2018 S-1	S1 28-Nov-2018 S-1	S1 20-Jun-2019 S-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	332000	360000	384000	450000	464000	395000	466000	429000	398000
Ammonia, unionized	ug/l	20	0.69	0.37	1.63	0.36	1.18	0.88	1.18	0.8	1.18
Ammonia Nitrogen	ug/l	--	50	60	60	30	140	30	70	170	120
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	3000	<2000	3000	<2000	<2000	4000	2000	<2000
Chemical Oxygen Demand	ug/l	--	34000	33000	32000	36000	29000	35000	49000	56000	36000
Chloride	ug/l	--	213000	224000	342000	443000	275000	328000	442000	269000	338000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1604	1660	1921	1811	1702	1875	2095	1549	1819
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	65200	63000	49000	85400	76000	80900	87700	80400	79300
Dissolved Organic Carbon	ug/l	--	27400	11600	25500	14200	9600	11600	17400	13100	10200
Dissolved Oxygen (Field)	ug/l	-- [7]	**4540**	9380	8480	**3010**	11590	11180	**3680**	13120	7020
Hardness, Calcium Carbonate	ug/l	--	520000	539000	561000	652000	539000	466000	599000	563000	556000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	100	<100	<100	400	200
Nitrite as N	ug/l	--	<50	<50	<50	<250 [18]	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	600	800	600	600	700	700	2400	1300	800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.46	7.6	7.77	7.54	8.00	7.88	7.71	7.72	7.51
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	20	<10	30	10	20	**310**	**140**	10
Sulphate	ug/l	--	305000	211000	215000	200000	202000	166000	133000	157000	168000
Temperature (Field)	deg c	-- [10]	22.9	7.9	22.5	18.2	0.4	20.1	17.7	1.1	16.5
Total Dissolved Solids	ug/l	--	1100000	988000	1330000	1520000	1110000	1150000	1280000	1050000	1140000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	29000	9000	2000	30000	21000	4000	91000	43000	<2000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<5 [17]	<1	<1	<1	1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**250**	161	174	196	171	189	166	118	172
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	148000	164000	158000	204000	154000	141000	186000	152000	160000
Chromium	ug/l	-- [13]	<1	<1	<5 [17]	1	<1	<1	4	**12**	<1
Cobalt	ug/l	0.9	<0.5	0.8	<2.5 [17]	0.5	0.5	<0.5	**1.4**	**2.8**	<0.5
Copper	ug/l	5	2.4	3.5	**5.7**	<0.5	2.0	2.0	**5.2**	**10.7**	2.6
Iron	ug/l	300	282	199	<500 [17]	**495**	**313**	101	**1960**	**3540**	201
Lead	ug/l	-- [14]	0.3	2.5	<0.5 [17]	0.6	0.5	0.3	**5.4**	4.6	0.2
Magnesium	ug/l	--	36300	31700	40600	34800	37400	27700	32800	44700	37800
Manganese	ug/l	--	160	106	170	518	308	49	676	340	222
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	14400	14000	14900	10300	10700	16200	14100	13300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	155000	149000	176000	266000	157000	180000	255000	195000	197000
Zinc	ug/l	30 [11]	7	**35**	<25 [17]	7	14	6	18	**31**	11
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	**6**	<1	<1	<1	<1	**5**	<1	<1

Parameter	Unit	PWQO [1]	S1 28-Aug-2019 S-1	S1 21-Nov-2019 S-1	S1 14-May-2020 S-1	S1 26-Aug-2020 S-1	S1 25-Nov-2020 S-1	S1 27-May-2021 S-1	S1 24-Aug-2021 S-1	S1 24-Nov-2021 S-1
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	167000	409000	342000	406000	404000	399000	404000	462000
Ammonia, unionized	ug/l	20	0.5	1.2	2.8	3.16	2.31	4.04	4.83	1.55
Ammonia Nitrogen	ug/l	--	40	130	80	110	120	140	180	210
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<2000	<2000	<2000	<2000	<2000	<2000	7000
Chemical Oxygen Demand	ug/l	--	53000	34000	29000	52000	30000	34000	38000	31000
Chloride	ug/l	--	251000	383000	445000	320000	279000	387000	376000	169000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1232	2350	2038	1976	1880	2151	2168	1953
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	52800	<500	72000	79400	83700	82500	82800	96100
Dissolved Organic Carbon	ug/l	--	14800	10100	26000	11900	10400	12800	13600	9000
Dissolved Oxygen (Field)	ug/l	-- [7]	6270	13560	11370	9660	14170	**5670**	6800	11850
Hardness, Calcium Carbonate	ug/l	--	325000	660000	611000	646000	586000	631000	630000	651000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	200	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	700	700	400	600	500	600	800	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.53	8.03	8.12	7.76	8.29	8.07	7.83	7.73
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**110**	30	<10	10	10	<10	20	10
Sulphate	ug/l	--	151000	220000	235000	210000	215000	194000	188000	222000
Temperature (Field)	deg c	-- [10]	19.2	0.6	15.1	23.6	2.4	14	20.4	6.3
Total Dissolved Solids	ug/l	--	794000	1180000	1200000	1160000	1190000	1380000	1320000	1050000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	68000	<2000	4000	4000	4000	2000	6000	44000
Metals										
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1	<1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	130	124	112	**216**	117	121	145	119
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	104000	189000	183000	192000	175000	184000	189000	183000
Chromium	ug/l	-- [13]	8	1	<1	<1	<1	2	<1	6
Cobalt	ug/l	0.9	**1.8**	0.6	**1.1**	0.9	<0.5	0.8	0.6	**3.0**
Copper	ug/l	5	**6.8**	4.0	1.6	1.9	1.2	1.3	1.6	**7.6**
Iron	ug/l	300	**2690**	295	**440**	**897**	**845**	**1640**	**2160**	**6440**
Lead	ug/l	-- [14]	3.2	0.3	0.1	0.1	<0.1	0.5	0.3	3.1
Magnesium	ug/l	--	16200	45600	37100	40200	36300	41600	38300	47100
Manganese	ug/l	--	202	409	418	171	300	390	540	1140
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10100	14100	12200	15900	11400	13800	16300	11400
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	142000	261000	194000	216000	172000	218000	251000	106000
Zinc	ug/l	30 [11]	25	11	8	<5	<5	5	<5	28
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	<1	<1	**4**	<4 [19]	**3**	<1	**2**

Parameter	Unit	PWQO [1]	S3 01-May-1981	S3 01-Apr-1984	S3 01-May-1987	S3 01-Oct-1987	S3 06-Sep-1992	S3 08-Jun-1993	S3 15-Nov-1993	S3 15-Jun-1994	S3 02-Nov-1994
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	--	122000	217000	184000	326000	114000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	80	30	610	100	100	100	--	140
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	--	2000	3000	1800	1900	2000
Chemical Oxygen Demand	ug/l	--	24000	1600	162000	93000	129000	45000	53900	25000	45000
Chloride	ug/l	--	22000	42000	123000	255300	43000	123000	301000	196000	101000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	330	600	761	1794	488	1004	1204	1261	739
Cyanide	ug/l	5 [6]	--	--	--	--	15	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	--	24900	59100	50100	--	27000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	12800	--	10300	8970	11460
Hardness, Calcium Carbonate	ug/l	--	96000	--	910000	534000	207670	328000	329000	285000	197000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	840	900	6060	100	2500
Nitrite as N	ug/l	--	--	--	--	--	100	100	100	100	100
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	--	3920	930	1770	3920	5320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	3820	830	1670	1670	5180
pH (Field)	-	6.5 - 8.5	7.9	--	8.15	7.82	6.4	8.32	7.84	8.15	7.95
Phosphate	ug/l	--	--	--	--	--	420	100	100	190	240
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	53000	--	39900	305400	41000	112000	93000	56000	70000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	170000	300000	380000	900000	328000	728000	724000	632000	371000
Total Organic Carbon	ug/l	--	--	--	--	--	10100	23700	8400	18100	10600
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	1	--	--	--	--
Barium	ug/l	--	--	--	--	--	80	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	10	--	--	58	48
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	0.1
Calcium	ug/l	--	--	--	252700	100000	50800	81000	102000	76000	61000
Chromium	ug/l	-- [13]	2	--	100	30	20	51	10	10	10
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	--	--	100	10	10	6	4	3	3.9
Iron	ug/l	300	200	--	700	400	21330	1334	2204	776	1002
Lead	ug/l	-- [14]	3	--	10	10	50	7.4	9.3	0.5	1.7
Magnesium	ug/l	--	--	--	56900	56800	19600	31000	18100	23000	11100
Manganese	ug/l	--	--	--	40	140	5600	36	294	70	129
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	1	--	10	40	20	20	20	20	20
Potassium	ug/l	--	--	--	--	--	2900	23000	10100	9100	11100
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	--	--	--	20600	54000	119000	121000	51000
Zinc	ug/l	30 [11]	3	--	10	210	60	10	39	28	27
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	17	2	2	2	10

Parameter	Unit	PWQO [1]	S3 28-Jun-1995	S3 14-Nov-1995	S3 12-Jun-1996	S3 12-Oct-1996	S3 17-Jun-1997	S3 05-Nov-1997	S3 05-Jun-1998	S3 28-Aug-1998	S3 30-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	226000	210000	235000	239000	193000	220000	285000	240000	256000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	10
Ammonia Nitrogen	ug/l	--	10	120	90	60	10	30	30	30	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	2000	1000	1000	2000	3000	1000	3000
Chemical Oxygen Demand	ug/l	--	58000	28000	24000	18000	24000	14000	40000	29000	35000
Chloride	ug/l	--	195000	172000	177000	188000	136000	226000	183000	229000	112000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	792	1240	1060	1250	854	1375	1343	1290	1480
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	68200	49200	46700	46300	36100	42600	57900	49900	61200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10660	11870	7300	8630	6970	12100	9580	8050	9390
Hardness, Calcium Carbonate	ug/l	--	402000	320000	299000	347000	276000	336000	524000	513000	402000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	2200	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	630	2100	560	850	860	830	1630	1600	610
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	620	1980	470	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.56	7.68	7.44	7.11	7.24	7.9	--	8.04	7.4
Phosphate	ug/l	--	200	90	0.1	100	110	50	120	90	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	166000	106000	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	824000	620000	528000	630	428000	689000	673000	650000	740000
Total Organic Carbon	ug/l	--	14900	9200	10300	9500	11900	9800	10700	11000	10300
Total Suspended Solids	ug/l	--	9000	5000	8000	5000	1000	22000	64000	9000	1000
Metals											
Arsenic	ug/l	100 [11]	100	--	--	--	--	--	--	--	--
Barium	ug/l	--	87	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	200	10	35	50	100	80	80	100	80
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--	--	--
Calcium	ug/l	--	131000	94300	90200	108000	87000	105000	160000	172000	122000
Chromium	ug/l	-- [13]	**10**	**10**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	4	2	4.4	1.8	4	**10.9**	**5.3**	2.8	2.7
Iron	ug/l	300	240	210	**326**	**380**	**340**	260	**1700**	**340**	290
Lead	ug/l	-- [14]	1.1	0.4	0.3	3	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	32100	20100	17700	18500	14000	17700	30100	20000	23200
Manganese	ug/l	--	62	130	305	210	180	100	1070	120	100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	20
Potassium	ug/l	--	27700	12400	11700	12300	8400	11000	8800	10500	6800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	65400	126000	109000	112000	82200	108000	102000	127000	168000
Zinc	ug/l	30 [11]	10	**50**	10	20	10	10	30	**960**	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	**2**	--	**24**	1	1	**4**	1

Parameter	Unit	PWQO [1]	S3 19-Oct-1999	S3 03-May-2000	S3 25-Oct-2000	S3 13-Jun-2001	S3 27-Sep-2001	S3 21-Nov-2001	S3 22-May-2002	S3 08-Nov-2002	S3 31-May-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	238000	244000	300000	272000	215000	212000	238000	216000	209000
Ammonia, unionized	ug/l	20	--	10	--	<20	<20	<20	--	--	--
Ammonia Nitrogen	ug/l	--	30	20	--	10	20	10	20	120	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	--	1000	1000	1000	1000	2000	1000
Chemical Oxygen Demand	ug/l	--	30000	21000	--	27000	9000	18000	26000	44000	26000
Chloride	ug/l	--	323000	215000	244000	212000	342000	290000	220000	261000	205000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1520	1290	1400	1050	1520	1200	1110	1300	1220
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	62700	38200	--	46400	40900	29700	29000	60000	55000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	9510	11660	8730	11200	8260	11130	10030	12800	9660
Hardness, Calcium Carbonate	ug/l	--	419000	360000	525000	366000	463000	359000	345000	408000	293000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	10	100	100	600	900	1400	900
Nitrite as N	ug/l	--	--	--	200	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	680	510	6180	530	520	420	400	1500	580
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	7.46	6.81	7.8	7.99	7.13	7.16	7	7.8
Phosphate	ug/l	--	40	20	2210	30	50	30	20	400	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	89000	53000	199000	85000	77000	126000	74000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	760000	650000	772000	708000	1030000	791000	696000	650000	657000
Total Organic Carbon	ug/l	--	10100	8800	--	12600	9900	11000	8000	11000	10000
Total Suspended Solids	ug/l	--	14000	32000	570000	63000	1000	9000	7000	244000	6000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	90	50	**600**	120	90	70	70	100	50
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	133000	111000	143000	108000	147000	114000	109000	126000	93600
Chromium	ug/l	-- [13]	--	--	**120**	**10**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.2	**7.3**	**62.7**	2	2.9	4.8	<1	**25.9**	4
Iron	ug/l	300	**530**	**320**	**6240**	**320**	200	80	100	**5210**	290
Lead	ug/l	-- [14]	0.2	0.2	**39.6**	0.5	0.2	0.2	<1	**11.9**	0.5
Magnesium	ug/l	--	20700	19900	40900	23300	23400	18000	17800	22600	14500
Manganese	ug/l	--	260	150	5460	150	110	30	90	420	220
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**80**	20	20	20	20	20	20
Potassium	ug/l	--	15400	8600	12000	4800	5500	8400	8300	13100	8000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	174000	126000	122000	113000	169000	154000	136000	154000	132000
Zinc	ug/l	30 [11]	10	10	**410**	**70**	**50**	10	20	**60**	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	**2**	**4**	**90**	1	1	1	1	1

Parameter	Unit	PWQO [1]	S3 03-Jul-2003	S3 22-Oct-2003	S3 17-May-2004	S3 21-Aug-2004	S3 18-Nov-2004	S3 25-May-2005	S3 09-Sep-2005 [20]	S3 09-Nov-2005	S3 24-May-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	285000	--	325000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	<5000	--	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	240000	194000	201000	264000	250000	234000	--	266000	233000
Ammonia, unionized	ug/l	20	--	--	<10	<10	<10	<10	--	<10	<10
Ammonia Nitrogen	ug/l	--	10	180	20	10	10	<10	--	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	2000	1000	1000	<3000	--	<3000	<3000
Chemical Oxygen Demand	ug/l	--	24000	29000	38000	29000	26000	21000	--	24000	23000
Chloride	ug/l	--	283000	244000	249000	280000	344000	267000	--	326000	212000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1400	1300	1270	1320	1300	1650	--	980	725
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	61000	48000	37200	29200	36000	58500	--	56500	59600
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	9200	--	9100	12000
Dissolved Oxygen (Field)	ug/l	-- [7]	6040	10400	8600	7400	9760	9540	--	8900	9330
Hardness, Calcium Carbonate	ug/l	--	393000	--	329000	400000	374000	367000	--	405000	311000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	<10	--	<10	--
Nitrate as N	ug/l	--	100	600	300	100	600	200	--	500	500
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	600	710	900	420	360	550	--	460	430
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.94	8.08	7.9	7.6	6.9	7.6	--	7.2	7.9
Phosphate	ug/l	--	70	60	70	20	30	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	20	--	20	20
Sulphate	ug/l	--	99000	86000	76000	83000	95000	75000	--	106000	70000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	18.8	--	1	9.5
Total Dissolved Solids	ug/l	--	913000	710000	635000	660000	650000	799000	--	945000	686000
Total Organic Carbon	ug/l	--	16000	19000	8200	9000	7200	--	--	--	--
Total Suspended Solids	ug/l	--	90000	11000	29000	40000	14000	5000	--	2000000	3000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	<1	--	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	91	52	70	82	53	76	--	70	54
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.5	--	<0.5	<0.1
Calcium	ug/l	--	120000	96900	101000	119000	114000	113000	--	126000	99300
Chromium	ug/l	-- [13]	2	6	1	2	2	<2	--	<2	<2
Cobalt	ug/l	0.9	--	--	--	--	--	**69**	--	**1**	0.5
Copper	ug/l	5	2	**27**	3	3	2	<2	--	<2	<2
Iron	ug/l	300	**488**	231	**894**	128	**828**	239	--	**341**	161
Lead	ug/l	-- [14]	1.4	2	0.8	1.3	0.7	1	--	1.5	0.9
Magnesium	ug/l	--	22600	14200	18400	25000	21700	20600	--	21900	15200
Manganese	ug/l	--	139	80	368	210	250	233	--	153	99
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	<0.05	--	<0.06	--
Molybdenum	ug/l	40	--	--	--	--	--	4	--	<5	--
Nickel	ug/l	25	10	10	10	10	10	<10	--	<10	--
Potassium	ug/l	--	11500	9400	10200	10200	9600	10500	--	10200	7500
Selenium	ug/l	100	--	--	--	--	--	<1	--	<1	--
Sodium	ug/l	--	158000	149000	143000	182000	183000	181000	--	203000	148000
Zinc	ug/l	30 [11]	18	16	21	**64**	15	**35**	--	9	8
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S3 15-Aug-2006	S3 16-Nov-2006	S3 08-May-2007	S3 22-Aug-2007 [20]	S3 20-Nov-2007	S3 23-May-2008	S3 12-Aug-2008 [20]	S3 06-Nov-2008	S3 13-May-2009 S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	302000	171000	232000	--	170000	244000	--	276000	262000
Ammonia, unionized	ug/l	20	<10	--	0.346508	--	<10	<20	--	<20	1.2
Ammonia Nitrogen	ug/l	--	<10	80	<10	--	<10	<10	--	<10	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	--	<3000	<3000	--	<3000	<1000
Chemical Oxygen Demand	ug/l	--	30000	19000	31000	--	29000	26000	--	14000	25000
Chloride	ug/l	--	295000	88600	207000	--	194000	199000	--	259000	174000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	1170
Conductivity (Field)	uS/cm	--	1470	490	900	--	750	1050	--	1200	1000
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	72500	42800	58000	--	44200	57300	--	66800	64900
Dissolved Organic Carbon	ug/l	--	16200	8800	7600	--	10400	5000	--	3700	10200
Dissolved Oxygen (Field)	ug/l	-- [7]	**1600**	8270	8010	--	10890	10590	--	8540	9390
Hardness, Calcium Carbonate	ug/l	--	403000	232000	297000	--	264000	269000	--	346000	313000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	700	200	--	500	200	--	200	300
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	460	820	330	--	580	550	--	470	560
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	--	8.1	--	8.1	8	--	7.5	7.6
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	**140**	<10	--	**150**	30	--	30	**60**
Sulphate	ug/l	--	93000	48000	65000	--	74000	54000	--	75000	53000
Temperature (Field)	deg c	-- [10]	16	8.3	15.5	--	2.1	13.3	--	10.5	17.9
Total Dissolved Solids	ug/l	--	895000	407000	663000	--	594000	642000	--	800000	761000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<3000	58000	<3000	--	46000	<3000	--	3000	16000
Metals											
Arsenic	ug/l	100 [11]	1.1	<1	0.7	--	1.2	1.8	--	0.8	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	102	41	66	--	45	40	--	63	70
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	<0.1	--	<0.1	<0.1	--	<0.1	<0.1
Calcium	ug/l	--	125000	72800	92000	--	83900	87000	--	110000	99000
Chromium	ug/l	-- [13]	<2	8	<2	--	4	<2	--	<2	5
Cobalt	ug/l	0.9	0.4	**1**	<0.5	--	**1.5**	<0.5	--	0.7	0.8
Copper	ug/l	5	2	**38**	**16**	--	5	<2	--	<2	2
Iron	ug/l	300	191	**2130**	252	--	**2120**	**355**	--	**1150**	**1310**
Lead	ug/l	-- [14]	0.5	**6**	0.2	--	**10**	<0.1	--	<0.1	<1
Magnesium	ug/l	--	22000	12100	16300	--	13200	12400	--	17100	16000
Manganese	ug/l	--	170	238	273	--	267	258	--	420	440
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10300	8800	8100	--	8000	6100	--	8000	7000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	177000	68800	134000	--	111000	135000	--	163000	127000
Zinc	ug/l	30 [11]	10	**42**	19	--	**36**	6	--	<5	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	--	<1	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S3 25-Aug-2009 A-7	S3 27-Nov-2009 [28] S-10	S3 18-May-2010 S-1	S3 18-Aug-2010 S-8	S3 14-Oct-2010 S-12	S3 19-May-2011 W-2	S3 16-Aug-2011 [2] N-8	S3 30-Nov-2011 [22] S3	S3 30-May-2012 S 3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	417000	250000	343000	363000	320000	232000	407000	228000	360000
Ammonia, unionized	ug/l	20	1.51	0.14	0.76	0.64	0.89	0.48	1.85	0.23	0.79
Ammonia Nitrogen	ug/l	--	190	80	140	150	70	50	280	30	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	2000	2000	1000	<1000	<1000	1000	2000	<2000
Chemical Oxygen Demand	ug/l	--	58000	25000	30000	35000	30000	25000	40000	20000	41000
Chloride	ug/l	--	211000	162000	186000	170000	197000	112000	186000	128000	170000
Conductivity	uS/cm	--	1590	1160	1350	1580	1500	914	1630	1080	--
Conductivity (Field)	uS/cm	--	1234	1014	1452	1429	610	879	1313	985	1356
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	107000	61200	73500	79500	89000	55100	90700	28800	91000
Dissolved Organic Carbon	ug/l	--	13300	8900	11800	12400	11400	9500	14500	7800	15000
Dissolved Oxygen (Field)	ug/l	-- [7]	9160	12410	11000	9000	13000	6210	6150	7780	5410
Hardness, Calcium Carbonate	ug/l	--	422000	326000	357000	541000	438000	275000	518000	315000	460000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	600	<100	<100	<100	300	<100	600	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<10
Nitrogen, Total Kjeldahl	ug/l	--	670	380	590	360	580	840	880	880	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.37	7.13	7.37	7.14	7.81	7.61	7.28	7.76	7.20
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	**90**	20	20	20	**40**	20	**40**	**59**
Sulphate	ug/l	--	82000	78000	81000	214000	155000	71000	158000	111000	130000
Temperature (Field)	deg c	-- [10]	18	5.5	12.9	16.8	10.9	13.1	18.3	6.1	22.0
Total Dissolved Solids	ug/l	--	1030000	754000	878000	1030000	975000	594000	1060000	702000	854000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	7000	24000	8000	4000	5000	4000	13000	6000	38000
Metals											
Arsenic	ug/l	100 [11]	1	<1	<1	<1	<1	<1	<10	<50	<1.0
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	90	60	90	110	70	60	100	200	100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	<0.10
Calcium	ug/l	--	131000	104000	110000	172000	139000	87000	158000	93000	150000
Chromium	ug/l	-- [13]	6	4	5	4	5	4	6	**<50**	<5.0
Cobalt	ug/l	0.9	**1.4**	0.7	**1.2**	0.8	0.6	0.4	0.8	<10	**1.1**
Copper	ug/l	5	2	2	2	3	3	2	2	**<10**	3.8
Iron	ug/l	300	**3050**	**1190**	**3840**	**3320**	**1510**	**740**	**4660**	**1300**	**8600**
Lead	ug/l	-- [14]	<1	<1	<1	<1	<1	<1	<1	**<10**	0.57
Magnesium	ug/l	--	23000	16000	20000	27000	22000	14000	30000	20000	27000
Manganese	ug/l	--	1210	490	1290	1020	520	280	1440	370	1500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8000	8000	7000	10000	9000	6000	10000	8000	9600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	119000	143000	153000	141000	81000	142000	89000	150000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<10	<10	<10	<50	20
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	<1	<1.0

Parameter	Unit	PWQO [1]	S3 22-Aug-2012 S-3	S3 29-Nov-2012 S3	S3 28-May-2013 S15	S3 15-Aug-2013 S3	S3 21-Nov-2013 SA-11	S3 28-May-2014 S3	S3 26-Aug-2014 S3	S3 13-Nov-2014 S-3	S3 27-May-2015 S-3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	450000	340000	320000	510000	330000	340000	440000	330000	327000
Ammonia, unionized	ug/l	20	2.1	0.83	0.86	3.3	0.31	1.47	2.3	0.35	5.8
Ammonia Nitrogen	ug/l	--	350	330	290	1300	63	230	750	140	320
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	2000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	50000	29000	27000	64000	24000	29000	47000	25000	29000
Chloride	ug/l	--	200000	210000	190000	180000	210000	200000	230000	230000	265000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1613	1520	1322	1695	1396	1299	1694	1237	1501
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	93000	76000	73000	130000	84000	77000	120000	79000	70500
Dissolved Organic Carbon	ug/l	--	<200	10000	12000	20000	10000	11000	14000	9500	14400
Dissolved Oxygen (Field)	ug/l	-- [7]	5500	**1990**	9370	**210**	**2090**	**5630**	**1400**	**2930**	5670
Hardness, Calcium Carbonate	ug/l	--	670000	480000	470000	580000	460000	440000	530000	430000	398000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	420	400	100	840	360	130	480	200
Nitrite as N	ug/l	--	<10	<10	<10	<10	<10	<10	<10	18	<50
Nitrogen, Total Kjeldahl	ug/l	--	1400	1500	1100	2100	780	1300	1600	620	900
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	420	400	100	840	360	130	500	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.26	7.48	7.04	6.97	7.71	7.40	6.96	7.31	7.71
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**69**	**42**	**35**	**100**	19	**97**	**32**	21	**60**
Sulphate	ug/l	--	270000	160000	120000	140000	140000	100000	100000	88000	97000
Temperature (Field)	deg c	-- [10]	17.6	0.2	14.9	15.0	1.8	14.2	17.8	4.9	18.7
Total Dissolved Solids	ug/l	--	1290000	994000	832000	1130000	996000	926000	1040000	860000	856000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	31000	8000	8000	<5000	7000	9000	22000	8000	2000
Metals											
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	160	80	77	110	97	76	96	76	96
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Calcium	ug/l	--	220000	170000	140000	210000	150000	140000	160000	140000	120000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1
Cobalt	ug/l	0.9	**0.94**	0.53	0.61	**1.7**	<0.50	0.71	**1.2**	0.57	0.6
Copper	ug/l	5	3.9	2.4	2.0	1.4	2.1	1.8	1.4	1.6	<0.5
Iron	ug/l	300	**7200**	**3300**	**3000**	**22000**	**1300**	**4000**	**11000**	**2000**	**2990**
Lead	ug/l	-- [14]	0.54	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.1
Magnesium	ug/l	--	43000	32000	26000	47000	31000	26000	35000	24000	23600
Manganese	ug/l	--	1500	1300	900	4800	550	1100	2800	760	1050
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	16000	9300	9300	11000	9300	9100	10000	9200	9020
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	180000	180000	150000	150000	170000	140000	160000	150000	147000
Zinc	ug/l	30 [11]	<5.0	<5.0	<5.0	9.7	<5.0	5.1	13	<5.0	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.2**	<1

Parameter	Unit	PWQO [1]	S3 25-Aug-2015 S-3	S3 25-Nov-2015 S-3	S3 24-May-2016 S-3	S3 18-Aug-2016 S-3	S3 16-Nov-2016 S-3	S3 18-May-2017 S-3	S3 28-Aug-2017 S-3	S3 28-Nov-2017 S-3	S3 23-May-2018 S-3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	547000	352000	367000	595000	351000	302000	425000	317000	330000
Ammonia, unionized	ug/l	20	**36.7**	0.67	2.91	13.86	0.82	3.02	2.81	2.4	0.81
Ammonia Nitrogen	ug/l	--	900	130	410	1830	160	170	410	170	220
Biochemical Oxygen Demand, 5 Day	ug/l	--	13000	<2000	2000	<2000	3000	<2000	4000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	48000	34000	37000	59000	25000	31000	30000	23000	27000
Chloride	ug/l	--	240000	328000	227000	198000	339000	198000	227000	223000	194000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1737	1682	1375	1743	1914	1201	1196	1241	1265
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	134000	70500	74700	111000	64900	40300	77600	51300	69100
Dissolved Organic Carbon	ug/l	--	15500	9800	12600	37900	9000	21900	14600	8400	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	**570**	**550**	5890	**240**	**1140**	5960	**5350**	**4740**	**4480**
Hardness, Calcium Carbonate	ug/l	--	474000	610000	592000	523000	475000	331000	445000	362000	347000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	500	<100	100	<100	200	<100	600	100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1800	700	1000	2800	600	700	600	700	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.14	7.77	7.34	7.32	7.53	7.71	7.41	8.20	7.07
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	20	10	**110**	30	30	20	10	20
Sulphate	ug/l	--	117000	127000	106000	212000	140000	81000	98000	75000	60000
Temperature (Field)	deg c	-- [10]	16.6	0.7	17.4	18.9	7.5	18.4	14.8	1.1	16.9
Total Dissolved Solids	ug/l	--	1060000	961000	872000	1250000	1130000	742000	950000	758000	704000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	47000	8000	13000	70000	6000	9000	12000	<2000	4000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<5 [17]	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	102	85	109	147	101	**444**	95	90	105
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1
Calcium	ug/l	--	132000	204000	173000	145000	147000	99700	139000	110000	107000
Chromium	ug/l	-- [13]	1	<1	2	<1	<1	<5 [17]	<1	<1	<1
Cobalt	ug/l	0.9	**1.1**	<0.5	**1.6**	**1.3**	0.6	<2.5 [17]	0.7	0.6	0.5
Copper	ug/l	5	<0.5	<0.5	1.6	2.7	1.0	4.2	<0.5	1.5	0.7
Iron	ug/l	300	**12700**	**1500**	**19200**	**13200**	**1350**	**4320**	**4860**	**1150**	**1650**
Lead	ug/l	-- [14]	0.2	<0.1	0.4	<0.1	<0.1	<0.5 [17]	0.1	0.1	<0.1
Magnesium	ug/l	--	34600	24300	38800	39300	26300	19800	23900	21200	19200
Manganese	ug/l	--	2780	565	2970	2220	616	520	1210	653	831
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10800	8450	10300	14700	10800	7920	7790	8030	7440
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	199000	149000	147000	187000	106000	138000	137000	119000
Zinc	ug/l	30 [11]	10	5	9	8	6	<25 [17]	<5	7	6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	<1	**4**	**5**	**2**	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S3 30-Aug-2018 S-3	S3 28-Nov-2018 S-3	S3 20-Jun-2019 S-3	S3 28-Aug-2019 S-3	S3 21-Nov-2019 S-3	S3 14-May-2020 S-3	S3 26-Aug-2020 S-3	S3 25-Nov-2020 S-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	784000	358000	318000	208000	311000	281000	385000	321000
Ammonia, unionized	ug/l	20	5.39	0.31	2.03	2.27	0.79	1.38	2.21	2.59
Ammonia Nitrogen	ug/l	--	3490	80	170	250	170	240	390	240
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	<2000	<2000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	68000	26000	28000	52000	24000	27000	20000	33000
Chloride	ug/l	--	203000	370000	160000	234000	322000	303000	336000	340000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1831	1617	1213	1132	1828	1457	1835	41
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	134000	54600	67200	70900	655	59100	77200	67400
Dissolved Organic Carbon	ug/l	--	29400	24900	7400	18600	8400	24400	11700	8600
Dissolved Oxygen (Field)	ug/l	-- [7]	**1400**	11190	**2070**	**1330**	**4540**	**5940**	7240	11430
Hardness, Calcium Carbonate	ug/l	--	733000	445000	315000	322000	528000	361000	493000	468000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	900	800	200	500	500	600	600
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	5400	900	700	1000	600	600	900	600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.73	7.56	7.61	7.46	7.71	7.38	7.32	8.10
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	**50**	30	**70**	20	<10	20	**70**
Sulphate	ug/l	--	31000	97000	146000	117000	120000	103000	114000	108000
Temperature (Field)	deg c	-- [10]	15.7	3.1	16.1	17	1.2	13.4	15	0.6
Total Dissolved Solids	ug/l	--	1100000	978000	764000	762000	926000	780000	972000	1020000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	116000	2000	4000	10000	2000	3000	7000	34000
Metals										
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	54	92	100	76	74	49	79	51
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	197000	128000	85500	98300	155000	111000	148000	141000
Chromium	ug/l	-- [13]	2	1	2	1	<1	<1	<1	1
Cobalt	ug/l	0.9	**2.6**	0.5	0.6	0.6	0.7	<0.5	0.8	0.8
Copper	ug/l	5	0.9	4.3	3.0	3.5	1.9	1.7	1.4	1.8
Iron	ug/l	300	**44700**	**935**	**1870**	**2020**	**2270**	**2160**	**2980**	**3820**
Lead	ug/l	-- [14]	<0.1	0.2	0.2	0.3	0.1	0.1	<0.1	0.5
Magnesium	ug/l	--	58800	30300	24700	18600	34300	20000	29800	28400
Manganese	ug/l	--	6550	269	438	738	885	647	1170	964
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	14100	11300	9230	9830	12400	7520	11100	9700
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	125000	251000	128000	126000	171000	129000	187000	168000
Zinc	ug/l	30 [11]	6	11	<5	10	8	<5	5	<5
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	<1	<1	**5**	<1	<1	**6**	<4 [19]

Parameter	Unit	PWQO [1]	S3 27-May-2021 S-3	S3 24-Aug-2021 S-3	S3 24-Nov-2021 S-3
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	392000	457000	429000
Ammonia, unionized	ug/l	20	2.67	2.58	0.68
Ammonia Nitrogen	ug/l	--	490	1040	760
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	3000	<2000
Chemical Oxygen Demand	ug/l	--	51000	54000	60000
Chloride	ug/l	--	289000	282000	331000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	1715	1839	2032
Cyanide	ug/l	5 [6]	--	--	--
Dissolved Inorganic Carbon	ug/l	--	86600	91400	40300
Dissolved Organic Carbon	ug/l	--	13700	14400	14500
Dissolved Oxygen (Field)	ug/l	-- [7]	**240**	**470**	**3400**
Hardness, Calcium Carbonate	ug/l	--	470000	540000	569000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	500	300	900
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1300	2100	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.26	6.75	6.81
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**50**	**140**	**40**
Sulphate	ug/l	--	116000	112000	187000
Temperature (Field)	deg c	-- [10]	16.3	21.5	6.4
Total Dissolved Solids	ug/l	--	1000000	1110000	1160000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	24000	52000	22000
Metals					
Arsenic	ug/l	100 [11]	<1	1	<1
Barium	ug/l	--	--	--	--
Boron	ug/l	200 [12]	65	79	174
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	142000	160000	182000
Chromium	ug/l	-- [13]	2	4	1
Cobalt	ug/l	0.9	**1.3**	**1.8**	**1.8**
Copper	ug/l	5	1.8	2.5	1.8
Iron	ug/l	300	**6480**	**13300**	**9860**
Lead	ug/l	-- [14]	0.5	2.0	0.7
Magnesium	ug/l	--	28100	34000	27500
Manganese	ug/l	--	1530	1810	2970
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	9290	12300	11000
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	178000	171000	205000
Zinc	ug/l	30 [11]	28	**90**	**77**
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**7**	<1	**12**

Parameter	Unit	PWQO [1]	S5 19-Jun-1989	S5 24-Jul-1989	S5 17-Nov-1989	S5 27-Mar-1990	S5 16-Apr-1990	S5 18-May-1990	S5 27-Jun-1990	S5 04-Oct-1990	S5 06-Nov-1990
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	892000	1029000	980000	1330000	1254000	1048000	955000	973000	1008000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4500	1830	3460	10000	530	660	6100	4100	4000
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	6000	5000	27000	14000	6000	35000	2000	8000
Chemical Oxygen Demand	ug/l	--	82000	65000	105000	287000	209000	202000	332000	218000	235000
Chloride	ug/l	--	136000	148000	177000	245000	239000	202000	234000	199000	193000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2199	2203	2200	3207	2614	2570	2213	2323	2196
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	4760	193000	211000	395000	302000	323000	331000	238000	291000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	<1000	500	6600	450	3440	4650
Hardness, Calcium Carbonate	ug/l	--	860000	414000	816000	1669000	1521000	1078000	958000	1045000	1027000
Nitrate as N	ug/l	--	<100	<100	6580	4000	7300	2900	<100	<100	<100
Nitrite as N	ug/l	--	<100	<100	250	<1000	<100	800	<100	<100	30
Nitrogen, Total Kjeldahl	ug/l	--	4760	1870	6470	12690	14000	12000	13000	6050	5590
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	260	40	3010	2690	13470	11340	6900	1950	1590
pH (Field)	-	6.5 - 8.5	7.64	7.63	7.2	7.9	7.28	7.81	8.18	8.01	8.08
Phosphate	ug/l	--	<100	<100	250	100	930	160	470	130	240
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	30000	25000	96000	156000	166000	47000	51000	70000	45000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1100000	1100000	1100000	1600000	1300000	1280000	1100000	1160000	1100000
Total Organic Carbon	ug/l	--	800	--	33900	65000	63000	44000	73000	41000	39000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	277000	83000	238000	526000	453000	309000	243000	281000	284000
Chromium	ug/l	-- [13]	**20**	**240**	**<10**	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**<100**	**<100**	**30**	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**
Iron	ug/l	300	**14900**	**8990**	**9900**	**16970**	**7600**	**10000**	**30010**	**510**	**8430**
Lead	ug/l	-- [14]	**30**	**80**	**70**	**170**	**<50**	**<50**	**90**	**<50**	**<50**
Magnesium	ug/l	--	41000	56000	53600	86000	84000	74000	85000	83000	77000
Manganese	ug/l	--	2370	2030	2460	3120	2300	1700	1800	1930	2480
Nickel	ug/l	25	<100	<100	**30**	<50	<50	<50	<50	<50	<50
Potassium	ug/l	--	19000	31000	24900	51000	43000	14500	32000	46000	26000
Sodium	ug/l	--	127000	176000	173000	217000	235000	192000	215000	291000	224000
Zinc	ug/l	30 [11]	**260**	**120**	**40**	**270**	<50	**70**	**130**	<50	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<2	**8**	**10**	**75**	**17**	**8**	<2	<2	<2

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S5 27-Nov-1990	S5 02-Nov-1991	S5 24-Nov-1991	S5 09-Jun-1992	S5 15-Nov-1993	S5 15-Jun-1994	S5 02-Nov-1994	S5 12-Jun-1996	S5 26-Aug-1998
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	718000	1296000	1256000	712000	320000	468000	113000	616000	88000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4600	29000	9290	2630	100	1430	100	500	260
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	16000	6000	1700	4000	1600	4200	7000	2000
Chemical Oxygen Demand	ug/l	--	141000	278000	300000	148000	106000	47000	62000	51000	19000
Chloride	ug/l	--	80000	389000	244000	182000	241000	83000	36000	72000	15500
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2384	6500	2792	2274	2030	1711	756	1640	306
Cyanide	ug/l	5 [6]	--	--	--	**107**	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	270000	--	351000	165700	97200	--	27000	101000	17000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4890	4800	6900	2500	4900	5910	12050	5880	6290
Hardness, Calcium Carbonate	ug/l	--	915000	1068000	1194000	774150	938000	603000	247000	718000	175000
Nitrate as N	ug/l	--	<100	--	7700	600	3350	240	100	--	--
Nitrite as N	ug/l	--	<10	--	140	<100	100	--	100	--	--
Nitrogen, Total Kjeldahl	ug/l	--	6610	31500	13900	7650	3580	5040	4760	1750	820
Nitrogen, Nitrate-Nitrite	ug/l	--	--	1530	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	2010	2500	4610	5020	3480	3610	4660	1250	--
pH (Field)	-	6.5 - 8.5	7.8	7.2	7.62	7.46	7.09	7.19	8.18	**5.92**	7.68
Phosphate	ug/l	--	<100	700	400	<100	200	10	460	1340	960
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	36000	12000	121000	240000	796000	184000	194000	--	80
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1200000	3250000	1400000	1384000	1692000	857000	349000	820000	154000
Total Organic Carbon	ug/l	--	42000	--	50000	28200	17200	20000	9100	16300	6000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	67000	244000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	<1	--	--	--	--	--
Barium	ug/l	--	--	--	--	160	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	**3860**	--	**2372**	**1081**	**1630**	**350**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	**0.3**	--	--
Calcium	ug/l	--	244000	269300	341000	179100	244000	150000	67000	167000	37200
Chromium	ug/l	-- [13]	**<50**	**<10**	**<50**	**<20**	**10**	**11**	**10**	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**<50**	**20**	**<50**	**10**	**6**	3.1	**13.6**	**5.7**	**13.2**
Iron	ug/l	300	**14210**	**450**	**8900**	**22000**	**19170**	**7648**	**15040**	**2740**	**18600**
Lead	ug/l	-- [14]	**<50**	<1	**<50**	**100**	**20.9**	0.5	3.6	1	0.6
Magnesium	ug/l	--	74000	96000	83000	79300	79900	55300	19200	72300	19600
Manganese	ug/l	--	2720	1400	3300	2620	3347	1348	352	2480	240
Nickel	ug/l	25	<50	**50**	<50	<20	**37**	20	20	20	**50**
Potassium	ug/l	--	25000	76000	49000	17100	20700	14900	11800	7420	3500
Sodium	ug/l	--	241000	270000	259000	195800	194000	134000	44000	128000	19000
Zinc	ug/l	30 [11]	<50	20	<50	**230**	**2334**	**53**	**150**	19	**70**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**15**	**9**	**16**	<2	**2**	**12**	1	**163**	**5**

Parameter	Unit	PWQO [1]	S5 25-May-2005 [20]	S5 09-Sep-2005 [20]	S5 09-Nov-2005 [20]	S5 24-May-2006 [20]	S5 15-Aug-2006 [20]	S5 16-Nov-2006	S5 08-May-2007 [20]	S5 22-Aug-2007 [20]	S5 20-Nov-2007 [20]
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	--	--	458000	--	--	--
Ammonia, unionized	ug/l	20	--	--	--	--	--	<10	--	--	--
Ammonia Nitrogen	ug/l	--	--	--	--	--	--	200	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	--	--	6000	--	--	--
Chemical Oxygen Demand	ug/l	--	--	--	--	--	--	105000	--	--	--
Chloride	ug/l	--	--	--	--	--	--	49700	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	--	--	750	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	--	--	119000	--	--	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	31700	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	--	**4990**	--	--	--
Hardness, Calcium Carbonate	ug/l	--	--	--	--	--	--	491000	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	200	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	--	--	3760	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	--	--	--	--	6.7	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	**590**	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	101000	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	7.3	--	--	--
Total Dissolved Solids	ug/l	--	--	--	--	--	--	706000	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	--	--	--	114000	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	<1	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	**526**	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.5	--	--	--
Calcium	ug/l	--	--	--	--	--	--	129000	--	--	--
Chromium	ug/l	-- [13]	--	--	--	--	--	**14**	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	**3**	--	--	--
Copper	ug/l	5	--	--	--	--	--	**52**	--	--	--
Iron	ug/l	300	--	--	--	--	--	**3960**	--	--	--
Lead	ug/l	-- [14]	--	--	--	--	--	**10**	--	--	--
Magnesium	ug/l	--	--	--	--	--	--	40900	--	--	--
Manganese	ug/l	--	--	--	--	--	--	237	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	--	--	43000	--	--	--
Sodium	ug/l	--	--	--	--	--	--	62600	--	--	--
Zinc	ug/l	30 [11]	--	--	--	--	--	**60**	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	--	<1	--	--	--

Parameter	Unit	PWQO [1]	S5 23-May-2008 [20]	S5 12-Aug-2008 [20]	S5 06-Nov-2008 [20]	S5 13-May-2009 S-4	S5 25-Aug-2009 [20] S5	S5 27-Nov-2009 S-3	S5 18-May-2010 [37] S5	S5 18-Aug-2010 [2] S-2	S5 14-Oct-2010 [2] S-10
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	610000	--	417000	--	220000	566000
Ammonia, unionized	ug/l	20	--	--	--	0.32	--	0.02	--	0.08	0.32
Ammonia Nitrogen	ug/l	--	--	--	--	120	--	80	--	130	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	<1000	--	4000	--	3000	2000
Chemical Oxygen Demand	ug/l	--	--	--	--	33000	--	75000	--	30000	35000
Chloride	ug/l	--	--	--	--	37000	--	53000	--	64000	40000
Conductivity	uS/cm	--	--	--	--	1290	--	1120	--	919	1280
Conductivity (Field)	uS/cm	--	--	--	--	1025	--	992	--	855	1070
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	133000	--	129000	--	50600	141000
Dissolved Organic Carbon	ug/l	--	--	--	--	11400	--	10100	--	15500	11300
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	**2140**	--	**4160**	--	**2920**	**5480**
Hardness, Calcium Carbonate	ug/l	--	--	--	--	573000	--	408000	--	305000	632000
Nitrate as N	ug/l	--	--	--	--	<100	--	300	--	180	<100
Nitrite as N	ug/l	--	--	--	--	<100	--	<100	--	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	1050	--	650	--	1280	760
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	--	--	7.2	--	**6.33**	--	**6.27**	7.19
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**130**	--	**340**	--	**260**	**200**
Sulphate	ug/l	--	--	--	--	78000	--	123000	--	159000	107000
Temperature (Field)	deg c	-- [10]	--	--	--	8.8	--	4.8	--	16.8	10.1
Total Dissolved Solids	ug/l	--	--	--	--	839000	--	728000	--	597000	832000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	--	6000	--	36000	--	21000	27000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	--	<50	--	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	**880**	--	**700**	--	**300**	**560**
Cadmium	ug/l	0.2 [11]	--	--	--	<0.1	--	**<10**	--	<0.1	<0.1
Calcium	ug/l	--	--	--	--	142000	--	104000	--	86000	179000
Chromium	ug/l	-- [13]	--	--	--	6	--	**<20**	--	4	4
Cobalt	ug/l	0.9	--	--	--	**1.0**	--	<5	--	0.4	**1.5**
Copper	ug/l	5	--	--	--	2	--	**20**	--	5	2
Iron	ug/l	300	--	--	--	**770**	--	**2400**	--	260	**1300**
Lead	ug/l	-- [14]	--	--	--	<1	--	**<10**	--	<1	<1
Magnesium	ug/l	--	--	--	--	53000	--	36000	--	22000	45000
Manganese	ug/l	--	--	--	--	420	--	190	--	70	760
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	11000	--	16000	--	17000	15000
Sodium	ug/l	--	--	--	--	78000	--	68000	--	73000	64000
Zinc	ug/l	30 [11]	--	--	--	<10	--	<50	--	<10	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	<1	--	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S5 19-May-2011 [2] W-14	S5 16-Aug-2011 [20] S-5	S5 30-Nov-2011 [20] S5	S5 30-May-2012 [20] S5	S5 22-Aug-2012 [20] S-5	S5 29-Nov-2012 [20] S5	S5 28-May-2013 S5	S5 15-Aug-2013 [20] S5	S5 21-Nov-2013 [20] S-5
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	669000	--	--	--	--	--	540000	--	--
Ammonia, unionized	ug/l	20	0.41	--	--	--	--	--	0.15	--	--
Ammonia Nitrogen	ug/l	--	170	--	--	--	--	--	330	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	--	--	--	--	--	3000	--	--
Chemical Oxygen Demand	ug/l	--	35000	--	--	--	--	--	48000	--	--
Chloride	ug/l	--	24000	--	--	--	--	--	49000	--	--
Conductivity	uS/cm	--	1260	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1181	--	--	--	--	--	1107	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	166000	--	--	--	--	--	110000	--	--
Dissolved Organic Carbon	ug/l	--	12200	--	--	--	--	--	17000	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**2050**	--	--	--	--	--	**1740**	--	--
Hardness, Calcium Carbonate	ug/l	--	615000	--	--	--	--	--	600000	--	--
Nitrate as N	ug/l	--	<100	--	--	--	--	--	<100	--	--
Nitrite as N	ug/l	--	<100	--	--	--	--	--	<10	--	--
Nitrogen, Total Kjeldahl	ug/l	--	810	--	--	--	--	--	2100	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	<100	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.12	--	--	--	--	--	**6.37**	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**140**	--	--	--	--	--	**530**	--	--
Sulphate	ug/l	--	41000	--	--	--	--	--	75000	--	--
Temperature (Field)	deg c	-- [10]	9.7	--	--	--	--	--	10.9	--	--
Total Dissolved Solids	ug/l	--	819000	--	--	--	--	--	748000	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	23000	--	--	--	--	--	12000	--	--
Metals											
Arsenic	ug/l	100 [11]	<10	--	--	--	--	--	1.7	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**520**	--	--	--	--	--	**790**	--	--
Cadmium	ug/l	0.2 [11]	<0.1	--	--	--	--	--	<0.10	--	--
Calcium	ug/l	--	149000	--	--	--	--	--	170000	--	--
Chromium	ug/l	-- [13]	4	--	--	--	--	--	<5.0	--	--
Cobalt	ug/l	0.9	**1.1**	--	--	--	--	--	**1.7**	--	--
Copper	ug/l	5	1	--	--	--	--	--	3.9	--	--
Iron	ug/l	300	**1280**	--	--	--	--	--	**2300**	--	--
Lead	ug/l	-- [14]	<1	--	--	--	--	--	1.2	--	--
Magnesium	ug/l	--	59000	--	--	--	--	--	56000	--	--
Manganese	ug/l	--	510	--	--	--	--	--	900	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10000	--	--	--	--	--	15000	--	--
Sodium	ug/l	--	60000	--	--	--	--	--	77000	--	--
Zinc	ug/l	30 [11]	<10	--	--	--	--	--	21	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	--	--	--	<1.0	--	--

Parameter	Unit	PWQO [1]	S5 28-May-2014 S5	S5 26-Aug-2014 [20] S5	S5 13-Nov-2014 S-5	S5 27-May-2015 [20] S-5	S5 25-Aug-2015 [20] S-5	S5 25-Nov-2015 [20] S5	S5 24-May-2016 [20] S-5	S5 18-Aug-2016 [20] S5	S5 16-Nov-2016 [20] S5
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	470000	--	600000	--	--	--	--	--	--
Ammonia, unionized	ug/l	20	0.45	--	0.02	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	290	--	78	--	--	--	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	<2000	--	--	--	--	--	--
Chemical Oxygen Demand	ug/l	--	42000	--	26000	--	--	--	--	--	--
Chloride	ug/l	--	32000	--	35000	--	--	--	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	994	--	1150	--	--	--	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	100000	--	140000	--	--	--	--	--	--
Dissolved Organic Carbon	ug/l	--	15000	--	9500	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**1160**	--	**3540**	--	--	--	--	--	--
Hardness, Calcium Carbonate	ug/l	--	510000	--	640000	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	--	--	--	--	--	--
Nitrite as N	ug/l	--	17	--	13	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1700	--	910	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	<100	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.81	--	**6.29**	--	--	--	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**230**	--	**130**	--	--	--	--	--	--
Sulphate	ug/l	--	110000	--	160000	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	13.3	--	5.7	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	718000	--	836000	--	--	--	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	--	5000	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	1.9	--	<1.0	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**710**	--	**870**	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	<0.10	--	<0.10	--	--	--	--	--	--
Calcium	ug/l	--	140000	--	190000	--	--	--	--	--	--
Chromium	ug/l	-- [13]	<5.0	--	<5.0	--	--	--	--	--	--
Cobalt	ug/l	0.9	**1.0**	--	**1.6**	--	--	--	--	--	--
Copper	ug/l	5	1.5	--	1.7	--	--	--	--	--	--
Iron	ug/l	300	**710**	--	**1000**	--	--	--	--	--	--
Lead	ug/l	-- [14]	<0.50	--	<0.50	--	--	--	--	--	--
Magnesium	ug/l	--	43000	--	59000	--	--	--	--	--	--
Manganese	ug/l	--	860	--	640	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	--	17000	--	--	--	--	--	--
Sodium	ug/l	--	69000	--	79000	--	--	--	--	--	--
Zinc	ug/l	30 [11]	<5.0	--	6.1	--	--	--	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	--	**3.0**	--	--	--	--	--	--

Parameter	Unit	PWQO [1]	S5 18-May-2017 S-5	S5 28-Aug-2017 [20] S5	S5 28-Nov-2017 S-5	S5 23-May-2018 S-5	S5 30-Aug-2018 [20] S-5	S5 28-Nov-2018 S-5	S5 20-Jun-2019 [20] S-5	S5 28-Aug-2019 [20] S-5	S5 21-Nov-2019 [20] S-5
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	557000	--	724000	823000	--	320000	--	--	--
Ammonia, unionized	ug/l	20	0.38	--	0.02	0.25	--	0.03	--	--	--
Ammonia Nitrogen	ug/l	--	60	--	50	80	--	40	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	--	<2000	<2000	--	4000	--	--	--
Chemical Oxygen Demand	ug/l	--	41000	--	28000	33000	--	42000	--	--	--
Chloride	ug/l	--	24000	--	34000	23000	--	58000	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1139	--	1036	1373	--	842	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	73000	--	76000	157000	--	60500	--	--	--
Dissolved Organic Carbon	ug/l	--	28400	--	66100	11400	--	15400	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**3070**	--	**3620**	**2450**	--	8240	--	--	--
Hardness, Calcium Carbonate	ug/l	--	609000	--	730000	579000	--	423000	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	500	--	--	--
Nitrite as N	ug/l	--	<50	--	<50	<50	--	<50	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	900	--	600	800	--	1500	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.32	--	6.66	7.16	--	7.01	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**70**	--	**60**	**90**	--	**190**	--	--	--
Sulphate	ug/l	--	111000	--	163000	40000	--	153000	--	--	--
Temperature (Field)	deg c	-- [10]	16.4	--	0.2	12.2	--	0.4	--	--	--
Total Dissolved Solids	ug/l	--	740000	--	888000	818000	--	558000	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	235000	--	32000	4000	--	11000	--	--	--
Metals											
Arsenic	ug/l	100 [11]	<5 [17]	--	<1	<1	--	1	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**774**	--	**519**	**706**	--	**399**	--	--	--
Cadmium	ug/l	0.2 [11]	<0.5 [17]	--	<0.1	**0.3**	--	<0.1	--	--	--
Calcium	ug/l	--	149000	--	183000	146000	--	118000	--	--	--
Chromium	ug/l	-- [13]	<5 [17]	--	6	<1	--	2	--	--	--
Cobalt	ug/l	0.9	<2.5 [17]	--	**1.2**	0.6	--	0.5	--	--	--
Copper	ug/l	5	4.2	--	2.6	<0.5	--	**8.8**	--	--	--
Iron	ug/l	300	<500 [17]	--	**1070**	**337**	--	284	--	--	--
Lead	ug/l	-- [14]	<0.5 [17]	--	0.8	0.1	--	0.5	--	--	--
Magnesium	ug/l	--	57600	--	66600	51900	--	31400	--	--	--
Manganese	ug/l	--	370	--	377	308	--	16	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	11800	--	12000	8670	--	17800	--	--	--
Sodium	ug/l	--	58300	--	66600	54600	--	59200	--	--	--
Zinc	ug/l	30 [11]	<25 [17]	--	11	7	--	13	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	--	<1	--	--	--

Parameter	Unit	PWQO [1]	S5 14-May-2020 S-5	S5 26-Aug-2020 [20] S-5	S5 25-Nov-2020 [20] S-5	S5 27-May-2021 [20] S-5	S5 24-Aug-2021 [20] S5	S5 24-Nov-2021 S-5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	-- [5]	518000	--	--	--	--	312000
Ammonia, unionized	ug/l	20	0.87	--	--	--	--	0.08
Ammonia Nitrogen	ug/l	--	90	--	--	--	--	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	--	--	--	--	3000
Chemical Oxygen Demand	ug/l	--	122000	--	--	--	--	34000
Chloride	ug/l	--	34000	--	--	--	--	36000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1154	--	--	--	--	1063
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	98100	--	--	--	--	62800
Dissolved Organic Carbon	ug/l	--	39700	--	--	--	--	11900
Dissolved Oxygen (Field)	ug/l	-- [7]	6600	--	--	--	--	332000
Hardness, Calcium Carbonate	ug/l	--	378000	--	--	--	--	457000
Nitrate as N	ug/l	--	<100	--	--	--	--	<100
Nitrite as N	ug/l	--	<50	--	--	--	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	4200	--	--	--	--	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.75	--	--	--	--	7.58
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**540**	--	--	--	--	**110**
Sulphate	ug/l	--	131000	--	--	--	--	216000
Temperature (Field)	deg c	-- [10]	9.1	--	--	--	--	2.6
Total Dissolved Solids	ug/l	--	712000	--	--	--	--	650000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	15000	--	--	--	--	33000
Metals								
Arsenic	ug/l	100 [11]	<1	--	--	--	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**298**	--	--	--	--	**258**
Cadmium	ug/l	0.2 [11]	<0.1	--	--	--	--	<0.1
Calcium	ug/l	--	98700	--	--	--	--	128000
Chromium	ug/l	-- [13]	2	--	--	--	--	**41**
Cobalt	ug/l	0.9	0.6	--	--	--	--	0.6
Copper	ug/l	5	2.9	--	--	--	--	**6.7**
Iron	ug/l	300	**667**	--	--	--	--	**602**
Lead	ug/l	-- [14]	0.8	--	--	--	--	0.9
Magnesium	ug/l	--	32000	--	--	--	--	33100
Manganese	ug/l	--	92	--	--	--	--	41
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	6990	--	--	--	--	13900
Sodium	ug/l	--	39200	--	--	--	--	52200
Zinc	ug/l	30 [11]	17	--	--	--	--	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	--	--	**6**

Parameter	Unit	PWQO [1]	S8 18-May-1990	S8 27-Jun-1990	S8 04-Oct-1990	S8 06-Nov-1990	S8 27-Nov-1990	S8 25-Apr-1991	S8 08-Jun-1992	S8 15-Nov-1993	S8 15-Jun-1994	S8 02-Nov-1994
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	442000	720000	304000	235000	328000	360000	760000	202000	326000	226000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	<100	<100	680	440	2000	2110	950	100	100	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	6000	1000	1000	2000	6000	1900	1800	1900	2100
Chemical Oxygen Demand	ug/l	--	107000	336000	137000	116000	92000	164000	230000	60100	38000	51000
Chloride	ug/l	--	200000	299000	161000	92000	50000	170000	268000	288000	129000	56000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1888	1980	1302	687	1199	1482	2941	890	1117	973
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	143	--	--	--
Dissolved Inorganic Carbon	ug/l	--	103000	255000	74000	43000	84000	95000	168200	56000	--	54000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12000	9950	500	8900	10080	10000	6900	10700	7780	12800
Hardness, Calcium Carbonate	ug/l	--	565000	731000	374000	224000	344000	510000	797630	285000	285000	240000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	11000	960	1970	2730	2740	8500	240	3980	100	1600
Nitrite as N	ug/l	--	<100	1000	<100	50	<10	20	<100	20	--	10
Nitrogen, Total Kjeldahl	ug/l	--	6700	6900	1950	1210	3820	4800	5180	1030	3920	5320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	6600	6800	1270	770	1820	2690	4230	930	3820	5220
pH (Field)	-	6.5 - 8.5	8.24	8.19	8.45	8.04	8.1	8.06	7.93	7.04	7.67	7.93
Phosphate	ug/l	--	410	300	190	160	<100	<100	100	180	190	320
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	167000	133000	119000	48000	98000	173000	398000	96000	56000	156000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	--	--	650000	340000	600000	740000	1936000	584000	559000	488000
Total Organic Carbon	ug/l	--	40000	80000	22000	17000	21000	29000	28200	10200	18100	8900
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	2450
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	<1	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	80	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--	5300	--	58	142
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--	0.1
Calcium	ug/l	--	127000	139000	95000	60000	85000	130000	144700	80000	76000	55000
Chromium	ug/l	-- [13]	<50	<50	<50	<50	<50	<50	<20	10	10	10
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	<50	<50	<50	<50	<50	<50	<10	3	3	13.7
Iron	ug/l	300	670	13640	190	910	2410	630	1500	1688	776	3717
Lead	ug/l	-- [14]	<50	<50	<50	<50	<50	<50	70	8.2	0.5	2.5
Magnesium	ug/l	--	60000	93000	33000	18000	32000	46000	105900	21000	23000	24700
Manganese	ug/l	--	300	980	80	170	580	290	920	93	70	216
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	<50	<50	<50	<50	<50	<50	<20	20	20	20
Potassium	ug/l	--	35500	52000	35000	15000	18000	1161000	35300	10100	9100	10000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	3.4
Sodium	ug/l	--	202000	335000	188000	76000	132000	161000	329800	103000	121000	97000
Zinc	ug/l	30 [11]	<50	90	<50	<50	<50	<50	<20	21	28	10
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<2	<2	<2	<2	2	8	<2	2	2	1

Parameter	Unit	PWQO [1]	S8 12-Jun-1996	S8 12-Oct-1996	S8 17-Jun-1997	S8 05-Nov-1997	S8 30-Oct-1998	S8 30-Jun-1999	S8 19-Oct-1999	S8 03-May-2000	S8 25-Oct-2000	S8 13-Jun-2001
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	260000	235000	229000	278000	358000	662000	208000	537000	1090000	705000
Ammonia, unionized	ug/l	20	--	--	--	--	10	--	--	10	--	<20
Ammonia Nitrogen	ug/l	--	30	190	50	10	20	340	30	190	120	160
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	5000	1000	1000	7000	1000	5000	--	1000
Chemical Oxygen Demand	ug/l	--	31000	49000	63000	34000	40000	97000	38000	38000	--	38000
Chloride	ug/l	--	114000	147000	174000	210000	165000	109000	171000	158000	326000	200000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	930	960	1415	2750	1390	499	1280	1590	2600	1650
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	52300	46600	46600	43500	87400	101000	83200	74500	--	69100
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	2000	7530	6090	7100	8340	8150	7480	7250	3040	2600
Hardness, Calcium Carbonate	ug/l	--	269000	295000	348000	967000	410000	387000	308000	438000	774000	480000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--	--	--	120	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	100	--
Nitrogen, Total Kjeldahl	ug/l	--	960	750	2060	1210	840	2030	830	1100	1520	1210
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	930	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.46	7.11	7.26	7.04	7.1	8.2	7.5	7.28	7.51	7.4
Phosphate	ug/l	--	120	140	220	110	100	100	70	100	180	140
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--	--	--	65000	87000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	470000	480000	710000	1400000	693000	251000	640000	800000	1480000	1110000
Total Organic Carbon	ug/l	--	15300	11800	23400	14700	12600	33500	18800	11000	--	17900
Total Suspended Solids	ug/l	--	3000	4000	42000	26000	29000	19000	10000	56000	128000	53000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	136	90	**1360**	**2800**	**1010**	**2200**	**400**	**450**	**2500**	**1010**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	70800	81700	85100	234000	99500	71400	79600	102000	152000	99300
Chromium	ug/l	-- [13]	--	--	--	--	--	--	--	--	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	4	3.9	0.5	**19**	3.4	3.3	0.5	**6.2**	**7.7**	2.5
Iron	ug/l	300	**360**	**460**	**1690**	**410**	**2390**	**1110**	**340**	**2860**	**3870**	**2090**
Lead	ug/l	-- [14]	0.2	0.5	0.2	0.8	0.2	0.2	0.2	0.6	0.2	1.3
Magnesium	ug/l	--	22100	21900	32400	91700	38800	50000	26100	43900	95700	56400
Manganese	ug/l	--	610	30	160	100	320	760	100	450	4940	1230
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	**40**	20	20	20	20	20	20
Potassium	ug/l	--	10100	13500	10200	20300	11700	15700	12900	10000	14200	7600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	100000	97100	163000	306000	184000	284000	177000	187000	367000	259000
Zinc	ug/l	30 [11]	10	10	10	**40**	10	10	10	10	10	10
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	**43**	1	1	**3**	1	**5**	**6**	**19**

Parameter	Unit	PWQO [1]	S8 27-Sep-2001	S8 21-Nov-2001	S8 22-May-2002	S8 12-Nov-2002	S8 31-May-2003	S8 03-Jul-2003	S8 22-Oct-2003	S8 17-May-2004	S8 21-Aug-2004	S8 18-Nov-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	375000	342000	396000	228000	411000	612000	387000	470000	726000	462000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--	<10	<10	<10
Ammonia Nitrogen	ug/l	--	400	10	30	150	100	10	20	10	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	1000	1000	1000	12000	2000	2000
Chemical Oxygen Demand	ug/l	--	33000	23000	23000	42000	53000	67000	46000	86000	54000	31000
Chloride	ug/l	--	259000	179000	110000	169000	122000	145000	131000	157000	166000	207000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2400	1090	970	--	1250	1410	1310	1360	1430	1260
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	91000	47900	46000	57000	112000	157000	98000	114000	127800	32300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4190	7200	10770	--	3610	940	7600	8200	3200	--
Hardness, Calcium Carbonate	ug/l	--	852000	327000	331000	292000	323000	350000	--	388000	432000	375000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	100	100	100	100	200	100	100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1100	490	440	750	960	1220	830	2800	950	590
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.39	6.84	7.04	--	7.7	7.55	7.99	7.4	7.4	7.1
Phosphate	ug/l	--	90	30	20	60	30	100	100	340	90	90
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	895000	140000	77000	197000	90000	71000	143000	78000	21000	61000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1930000	772000	642000	750000	750000	1020000	790000	680000	715000	630000
Total Organic Carbon	ug/l	--	14000	12000	8000	18000	22000	34000	22000	13000	17200	9700
Total Suspended Solids	ug/l	--	18000	14000	4000	4000	10000	3000	16000	112000	19000	68000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	2	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1400**	**320**	**370**	**290**	**340**	**422**	**421**	**298**	**388**	155
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	194000	76800	81900	71200	75900	79800	68600	91800	101000	87600
Chromium	ug/l	-- [13]	**20**	**10**	**10**	**10**	**10**	2	**10**	1	4	7
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**19**	2.5	<1	**5.6**	5	2	**30**	5	**81**	**57**
Iron	ug/l	300	**490**	230	90	150	**320**	132	**1520**	278	**1030**	**3010**
Lead	ug/l	-- [14]	0.2	0.2	**<1000**	0.7	0.5	0.5	1.7	0.4	3.2	0.8
Magnesium	ug/l	--	89300	32900	30600	27700	32400	36700	34800	38500	43600	38100
Manganese	ug/l	--	310	10	20	10	30	147	161	293	62	430
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10	10	**60**	10
Potassium	ug/l	--	14300	8300	9600	10100	10300	8500	13500	13100	11300	10400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	360000	200000	152000	169000	166000	246000	178000	184000	286000	203000
Zinc	ug/l	30 [11]	10	10	10	10	10	5	13	5	**195**	**31**
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S8 25-May-2005	S8 09-Sep-2005 [20]	S8 09-Nov-2005	S8 24-May-2006	S8 15-Aug-2006 [20]	S8 16-Nov-2006	S8 08-May-2007	S8 22-Aug-2007 [20]	S8 20-Nov-2007	S8 23-May-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	573000	--	500000	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	<5000	--	<5000	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	470000	--	410000	436000	--	338000	486000	--	310000	260000
Ammonia, unionized	ug/l	20	<10	--	<10	<10	--	<10	0.242165	--	<10	<20
Ammonia Nitrogen	ug/l	--	<10	--	30	50	--	<10	20	--	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	--	<3000	<3000	--	<3000	<3000	--	3000	<3000
Chemical Oxygen Demand	ug/l	--	36000	--	25000	38000	--	32000	80000	--	31000	40000
Chloride	ug/l	--	161000	--	283000	102000	--	39600	95900	--	206000	109000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1700	--	2700	625	--	600	800	--	900	800
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	122000	--	84800	93400	--	84500	122000	--	80600	61500
Dissolved Organic Carbon	ug/l	--	13600	--	12000	19200	--	12700	11100	--	13900	8900
Dissolved Oxygen (Field)	ug/l	-- [7]	6430	--	10100	11300	--	8300	5760	--	11090	8410
Hardness, Calcium Carbonate	ug/l	--	354000	--	470000	371000	--	307000	361000	--	329000	232000
Hydrogen Sulfide	ug/l	2 [8]	<10	--	20	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	--	400	100	--	500	200	--	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	880	--	630	1070	--	910	840	--	600	1140
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.3	--	7.6	7.2	--	6.9	7.8	--	8.3	7.8
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	90	--	90	210	--	140	810	--	130	140
Sulphate	ug/l	--	28000	--	119000	69000	--	98000	37000	--	119000	46000
Temperature (Field)	deg c	-- [10]	12.9	--	0	5.5	--	7.1	10.5	--	0.4	10.5
Total Dissolved Solids	ug/l	--	771000	--	1060000	712000	--	554000	734000	--	802000	501000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	11000	--	98000	122000	--	47000	236000	--	8000	<3000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	<1	<1	--	<1	2	--	1.3	1.7
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	225	--	181	284	--	319	218	--	121	97
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.5	<0.1	--	<0.5	0.1	--	<0.1	<0.1
Calcium	ug/l	--	86200	--	123000	89500	--	80000	85300	--	82800	63500
Chromium	ug/l	-- [13]	6	--	17	30	--	12	22	--	<2	<2
Cobalt	ug/l	0.9	14	--	5	4.9	--	1	6.1	--	0.9	<0.5
Copper	ug/l	5	5	--	12	25	--	47	37	--	10	4
Iron	ug/l	300	2330	--	7270	14300	--	2240	14400	--	1020	390
Lead	ug/l	-- [14]	0.3	--	3.5	5.7	--	2	5.8	--	1.8	<0.1
Magnesium	ug/l	--	33800	--	39900	35800	--	26000	35900	--	29800	17800
Manganese	ug/l	--	335	--	458	782	--	170	2320	--	54	21
Mercury, dissolved	ug/l	0.2 [15]	<0.05	--	<0.06	--	--	--	--	--	--	--
Molybdenum	ug/l	40	1.1	--	<5	--	--	--	--	--	--	--
Nickel	ug/l	25	<10	--	<10	--	--	--	--	--	--	--
Potassium	ug/l	--	15100	--	18800	17900	--	13700	14900	--	13100	7000
Selenium	ug/l	100	<1	--	<1	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	178000	--	252000	138000	--	89300	156000	--	164000	100000
Zinc	ug/l	30 [11]	7	--	23	52	--	27	58	--	19	<5
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	--	<1	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S8 12-Aug-2008 [20]	S8 06-Nov-2008	S8 13-May-2009 S-1	S8 25-Aug-2009 [20] S8	S8 27-Nov-2009 S-1	S8 18-May-2010 [20] S8	S8 18-Aug-2010 [20] -	S8 14-Oct-2010 S-1	S8 19-May-2011 W-3	S8 16-Aug-2011 [20] S-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	320000	290000	--	333000	--	--	455000	422000	--
Ammonia, unionized	ug/l	20	--	<20	<0.12	--	0.2	--	--	0.03	<0.24	--
Ammonia Nitrogen	ug/l	--	--	<10	<20	--	20	--	--	30	<20	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	<3000	2000	--	<1000	--	--	1000	<1000	--
Chemical Oxygen Demand	ug/l	--	--	27000	33000	--	28000	--	--	30000	35000	--
Chloride	ug/l	--	--	172000	101000	--	54000	--	--	121000	62000	--
Conductivity	uS/cm	--	--	--	943	--	1040	--	--	1380	1020	--
Conductivity (Field)	uS/cm	--	--	925	750	--	912	--	--	1342	982	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	73700	70100	--	102000	--	--	109000	95800	--
Dissolved Organic Carbon	ug/l	--	--	6300	12700	--	11800	--	--	13100	15000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	8660	8130	--	10100	--	--	12590	**3000**	--
Hardness, Calcium Carbonate	ug/l	--	--	321000	266000	--	235000	--	--	367000	323000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	200	<100	--	<100	--	--	<100	<100	--
Nitrite as N	ug/l	--	--	--	<100	--	<100	--	--	<100	<100	--
Nitrogen, Total Kjeldahl	ug/l	--	--	550	570	--	530	--	--	530	1100	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	8.1	7.5	--	7.9	--	--	6.73	7.72	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**70**	30	--	**50**	--	--	**90**	**60**	--
Sulphate	ug/l	--	--	84000	48000	--	64000	--	--	114000	47000	--
Temperature (Field)	deg c	-- [10]	--	5.4	10	--	5.1	--	--	8.1	12.8	--
Total Dissolved Solids	ug/l	--	--	713000	613000	--	676000	--	--	897000	663000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	10000	4000	--	11000	--	--	8000	25000	--
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	1.2	<1	--	<1	--	--	<1	<1	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	120	110	--	150	--	--	**220**	**210**	--
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	--
Calcium	ug/l	--	--	87400	72000	--	61000	--	--	96000	80000	--
Chromium	ug/l	-- [13]	--	4	4	--	6	--	--	7	4	--
Cobalt	ug/l	0.9	--	**2.2**	0.3	--	0.5	--	--	0.4	0.5	--
Copper	ug/l	5	--	5	3	--	4	--	--	4	4	--
Iron	ug/l	300	--	**1350**	220	--	**530**	--	--	**330**	**440**	--
Lead	ug/l	-- [14]	--	0.7	<1	--	<1	--	--	<1	<1	--
Magnesium	ug/l	--	--	25000	21000	--	20000	--	--	31000	30000	--
Manganese	ug/l	--	--	39	10	--	80	--	--	40	30	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	9500	8000	--	8000	--	--	10000	10000	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	140000	107000	--	109000	--	--	139000	107000	--
Zinc	ug/l	30 [11]	--	<5	<10	--	<10	--	--	<10	<10	--
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	--	<1	--	--	<1	<1	--

Parameter	Unit	PWQO [1]	S8 30-Nov-2011 [22] S8	S8 30-May-2012 S8	S8 22-Aug-2012 [20] S-8	S8 29-Nov-2012 [38] S8	S8 28-May-2013 S8	S8 15-Aug-2013 [20] S8	S8 21-Nov-2013 SA-7	S8 28-May-2014 S8	S8 26-Aug-2014 [20] S8	S8 13-Nov-2014 S-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	134000	460000	--	--	360000	--	280000	410000	--	400000
Ammonia, unionized	ug/l	20	<0.1	<0.19	--	--	0.04	--	<0.01	<0.01	--	<0.01
Ammonia Nitrogen	ug/l	--	<20	<50	--	--	110	--	<50	<50	--	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	3000	--	--	<2000	--	2000	<2000	--	<2000
Chemical Oxygen Demand	ug/l	--	25000	61000	--	--	52000	--	66000	42000	--	31000
Chloride	ug/l	--	58000	83000	--	--	120000	--	140000	130000	--	130000
Conductivity	uS/cm	--	737	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	722	1080	--	--	1015	--	1254	1143	--	1222
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	27600	110000	--	--	81000	--	70000	95000	--	93000
Dissolved Organic Carbon	ug/l	--	7800	17000	--	--	13000	--	10000	13000	--	10000
Dissolved Oxygen (Field)	ug/l	-- [7]	8990	**2220**	--	--	**5500**	--	11100	**2570**	--	10220
Hardness, Calcium Carbonate	ug/l	--	210000	320000	--	--	290000	--	340000	320000	--	330000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	890	<100	--	--	<100	--	<100	<100	--	<100
Nitrite as N	ug/l	--	<100	<10	--	--	<10	--	<10	<10	--	<10
Nitrogen, Total Kjeldahl	ug/l	--	480	1800	--	--	1600	--	2200	1700	--	720
Nitrogen, Nitrate-Nitrite	ug/l	--	--	<100	--	--	<100	--	<100	<100	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.59	7.10	--	--	**6.26**	--	**6.48**	**6.06**	--	**6.36**
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**300**	--	--	**210**	--	**290**	**210**	--	**93**
Sulphate	ug/l	--	124000	54000	--	--	38000	--	180000	49000	--	68000
Temperature (Field)	deg c	-- [10]	5.5	16.2	--	--	9.3	--	0.2	13.2	--	2.7
Total Dissolved Solids	ug/l	--	479000	664000	--	--	632000	--	818000	720000	--	698000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	24000	78000	--	--	500000	--	130000	9000	--	4000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<50	1.2	--	--	1.3	--	<1.0	<1.0	--	<1.0
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	100	**280**	--	--	140	--	150	**210**	--	140
Cadmium	ug/l	0.2 [11]	**<10**	<0.10	--	--	<0.10	--	<0.10	<0.10	--	<0.10
Calcium	ug/l	--	56000	87000	--	--	81000	--	94000	86000	--	87000
Chromium	ug/l	-- [13]	**<50**	8.1	--	--	**11**	--	<5.0	<5.0	--	<5.0
Cobalt	ug/l	0.9	<10	**2.3**	--	--	**3.6**	--	<0.50	<0.50	--	<0.50
Copper	ug/l	5	**<10**	**9.5**	--	--	**25**	--	**5.1**	3.7	--	3.6
Iron	ug/l	300	**2000**	**3300**	--	--	**5800**	--	**670**	**410**	--	**590**
Lead	ug/l	-- [14]	**<10**	1.3	--	--	3.1	--	<0.50	<0.50	--	<0.50
Magnesium	ug/l	--	17000	31000	--	--	29000	--	34000	30000	--	34000
Manganese	ug/l	--	30	1800	--	--	1700	--	110	120	--	46
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10000	11000	--	--	10000	--	9600	10000	--	9600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	69000	150000	--	--	140000	--	150000	160000	--	150000
Zinc	ug/l	30 [11]	<50	16	--	--	**33**	--	5.2	<5.0	--	6.3
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1.0	--	--	<1.0	--	<1.0	<1.0	--	**1.8**

Parameter	Unit	PWQO [1]	S8 27-May-2015 S-8	S8 25-Aug-2015 [20] S8	S8 25-Nov-2015 [20] S8	S8 24-May-2016 S-8	S8 18-Aug-2016 [20] S8	S8 16-Nov-2016 S-8	S8 18-May-2017 S-8	S8 28-Aug-2017 [20] S8	S8 28-Nov-2017 [39] S-8	S8 23-May-2018 S-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	455000	--	--	457000	--	304000	408000	--	--	482000
Ammonia, unionized	ug/l	20	2.77	--	--	0.52	--	0.54	0.33	--	--	0.29
Ammonia Nitrogen	ug/l	--	100	--	--	160	--	80	80	--	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	--	64000	--	7000	15000	--	--	<2000
Chemical Oxygen Demand	ug/l	--	28000	--	--	321000	--	39000	105000	--	--	67000
Chloride	ug/l	--	129000	--	--	120000	--	133000	94000	--	--	85000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1244	--	--	1180	--	1283	1076	--	--	1048
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	110000	--	--	88200	--	55000	53600	--	--	98000
Dissolved Organic Carbon	ug/l	--	16700	--	--	23400	--	15600	29000	--	--	12700
Dissolved Oxygen (Field)	ug/l	-- [7]	**2950**	--	--	**2170**	--	8240	**2090**	--	--	**2650**
Hardness, Calcium Carbonate	ug/l	--	263000	--	--	369000	--	278000	319000	--	--	286000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	--	<100	--	<100	<100	--	--	<100
Nitrite as N	ug/l	--	<50	--	--	<50	--	<50	<50	--	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	900	--	--	8100	--	800	1600	--	--	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.98	--	--	7.16	--	7.75	7.10	--	--	7.53
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	--	--	**1190**	--	**270**	**180**	--	--	**100**
Sulphate	ug/l	--	47000	--	--	62000	--	149000	63000	--	--	25000
Temperature (Field)	deg c	-- [10]	16.2	--	--	12.5	--	4.6	17.6	--	--	11.8
Total Dissolved Solids	ug/l	--	698000	--	--	754000	--	716000	626000	--	--	598000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	--	--	674000	--	112000	159000	--	--	27000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	--	2	--	<1	<5 [17]	--	--	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**235**	--	--	**316**	--	**208**	**357**	--	--	**261**
Cadmium	ug/l	0.2 [11]	<0.1	--	--	0.2	--	<0.1	<0.5 [17]	--	--	<0.1
Calcium	ug/l	--	61800	--	--	87200	--	68700	76400	--	--	71200
Chromium	ug/l	-- [13]	<1	--	--	**26**	--	2	<5 [17]	--	--	<1
Cobalt	ug/l	0.9	<0.5	--	--	**6.2**	--	<0.5	<2.5 [17]	--	--	<0.5
Copper	ug/l	5	<0.5	--	--	**24.9**	--	**5.6**	**6.4**	--	--	1.4
Iron	ug/l	300	<100	--	--	**10900**	--	**308**	**686**	--	--	109
Lead	ug/l	-- [14]	<0.1	--	--	**5.2**	--	0.2	<0.5 [17]	--	--	0.1
Magnesium	ug/l	--	26400	--	--	36700	--	25900	31300	--	--	26300
Manganese	ug/l	--	40	--	--	3160	--	66	168	--	--	387
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	9220	--	--	11900	--	11000	10900	--	--	7670
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	149000	--	--	168000	--	149000	102000	--	--	115000
Zinc	ug/l	30 [11]	<5	--	--	**84**	--	10	<25 [17]	--	--	5
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	**13**	--	**12**	<1	--	--	<1

Parameter	Unit	PWQO [1]	S8 30-Aug-2018 [20] S-8	S8 28-Nov-2018 S-8	S8 20-Jun-2019 S-8	S8 28-Aug-2019 [20] S-8	S8 21-Nov-2019 S-8	S8 14-May-2020 S-8	S8 26-Aug-2020 [20] S-8	S8 25-Nov-2020 S-8	S8 27-May-2021 S-8	S8 24-Aug-2021 [20] S8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	377000	395000	--	229000	345000	--	295000	441000	--
Ammonia, unionized	ug/l	20	--	0.04	0.03	--	0.17	0.37	--	0.08	2.9	--
Ammonia Nitrogen	ug/l	--	--	50	60	--	50	70	--	30	300	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	2000	5000	--	<30000 [26]	5000	--	<2000	12000	--
Chemical Oxygen Demand	ug/l	--	--	31000	78000	--	122000	154000	--	34000	112000	--
Chloride	ug/l	--	--	91000	105000	--	176000	124000	--	154000	100000	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	955	1003	--	1271	1077	--	77	1383	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	72700	78600	--	<500	74200	--	62500	92100	--
Dissolved Organic Carbon	ug/l	--	--	12100	11200	--	10500	26300	--	10000	19000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	14740	**1510**	--	7540	**5690**	--	8380	**1600**	--
Hardness, Calcium Carbonate	ug/l	--	--	327000	347000	--	351000	294000	--	305000	528000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	400	<100	--	<100	<100	--	<100	<100	--
Nitrite as N	ug/l	--	--	<50	<50	--	<50	<50	--	<50	<50	--
Nitrogen, Total Kjeldahl	ug/l	--	--	700	1600	--	1400	1600	--	500	2500	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	6.91	**6.14**	--	7.33	7.6	--	7.53	7.60	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**140**	**230**	--	**240**	**160**	--	**40**	**460**	--
Sulphate	ug/l	--	--	99000	24000	--	139000	76000	--	92000	222000	--
Temperature (Field)	deg c	-- [10]	--	2.9	17.4	--	8.3	5.8	--	0	13.6	--
Total Dissolved Solids	ug/l	--	--	596000	560000	--	650000	552000	--	646000	994000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	4000	9000	--	245000	23000	--	15000	64000	--
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	<1	<1	--	<1	<1	--	<1	1	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	136	143	--	93	114	--	74	92	--
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	--	<0.1	<0.1	--	<0.1	<0.1	--
Calcium	ug/l	--	--	73700	88100	--	83800	72200	--	75900	138000	--
Chromium	ug/l	-- [13]	--	1	<1	--	**10**	1	--	<1	3	--
Cobalt	ug/l	0.9	--	<0.5	0.8	--	**4.0**	**1.1**	--	<0.5	**3.1**	--
Copper	ug/l	5	--	**5.3**	2.4	--	**10.5**	4.1	--	2.1	3.2	--
Iron	ug/l	300	--	248	108	--	**3790**	**530**	--	<100	**1050**	--
Lead	ug/l	-- [14]	--	0.1	<0.1	--	1.9	0.5	--	<0.1	0.5	--
Magnesium	ug/l	--	--	34800	30700	--	34400	27700	--	28100	44600	--
Manganese	ug/l	--	--	13	3890	--	3180	1390	--	88	12800	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	11200	9440	--	9730	7270	--	7110	12800	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	122000	122000	--	120000	108000	--	116000	125000	--
Zinc	ug/l	30 [11]	--	10	<5	--	25	14	--	<5	9	--
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	--	<1	<1	--	<1	**10**	--

Parameter	Unit	PWQO [1]	S8 24-Nov-2021 S-8
General Chemistry			
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	525000
Ammonia, unionized	ug/l	20	0.08
Ammonia Nitrogen	ug/l	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000
Chemical Oxygen Demand	ug/l	--	80000
Chloride	ug/l	--	128000
Conductivity	uS/cm	--	--
Conductivity (Field)	uS/cm	--	1548
Cyanide	ug/l	5 [6]	--
Dissolved Inorganic Carbon	ug/l	--	98300
Dissolved Organic Carbon	ug/l	--	25200
Dissolved Oxygen (Field)	ug/l	-- [7]	8400
Hardness, Calcium Carbonate	ug/l	--	470000
Hydrogen Sulfide	ug/l	2 [8]	--
Nitrate as N	ug/l	--	<100
Nitrite as N	ug/l	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	1800
Nitrogen, Nitrate-Nitrite	ug/l	--	--
Nitrogen, Organic	ug/l	--	--
pH (Field)	-	6.5 - 8.5	7.39
Phosphate	ug/l	--	--
Phosphorus	ug/l	-- [9]	**190**
Sulphate	ug/l	--	127000
Temperature (Field)	deg c	-- [10]	0.4
Total Dissolved Solids	ug/l	--	880000
Total Organic Carbon	ug/l	--	--
Total Suspended Solids	ug/l	--	131000
Metals			
Aluminum, dissolved	ug/l	-- [40]	--
Arsenic	ug/l	100 [11]	<1
Barium	ug/l	--	--
Boron	ug/l	200 [12]	132
Cadmium	ug/l	0.2 [11]	<0.1
Calcium	ug/l	--	122000
Chromium	ug/l	-- [13]	4
Cobalt	ug/l	0.9	**1.2**
Copper	ug/l	5	**5.4**
Iron	ug/l	300	**1360**
Lead	ug/l	-- [14]	0.9
Magnesium	ug/l	--	40300
Manganese	ug/l	--	713
Mercury, dissolved	ug/l	0.2 [15]	--
Molybdenum	ug/l	40	--
Nickel	ug/l	25	--
Potassium	ug/l	--	9560
Selenium	ug/l	100	--
Silver	ug/l	0.1	--
Sodium	ug/l	--	140000
Zinc	ug/l	30 [11]	12
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	**3**

Parameter	Unit	PWQO [1]	S9 27-Mar-1990	S9 16-Apr-1990	S9 27-Jun-1990	S9 31-Jul-1990	S9 27-Aug-1990	S9 04-Oct-1990	S9 06-Nov-1990	S9 17-Nov-1990
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	608000	294000	532000	561000	594000	215000	154000	1134000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4090	2200	100	4550	3130	800	320	1380
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	3000	4000	3000	4000	2000	2000	9000
Chemical Oxygen Demand	ug/l	--	112000	62000	287000	95000	160000	67000	137000	76000
Chloride	ug/l	--	123000	83000	163000	204000	216000	81000	43000	186000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1528	951	858	1877	1699	814	457	48.2
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	137000	421000	199000	185000	132000	53000	56000	194000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3000	7400	5050	6150	6160	8840	10300	--
Hardness, Calcium Carbonate	ug/l	--	774000	424000	626000	625000	505000	293000	168000	7940
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	4160	11000	2000	1650	5160	3000	3620	16340
Nitrite as N	ug/l	--	330	100	2900	100	100	100	50	100
Nitrogen, Total Kjeldahl	ug/l	--	5030	5700	270	4720	4970	2340	2420	7080
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	940	3500	170	170	1840	1540	2100	5700
pH (Field)	-	6.5 - 8.5	7.9	7.47	7.92	7.93	8.05	8.2	7.82	7.48
Phosphate	ug/l	--	390	280	180	120	400	160	200	260
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	160000	86000	70000	97000	63000	72000	42000	115000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	--	--	--	--	850000	400000	250000	--
Total Organic Carbon	ug/l	--	28000	20000	39000	35000	31000	18000	17000	51100
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--
Calcium	ug/l	--	247000	135000	181000	176000	128000	86000	44000	234000
Chromium	ug/l	-- [13]	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--
Copper	ug/l	5	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**140**
Iron	ug/l	300	**1720**	**1300**	**1280**	**1340**	**3860**	**720**	**4380**	**3900**
Lead	ug/l	-- [14]	**170**	**50**	**50**	**70**	**50**	**50**	**50**	**9**
Magnesium	ug/l	--	38000	21000	42000	45000	45000	19000	14000	50800
Manganese	ug/l	--	920	400	660	740	530	50	170	1450
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	**50**	**50**	**50**	**50**	**50**	**50**	**50**	7
Potassium	ug/l	--	23000	13000	23000	24000	24000	23000	12000	35500
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	101000	60000	136000	168000	155000	97000	32000	179000
Zinc	ug/l	30 [11]	**130**	**50**	**50**	**50**	**50**	**50**	**50**	**110**
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**20**	**2**	**2**	**14**	**2**	**2**	**2**	**9**

Parameter	Unit	PWQO [1]	S9 27-Nov-1990	S9 24-Apr-1991	S9 29-Nov-1991	S9 08-Jun-1992	S9 08-Jun-1993	S9 04-Nov-1993	S9 15-Jun-1994	S9 02-Nov-1994	S9 28-Jun-1995
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	420000	266000	1124000	151000	485000	861000	84000	1380000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	1300	3440	300	13940	100	3200	--	290	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	5000	6000	4800	2000	3700	10200	4100	2000
Chemical Oxygen Demand	ug/l	--	56000	94000	30000	180000	26000	108000	131000	64000	172000
Chloride	ug/l	--	69000	196000	224000	243000	220000	221000	107000	43000	94500
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1090	1304	1145	2850	929	1378	2440	478	792
Cyanide	ug/l	5 [6]	--	--	--	**123**	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	62000	118000	--	259700	41000	126000	--	20000	321000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	9300	7000	6600	10000	9500	11280	12150	10660
Hardness, Calcium Carbonate	ug/l	--	278000	450000	349000	853220	198000	474000	628000	141000	1070000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	2200	26100	--	240	660	7690	340	4000	100
Nitrite as N	ug/l	--	10	1700	--	100	100	100	--	100	100
Nitrogen, Total Kjeldahl	ug/l	--	1960	6500	1400	19710	750	5690	12900	4480	17000
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	2090	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	660	3060	1100	5770	650	2490	12900	4190	16990
pH (Field)	-	6.5 - 8.5	8.1	7.86	7.8	7.72	**8.57**	7.74	8.09	7.96	7.56
Phosphate	ug/l	--	100	100	200	100	120	180	120	500	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	47000	213000	128000	130000	55900	86000	100000	56000	64000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	550000	650000	--	1853000	560000	816000	1230000	240000	474000
Total Organic Carbon	ug/l	--	16000	25000	--	48100	11800	26200	43800	15000	70000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	--	--	--	--	100
Barium	ug/l	--	--	--	--	210	--	--	--	--	43
Boron	ug/l	200 [12]	--	--	--	**7450**	--	--	**4509**	**213**	11
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	0.1	0.1
Calcium	ug/l	--	80000	147000	100400	210400	51000	124000	145000	37000	70000
Chromium	ug/l	-- [13]	**50**	**50**	**10**	**20**	**59**	**10**	**10**	**10**	**14**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**50**	**50**	**30**	**10**	5	**6**	**16.6**	4.8	4.2
Iron	ug/l	300	**3930**	**1200**	**310**	**3900**	**2111**	**2734**	**1815**	**1211**	**659**
Lead	ug/l	-- [14]	**50**	**50**	2	**70**	**19**	**10.8**	1.6	1.2	0.8
Magnesium	ug/l	--	19000	20000	23800	79500	17000	39800	64500	11500	20400
Manganese	ug/l	--	320	410	170	1790	76	429	242	74	36
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	**50**	**50**	**50**	20	20	20	20	20	20
Potassium	ug/l	--	12000	108000	9400	42800	10000	18900	39800	9500	10800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	129000	108000	114000	263800	106000	128000	240000	29000	46000
Zinc	ug/l	30 [11]	**50**	**50**	10	**40**	18	**49**	**44**	14	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	**33**	**2**	**17**	**2**	**3**	**2**	**10**	1

Parameter	Unit	PWQO [1]	S9 14-Nov-1995	S9 12-Jun-1996	S9 12-Oct-1996	S9 17-Jun-1997	S9 05-Nov-1997	S9 05-Jun-1998	S9 28-Aug-1998	S9 30-Oct-1998	S9 30-Jun-1999
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	229000	464000	395000	187000	254000	688000	114000	254000	370000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	10	--
Ammonia Nitrogen	ug/l	--	1010	40	940	10	10	70	60	10	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	2000	11000	3000	1000	3000	3000	1000	1000
Chemical Oxygen Demand	ug/l	--	50000	26000	63000	28000	19000	142000	36000	39000	71000
Chloride	ug/l	--	157000	99000	140000	115000	172000	362000	37300	114000	219000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	910	780	1270	7.76	1310	2350	390	890	1410
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	6400	44000	87800	35100	51000	137000	23900	46900	47700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	10390	9410	8920	12360	12460	8520	13440	11360
Hardness, Calcium Carbonate	ug/l	--	277000	230000	441000	236000	302000	618000	132000	325000	354000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1500	--	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	5500	710	3980	1170	770	3950	1180	860	1150
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	4490	670	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.92	7.25	7.63	7.71	8.03	--	7.88	7.8	8.1
Phosphate	ug/l	--	200	120	170	260	50	120	380	60	70
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	77600	--	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	460000	390000	640000	389000	650000	1166000	200000	450000	710000
Total Organic Carbon	ug/l	--	66200	12400	24200	14300	11400	39200	10000	14700	22300
Total Suspended Solids	ug/l	--	116000	36000	20000	126000	24000	15000	180000	5000	6000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**770**	200	**2360**	**320**	**400**	**5210**	**390**	**760**	**2370**
Cadmium	ug/l	0.2 [11]	0.1	--	--	--	--	--	--	--	--
Calcium	ug/l	--	73200	63600	108000	53800	80400	114000	36700	70000	77300
Chromium	ug/l	-- [13]	**10**	--	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	5	**6.1**	2.8	0.5	**12.4**	**5.9**	4.2	3.1	2.4
Iron	ug/l	300	**2650**	**1080**	**1030**	**3970**	**450**	**380**	**2450**	**790**	220
Lead	ug/l	-- [14]	0.8	0.2	0.3	0.2	0.2	0.2	0.5	0.2	0.2
Magnesium	ug/l	--	22500	17100	41200	18400	24300	80800	9670	36100	38700
Manganese	ug/l	--	210	54	140	150	40	40	50	20	40
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**30**	20	**30**	20	20	20	10
Potassium	ug/l	--	15700	11000	16000	5400	8900	19600	4900	6500	14500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	82200	78000	130000	83700	124000	305000	37800	97400	198000
Zinc	ug/l	30 [11]	20	10	10	20	10	**80**	**80**	10	**60**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	1	--	**4**	**3**	1	1	1	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 19-Oct-1999	S9 03-May-2000	S9 25-Oct-2000	S9 13-Jun-2001	S9 27-Sep-2001	S9 21-Nov-2001	S9 22-May-2002	S9 08-Nov-2002	S9 31-May-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	256000	293000	370000	245000	126000	179000	183000	243000	162000
Ammonia, unionized	ug/l	20	--	10	--	<20	<20	<20	--	--	--
Ammonia Nitrogen	ug/l	--	10	20	10	10	40	10	40	10	200
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	3000	--	1000	1000	1000	1000	1000	1000
Chemical Oxygen Demand	ug/l	--	32000	32000	--	32000	11000	29000	34000	26000	43000
Chloride	ug/l	--	198000	162000	248000	239000	82500	104000	110000	305000	77000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1310	1100	1550	1300	1160	610	620	1450	660
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	68900	31300	--	31900	30200	25100	24000	64000	37000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	11620	19920	10300	13200	9930	13350	10230	9200	8220
Hardness, Calcium Carbonate	ug/l	--	350000	286000	417000	334000	439000	248000	261000	402000	195000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	10	100	1600	700	200	300	300
Nitrite as N	ug/l	--	--	--	500	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	580	780	740	760	640	670	640	640	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.2	7.98	7.81	8.4	8.1	7.53	7.39	--	7.7
Phosphate	ug/l	--	40	30	70	30	90	40	20	90	40
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	116000	173000	435000	85000	51000	116000	64000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	650000	650000	858000	798000	910000	492000	416000	725000	389000
Total Organic Carbon	ug/l	--	10300	10000	--	13100	7800	14000	9000	10000	17000
Total Suspended Solids	ug/l	--	16000	22000	49000	5000	29000	17000	4000	56000	3000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**570**	**380**	**1430**	**760**	**940**	80	90	80	70
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	92500	73300	95700	77700	112000	71800	76500	119000	53200
Chromium	ug/l	-- [13]	--	--	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	0.5	**8.2**	**11**	3	**7**	2.9	<1	**5.7**	3
Iron	ug/l	300	**640**	**310**	**2340**	120	20	**530**	200	**1910**	290
Lead	ug/l	-- [14]	0.2	0.2	0.2	0.8	0.2	0.2	<1	3.1	0.5
Magnesium	ug/l	--	28500	24600	43300	34100	38700	16600	17100	25500	13800
Manganese	ug/l	--	30	130	120	20	970	10	30	60	10
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	20
Potassium	ug/l	--	13300	7800	8900	6200	10000	5200	3300	9000	5400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	162000	124000	159000	180000	123000	65900	75300	173000	61700
Zinc	ug/l	30 [11]	20	10	10	10	10	10	10	20	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	**4**	**2**	**15**	1	1	1	1	1

Parameter	Unit	PWQO [1]	S9 03-Jul-2003	S9 22-Oct-2003	S9 17-May-2004	S9 21-Aug-2004	S9 18-Nov-2004	S9 25-May-2005	S9 09-Sep-2005	S9 09-Nov-2005	S9 24-May-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	276000	343000	339000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	<5000	<5000	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	237000	142000	241000	291000	240000	226000	281000	278000	168000
Ammonia, unionized	ug/l	20	--	--	<10	<10	<10	<10	<10	<10	<10
Ammonia Nitrogen	ug/l	--	10	30	10	10	10	<10	<10	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	1000	1000	1000	<3000	<3000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	22000	31000	42000	30000	21000	35000	33000	35000	41000
Chloride	ug/l	--	124000	84600	176000	198000	152000	128000	191000	140000	101000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1600	820	1030	1070	820	1200	860	500	480
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	56000	34000	55500	30500	22300	54200	67400	56500	35800
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	11700	79400	9500	16200
Dissolved Oxygen (Field)	ug/l	-- [7]	6880	9100	8800	10800	7200	11800	8400	9100	11340
Hardness, Calcium Carbonate	ug/l	--	809000	--	299000	330000	261000	264000	354000	448000	216000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	<10	<10	**30**	--
Nitrate as N	ug/l	--	100	800	100	100	300	600	<100	200	500
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	650	1720	640	540	350	690	570	1210	830
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	8.1	7.7	8.3	7.5	7.7	8.1	7.3	8.3
Phosphate	ug/l	--	40	110	30	40	30	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	**40**	20	**360**	**60**
Sulphate	ug/l	--	840000	173000	49000	50000	95000	53000	53000	147000	58000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	21.9	20	1	12
Total Dissolved Solids	ug/l	--	1630000	503000	515000	535000	410000	509000	656000	717000	406000
Total Organic Carbon	ug/l	--	14000	15000	10500	9700	6800	--	--	--	--
Total Suspended Solids	ug/l	--	8000	21000	7000	6000	4000	6000	<3000	208000	10000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	<1	2	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**292**	67	84	166	127	94	113	200	51
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.3	<0.1	<0.5	<0.1
Calcium	ug/l	--	229000	77200	86100	97800	73100	74600	104000	109000	63100
Chromium	ug/l	-- [13]	2	8	2	2	2	<2	<2	**90**	2
Cobalt	ug/l	0.9	--	--	--	--	--	**30**	0.5	**10**	0.4
Copper	ug/l	5	2	**35**	3	3	3	2	3	**38**	3
Iron	ug/l	300	**378**	**1190**	291	**543**	**630**	**337**	128	**35700**	**869**
Lead	ug/l	-- [14]	0.5	1.9	0.3	0.3	0.6	<0.6	<0.5	**5.5**	0.5
Magnesium	ug/l	--	57500	18700	20400	20900	19000	18800	22900	42700	14100
Manganese	ug/l	--	22	28	63	22	48	17	4	710	69
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	<0.05	<0.06	<0.06	--
Molybdenum	ug/l	40	--	--	--	--	--	20	2	<5	--
Nickel	ug/l	25	10	10	10	10	10	<10	<10	**50**	--
Potassium	ug/l	--	17600	9300	5600	6700	6500	6400	8900	20600	5500
Selenium	ug/l	100	--	--	--	--	--	<1	1	<1	--
Sodium	ug/l	--	182000	59100	115000	154000	117000	95800	117000	110000	66500
Zinc	ug/l	30 [11]	5	9	5	5	5	**33**	15	**121**	11
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S9 15-Aug-2006	S9 16-Nov-2006	S9 08-May-2007	S9 22-Aug-2007	S9 20-Nov-2007	S9 23-May-2008	S9 12-Aug-2008	S9 06-Nov-2008	S9 13-May-2009 S-5
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	274000	130000	226000	366000	250000	180000	200000	226000	197000
Ammonia, unionized	ug/l	20	<10	<10	0.933832	<10	<10	<20	<20	<20	<0.05
Ammonia Nitrogen	ug/l	--	<10	90	<10	730	80	<10	<10	<10	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	5000	9000	<3000	<3000	<3000	1000
Chemical Oxygen Demand	ug/l	--	34000	23000	29000	51000	25000	44000	26000	15000	38000
Chloride	ug/l	--	233000	25000	140000	200000	173000	100000	156000	139000	99000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	847
Conductivity (Field)	uS/cm	--	1270	310	800	1250	800	650	900	800	700
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	65800	32500	54200	87600	168000	40100	50800	54800	46700
Dissolved Organic Carbon	ug/l	--	16500	12200	9000	19400	10300	11700	8800	6100	15300
Dissolved Oxygen (Field)	ug/l	-- [7]	**1800**	9270	12680	**990**	9650	13980	5310	**6210**	17710
Hardness, Calcium Carbonate	ug/l	--	332000	101000	273000	310000	304000	209000	226000	279000	242000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	1100	<100	100	500	<100	200	1400	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	610	1260	600	2240	850	890	470	710	810
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.2	7.2	8.4	7.3	8	8.5	8.1	7.9	6.8
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	**600**	30	**280**	**110**	**80**	**90**	**80**	**60**
Sulphate	ug/l	--	56000	52000	85000	40000	76000	59000	54000	82000	76000
Temperature (Field)	deg c	-- [10]	20.5	7.6	20.4	14.1	0.3	14.1	19.9	8.2	20
Total Dissolved Solids	ug/l	--	734000	246000	571000	743000	636000	420000	527000	571000	551000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	14000	332000	10000	75000	19000	7000	16000	42000	8000
Metals											
Arsenic	ug/l	100 [11]	2.1	<1	0.9	3.2	1	2	1	0.5	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	80	63	88	181	85	82	61	54	70
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	99400	24900	73100	78400	88500	59700	64900	82200	69000
Chromium	ug/l	-- [13]	<2	**30**	<2	7	3	<2	4	5	4
Cobalt	ug/l	0.9	**1**	**6.6**	<0.5	**1.9**	0.7	<0.5	0.8	**1.2**	0.5
Copper	ug/l	5	**45**	**56**	**17**	3	2	3	3	5	4
Iron	ug/l	300	**718**	**2710**	**350**	**2880**	**1060**	**1060**	**1930**	**2230**	**550**
Lead	ug/l	-- [14]	0.8	**6**	0.2	1	<0.1	<0.1	0.8	0.7	<1
Magnesium	ug/l	--	20300	9330	21900	27600	20200	14500	15600	17800	17000
Manganese	ug/l	--	113	243	74	213	152	123	57	46	50
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7500	8200	7200	17700	9500	5900	5400	7600	7000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	160000	41100	108000	156000	115000	72800	109000	97600	84000
Zinc	ug/l	30 [11]	26	**65**	**49**	22	16	7	7	10	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	**3**	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S9 25-Aug-2009 A-3	S9 27-Nov-2009 S-4	S9 18-May-2010 S-3	S9 18-Aug-2010 [29] S-4	S9 14-Oct-2010 S-3	S9 19-May-2011 [41] W-7	S9 16-Aug-2011 [2] N-3	S9 30-Nov-2011 [42] S9	S9 30-May-2012 S 9
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	256000	211000	306000	183000	265000	203000	204000	132000	260000
Ammonia, unionized	ug/l	20	0.11	0.1	0.17	0.15	<0.02	<0.84	0.32	0.6	<0.71
Ammonia Nitrogen	ug/l	--	30	40	30	110	<20	<20	30	50	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	2000	2000	4000	2000	2000	2000	3000	<2000
Chemical Oxygen Demand	ug/l	--	63000	33000	35000	35000	35000	45000	35000	28000	46000
Chloride	ug/l	--	141000	57000	142000	43000	94000	47000	93000	33000	130000
Conductivity	uS/cm	--	1270	786	1240	896	1030	665	907	594	--
Conductivity (Field)	uS/cm	--	1088	709	1337	826	856	634	758	557	969
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	62800	51600	63800	40000	61100	49800	46500	26900	63000
Dissolved Organic Carbon	ug/l	--	15200	11500	14900	16800	13600	13700	11500	7300	17000
Dissolved Oxygen (Field)	ug/l	-- [7]	5900	9730	**5080**	**610**	7970	6250	**4060**	9040	**2880**
Hardness, Calcium Carbonate	ug/l	--	344000	231000	375000	256000	327000	219000	263000	177000	320000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	1040	<100	1030	480	200	<100	1950	<100
Nitrite as N	ug/l	--	<100	<100	<100	330	<100	<100	<100	<100	<10
Nitrogen, Total Kjeldahl	ug/l	--	1060	760	1070	1290	600	400	570	790	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.97	7.31	7.40	6.58	6.82	8.20	7.41	7.95	7.54
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**70**	**200**	**110**	**310**	**120**	**120**	**170**	**440**	**92**
Sulphate	ug/l	--	163000	100000	119000	199000	118000	69000	106000	101000	84000
Temperature (Field)	deg c	-- [10]	19.9	5.0	12.2	18.8	9.5	15.2	20.7	6.2	20.7
Total Dissolved Solids	ug/l	--	825000	511000	806000	582000	670000	432000	590000	386000	618000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	15000	47000	24000	46000	14000	86000	78000	80000	31000
Metals											
Arsenic	ug/l	100 [11]	2	<50	2	<1	<1	<50	<10	<50	1.7
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	140	<100	150	**250**	90	<100	110	100	130
Cadmium	ug/l	0.2 [11]	<0.1	**<10**	<0.1	<0.1	<0.1	**<10**	<0.1	**<10**	<0.10
Calcium	ug/l	--	103000	61000	104000	71000	98000	58000	79000	46000	92000
Chromium	ug/l	-- [13]	4	**<20**	7	6	6	**<50**	6	**<50**	5.4
Cobalt	ug/l	0.9	0.5	<5	**1.4**	**1.3**	0.9	<10	**1.1**	<10	**1.2**
Copper	ug/l	5	3	**20**	4	**6**	4	**<10**	5	**10**	**6.4**
Iron	ug/l	300	**440**	**4800**	**1690**	**1420**	**770**	**4900**	**1250**	**7000**	**1800**
Lead	ug/l	-- [14]	<1	**<10**	<1	1	<1	**<10**	1	**<10**	0.75
Magnesium	ug/l	--	21000	19000	28000	19000	20000	18000	16000	15000	24000
Manganese	ug/l	--	110	110	980	210	90	160	110	140	220
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	8000	12000	30000	10000	8000	9000	12000	9400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	119000	67000	118000	81000	80000	58000	65000	49000	100000
Zinc	ug/l	30 [11]	10	**100**	10	<10	10	<50	<10	<50	15
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	1	1	<1	<1	<1	<1.0

Parameter	Unit	PWQO [1]	S9 22-Aug-2012 S-9	S9 29-Nov-2012 S9	S9 28-May-2013 S9	S9 15-Aug-2013 S9	S9 21-Nov-2013 SA-4	S9 28-May-2014 S9	S9 26-Aug-2014 S9	S9 13-Nov-2014 S-9	S9 27-May-2015 S-9
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	290000	330000	200000	220000	220000	240000	220000	240000	295000
Ammonia, unionized	ug/l	20	<0.25	0.26	0.37	0.52	<0.06	<0.14	1.08	<0.04	12.62
Ammonia Nitrogen	ug/l	--	<50	120	130	62	<50	<50	90	<50	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	6000	<2000	3000	<2000	2000	2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	41000	46000	42000	47000	32000	38000	41000	28000	27000
Chloride	ug/l	--	150000	90000	83000	120000	90000	140000	120000	81000	189000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1218	1030	670	993	808	885	915	803	1443
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	66000	74000	45000	52000	54000	55000	57000	60000	70800
Dissolved Organic Carbon	ug/l	--	16000	14000	17000	17000	11000	15000	12000	11000	11600
Dissolved Oxygen (Field)	ug/l	-- [7]	**4920**	**6460**	**3400**	**5050**	12960	7060	**2950**	**5630**	**270**
Hardness, Calcium Carbonate	ug/l	--	460000	360000	250000	300000	290000	300000	250000	300000	316000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	270	<100	<100	440	<100	<100	<100	300
Nitrite as N	ug/l	--	<10	<10	<10	<10	10	<10	<10	<10	<50
Nitrogen, Total Kjeldahl	ug/l	--	960	1800	1400	1200	740	1400	1100	650	500
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	270	<100	<100	450	<100	<100	<100	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.13	7.41	6.99	7.35	7.13	7.00	7.40	6.84	**8.55**
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**110**	**160**	**72**	**150**	**72**	**74**	**79**	**52**	**80**
Sulphate	ug/l	--	220000	120000	55000	130000	110000	64000	79000	110000	206000
Temperature (Field)	deg c	-- [10]	19.4	0.1	15.8	19.4	1.1	15.2	22.8	4.2	18.9
Total Dissolved Solids	ug/l	--	942000	660000	426000	646000	562000	614000	544000	548000	858000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	39000	83000	8000	<1000	14000	13000	11000	12000	3000
Metals											
Arsenic	ug/l	100 [11]	1.4	<1.0	1.2	<1.0	<1.0	1.2	1.1	<1.0	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**240**	120	58	180	85	82	130	110	**255**
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	**0.33**	<0.10	<0.10	<0.10	<0.10	<0.1
Calcium	ug/l	--	130000	110000	74000	87000	84000	79000	69000	88000	67400
Chromium	ug/l	-- [13]	<5.0	**11**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	1
Cobalt	ug/l	0.9	**1.4**	**2.3**	0.69	<0.50	0.60	0.66	<0.50	<0.50	<0.5
Copper	ug/l	5	**7.9**	**7.0**	**6.0**	**14**	3.4	3.5	2.5	2.5	<0.5
Iron	ug/l	300	**1800**	**4500**	**1100**	**570**	**1000**	**1200**	**580**	**600**	**598**
Lead	ug/l	-- [14]	1.1	1.5	<0.50	<0.50	0.58	<0.50	<0.50	<0.50	0.3
Magnesium	ug/l	--	37000	37000	20000	29000	23000	22000	19000	27000	35800
Manganese	ug/l	--	95	310	110	120	63	130	98	110	234
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	16000	14000	6800	15000	11000	7900	8500	10000	12300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	110000	74000	110000	75000	110000	100000	82000	190000
Zinc	ug/l	30 [11]	12	17	8.0	<5.0	9.7	9.1	8.3	9.9	14
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	**24**	<1.0	<1.0	<1.0	<1.0	<1.0	**11**	<1

Parameter	Unit	PWQO [1]	S9 25-Aug-2015 S-9	S9 25-Nov-2015 S-9	S9 24-May-2016 S-9	S9 18-Aug-2016 S-9	S9 16-Nov-2016 S-9	S9 18-May-2017 S-9	S9 28-Aug-2017 S-9	S9 28-Nov-2017 S-9	S9 23-May-2018 S-9
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	258000	250000	308000	179000	236000	210000	337000	253000	320000
Ammonia, unionized	ug/l	20	0.73	0.21	0.86	0.1	0.26	1.48	0.43	0.34	**42.92**
Ammonia Nitrogen	ug/l	--	40	60	70	50	80	50	90	270	3700
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	2000	3000	<2000	<2000	<2000	2000	<2000
Chemical Oxygen Demand	ug/l	--	63000	45000	42000	37000	20000	42000	30000	41000	67000
Chloride	ug/l	--	131000	164000	137000	135000	162000	140000	114000	101000	230000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1179	250	1062	974	1148	837	872	140	1285
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	53300	54800	64400	13900	47500	24500	66800	17400	72500
Dissolved Organic Carbon	ug/l	--	14300	11900	14100	42000	6600	24600	11500	44600	17900
Dissolved Oxygen (Field)	ug/l	-- [7]	**3570**	**7740**	**2420**	**4580**	9810	**2400**	**4510**	14070	9540
Hardness, Calcium Carbonate	ug/l	--	278000	368000	335000	247000	292000	238000	331000	340000	373000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	1200	<100	<100	700	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	800	800	900	500	800	900	1100	4500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.72	7.63	7.56	6.64	7.40	7.83	7.29	7.19	7.63
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**80**	**80**	**130**	30	**50**	**110**	**40**	**50**
Sulphate	ug/l	--	220000	102000	115000	151000	106000	57000	126000	74000	55000
Temperature (Field)	deg c	-- [10]	18.4	0	18.0	21.9	5.7	21.8	13.5	0	15.1
Total Dissolved Solids	ug/l	--	772000	648000	680000	620000	638000	516000	712000	514000	756000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	7000	31000	7000	8000	7000	14000	43000	16000	<2000
Metals											
Arsenic	ug/l	100 [11]	1	<1	1	3	<1	<5 [17]	<1	<1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**423**	92	144	185	109	**220**	127	**231**	13
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1
Calcium	ug/l	--	64800	114000	84700	63600	86700	66100	93300	93600	102000
Chromium	ug/l	-- [13]	1	4	2	2	<1	<5 [17]	2	3	2
Cobalt	ug/l	0.9	<0.5	0.8	0.6	<0.5	<0.5	<2.5 [17]	<0.5	**1.2**	**1.2**
Copper	ug/l	5	<0.5	0.8	2.3	1.2	0.8	4.8	0.7	3.3	1.4
Iron	ug/l	300	**670**	**1510**	**879**	**677**	298	**861**	**732**	**1070**	**909**
Lead	ug/l	-- [14]	<0.1	0.6	0.4	0.4	0.1	<0.5 [17]	0.4	0.5	0.2
Magnesium	ug/l	--	28300	20400	30000	21400	18300	17800	23800	25700	29000
Manganese	ug/l	--	341	88	791	164	59	177	189	155	292
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	11700	8970	8170	9180	5270	6190	7710	8390	11600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	111000	135000	135000	110000	114000	98800	94900	84300	155000
Zinc	ug/l	30 [11]	7	16	7	8	6	<25 [17]	6	12	5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	<1	**9**	**4**	**4**	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S9 30-Aug-2018 [20] S-9	S9 28-Nov-2018 S-9	S9 20-Jun-2019 S-9	S9 28-Aug-2019 [39] S-9	S9 21-Nov-2019 S-9	S9 14-May-2020 S-9	S9 26-Aug-2020 S-9	S9 25-Nov-2020 S-9
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	209000	259000	--	252000	225000	250000	283000
Ammonia, unionized	ug/l	20	--	0.09	0.32	--	0.17	0.28	0.72	0.17
Ammonia Nitrogen	ug/l	--	--	120	110	--	40	20	50	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	3000	<2000	--	4000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	--	34000	32000	--	41000	41000	37000	31000
Chloride	ug/l	--	--	141000	208000	--	185000	171000	199000	192000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	462	1150	--	1405	1011	1253	13
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	37500	53900	--	<500	47500	51800	65300
Dissolved Organic Carbon	ug/l	--	--	12800	12000	--	9100	22100	12600	11700
Dissolved Oxygen (Field)	ug/l	-- [7]	--	**4570**	**4750**	--	14560	11710	8110	13440
Hardness, Calcium Carbonate	ug/l	--	--	279000	306000	--	386000	270000	362000	355000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	900	200	--	<100	<100	<100	100
Nitrite as N	ug/l	--	--	<50	<50	--	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	--	1100	1000	--	800	500	700	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	6.93	6.93	--	7.71	7.90	7.74	7.83
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**130**	**80**	--	**60**	20	**50**	**40**
Sulphate	ug/l	--	--	105000	86000	--	159000	97000	164000	134000
Temperature (Field)	deg c	-- [10]	--	0.2	18.2	--	0	9.4	14.7	0
Total Dissolved Solids	ug/l	--	--	544000	692000	--	690000	542000	670000	732000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	8000	2000	--	12000	<2000	3000	6000
Metals										
Arsenic	ug/l	100 [11]	--	<1	1	--	<1	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	118	**391**	--	200	54	**220**	88
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	--	76700	82100	--	103000	75600	87800	97800
Chromium	ug/l	-- [13]	--	4	2	--	2	<1	1	1
Cobalt	ug/l	0.9	--	0.9	0.7	--	0.5	<0.5	<0.5	<0.5
Copper	ug/l	5	--	**6.3**	3.2	--	3.3	2.0	2.0	1.9
Iron	ug/l	300	--	**1020**	**781**	--	**511**	187	**305**	**315**
Lead	ug/l	-- [14]	--	0.6	0.3	--	0.2	0.1	0.1	0.2
Magnesium	ug/l	--	--	21400	24400	--	31100	19600	34600	26900
Manganese	ug/l	--	--	91	294	--	88	86	73	44
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	10700	8520	--	10900	4820	11100	8050
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	116000	133000	--	129000	87500	149000	122000
Zinc	ug/l	30 [11]	--	15	7	--	8	<5	7	<5
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	--	<1	**4**	**3**	<1

Parameter	Unit	PWQO [1]	S9 27-May-2021 S-9	S9 24-Aug-2021 S-9	S9 24-Nov-2021 S-9
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	337000	324000	274000
Ammonia, unionized	ug/l	20	1.88	0.78	0.15
Ammonia Nitrogen	ug/l	--	90	40	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	65000	41000	29000
Chloride	ug/l	--	127000	53000	75000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	1203	1246	1244
Cyanide	ug/l	5 [6]	--	--	--
Dissolved Inorganic Carbon	ug/l	--	69900	55300	57200
Dissolved Organic Carbon	ug/l	--	13900	12800	11700
Dissolved Oxygen (Field)	ug/l	-- [7]	**200**	**4350**	12810
Hardness, Calcium Carbonate	ug/l	--	423000	627000	592000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	<100	<100	400
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	900	700	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.98	7.68	7.66
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**100**	**70**	20
Sulphate	ug/l	--	150000	332000	302000
Temperature (Field)	deg c	-- [10]	12.4	20.7	0
Total Dissolved Solids	ug/l	--	744000	876000	804000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	35000	30000	3000
Metals					
Arsenic	ug/l	100 [11]	<1	<1	<1
Barium	ug/l	--	--	--	--
Boron	ug/l	200 [12]	112	126	83
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	112000	185000	187000
Chromium	ug/l	-- [13]	4	3	<1
Cobalt	ug/l	0.9	**1.0**	0.7	<0.5
Copper	ug/l	5	3.4	2.5	1.6
Iron	ug/l	300	**1470**	**883**	174
Lead	ug/l	-- [14]	0.5	0.4	0.1
Magnesium	ug/l	--	34900	39700	30600
Manganese	ug/l	--	145	69	34
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	8920	13300	10900
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	115000	55600	60400
Zinc	ug/l	30 [11]	8	5	<5
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**4**	<1	**2**

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Parameter	Unit	PWQO [1]	S10 28-Jun-1995	S10 14-Nov-1995	S10 13-Jun-1996	S10 12-Oct-1996	S10 17-Jun-1997	S10 05-Nov-1997	S10 05-Jun-1998	S10 26-Aug-1998	S10 30-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	237000	312000	212000	193000	145000	8000	100000	67000	202000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	10
Ammonia Nitrogen	ug/l	--	10	60	20	130	10	10	70	60	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	7000	2000	1000	10000	1000	14000	4000	1000
Chemical Oxygen Demand	ug/l	--	291000	120000	75000	67000	51000	43000	232000	106000	100000
Chloride	ug/l	--	121000	118000	43000	68000	19400	58000	25400	33800	87900
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1026	1230	520	640	431	950	360	371	659
Dissolved Inorganic Carbon	ug/l	--	87700	18200	46300	39400	31000	1000	32600	16700	52000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3950	--	4780	3840	2800	6390	6220	6250	8070
Hardness, Calcium Carbonate	ug/l	--	200000	257000	148000	178000	112000	287000	87000	157000	193000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1250	12000	980	830	2050	1280	4370	1600	1320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	1240	11940	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.79	7.08	7.55	6.56	6.85	6.89	--	7.33	7.2
Phosphate	ug/l	--	900	540	380	150	180	90	590	180	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	13000	91200	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	636000	620000	260000	320000	216000	480000	183000	191000	331000
Total Organic Carbon	ug/l	--	31500	92400	24100	21200	37800	16600	41600	20000	31400
Total Suspended Solids	ug/l	--	39000	165000	11000	4000	18000	14000	234000	30000	16000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**2000**	**1630**	**1060**	**1300**	**1360**	**1120**	**790**	**1120**	**800**
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--	--	--
Calcium	ug/l	--	66800	50900	35200	37500	27400	76800	22300	46800	46000
Chromium	ug/l	-- [13]	**11**	**10**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	1.7	3.2	1.9	1.5	0.5	**10.6**	4.2	1.5	0.6
Iron	ug/l	300	**570**	**5840**	**503**	**2890**	**660**	**600**	**5330**	**2160**	**1050**
Lead	ug/l	-- [14]	1.3	1.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	28100	31100	14300	20100	10500	22700	7710	9590	18700
Manganese	ug/l	--	740	680	217	580	310	780	850	120	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	**30**	20
Potassium	ug/l	--	15200	16600	7730	1300	800	10800	400	1500	14500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	87100	182000	64800	94000	53300	47700	36100	43400	78400
Zinc	ug/l	30 [11]	10	20	10	10	10	**120**	30	**460**	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**2**	**2**	1	**19**	1

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Parameter	Unit	PWQO [1]	S10 30-Jun-1999	S10 19-Oct-1999	S10 03-May-2000	S10 25-Oct-2000	S10 13-Jun-2001	S10 27-Sep-2001	S10 21-Nov-2001	S10 22-May-2002	S10 12-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	94000	38000	98000	151000	166000	54000	78000	181000	29000
Ammonia, unionized	ug/l	20	--	--	10	--	<20	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	410	40	20	1	20	40	10	40	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	24000	5000	3000	--	5000	1000	1000	1000	7000
Chemical Oxygen Demand	ug/l	--	280000	80000	43000	--	84000	71000	84000	55000	190000
Chloride	ug/l	--	86000	57500	24100	112000	59000	87300	93400	29300	26700
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	199.1	650	383	667	500	680	650	370	--
Dissolved Inorganic Carbon	ug/l	--	23100	61000	18100	--	28900	10100	10900	2000	4000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4910	6880	6600	2100	3400	5060	2030	6370	--
Hardness, Calcium Carbonate	ug/l	--	105000	200000	99000	179000	142000	160000	155000	149000	180000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	100	100	100	100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	10500	1510	250	17700	1720	2020	1550	2470	5960
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	**6.1**	7.2	6.62	7.4	7	6.66	**5.94**	7.02	--
Phosphate	ug/l	--	1440	110	30	--	270	260	260	300	720
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	42000	12000	188000	188000	60000	180000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	98900	320000	190000	414000	326000	540000	538000	276000	360000
Total Organic Carbon	ug/l	--	50100	19200	16300	--	28100	25500	27000	13000	23000
Total Suspended Solids	ug/l	--	22000	14000	22000	352000	198000	7000	90000	14000	251000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	1	1	1	1	1
Boron	ug/l	200 [12]	**750**	**1240**	**460**	**1230**	**590**	**1330**	**1450**	**620**	**510**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	30100	51600	25000	45800	35900	42000	34000	36400	49400
Chromium	ug/l	-- [13]	--	--	--	**10**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**13.4**	3.1	0.5	**11**	1.5	4.4	3.8	<1	5
Iron	ug/l	300	**13600**	**4790**	300	**26200**	**3330**	**3060**	**12100**	**390**	**3560**
Lead	ug/l	-- [14]	**6.6**	0.2	0.2	2.2	1.1	0.2	0.6	<1	4.3
Magnesium	ug/l	--	7130	17100	8700	15600	12600	13500	17000	14000	13700
Manganese	ug/l	--	740	450	40	2700	420	670	240	40	500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	20
Potassium	ug/l	--	800	3400	4600	9700	4700	4500	5500	7500	4900
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	18300	69000	39700	69800	61100	93400	120000	54200	35500
Zinc	ug/l	30 [11]	30	10	10	30	10	10	10	10	**60**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**9**	**15**	**35**	1	1	1	1

Parameter	Unit	PWQO [1]	S10 31-May-2003	S10 03-Jul-2003	S10 22-Oct-2003	S10 17-May-2004	S10 21-Aug-2004	S10 18-Nov-2004	S10 25-May-2005	S10 09-Sep-2005 [20]	S10 09-Nov-2005
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	168000	--	77000
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	<5000	--	<5000
Alkalinity (Total as CaCO3)	ug/l	-- [5]	104000	136000	47000	175000	156000	180000	140000	--	63000
Ammonia, unionized	ug/l	20	--	--	--	<10	<10	<10	<10	--	<10
Ammonia Nitrogen	ug/l	--	240	110	40	20	30	10	<10	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	9000	7000	7000	8000	20000	<3000	--	9000
Chemical Oxygen Demand	ug/l	--	75000	138000	245000	132000	230000	891000	77000	--	227000
Chloride	ug/l	--	97000	25500	56000	48100	40400	69000	41900	--	52600
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	500	400	820	470	380	550	400	--	380
Dissolved Inorganic Carbon	ug/l	--	24000	35000	12000	39300	37200	36500	43400	--	20600
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	23200	--	26000
Dissolved Oxygen (Field)	ug/l	-- [7]	7400	1930	9100	2400	1800	--	**4200**	--	**3950**
Hardness, Calcium Carbonate	ug/l	--	125000	85000	--	148000	133000	166000	121000	--	142000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	**20**	--	**400**
Nitrate as N	ug/l	--	100	100	200	100	100	100	300	--	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1700	5880	6040	3930	4970	7090	1200	--	5500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	6.69	8.1	7.2	6.7	7	7.2	--	6.9
Phosphate	ug/l	--	160	1320	880	770	900	1440	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	**100**	--	**810**
Sulphate	ug/l	--	92000	28000	106000	31000	15000	54000	13000	--	152000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	10	--	1
Total Dissolved Solids	ug/l	--	297000	315000	289000	235000	190000	275000	225000	--	371000
Total Organic Carbon	ug/l	--	27000	46000	25000	21100	24800	17300	--	--	--
Total Suspended Solids	ug/l	--	25000	224000	294000	84000	156000	1630000	13000	--	320000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	3	<1	--	1
Boron	ug/l	200 [12]	**580**	**645**	**631**	**248**	**413**	**374**	**237**	--	**513**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	<0.1	--	<0.5
Calcium	ug/l	--	29800	19600	33800	39500	33900	41700	31200	--	35200
Chromium	ug/l	-- [13]	**10**	5	**9**	1	3	**48**	<2	--	**11**
Cobalt	ug/l	0.9	--	--	--	--	--	--	**4**	--	**3**
Copper	ug/l	5	3	2	**20**	**17**	**58**	**103**	<2	--	**17**
Iron	ug/l	300	**1280**	**6170**	270	**2050**	**502**	**593**	**816**	--	**2610**
Lead	ug/l	-- [14]	0.5	3.7	0.5	0.6	3	2.6	0.2	--	**6**
Magnesium	ug/l	--	12200	8860	10800	12000	11700	15000	10500	--	13100
Manganese	ug/l	--	70	1030	4	258	1750	4710	39	--	1080
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	<0.05	--	<0.06
Molybdenum	ug/l	40	--	--	--	--	--	--	<0.5	--	<5
Nickel	ug/l	25	20	10	10	20	**50**	**40**	<10	--	<10
Potassium	ug/l	--	5600	1100	8000	7800	3200	4800	7400	--	4100
Selenium	ug/l	100	--	--	--	--	--	--	<1	--	<1
Sodium	ug/l	--	54300	55300	53100	62300	50200	76500	43900	--	79200
Zinc	ug/l	30 [11]	10	12	**45**	**46**	**153**	**154**	<5	--	**64**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	**3**	<1	--	<1

Parameter	Unit	PWQO [1]	S10 24-May-2006	S10 15-Aug-2006	S10 16-Nov-2006	S10 08-May-2007	S10 22-Aug-2007	S10 20-Nov-2007	S10 23-May-2008	S10 12-Aug-2008	S10 06-Nov-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	123000	127000	158000	107000	56000	103000	174000	160000	140000
Ammonia, unionized	ug/l	20	<10	<10	<10	0.251849	<10	<10	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	30	<10	<10	90	60	<10	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	21000	<3000	<3000	13000	13000	4000	3000	<3000
Chemical Oxygen Demand	ug/l	--	52000	361000	52000	66000	342000	308000	88000	71000	98000
Chloride	ug/l	--	28200	22000	29400	20000	8200	60200	45700	64800	80600
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	280	520	320	300	425	390	480	500	500
Dissolved Inorganic Carbon	ug/l	--	23900	39400	41100	26800	15100	26800	38400	42200	35600
Dissolved Organic Carbon	ug/l	--	20700	35800	20700	14300	28100	19400	20300	21700	13000
Dissolved Oxygen (Field)	ug/l	-- [7]	11450	**2200**	**6290**	--	**2340**	**2950**	**3840**	**960**	**6240**
Hardness, Calcium Carbonate	ug/l	--	129000	106000	168000	96000	33000	156000	150000	167000	169000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	100	<100	200	<100	200	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	960	7980	1450	1650	11200	6620	1620	1610	1280
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	**5.9**	6.6	8.3	7.3	8.1	7.3	7	7.5
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**1470**	**100**	**180**	**310**	**1120**	**150**	**320**	**130**
Sulphate	ug/l	--	42000	17000	37000	8000	9000	72000	20000	12000	69000
Temperature (Field)	deg c	-- [10]	4.5	16	6.5	5.4	11.3	0.2	9.1	15.6	5
Total Dissolved Solids	ug/l	--	225000	189000	279000	161000	84600	316000	277000	308000	367000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	34000	345000	11000	32000	476000	320000	20000	45000	9000
Metals											
Arsenic	ug/l	100 [11]	<1	0.9	<1	0.6	2.7	1.6	1.2	0.7	0.5
Boron	ug/l	200 [12]	192	**232**	**223**	105	76	162	200	124	113
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	35300	21600	45100	25400	8370	40800	40500	48500	45600
Chromium	ug/l	-- [13]	<2	**21**	8	<2	**26**	8	<2	<2	<2
Cobalt	ug/l	0.9	0.4	**3.3**	<0.5	0.6	**6.5**	**2.5**	<0.5	<0.5	<0.5
Copper	ug/l	5	2	**46**	**44**	**11**	**17**	**8**	<2	**6**	<2
Iron	ug/l	300	**1360**	**1190**	**793**	**1630**	**2310**	**7560**	**658**	**4390**	192
Lead	ug/l	-- [14]	0.8	4.5	0.9	1.4	**8**	3.4	<0.1	1	<0.1
Magnesium	ug/l	--	9930	12600	13400	7980	2820	13100	11900	11200	13400
Manganese	ug/l	--	392	1470	27	141	725	704	184	441	22
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5000	4800	16300	5200	1000	7200	5900	4100	8800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	33500	36700	42200	28000	18700	51900	47200	64600	65000
Zinc	ug/l	30 [11]	7	**76**	26	23	**103**	**36**	8	**38**	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S10 13-May-2009 S-6	S10 25-Aug-2009 A-1	S10 27-Nov-2009 S-2	S10 18-May-2010 S-7	S10 18-Aug-2010 [2] S-1	S10 14-Oct-2010 S-2	S10 19-May-2011 W-1	S10 16-Aug-2011 [21] N-2	S10 30-Nov-2011 [22] S10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	176000	230000	158000	266000	135000	178000	167000	145000	90000
Ammonia, unionized	ug/l	20	<0.12	0.03	0.02	0.03	<0.01	<0.02	0.18	0.05	<0.09
Ammonia Nitrogen	ug/l	--	<20	30	20	20	<20	<20	30	30	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	3000	1000	3000	2000	1000	<1000	3000	2000
Chemical Oxygen Demand	ug/l	--	48000	99000	53000	60000	70000	40000	50000	95000	40000
Chloride	ug/l	--	54000	61000	57000	41000	36000	42000	30000	19000	39000
Conductivity	uS/cm	--	587	635	610	622	568	605	477	354	432
Conductivity (Field)	uS/cm	--	500	510	550	702	528	530	464	349	428
Dissolved Inorganic Carbon	ug/l	--	44600	60400	39800	57000	29100	43900	41600	37900	17800
Dissolved Organic Carbon	ug/l	--	18800	26900	13800	25900	27500	14900	18500	33600	14700
Dissolved Oxygen (Field)	ug/l	-- [7]	**3480**	**5770**	**5820**	**5420**	**1610**	9070	**2260**	**4250**	**5740**
Hardness, Calcium Carbonate	ug/l	--	173000	191000	158000	193000	175000	183000	165000	127000	116000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	110	<100	<100	<100	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1050	1370	160	2620	1310	1020	1060	1820	590
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	6.59	6.84	6.93	**6.26**	6.86	7.37	6.66	7.54
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	**970**	30	**750**	**80**	**170**	**70**	**80**	<10
Sulphate	ug/l	--	36000	2000	63000	<1000	90000	61000	31000	12000	56000
Temperature (Field)	deg c	-- [10]	10	15.6	4.3	11.0	15.5	7.2	14.0	18.3	5.3
Total Dissolved Solids	ug/l	--	382000	413000	397000	404000	369000	393000	310000	230000	281000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	38000	4000	43000	8000	12000	52000	18000	<2000
Metals											
Arsenic	ug/l	100 [11]	<1	2	<1	2	<1	<1	<1	<50	<50
Boron	ug/l	200 [12]	130	90	110	170	**330**	110	100	100	200
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	**<10**
Calcium	ug/l	--	46000	55000	42000	51000	47000	50000	43000	36000	30000
Chromium	ug/l	-- [13]	2	3	3	3	3	3	2	**<50**	**<50**
Cobalt	ug/l	0.9	<0.2	0.7	<0.2	**1.1**	0.4	0.5	<0.2	<10	<10
Copper	ug/l	5	<1	<1	1	1	1	1	<1	**<10**	**<10**
Iron	ug/l	300	170	**4660**	220	**8840**	**930**	**1610**	200	**1600**	100
Lead	ug/l	-- [14]	<1	<1	<1	<1	<1	<1	<1	**<10**	**<10**
Magnesium	ug/l	--	14000	13000	13000	16000	14000	14000	14000	9000	10000
Manganese	ug/l	--	40	780	50	2080	470	580	40	320	30
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	6000	9000	8000	8000	7000	10000	5000	<1000	5000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	57000	53000	50000	59000	50000	45000	39000	26000	38000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<10	<10	<10	<50	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	**2**	<1	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S10 30-May-2012 S 10	S10 22-Aug-2012 S-10	S10 29-Nov-2012 S10	S10 28-May-2013 S10	S10 15-Aug-2013 S10	S10 21-Nov-2013 SA-6	S10 28-May-2014 [23] S10 (SW-W)	S10 26-Aug-2014 [24] S10	S10 13-Nov-2014 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	230000	44000	250000	150000	200000	160000	210000	200000	180000
Ammonia, unionized	ug/l	20	<0.12	<0.01	0.07	0.04	0.09	<0.03	<0.09	0.2	<0.02
Ammonia Nitrogen	ug/l	--	<50	<50	180	97	210	<50	<50	160	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	<2000	4000	<2000	5000	<2000	2000	4000	6000
Chemical Oxygen Demand	ug/l	--	130000	160000	600000	79000	690000	150000	190000	410000	180000
Chloride	ug/l	--	33000	43000	83000	48000	42000	78000	55000	58000	62000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	518	759	894	524	548	725	571	603	558
Dissolved Inorganic Carbon	ug/l	--	56000	9200	52000	33000	57000	43000	48000	52000	43000
Dissolved Organic Carbon	ug/l	--	35000	27000	22000	23000	31000	18000	22000	23000	21000
Dissolved Oxygen (Field)	ug/l	-- [7]	**2250**	**560**	**1410**	**2770**	**1050**	**7580**	**680**	**600**	**3660**
Hardness, Calcium Carbonate	ug/l	--	200000	280000	280000	160000	170000	200000	200000	180000	160000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<500	<500	<100
Nitrite as N	ug/l	--	<10	<10	<10	<10	<10	<10	<50	<50	<10
Nitrogen, Total Kjeldahl	ug/l	--	2400	4000	16000	2300	16000	2400	11000	12000	7400
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	<100	<100	<100	<100	<100	<500	<500	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.91	**5.87**	6.66	**6.41**	**6.23**	6.86	6.87	6.57	6.61
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**330**	**390**	**1900**	**270**	**4200**	**240**	**1100**	**1200**	**680**
Sulphate	ug/l	--	<1000	280000	100000	41000	<1000	100000	29000	31000	21000
Temperature (Field)	deg c	-- [10]	16.4	15.2	0	9.0	14	0.2	13.1	17.9	2.1
Total Dissolved Solids	ug/l	--	328000	628000	560000	352000	378000	476000	408000	440000	334000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	62000	57000	380000	160000	380000	120000	120000	280000	93000
Metals											
Arsenic	ug/l	100 [11]	2.0	2.3	5.2	<1.0	5.9	<1.0	2.6	3.0	1.3
Boron	ug/l	200 [12]	130	**340**	160	170	190	190	160	170	160
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	58000	82000	87000	44000	63000	60000	60000	56000	47000
Chromium	ug/l	-- [13]	<5.0	<5.0	**17**	<5.0	<5.0	<5.0	<5.0	8.0	<5.0
Cobalt	ug/l	0.9	**1.1**	**2.0**	**4.5**	<0.50	**2.3**	0.55	**1.2**	**2.6**	**1.3**
Copper	ug/l	5	2.6	2.9	**17**	<1.0	**7.2**	3.3	3.0	**7.3**	2.8
Iron	ug/l	300	**5100**	**12000**	**43000**	**1900**	**59000**	**4400**	**10000**	**23000**	**7500**
Lead	ug/l	-- [14]	<0.50	0.66	**6.6**	<0.50	**6.3**	2.2	2.4	4.8	1.3
Magnesium	ug/l	--	15000	23000	29000	14000	17000	20000	16000	16000	15000
Manganese	ug/l	--	1900	730	1500	280	1100	220	1100	1300	1100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5300	4100	7400	6600	2900	8700	11000	4300	9000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	46000	73000	87000	62000	59000	76000	59000	57000	60000
Zinc	ug/l	30 [11]	7.9	12	**51**	<5.0	**42**	11	25	30	19
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**3.0**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.6**	**11**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S10 27-May-2015 S-10	S10 25-Aug-2015 S-10	S10 25-Nov-2015 S-10	S10 24-May-2016 S-10	S10 18-Aug-2016 S-10	S10 16-Nov-2016 S-10	S10 18-May-2017 S-10	S10 28-Aug-2017 S-10	S10 28-Nov-2017 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	204000	199000	183000	163000	21000	147000	192000	179000	189000
Ammonia, unionized	ug/l	20	1.34	0.11	0.01	0.71	0.07	0.4	0.3	0.06	0.02
Ammonia Nitrogen	ug/l	--	100	30	30	150	80	70	30	40	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	<20000 [25]	<30000 [25]	6000	74000	12000	4000	4000	35000	<100000 [26]
Chemical Oxygen Demand	ug/l	--	115000	171000	126000	671000	100000	52000	64000	153000	526000
Chloride	ug/l	--	77000	75000	108000	43000	33000	117000	75000	63000	64000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	619	602	39	458	864	942	673	520	656
Dissolved Inorganic Carbon	ug/l	--	45900	38300	43300	20200	900	29800	11000	36300	8800
Dissolved Organic Carbon	ug/l	--	38100	38900	19900	50500	25400	12800	42000	21400	43800
Dissolved Oxygen (Field)	ug/l	-- [7]	**930**	**1380**	**1940**	**1700**	**1310**	9270	**1660**	**2850**	**5580**
Hardness, Calcium Carbonate	ug/l	--	43000	137000	232000	193000	332000	229000	208000	202000	237000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2400	2300	2900	17400	4100	900	2300	4500	1700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.63	7.13	6.56	7.38	**6.43**	7.71	7.52	6.83	6.51
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**390**	**420**	**420**	**2500**	**650**	**120**	**260**	**540**	**480**
Sulphate	ug/l	--	12000	3000	87000	10000	398000	130000	51000	37000	67000
Temperature (Field)	deg c	-- [10]	17.0	15.5	0	10.8	17.9	3.7	16.3	12.3	0.4
Total Dissolved Solids	ug/l	--	358000	397000	488000	324000	668000	518000	408000	360000	390000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	97000	46000	129000	1160000	96000	36000	49000	410000	1000000
Metals											
Arsenic	ug/l	100 [11]	<1	1	<1	6	4	<1	<5 [17]	<1	2
Boron	ug/l	200 [12]	32	199	174	182	**489**	124	**255**	161	162
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.5 [17]	<0.1	**0.3**
Calcium	ug/l	--	13000	34300	71000	56300	91300	61900	55400	57600	66300
Chromium	ug/l	-- [13]	<1	1	2	**9**	2	<1	<5 [17]	2	**11**
Cobalt	ug/l	0.9	<0.5	0.6	<0.5	**6.3**	**3.4**	<0.5	<2.5 [17]	0.6	**3.6**
Copper	ug/l	5	<0.5	<0.5	<0.5	**8.7**	3.3	<0.5	<2.5 [17]	0.7	**13.1**
Iron	ug/l	300	**801**	**9020**	**3000**	**43300**	**4450**	**2580**	**1880**	**4090**	**17900**
Lead	ug/l	-- [14]	0.2	0.1	0.8	**11.7**	1.9	0.2	0.5	1.0	4.9
Magnesium	ug/l	--	2560	12500	18900	12800	25200	18000	16900	14200	17500
Manganese	ug/l	--	179	683	179	7530	1080	52	984	400	648
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	1180	3050	4830	8370	9080	5850	8190	3670	6080
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	13000	61700	106000	52200	57000	88700	66000	57500	52400
Zinc	ug/l	30 [11]	<5	10	13	**86**	**82**	18	<25 [17]	14	**70**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**5**	<1	**29**	**10**	**7**	<1	<1	<1

Parameter	Unit	PWQO [1]	S10 23-May-2018 S-10	S10 30-Aug-2018 S-10	S10 28-Nov-2018 S-10	S10 20-Jun-2019 S-10	S10 28-Aug-2019 [20] S-10	S10 21-Nov-2019 S-10	S10 14-May-2020 S-10	S10 26-Aug-2020 [20] S-10	S10 25-Nov-2020 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	243000	267000	175000	218000	--	89000	138000	--	191000
Ammonia, unionized	ug/l	20	0.11	0.05	0.02	0.05	--	0.01	0.02	--	0.05
Ammonia Nitrogen	ug/l	--	30	40	30	30	--	30	20	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	18000	4000	<12000 [26]	--	<20000 [26]	8000	--	<60000 [26]
Chemical Oxygen Demand	ug/l	--	106000	280000	66000	91000	--	178000	89000	--	361000
Chloride	ug/l	--	32000	118000	89000	62000	--	113000	59000	--	91000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	510	799	649	560	--	1091	505	--	23
Dissolved Inorganic Carbon	ug/l	--	50800	43000	32000	47100	--	<500	31100	--	45900
Dissolved Organic Carbon	ug/l	--	21500	37600	22400	23100	--	21800	31500	--	27600
Dissolved Oxygen (Field)	ug/l	-- [7]	**1920**	**1170**	13250	**1010**	--	**2980**	**5970**	--	**3000**
Hardness, Calcium Carbonate	ug/l	--	177000	230000	212000	217000	--	328000	120000	--	201000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	--	<100	<100	--	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	--	<50	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	2300	9900	900	1600	--	3200	1500	--	6600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.20	6.60	6.9	6.69	--	6.51	6.95	--	7.22
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1190**	**1220**	**90**	**110**	--	**430**	**210**	--	**1470**
Sulphate	ug/l	--	4000	3000	73000	1000	--	243000	28000	--	40000
Temperature (Field)	deg c	-- [10]	12.3	17.3	0.9	17.6	--	0.2	6.0	--	0
Total Dissolved Solids	ug/l	--	314000	484000	424000	352000	--	612000	278000	--	442000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	47000	346000	13000	16000	--	106000	25000	--	428000
Metals											
Arsenic	ug/l	100 [11]	1	2	<1	1	--	1	<1	--	<1
Boron	ug/l	200 [12]	141	**222**	124	197	--	**246**	83	--	99
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	<0.1
Calcium	ug/l	--	47200	64700	55300	59400	--	85000	31500	--	53000
Chromium	ug/l	-- [13]	<1	3	<1	1	--	2	<1	--	<1
Cobalt	ug/l	0.9	0.8	**1.2**	<0.5	**2.3**	--	**2.1**	<0.5	--	<0.5
Copper	ug/l	5	<0.5	3.8	1.1	1.4	--	2.9	0.6	--	1.0
Iron	ug/l	300	**11200**	**15500**	**2070**	**13500**	--	**8400**	**1080**	--	**1050**
Lead	ug/l	-- [14]	0.6	2.0	0.3	2.3	--	1.3	0.1	--	<0.1
Magnesium	ug/l	--	14400	16600	17800	16600	--	28200	9940	--	16600
Manganese	ug/l	--	1400	773	476	2990	--	1600	215	--	324
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5600	3290	6910	4480	--	10700	4450	--	10800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	42500	86700	79100	65900	--	90200	43800	--	67700
Zinc	ug/l	30 [11]	9	19	11	18	--	20	9	--	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**6**	<1	<1	--	**5**	<1	--	**10**

Parameter	Unit	PWQO [1]	S10 27-May-2021 S-10	S10 24-Aug-2021 S-10	S10 24-Nov-2021 S-10
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	215000	156000	185000
Ammonia, unionized	ug/l	20	0.17	0.03	0.02
Ammonia Nitrogen	ug/l	--	90	90	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<150000 [26]	<150000 [26]	<100000 [26]
Chemical Oxygen Demand	ug/l	--	766000	834000	518000
Chloride	ug/l	--	71000	54000	82000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	660	501	799
Dissolved Inorganic Carbon	ug/l	--	52500	42500	42100
Dissolved Organic Carbon	ug/l	--	30700	41200	24300
Dissolved Oxygen (Field)	ug/l	-- [7]	**1090**	**1450**	**3660**
Hardness, Calcium Carbonate	ug/l	--	279000	169000	235000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	11100	12600	7700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.93	**5.88**	6.86
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**2920**	**1500**	**1430**
Sulphate	ug/l	--	2000	4000	96000
Temperature (Field)	deg c	-- [10]	12.5	19.7	0
Total Dissolved Solids	ug/l	--	416000	358000	486000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	221000	330000	404000
Metals					
Arsenic	ug/l	100 [11]	6	2	2
Boron	ug/l	200 [12]	143	112	143
Cadmium	ug/l	0.2 [11]	**0.3**	<0.1	<0.1
Calcium	ug/l	--	76700	48000	65400
Chromium	ug/l	-- [13]	**33**	6	3
Cobalt	ug/l	0.9	**9.1**	**1.5**	**2.7**
Copper	ug/l	5	**23.7**	**8.7**	5.0
Iron	ug/l	300	**54200**	**15400**	**20000**
Lead	ug/l	-- [14]	**13.6**	**6.9**	3.3
Magnesium	ug/l	--	21300	11900	17400
Manganese	ug/l	--	1970	819	2140
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	11300	2430	7480
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	71800	45300	70400
Zinc	ug/l	30 [11]	**108**	27	**32**
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**12**	**2**	**8**

Parameter	Unit	PWQO [1]	S11 28-Jun-1995	S11 14-Nov-1995	S11 13-Jun-1996	S11 12-Oct-1996	S11 17-Jun-1997	S11 05-Nov-1997	S11 05-Jun-1998	S11 26-Aug-1998	S11 30-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	300000	57000	78000	82000	71000	32000	72000	88000	218000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	10
Ammonia Nitrogen	ug/l	--	18000	330	50	190	10	10	730	90	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	15000	15000	5000	1000	3000	2000	5000	16000	1000
Chemical Oxygen Demand	ug/l	--	620000	130000	94000	50000	82000	51000	69000	116000	96000
Chloride	ug/l	--	75000	56500	42000	61000	68300	51000	120000	63400	120000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	790	500	320	710	706	770	1347	522	830
Dissolved Inorganic Carbon	ug/l	--	96800	7300	19100	16100	37000	6000	11400	23300	65700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4800	--	7700	4850	4700	4500	10520	5580	7860
Hardness, Calcium Carbonate	ug/l	--	234000	113000	70000	224000	190000	182000	397000	135000	223000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	19500	25800	1720	1660	2120	1080	1840	1640	1320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	1500	25470	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.73	6.93	**5.05**	**6.25**	**6.44**	7.27	--	7.6	**6.4**
Phosphate	ug/l	--	5920	1070	200	210	150	80	170	360	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	7000	46000	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	400000	250000	160000	350	354000	380000	673000	261000	410000
Total Organic Carbon	ug/l	--	56100	36700	29700	16500	36800	19800	22800	23000	32700
Total Suspended Solids	ug/l	--	--	625000	26000	16000	8000	12000	40000	28000	5000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1450**	**570**	**652**	**1270**	**2350**	**1340**	**3350**	**1100**	**810**
Cadmium	ug/l	0.2 [11]	**1.3**	**0.4**	--	--	--	--	--	--	--
Calcium	ug/l	--	57590	27600	18600	56500	52000	47300	102000	34400	52100
Chromium	ug/l	-- [13]	**90**	**20**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**14**	**11.1**	3.5	4.2	0.5	**10.8**	2	3.2	0.7
Iron	ug/l	300	**24210**	**14500**	**1860**	**2060**	**1650**	150	**3040**	**1210**	**740**
Lead	ug/l	-- [14]	**37.6**	**16.5**	0.6	0.2	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	21200	10600	5520	19800	14300	15400	34600	11700	22300
Manganese	ug/l	--	650	270	111	280	100	70	450	90	80
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	**30**	20	22	20	20	20	20	20	20
Potassium	ug/l	--	10430	7500	792	2900	400	1700	400	7600	17000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	74380	63200	45400	72800	81800	46400	153000	57800	103000
Zinc	ug/l	30 [11]	**120**	**80**	10	20	10	20	30	10	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**2**	**6**	1	1	1

Parameter	Unit	PWQO [1]	S11 19-Oct-1999	S11 03-May-2000	S11 25-Oct-2000	S11 13-Jun-2001	S11 21-Nov-2001	S11 22-May-2002	S11 12-Nov-2002	S11 31-May-2003	S11 22-Oct-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	46000	67000	210000	198000	80000	135000	44000	89000	42000
Ammonia, unionized	ug/l	20	--	10	--	<20	<20	--	--	--	--
Ammonia Nitrogen	ug/l	--	70	50	--	30	20	30	40	120	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	4000	--	3000	2000	1000	13000	9000	3000
Chemical Oxygen Demand	ug/l	--	118000	72000	--	66000	60000	49000	355000	150000	84000
Chloride	ug/l	--	70600	30400	149000	90400	79600	70700	89200	43200	80800
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	520	339	861	650	420	410	--	600	600
Dissolved Inorganic Carbon	ug/l	--	21300	13800	--	38300	11200	21000	9000	19000	10000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6400	8740	2270	2000	6110	6380	--	5000	5000
Hardness, Calcium Carbonate	ug/l	--	133000	67000	291000	192000	166000	186000	295000	98000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	100	100	100	200	100	500
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1460	1140	20800	1520	1200	740	8700	3460	1360
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.7	6.76	7.19	6.9	**6.15**	7.02	--	8.15	8.15
Phosphate	ug/l	--	200	140	--	410	140	40	970	530	170
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	61000	53000	107000	36000	300000	44000	110000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	260000	170000	258000	438000	380000	340000	672000	196000	333000
Total Organic Carbon	ug/l	--	24700	20100	--	22700	15000	11000	28000	35000	23000
Total Suspended Solids	ug/l	--	29000	30000	1340000	43000	106000	4000	427000	232000	28000
Metals											
Arsenic	ug/l	100 [11]	--	--	5	1	1	1	1	1	1
Boron	ug/l	200 [12]	**880**	**280**	**1430**	**550**	**690**	110	**1260**	**260**	**455**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	34800	17700	70400	49100	43700	48800	77400	25900	34600
Chromium	ug/l	-- [13]	--	--	**80**	**10**	**10**	**10**	**10**	**10**	8
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	0.5	0.5	**53**	0.5	3.5	<1	**10.9**	5	**21**
Iron	ug/l	300	**2620**	**1260**	**37200**	**1990**	**5340**	220	**4940**	**2860**	**922**
Lead	ug/l	-- [14]	0.3	0.2	**51**	5	0.3	<1	**8.3**	1.3	1.9
Magnesium	ug/l	--	11100	5370	28000	16900	13700	12800	24800	8010	11600
Manganese	ug/l	--	290	390	2420	540	430	20	530	790	153
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**50**	20	20	20	20	20	10
Potassium	ug/l	--	8000	8500	9600	2200	5700	4800	7800	4400	10600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	60600	30800	95900	85600	62300	51300	95400	44100	67700
Zinc	ug/l	30 [11]	20	10	**320**	20	10	10	**110**	**40**	18
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**31**	**17**	**7**	**43**	1	1	1	1	1

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Parameter	Unit	PWQO [1]	S11 17-May-2004	S11 21-Aug-2004	S11 18-Nov-2004	S11 25-May-2005	S11 09-Sep-2005 [20]	S11 09-Nov-2005	S11 24-May-2006	S11 15-Aug-2006	S11 16-Nov-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	149000	--	110000	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	<5000	--	<5000	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	155000	183000	250000	120000	--	90000	82000	191000	63000
Ammonia, unionized	ug/l	20	<10	<10	<10	<10	--	<10	<10	<10	<10
Ammonia Nitrogen	ug/l	--	10	40	80	<10	--	50	<10	20	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	7000	84000	10000	--	15000	13000	6000	<3000
Chemical Oxygen Demand	ug/l	--	76000	187000	2850000	64000	--	372000	264000	95000	48000
Chloride	ug/l	--	86500	72300	109000	62700	--	61200	39700	99300	19200
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	550	500	740	480	--	220	220	750	190
Dissolved Inorganic Carbon	ug/l	--	42300	38800	54100	38400	--	36800	29100	47800	17000
Dissolved Organic Carbon	ug/l	--	--	--	--	20100	--	22800	56800	29200	18900
Dissolved Oxygen (Field)	ug/l	-- [7]	3900	5800	--	**4800**	--	**7300**	10510	**1200**	**4340**
Hardness, Calcium Carbonate	ug/l	--	189000	164000	273000	121000	--	203000	40000	194000	32000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	**20**	--	**700**	--	--	--
Nitrate as N	ug/l	--	100	200	200	200	--	100	<100	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2040	4330	48400	1180	--	7720	5460	2480	990
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.2	7	7	7.2	--	7.2	7.3	6.9	7.6
Phosphate	ug/l	--	260	640	11800	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**120**	--	**1440**	**900**	**1180**	**130**
Sulphate	ug/l	--	30000	28000	79000	20000	--	174000	17000	20000	28000
Temperature (Field)	deg c	-- [10]	--	--	--	12.5	--	0.5	5	16	7.2
Total Dissolved Solids	ug/l	--	275000	250000	370000	252000	--	439000	175000	375000	139000
Total Organic Carbon	ug/l	--	17700	19200	17200	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	40000	172000	10400000	14000	--	1790000	253000	248000	67000
Metals											
Arsenic	ug/l	100 [11]	1	1	9	<1	--	1	<1	1.1	<1
Boron	ug/l	200 [12]	109	**223**	**410**	181	--	**758**	164	107	104
Cadmium	ug/l	0.2 [11]	--	--	--	<0.1	--	<0.5	**0.2**	<0.1	**<0.5**
Calcium	ug/l	--	53600	44200	74500	32000	--	52600	7280	45400	7250
Chromium	ug/l	-- [13]	2	7	**462**	<2	--	**45**	7	**33**	**13**
Cobalt	ug/l	0.9	--	--	--	**2**	--	**15**	**1.6**	**4.6**	0.9
Copper	ug/l	5	**17**	**96**	**370**	<2	--	**42**	**41**	**50**	**38**
Iron	ug/l	300	**922**	297	**1260**	**724**	--	**1390**	**1670**	**1110**	**1730**
Lead	ug/l	-- [14]	1.8	4.9	**22.5**	<0.2	--	**28**	**4.7**	**5.8**	1
Magnesium	ug/l	--	13400	12900	21200	10100	--	17400	5200	19600	3490
Manganese	ug/l	--	196	799	5760	69	--	1720	652	736	88
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	<0.05	--	<0.06	--	--	--
Molybdenum	ug/l	40	--	--	--	<0.5	--	<5	--	--	--
Nickel	ug/l	25	20	**80**	**300**	<10	--	**40**	--	--	--
Potassium	ug/l	--	6400	7700	9400	6200	--	5600	2000	7600	3600
Selenium	ug/l	100	--	--	--	<1	--	<1	--	--	--
Sodium	ug/l	--	73600	81100	100000	52500	--	77400	54900	73500	36900
Zinc	ug/l	30 [11]	**42**	**244**	**1080**	9	--	**145**	**46**	**78**	**31**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**7**	<1	--	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S11 08-May-2007	S11 22-Aug-2007 [20]	S11 20-Nov-2007	S11 23-May-2008	S11 12-Aug-2008	S11 06-Nov-2008	S11 13-May-2009 S-7	S11 25-Aug-2009 [27] A-2	S11 27-Nov-2009 [28] S-5
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	138000	--	182000	80000	170000	150000	181000	202000	157000
Ammonia, unionized	ug/l	20	0.120151	--	<10	<20	<20	<20	<0.16	0.3	3.35
Ammonia Nitrogen	ug/l	--	<10	--	60	<10	200	20	<20	190	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	--	14000	<3000	10000	<3000	<1000	14000	16000
Chemical Oxygen Demand	ug/l	--	55000	--	366000	115000	222000	42000	45000	95000	60000
Chloride	ug/l	--	53200	--	131000	56800	69200	104000	77000	79000	66000
Conductivity	uS/cm	--	--	--	--	--	--	--	710	734	654
Conductivity (Field)	uS/cm	--	400	--	600	370	500	600	600	640	--
Dissolved Inorganic Carbon	ug/l	--	34500	--	49100	20000	42600	38700	44500	53400	38600
Dissolved Organic Carbon	ug/l	--	13100	--	18100	8700	26200	13400	17200	26100	20100
Dissolved Oxygen (Field)	ug/l	-- [7]	**5150**	--	**2750**	**2330**	**460**	**2430**	6570	**4160**	**700**
Hardness, Calcium Carbonate	ug/l	--	155000	--	215000	70000	116000	181000	192000	188000	187000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	--	100	100	100	<100	<100	<100	220
Nitrite as N	ug/l	--	--	--	--	--	--	--	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1500	--	7620	2150	7340	1020	860	2910	1070
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	--	7.8	7.2	7.1	7.6	7.4	6.70	**8.68**
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**180**	--	**2330**	**210**	**2510**	**140**	**60**	**1210**	**250**
Sulphate	ug/l	--	25000	--	118000	16000	2000	71000	55000	44000	68000
Temperature (Field)	deg c	-- [10]	10.4	--	0.3	11.3	16.5	7.8	17.5	17.1	4.9
Total Dissolved Solids	ug/l	--	271000	--	575000	201000	283000	417000	462000	477000	425000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	30000	--	2020000	11000	93000	3000	5000	398000	112000
Metals											
Arsenic	ug/l	100 [11]	0.9	--	4.1	1.7	1.4	0.9	<1	<50	<50
Boron	ug/l	200 [12]	53	--	**205**	167	125	81	60	<100	<100
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	**<10**
Calcium	ug/l	--	41900	--	53100	18200	25800	46900	54000	52000	50000
Chromium	ug/l	-- [13]	<2	--	**86**	<2	5	<2	3	**<50**	**<20**
Cobalt	ug/l	0.9	0.8	--	**21.7**	<0.5	**1.8**	0.9	0.3	<10	<5
Copper	ug/l	5	**21**	--	**42**	<2	**8**	<2	3	**20**	**10**
Iron	ug/l	300	**1300**	--	**40600**	**1020**	**979**	**676**	**470**	**18900**	**3800**
Lead	ug/l	-- [14]	0.8	--	**14.8**	<0.1	2.1	<0.1	<1	**<10**	**<10**
Magnesium	ug/l	--	12300	--	19900	5950	12500	15400	14000	14000	15000
Manganese	ug/l	--	136	--	1040	156	1110	191	40	560	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5200	--	8000	3300	5000	9100	6000	11000	12000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	48100	--	92800	51100	64500	78200	65000	64000	56000
Zinc	ug/l	30 [11]	21	--	**161**	6	**44**	<5	<10	**60**	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	<1	<1	<1	**2**	**4**

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Parameter	Unit	PWQO [1]	S11 18-May-2010 S-6	S11 18-Aug-2010 [29] S-3	S11 14-Oct-2010 S-6	S11 19-May-2011 [30] W-5	S11 16-Aug-2011 [2] N-6	S11 30-Nov-2011 [22] S11	S11 30-May-2012 S 11	S11 22-Aug-2012 S-11	S11 29-Nov-2012 S11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	139000	134000	140000	197000	110000	190000	1400000	250000
Ammonia, unionized	ug/l	20	0.12	0.18	0.03	<0.1	0.32	<0.07	0.53	<0.02	0.05
Ammonia Nitrogen	ug/l	--	30	170	30	<20	50	<20	120	<50	150
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	8000	5000	3000	68000	3000	6000	<2000	4000
Chemical Oxygen Demand	ug/l	--	58000	53000	83000	60000	175000	40000	160000	47000	180000
Chloride	ug/l	--	66000	46000	37000	34000	45000	44000	46000	62000	99000
Conductivity	uS/cm	--	708	754	461	452	637	562	--	--	--
Conductivity (Field)	uS/cm	--	767	709	205	447	543	537	498	1111	998
Dissolved Inorganic Carbon	ug/l	--	48900	31000	33900	34900	47700	22300	44000	10000	56000
Dissolved Organic Carbon	ug/l	--	23800	21500	28000	18900	25300	10300	32000	13000	24000
Dissolved Oxygen (Field)	ug/l	-- [7]	**3630**	**5780**	**3780**	**1990**	**1760**	6740	**300**	**2280**	**1550**
Hardness, Calcium Carbonate	ug/l	--	212000	201000	140000	138000	198000	146000	150000	530000	340000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	100	<100	<100	1290	<100	<100	160
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	1450	1870	920	1760	3300	660	3200	1300	6200
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	<100	<100	160
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.25	6.55	6.83	7.26	7.23	7.40	7.13	**6.15**	6.62
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**250**	**160**	**110**	**290**	**90**	**340**	**140**	**1600**
Sulphate	ug/l	--	27000	163000	37000	34000	57000	91000	<1000	480000	170000
Temperature (Field)	deg c	-- [10]	12.9	15.88	9	15.4	19.3	6.3	17.4	15.5	0
Total Dissolved Solids	ug/l	--	460000	490000	300000	294000	414000	365000	320000	990000	678000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	14000	69000	17000	33000	517000	65000	60000	10000	460000
Metals											
Arsenic	ug/l	100 [11]	1	<1	<1	<50	<10	<50	1.3	<1.0	4.5
Boron	ug/l	200 [12]	100	**270**	60	<100	190	100	150	**650**	150
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	**<10**	<0.1	**<10**	<0.10	<0.10	**0.24**
Calcium	ug/l	--	57000	54000	38000	37000	53000	37000	42000	150000	96000
Chromium	ug/l	-- [13]	3	5	7	**<50**	4	**<50**	<5.0	<5.0	**29**
Cobalt	ug/l	0.9	0.5	0.7	**1.4**	<10	0.6	<10	0.53	<0.50	**12**
Copper	ug/l	5	1	3	5	**<10**	1	**<10**	2.6	1.8	**14**
Iron	ug/l	300	**990**	**1660**	**2540**	**2000**	**1860**	**4400**	**2200**	**640**	**34000**
Lead	ug/l	-- [14]	<1	1	<1	**<10**	<1	**<10**	0.79	<0.50	**9.3**
Magnesium	ug/l	--	17000	16000	11000	11000	16000	13000	13000	41000	35000
Manganese	ug/l	--	170	250	80	100	370	130	230	110	3400
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8000	13000	7000	5000	6000	10000	6800	8800	10000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	67000	67000	33000	36000	56000	55000	52000	88000	99000
Zinc	ug/l	30 [11]	<10	<10	<10	<50	<10	<50	<5.0	9.8	**53**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<5	<1	<1	1.0	<1.0	**2.6**

Parameter	Unit	PWQO [1]	S11 28-May-2013 S11	S11 15-Aug-2013 S11	S11 21-Nov-2013 SA-5	S11 28-May-2014 [23] S11 (SW-C)	S11 26-Aug-2014 [24] S11	S11 13-Nov-2014 S-11	S11 27-May-2015 S-11	S11 25-Aug-2015 S-11	S11 25-Nov-2015 S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	160000	190000	180000	120000	150000	140000	120000	136000	186000
Ammonia, unionized	ug/l	20	0.2	0.22	<0.04	<0.35	0.51	<0.06	1.88	0.12	0.2
Ammonia Nitrogen	ug/l	--	98	130	<50	<50	96	<50	120	30	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	2000	5000	3000	3000	<2000	<6000 [25]	<6000 [25]	<10000 [25]
Chemical Oxygen Demand	ug/l	--	50000	140000	73000	79000	81000	50000	79000	64000	107000
Chloride	ug/l	--	66000	56000	82000	59000	57000	60000	78000	100000	134000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	590	563	770	439	508	478	498	750	62
Dissolved Inorganic Carbon	ug/l	--	35000	50000	46000	28000	40000	34000	30700	29900	42800
Dissolved Organic Carbon	ug/l	--	20000	23000	15000	22000	21000	19000	27300	22300	20400
Dissolved Oxygen (Field)	ug/l	-- [7]	**3680**	**1260**	**4510**	**2430**	**300**	**3130**	**560**	**1560**	**3080**
Hardness, Calcium Carbonate	ug/l	--	190000	170000	220000	120000	130000	130000	22900	176000	270000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<500	<500	<100	<100	<100	<100
Nitrite as N	ug/l	--	<10	<10	<10	<50	<50	11	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1100	2700	1500	2200	2000	880	2100	1000	1300
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	<100	<100	<500	<500	<100	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.94	6.77	6.90	7.44	7.13	7.00	7.61	7.12	7.49
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**58**	**900**	**270**	**310**	**300**	**55**	**240**	**100**	**160**
Sulphate	ug/l	--	58000	23000	110000	23000	16000	20000	17000	117000	75000
Temperature (Field)	deg c	-- [10]	13.1	15.6	1.1	14.0	19.9	3.7	19.8	17.0	0
Total Dissolved Solids	ug/l	--	390000	368000	544000	320000	330000	282000	178000	461000	510000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<1000	120000	40000	90000	38000	3000	4000	8000	31000
Metals											
Arsenic	ug/l	100 [11]	<1.0	2.0	<1.0	1.4	1.7	<1.0	<1	<1	<1
Boron	ug/l	200 [12]	88	**220**	120	81	97	74	23	134	85
Cadmium	ug/l	0.2 [11]	<0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Calcium	ug/l	--	49000	54000	63000	27000	35000	32000	5910	42600	79300
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	1	3
Cobalt	ug/l	0.9	<0.50	**2.4**	<0.50	0.72	0.77	<0.50	<0.5	<0.5	<0.5
Copper	ug/l	5	1.6	5.0	2.0	1.7	2.0	1.0	<0.5	<0.5	<0.5
Iron	ug/l	300	**550**	**12000**	**1200**	**2500**	**4300**	**990**	216	**772**	**1210**
Lead	ug/l	-- [14]	<0.50	1.8	0.65	1.7	1.7	<0.50	0.1	<0.1	0.7
Magnesium	ug/l	--	16000	17000	23000	9700	12000	12000	1970	16800	17500
Manganese	ug/l	--	42	3400	210	130	260	87	44	157	90
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5900	9200	10000	4600	6700	5200	859	5860	7960
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	65000	57000	88000	54000	55000	55000	12900	76600	121000
Zinc	ug/l	30 [11]	<5.0	20	5.8	<5.0	7.3	6.6	<5	6	9
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	**1.8**	<1.0	<1.0	**7.3**	<1	**2**	<1

Parameter	Unit	PWQO [1]	S11 24-May-2016 S-11	S11 18-Aug-2016 S-11	S11 16-Nov-2016 S-11	S11 18-May-2017 S-11	S11 28-Aug-2017 S-11	S11 28-Nov-2017 S-11	S11 23-May-2018 S-11	S11 30-Aug-2018 S-11	S11 28-Nov-2018 S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	136000	32000	136000	150000	159000	110000	121000	249000	65000
Ammonia, unionized	ug/l	20	0.76	0.02	0.27	0.56	0.35	0.07	0.2	0.52	0.04
Ammonia Nitrogen	ug/l	--	100	50	70	40	160	100	30	140	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	10000	3000	3000	2000	34000	4000	3000	<40000 [26]	7000
Chemical Oxygen Demand	ug/l	--	122000	45000	38000	69000	128000	49000	76000	355000	83000
Chloride	ug/l	--	99000	95000	125000	97000	62000	51000	81000	112000	62000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	579	1354	974	648	414	228	530	771	462
Dissolved Inorganic Carbon	ug/l	--	31300	6600	27900	8400	28400	8400	32100	41000	7100
Dissolved Organic Carbon	ug/l	--	20600	15400	11000	34700	48700	32300	21200	37600	26200
Dissolved Oxygen (Field)	ug/l	-- [7]	**3520**	**1650**	**2950**	**930**	**640**	**3090**	**1800**	**1630**	**4570**
Hardness, Calcium Carbonate	ug/l	--	137000	510000	229000	167000	180000	89000	88000	212000	116000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2500	1100	600	900	3200	2500	1600	12600	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.47	**6.05**	7.47	7.55	7.00	6.94	7.42	7.08	6.93
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**490**	**170**	**80**	**80**	**330**	**480**	**140**	**1570**	**160**
Sulphate	ug/l	--	31000	630000	147000	51000	15000	37000	24000	38000	84000
Temperature (Field)	deg c	-- [10]	14.3	19.3	5.6	20.1	12.0	0.3	13.9	16.6	0.2
Total Dissolved Solids	ug/l	--	382000	1090000	540000	394000	348000	268000	298000	500000	308000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	159000	23000	5000	11000	208000	466000	22000	138000	41000
Metals											
Arsenic	ug/l	100 [11]	2	2	<1	<5 [17]	1	<1	<1	3	<1
Boron	ug/l	200 [12]	**207**	**542**	109	**201**	**230**	92	109	**435**	115
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	**0.6**	<0.1
Calcium	ug/l	--	36100	139000	60100	43400	52400	22200	21400	59900	27000
Chromium	ug/l	-- [13]	**10**	2	<1	<5 [17]	5	6	1	8	2
Cobalt	ug/l	0.9	**1.5**	**1.5**	<0.5	<2.5 [17]	**1.7**	**1.1**	<0.5	**2.9**	0.9
Copper	ug/l	5	3.2	1.3	<0.5	<2.5 [17]	**7.7**	2.8	<0.5	4.7	2.3
Iron	ug/l	300	**5170**	**821**	**778**	**1310**	**3450**	**2650**	**1040**	**5120**	**1360**
Lead	ug/l	-- [14]	4.4	2.0	0.3	0.5	1.4	1.8	0.2	2.8	0.7
Magnesium	ug/l	--	11500	39800	19200	14200	12000	8250	8300	15100	11900
Manganese	ug/l	--	342	1000	121	194	525	304	250	2850	213
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5020	9180	6630	5510	4650	3290	2500	13500	5200
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	85600	106000	92400	78500	67500	50400	60300	70700	57200
Zinc	ug/l	30 [11]	**33**	**33**	<5	<25 [17]	18	13	7	17	13
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**13**	**8**	**5**	<1	<1	<1	<1	**6**	<1

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Parameter	Unit	PWQO [1]	S11 20-Jun-2019 S-11	S11 28-Aug-2019 [20] S-11	S11 21-Nov-2019 S-11	S11 14-May-2020 S-11	S11 26-Aug-2020 [20] S-11	S11 25-Nov-2020 S-11	S11 27-May-2021 S-11	S11 24-Aug-2021 S-11	S11 24-Nov-2021 S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	117000	--	66000	96000	--	80000	204000	240000	207000
Ammonia, unionized	ug/l	20	0.13	--	0.05	0.08	--	0.06	0.39	2.54	0.04
Ammonia Nitrogen	ug/l	--	50	--	180	20	--	40	90	1590	70
Biochemical Oxygen Demand, 5 Day	ug/l	--	12000	--	<60000 [26]	<2000	--	2000	11000	<40000 [26]	<40000 [26]
Chemical Oxygen Demand	ug/l	--	78000	--	137000	64000	--	76000	103000	317000	231000
Chloride	ug/l	--	75000	--	121000	92000	--	113000	104000	91000	101000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	502	--	1317	594	--	15	731	760	961
Dissolved Inorganic Carbon	ug/l	--	24700	--	<500	19400	--	20000	50000	48100	49400
Dissolved Organic Carbon	ug/l	--	19600	--	22500	26600	--	20700	29900	32200	23100
Dissolved Oxygen (Field)	ug/l	-- [7]	**1310**	--	**2040**	**4800**	--	**4260**	**1220**	**570**	**1970**
Hardness, Calcium Carbonate	ug/l	--	111000	--	404000	127000	--	194000	204000	226000	262000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	--	<50	<50	--	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1800	--	6500	900	--	1500	1500	20500	1300
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.87	--	**6.49**	7.31	--	7.25	7.28	6.59	6.85
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**130**	--	**1270**	**40**	--	**210**	**170**	**5270**	**80**
Sulphate	ug/l	--	19000	--	371000	84000	--	162000	16000	5000	127000
Temperature (Field)	deg c	-- [10]	18.1	--	0.2	10.0	--	-0.1	12.7	20.5	0.7
Total Dissolved Solids	ug/l	--	282000	--	720000	306000	--	514000	436000	448000	546000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	38000	--	394000	4000	--	16000	4000	17000	48000
Metals											
Arsenic	ug/l	100 [11]	<1	--	2	<1	--	<1	1	4	<1
Boron	ug/l	200 [12]	111	--	**238**	97	--	137	117	143	94
Cadmium	ug/l	0.2 [11]	<0.1	--	0.1	<0.1	--	<0.1	<0.1	**0.5**	0.1
Calcium	ug/l	--	28400	--	108000	31600	--	50200	53600	59100	71600
Chromium	ug/l	-- [13]	1	--	**13**	5	--	1	2	**43**	8
Cobalt	ug/l	0.9	<0.5	--	**7.7**	<0.5	--	**1.4**	**1.1**	**7.6**	**1.4**
Copper	ug/l	5	0.8	--	**6.4**	1.2	--	1.2	0.7	**19.3**	4.0
Iron	ug/l	300	**706**	--	**11800**	**621**	--	**1660**	**1180**	**18300**	**2810**
Lead	ug/l	-- [14]	0.1	--	4.5	0.3	--	0.6	0.3	**15.9**	3.0
Magnesium	ug/l	--	9840	--	32600	11700	--	16600	16900	19100	20300
Manganese	ug/l	--	195	--	2650	68	--	594	1130	1110	206
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	2650	--	10900	3100	--	6860	8230	10300	7540
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	61700	--	89900	64200	--	75700	79200	70900	82100
Zinc	ug/l	30 [11]	6	--	**37**	<5	--	6	6	**69**	14
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	**5**	<1	--	**9**	**3**	<1	**7**

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Parameter	Unit	PWQO [1]	S12 28-Jun-1995	S12 14-Nov-1995	S12 13-Jun-1996	S12 12-Oct-1996	S12 17-Jun-1997	S12 05-Nov-1997	S12 05-Jun-1998	S12 30-Jun-1998	S12 26-Aug-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	735000	186000	67000	288000	231000	232000	576000	436000	102000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	840	810	40	570	10	100	30	70	470
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	4000	3000	7000	23000	2000	5000	7000	6000
Chemical Oxygen Demand	ug/l	--	167000	70000	65000	75000	90000	41000	122000	170000	10000
Chloride	ug/l	--	157000	60000	37000	113000	127000	181000	317000	242000	28900
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1276	890	530	920	793	1350	1920	1530	341
Dissolved Inorganic Carbon	ug/l	--	166000	6600	15700	66800	43600	46300	118000	61400	23800
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	5750	--	9750	9580	10590	7850	17570	9570	6520
Hardness, Calcium Carbonate	ug/l	--	449000	203000	133000	328000	235000	326000	507000	295000	150000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	400	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	3000	10000	1910	2650	6160	1420	4140	2280	1220
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	2160	9190	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.07	7.63	7.09	7.34	7.74	7.52	--	7.9	7.88
Phosphorus	ug/l	-- [9]	**300**	**140**	**320**	**180**	**970**	**130**	**150**	**250**	**450**
Sulphate	ug/l	--	45000	51000	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	736000	450000	270000	460000	398000	680000	950000	770000	171000
Total Organic Carbon	ug/l	--	50300	64200	20100	28000	30200	17100	42900	38600	8000
Total Suspended Solids	ug/l	--	38000	79000	7000	26000	116000	48000	22000	21000	103000
Metals											
Arsenic	ug/l	100 [11]	100	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**2600**	**710**	**678**	**1600**	**1870**	**1180**	**4480**	**3900**	**390**
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--	--	--
Calcium	ug/l	--	78200	53000	32900	81100	53400	82100	93800	44800	44900
Chromium	ug/l	-- [13]	**24**	**10**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.6	2.4	**4300**	2.6	0.5	**10.4**	4.6	1.8	**5.8**
Iron	ug/l	300	**1300**	**1550**	**1240**	**1510**	**6090**	**910**	**390**	**550**	**3680**
Lead	ug/l	-- [14]	1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.6
Magnesium	ug/l	--	35100	17000	12300	29900	24200	28900	66100	43800	8960
Manganese	ug/l	--	425	150	114	110	480	160	20	640	70
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**34**	20	20	20	**30**	20	20
Potassium	ug/l	--	26800	17600	10100	16800	11800	12900	21100	23900	5300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	103000	66000	51900	92700	107000	131000	268000	238000	33000
Zinc	ug/l	30 [11]	10	20	10	10	20	**80**	20	10	**330**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**14**	1	1	1	1

Parameter	Unit	PWQO [1]	S12 30-Oct-1998	S12 19-Oct-1999	S12 03-May-2000	S12 25-Oct-2000	S12 13-Jun-2001	S12 27-Sep-2001	S12 21-Nov-2001	S12 22-May-2002	S12 12-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	62000	24000	98000	145000	137000	38000	112000	131000	52000
Ammonia, unionized	ug/l	20	10	--	10	--	<20	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	40	130	60	--	20	50	10	20	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	5000	3000	--	8000	1000	1000	1000	3000
Chemical Oxygen Demand	ug/l	--	202000	120000	84000	--	66000	46000	38000	45000	71000
Chloride	ug/l	--	45800	55000	45500	82000	61600	119000	89200	34200	78200
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	342	410	319	487	500	960	500	250	--
Dissolved Inorganic Carbon	ug/l	--	43200	20500	16600	--	21500	5200	16000	16000	11000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	5080	7710	5830	1720	4500	3570	7540	7330	--
Hardness, Calcium Carbonate	ug/l	--	84000	89000	53000	192000	141000	373000	176000	109000	281000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	100	100	100	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	3690	2210	620	20800	1300	1060	770	760	1700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.5	7.2	6.9	7.15	7.3	6.9	6.56	7.03	--
Phosphorus	ug/l	-- [9]	**2850**	**770**	**50**	--	**370**	**160**	**100**	**50**	**330**
Sulphate	ug/l	--	--	--	--	20000	33000	355000	105000	19000	225000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	172000	200000	160000	318000	314000	830000	391000	212000	528000
Total Organic Carbon	ug/l	--	41600	31100	23600	--	25500	17000	19000	13000	22000
Total Suspended Solids	ug/l	--	19000	13000	34000	1580000	67000	5000	58000	4000	62000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	7	1	1	1	1	1
Boron	ug/l	200 [12]	120	**260**	40	**920**	**300**	**790**	**280**	110	**450**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	18600	22500	11900	49000	36400	101000	46400	30900	77400
Chromium	ug/l	-- [13]	--	--	--	**50**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	2.3	0.5	**5.5**	**39**	1	3.5	2.1	<1	4.3
Iron	ug/l	300	**6860**	**1990**	**440**	**97300**	**1520**	**740**	**2470**	**380**	**1890**
Lead	ug/l	-- [14]	0.2	0.8	0.2	**19**	0.9	0.2	0.2	<1	1.7
Magnesium	ug/l	--	8990	7960	5590	16900	12200	29300	14600	7650	21200
Manganese	ug/l	--	430	810	20	2790	150	230	90	10	120
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	**30**	20	20	20	20	20	20	20	20
Potassium	ug/l	--	12000	14100	4000	5600	1900	13400	5300	4800	8500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	41000	45800	48000	48400	59000	95800	65200	29700	59900
Zinc	ug/l	30 [11]	**50**	30	10	**250**	10	10	10	10	**40**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**7**	1	**17**	**13**	**37**	1	1	1	1

Parameter	Unit	PWQO [1]	S12 31-May-2003	S12 03-Jul-2003	S12 22-Oct-2003	S12 17-May-2004	S12 21-Aug-2004	S12 18-Nov-2004	S12 25-May-2005	S12 09-Sep-2005 [20]	S12 09-Nov-2005
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	134000	--	116000
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	<5000	--	<5000
Alkalinity (Total as CaCO3)	ug/l	-- [5]	122000	176000	78000	137000	153000	111000	110000	--	95000
Ammonia, unionized	ug/l	20	--	--	--	<10	<10	<10	<10	--	<10
Ammonia Nitrogen	ug/l	--	160	20	20	10	40	10	<10	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	3000	2000	13000	16000	8000	--	10000
Chemical Oxygen Demand	ug/l	--	52000	87000	56000	66000	253000	517000	74000	--	245000
Chloride	ug/l	--	53600	29100	70200	44500	41600	56600	51300	--	63700
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	540	450	520	350	360	330	440	--	100
Dissolved Inorganic Carbon	ug/l	--	26000	43000	18000	33800	48000	23300	34100	--	26500
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	17500	--	37400
Dissolved Oxygen (Field)	ug/l	-- [7]	6200	2660	5800	9400	3400	--	6500	--	11200
Hardness, Calcium Carbonate	ug/l	--	169000	138000	--	118000	121000	102000	131000	--	101000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	**80**	--	<300
Nitrate as N	ug/l	--	100	100	200	100	100	200	200	--	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1020	1660	820	1150	5420	9630	1530	--	3520
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.4	6.79	6.8	7.4	7.5	7.1	7.3	--	7
Phosphorus	ug/l	-- [9]	**70**	**210**	**110**	**90**	**4700**	**4720**	**250**	--	**1280**
Sulphate	ug/l	--	88000	15000	58000	12000	3000	17000	24000	--	51000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	10	--	0
Total Dissolved Solids	ug/l	--	338000	340000	275000	175000	180000	165000	234000	--	270000
Total Organic Carbon	ug/l	--	21000	38000	22000	18200	22000	16800	--	--	--
Total Suspended Solids	ug/l	--	5000	12000	84000	10000	346000	1660000	121000	--	400000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	10	10	<1	--	1
Boron	ug/l	200 [12]	130	**319**	195	121	**241**	**240**	106	--	158
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	<0.1	--	<0.5
Calcium	ug/l	--	46600	36600	33700	32100	31900	26100	35300	--	25800
Chromium	ug/l	-- [13]	**10**	4	8	2	**9**	**100**	4	--	**9**
Cobalt	ug/l	0.9	--	--	--	--	--	--	**2**	--	**5**
Copper	ug/l	5	2	2	**15**	**15**	**86**	**111**	<2	--	**18**
Iron	ug/l	300	**540**	**2270**	**617**	**1110**	**2700**	**2480**	**3660**	--	**1390**
Lead	ug/l	-- [14]	0.5	1.2	1.3	0.2	**9.6**	**6.7**	0.7	--	5
Magnesium	ug/l	--	12800	11400	10700	9210	10100	8850	10500	--	8790
Manganese	ug/l	--	50	394	41	137	9	15800	151	--	894
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	<0.05	--	<0.06
Molybdenum	ug/l	40	--	--	--	--	--	--	<0.5	--	<5
Nickel	ug/l	25	20	10	10	20	**50**	**50**	<10	--	<10
Potassium	ug/l	--	5700	1600	13200	5600	3800	6600	4500	--	5400
Selenium	ug/l	100	--	--	--	--	--	--	<1	--	<1
Sodium	ug/l	--	49600	49600	54000	50200	51000	40700	42000	--	62000
Zinc	ug/l	30 [11]	10	5	11	26	**190**	**278**	16	--	**128**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	**3**	<1	--	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 24-May-2006	S12 15-Aug-2006	S12 16-Nov-2006	S12 08-May-2007	S12 22-Aug-2007 [20]	S12 20-Nov-2007	S12 23-May-2008	S12 12-Aug-2008	S12 06-Nov-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	114000	172000	65000	89000	--	89000	97000	110000	84000
Ammonia, unionized	ug/l	20	<10	<10	<10	0.0901869	--	<10	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	20	30	<10	--	20	<10	<10	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	17000	<3000	<3000	--	5000	<3000	4000	<3000
Chemical Oxygen Demand	ug/l	--	72000	367000	42000	49000	--	234000	44000	108000	67000
Chloride	ug/l	--	34300	35300	18000	34900	--	48900	38600	27900	47500
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	407	670	170	300	--	290	335	315	385
Dissolved Inorganic Carbon	ug/l	--	27100	43000	17600	22300	--	24000	24300	33300	22500
Dissolved Organic Carbon	ug/l	--	18100	29400	14600	14200	--	32900	17900	32900	21700
Dissolved Oxygen (Field)	ug/l	-- [7]	9400	**1600**	7360	**5330**	--	**7620**	6990	**110**	**2490**
Hardness, Calcium Carbonate	ug/l	--	103000	116000	35000	103000	--	91000	94000	73000	103000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	--	1000	<100	100	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2040	7190	980	640	--	5400	800	1870	1740
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.9	6.7	6.9	7.6	--	7.8	7.3	7.1	6.8
Phosphorus	ug/l	-- [9]	**470**	**8350**	**170**	**50**	--	**1160**	**70**	**1750**	**380**
Sulphate	ug/l	--	41000	2000	19000	18000	--	28000	16000	1000	28000
Temperature (Field)	deg c	-- [10]	5	15.5	7	12.6	--	0	10.9	17	7
Total Dissolved Solids	ug/l	--	218000	229000	122000	185000	--	216000	183000	170000	207000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	390000	645000	81000	4000	--	196000	<3000	55000	23000
Metals											
Arsenic	ug/l	100 [11]	<1	6.9	1	0.6	--	3.4	1.3	2.7	1.2
Boron	ug/l	200 [12]	72	139	47	48	--	77	42	89	157
Cadmium	ug/l	0.2 [11]	0.2	<0.1	**<0.5**	<0.1	--	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	18200	27500	8550	28500	--	17600	26400	16800	25800
Chromium	ug/l	-- [13]	**22**	**10**	6	<2	--	**18**	<2	<2	2
Cobalt	ug/l	0.9	**6.7**	**5.5**	<0.5	<0.5	--	**5.2**	<0.5	**1.8**	**2**
Copper	ug/l	5	**225**	**35**	**38**	**19**	--	**17**	<2	**6**	<2
Iron	ug/l	300	228	**2620**	**860**	**800**	--	**812**	**497**	**2690**	**2500**
Lead	ug/l	-- [14]	**10.5**	2.8	0.6	0.3	--	**5.9**	<0.1	0.7	<0.1
Magnesium	ug/l	--	13900	11600	3320	7700	--	11400	6720	7530	9280
Manganese	ug/l	--	3550	4150	45	26	--	803	13	1200	871
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7000	4000	3600	3600	--	7800	3700	2800	2400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	38400	42100	28900	37500	--	42900	33400	42700	40300
Zinc	ug/l	30 [11]	**146**	**50**	20	16	--	**65**	<5	**32**	6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	--	<1	<1	<1	**3**

Parameter	Unit	PWQO [1]	S12 13-May-2009 S-9	S12 25-Aug-2009 [27] A-5	S12 27-Nov-2009 S-12	S12 18-May-2010 S-4	S12 18-Aug-2010 [31] S-6	S12 14-Oct-2010 S-5	S12 19-May-2011 [32] W-9	S12 16-Aug-2011 [20] S-12	S12 30-Nov-2011 [22] S12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	108000	146000	81000	117000	107000	94000	105000	--	81000
Ammonia, unionized	ug/l	20	<0.68	0.24	0.01	0.11	0.07	0.07	<0.11	--	<0.07
Ammonia Nitrogen	ug/l	--	<20	150	20	30	30	30	<20	--	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	12000	2000	3000	4000	6000	2000	--	2000
Chemical Oxygen Demand	ug/l	--	50000	133000	118000	58000	88000	450000	50000	--	63000
Chloride	ug/l	--	41000	28000	37000	28000	28000	24000	21000	--	33000
Conductivity	uS/cm	--	373	373	324	316	336	274	269	--	330
Conductivity (Field)	uS/cm	--	340	405	246	355	318	530	285	--	325
Dissolved Inorganic Carbon	ug/l	--	27300	43300	20900	26600	24000	19600	26300	--	14500
Dissolved Organic Carbon	ug/l	--	19800	35900	17900	21400	38000	21100	21900	--	17400
Dissolved Oxygen (Field)	ug/l	-- [7]	**4870**	**330**	**4660**	**4330**	**2680**	8740	**2990**	--	**6790**
Hardness, Calcium Carbonate	ug/l	--	100000	105000	72000	91000	96000	80000	86000	--	86000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	--	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	870	2740	1700	2710	2700	5620	1180	--	710
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.1	6.64	6.76	7.27	6.92	7.13	7.33	--	7.40
Phosphorus	ug/l	-- [9]	**160**	**1720**	**690**	**840**	**600**	**4210**	**60**	--	**40**
Sulphate	ug/l	--	12000	1000	16000	1000	16000	4000	2000	--	26000
Temperature (Field)	deg c	-- [10]	15.3	18.9	4.7	11.1	16.1	8.5	14.8	--	6.0
Total Dissolved Solids	ug/l	--	242000	242000	211000	205000	218000	178000	175000	--	214000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	50000	69000	111000	62000	54000	408000	<2000	--	72000
Metals											
Arsenic	ug/l	100 [11]	1	<50	<50	<1	<50	<50	<1	--	<50
Boron	ug/l	200 [12]	50	100	<100	70	200	100	50	--	<100
Cadmium	ug/l	0.2 [11]	<0.1	**<10**	**<10**	<0.1	**<10**	**<10**	<0.1	--	**<10**
Calcium	ug/l	--	27000	29000	19000	25000	27000	22000	23000	--	23000
Chromium	ug/l	-- [13]	2	**<50**	**20**	2	**<50**	**<50**	2	--	**<50**
Cobalt	ug/l	0.9	0.7	<10	<5	0.6	<10	<10	<0.2	--	<10
Copper	ug/l	5	3	**<10**	**20**	1	**<10**	**<10**	<1	--	**<10**
Iron	ug/l	300	**1260**	**22000**	**9300**	**3380**	**15200**	**30900**	**530**	--	**2600**
Lead	ug/l	-- [14]	4	**<10**	**<10**	<1	**<10**	**<10**	<1	--	**<10**
Magnesium	ug/l	--	8000	8000	6000	7000	7000	6000	7000	--	7000
Manganese	ug/l	--	80	890	220	240	400	1090	30	--	80
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5000	6000	5000	5000	4000	4000	4000	--	4000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	38000	31000	29000	29000	31000	21000	23000	--	29000
Zinc	ug/l	30 [11]	**40**	<50	**60**	<10	**800**	<50	<10	--	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	1	<5	--	<1

Parameter	Unit	PWQO [1]	S12 30-May-2012 S12	S12 22-Aug-2012 [20] S-12	S12 29-Nov-2012 [20] S12	S12 28-May-2013 S12	S12 15-Aug-2013 [20] S12	S12 21-Nov-2013 SA-9	S12 28-May-2014 [23] S12 (SW-E)	S12 26-Aug-2014 [24] S12	S12 13-Nov-2014 [24] S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	140000	--	--	90000	--	73000	120000	140000	61000
Ammonia, unionized	ug/l	20	<0.16	--	--	0.43	--	<0.12	0.28	0.53	<0.13
Ammonia Nitrogen	ug/l	--	<50	--	--	100	--	<50	62	150	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	10000	--	--	<2000	--	2000	2000	6000	<2000
Chemical Oxygen Demand	ug/l	--	270000	--	--	74000	--	210000	130000	200000	91000
Chloride	ug/l	--	22000	--	--	29000	--	31000	46000	32000	27000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	328	--	--	274	--	295	393	396	240
Dissolved Inorganic Carbon	ug/l	--	30000	--	--	20000	--	21000	29000	39000	14000
Dissolved Organic Carbon	ug/l	--	42000	--	--	22000	--	31000	20000	29000	30000
Dissolved Oxygen (Field)	ug/l	-- [7]	**3910**	--	--	**3510**	--	**5240**	**4180**	**1080**	9290
Hardness, Calcium Carbonate	ug/l	--	120000	--	--	87000	--	80000	110000	120000	63000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	--	<100	--	<100	<500	<500	<500
Nitrite as N	ug/l	--	<10	--	--	<10	--	<10	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	5000	--	--	2000	--	5200	13000	3800	920
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	--	<100	--	<100	<500	<500	<500
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.92	--	--	7.27	--	7.45	7.29	7.02	7.39
Phosphorus	ug/l	-- [9]	**1500**	--	--	**360**	--	**480**	**780**	**2400**	**520**
Sulphate	ug/l	--	<1000	--	--	<1000	--	13000	<1000	<1000	<1000
Temperature (Field)	deg c	-- [10]	19.3	--	--	12.9	--	0.3	13.0	18.0	2.9
Total Dissolved Solids	ug/l	--	272000	--	--	166000	--	244000	284000	262000	148000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	120000	--	--	44000	--	150000	23000	250000	33000
Metals											
Arsenic	ug/l	100 [11]	3.7	--	--	1.3	--	1.4	1.2	3.0	<1.0
Boron	ug/l	200 [12]	96	--	--	62	--	56	52	65	46
Cadmium	ug/l	0.2 [11]	<0.10	--	--	<0.10	--	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	36000	--	--	23000	--	25000	32000	35000	18000
Chromium	ug/l	-- [13]	5.6	--	--	<5.0	--	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	**5.3**	--	--	**1.3**	--	**1.7**	**1.3**	**5.1**	0.77
Copper	ug/l	5	4.1	--	--	1.4	--	2.9	1.5	1.9	1.1
Iron	ug/l	300	**22000**	--	--	**4500**	--	**6000**	**3800**	**19000**	**4300**
Lead	ug/l	-- [14]	1.7	--	--	<0.50	--	1.4	0.56	0.97	<0.50
Magnesium	ug/l	--	9300	--	--	7100	--	8400	9400	10000	6100
Manganese	ug/l	--	2200	--	--	500	--	320	460	2600	260
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	3500	--	--	4100	--	4600	5000	1700	2900
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	29000	--	--	30000	--	29000	43000	36000	23000
Zinc	ug/l	30 [11]	15	--	--	7.4	--	12	11	13	5.6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**1.6**	--	--	<1.0	--	**2.2**	<1.0	<1.0	**9.5**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 27-May-2015 S-12	S12 25-Aug-2015 S-12	S12 25-Nov-2015 S-12	S12 24-May-2016 S-12	S12 18-Aug-2016 S-12	S12 16-Nov-2016 S-12	S12 18-May-2017 S-12	S12 28-Aug-2017 S-12	S12 28-Nov-2017 S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	104000	116000	103000	123000	65000	158000	139000	115000	139000
Ammonia, unionized	ug/l	20	1.69	0.85	0.04	0.59	0.24	0.39	0.61	0.04	0.08
Ammonia Nitrogen	ug/l	--	110	20	30	90	90	80	40	20	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<20000 [25]	<75000 [25]	2000	13000	18000	4000	20000	<200000 [26]	3000
Chemical Oxygen Demand	ug/l	--	143000	321000	83000	192000	120000	59000	76000	1120000	53000
Chloride	ug/l	--	54000	52000	58000	66000	74000	100000	48000	35000	57000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	362	399	191	439	686	811	434	264	62
Dissolved Inorganic Carbon	ug/l	--	18500	4500	27100	9600	12800	31300	2300	<500	12000
Dissolved Organic Carbon	ug/l	--	37500	59500	27800	46500	30400	16200	40300	94900	35700
Dissolved Oxygen (Field)	ug/l	-- [7]	**2680**	**1060**	**4250**	**710**	**3500**	**3610**	**810**	**1710**	**2330**
Hardness, Calcium Carbonate	ug/l	--	17600	116000	289000	144000	161000	214000	138000	163000	139000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2800	6200	1100	4400	3000	800	900	7100	2100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.65	8.18	7.26	7.50	6.86	7.57	7.67	6.90	7.23
Phosphorus	ug/l	-- [9]	**960**	**3130**	**90**	**2000**	**1110**	**130**	**130**	**7620**	**750**
Sulphate	ug/l	--	4000	<1000	19000	5000	168000	72000	20000	2000	38000
Temperature (Field)	deg c	-- [10]	18.3	15.9	0	11.5	19	5.6	17.5	13.1	0
Total Dissolved Solids	ug/l	--	222000	275000	266000	306000	482000	458000	268000	212000	306000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	114000	220000	39000	272000	49000	15000	62000	2020000	508000
Metals											
Arsenic	ug/l	100 [11]	<1	6	<1	3	3	<1	<5 [17]	3	2
Boron	ug/l	200 [12]	16	95	54	63	**354**	117	154	83	69
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1
Calcium	ug/l	--	4760	30400	18500	41900	42700	58300	38800	49400	37800
Chromium	ug/l	-- [13]	<1	8	2	5	4	2	<5 [17]	3	4
Cobalt	ug/l	0.9	0.7	**4.4**	<0.5	**2.5**	**1.3**	<0.5	<2.5 [17]	**4.3**	**1.9**
Copper	ug/l	5	<0.5	<0.5	<0.5	3.2	3.4	0.7	3.2	1.8	1.9
Iron	ug/l	300	**1610**	**59200**	**845**	**47000**	**7760**	**1050**	**2810**	**52400**	**12000**
Lead	ug/l	-- [14]	0.5	4.3	0.2	2.7	1.2	1.0	0.6	1.2	1.1
Magnesium	ug/l	--	1400	9720	8850	9620	13100	16600	10000	9560	10900
Manganese	ug/l	--	278	1330	39	824	404	111	371	1860	706
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	643	2070	4380	4480	8380	6040	4600	1240	4400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	8050	41300	49400	49400	64300	86400	42800	39000	43000
Zinc	ug/l	30 [11]	5	28	6	24	**34**	27	<25 [17]	19	9
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**6**	<1	**23**	**9**	**9**	<1	<10 [33]	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 23-May-2018 S-12	S12 30-Aug-2018 [20] S-12	S12 28-Nov-2018 S-12	S12 20-Jun-2019 S-12	S12 28-Aug-2019 S-12	S12 21-Nov-2019 S-12	S12 14-May-2020 S-12	S12 26-Aug-2020 S-12	S12 25-Nov-2020 S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	118000	--	51000	164000	10000	85000	72000	83000	118000
Ammonia, unionized	ug/l	20	0.15	--	0.27	0.34	0.02	0.01	0.07	0.24	1.97
Ammonia Nitrogen	ug/l	--	30	--	100	130	30	30	30	200	160
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	4000	203000	6000	<20000 [26]	4000	16000	<400000 [26]
Chemical Oxygen Demand	ug/l	--	52000	--	107000	807000	73000	101000	82000	697000	1400000
Chloride	ug/l	--	67000	--	40000	54000	3000	92000	54000	109000	69000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	446	--	161	482	84	767	326	723	8
Dissolved Inorganic Carbon	ug/l	--	28700	--	5500	34400	<500	<500	17300	<500	27200
Dissolved Organic Carbon	ug/l	--	17400	--	15700	24800	9300	15400	21300	20200	19500
Dissolved Oxygen (Field)	ug/l	-- [7]	**4900**	--	**6430**	**4610**	5570	9800	**5330**	**2030**	**1420**
Hardness, Calcium Carbonate	ug/l	--	92000	--	75000	124000	30600	215000	76000	230000	298000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1200	--	2200	10900	1100	1500	1100	14300	61700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.37	--	7.51	6.96	**6.22**	6.63	7.00	6.64	8.18
Phosphorus	ug/l	-- [9]	**140**	--	**530**	**8390**	**300**	**370**	**190**	**3360**	**19100**
Sulphate	ug/l	--	9000	--	13000	2000	17000	127000	19000	130000	44000
Temperature (Field)	deg c	-- [10]	11.8	--	0	15.7	18.7	0.1	13.0	15.1	0
Total Dissolved Solids	ug/l	--	258000	--	144000	328000	50000	384000	154000	436000	330000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	18000	--	198000	1110000	113000	189000	59000	986000	7970000
Metals											
Arsenic	ug/l	100 [11]	<1	--	1	9	<1	1	<1	5	5
Boron	ug/l	200 [12]	86	--	46	109	63	127	48	145	115
Cadmium	ug/l	0.2 [11]	<0.1	--	**0.2**	0.2	<0.1	<0.1	<0.1	**0.3**	**0.6**
Calcium	ug/l	--	25900	--	21300	34200	8860	56600	20300	58700	89800
Chromium	ug/l	-- [13]	<1	--	**20**	6	**12**	3	6	**64**	**18**
Cobalt	ug/l	0.9	<0.5	--	**2.1**	**9.3**	**1.2**	0.8	0.7	**10.5**	**39.8**
Copper	ug/l	5	<0.5	--	**6.4**	**17.8**	4.4	2.4	2.7	**25.9**	**31.9**
Iron	ug/l	300	**604**	--	**6530**	**132000**	**3630**	**5020**	**2840**	**26400**	**83300**
Lead	ug/l	-- [14]	<0.1	--	**6.6**	**5.6**	**4.0**	0.8	**3.1**	**15.5**	**14.3**
Magnesium	ug/l	--	6750	--	5160	9310	2070	17900	6170	20400	17800
Manganese	ug/l	--	30	--	165	3240	55	313	121	428	11200
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	3580	--	3290	2240	1620	5410	3170	16000	8500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	43400	--	30600	51500	8130	75500	34100	78500	52300
Zinc	ug/l	30 [11]	7	--	23	**40**	22	13	8	**92**	**145**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	**2**	<1	**3**	**4**	**31**	**15**	**25**

Parameter	Unit	PWQO [1]	S12 27-May-2021 S-12	S12 24-Aug-2021 S-12	S12 24-Nov-2021 S-12
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	166000	180000	98000
Ammonia, unionized	ug/l	20	0.16	0.14	0.03
Ammonia Nitrogen	ug/l	--	60	40	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	6000	3000
Chemical Oxygen Demand	ug/l	--	149000	114000	112000
Chloride	ug/l	--	47000	56000	42000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	468	549	417
Dissolved Inorganic Carbon	ug/l	--	44400	37800	24400
Dissolved Organic Carbon	ug/l	--	29600	25400	34000
Dissolved Oxygen (Field)	ug/l	-- [7]	**4260**	**320**	**2470**
Hardness, Calcium Carbonate	ug/l	--	146000	150000	96300
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	3800	2600	1500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.06	6.87	6.82
Phosphorus	ug/l	-- [9]	**1800**	**390**	**230**
Sulphate	ug/l	--	<1000	15000	28000
Temperature (Field)	deg c	-- [10]	12.8	22.0	0.8
Total Dissolved Solids	ug/l	--	284000	346000	256000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	59000	68000	33000
Metals					
Arsenic	ug/l	100 [11]	2	1	<1
Boron	ug/l	200 [12]	63	92	42
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	40100	40900	25900
Chromium	ug/l	-- [13]	3	7	5
Cobalt	ug/l	0.9	**2.3**	0.8	0.5
Copper	ug/l	5	1.3	2.0	1.8
Iron	ug/l	300	**9170**	**3710**	**1920**
Lead	ug/l	-- [14]	0.6	2.2	1.5
Magnesium	ug/l	--	11100	11700	7720
Manganese	ug/l	--	684	371	102
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	5860	5190	4890
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	43500	46000	31200
Zinc	ug/l	30 [11]	9	9	6
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**7**	**5**	**11**

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Parameter	Unit	PWQO [1]	S15 13-Jun-2001	S15 27-Sep-2001	S15 21-Nov-2001	S15 22-May-2002	S15 08-Nov-2002	S15 31-May-2003	S15 03-Jul-2003	S15 22-Oct-2003	S15 17-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	241000	189000	177000	199000	225000	168000	253000	189000	214000
Ammonia, unionized	ug/l	20	<20	<20	<20	--	--	--	--	--	<10
Ammonia Nitrogen	ug/l	--	30	30	20	20	30	240	10	250	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	1000	1000	2000	1000	2000
Chemical Oxygen Demand	ug/l	--	30000	27000	26000	28000	35000	48000	27000	58000	37000
Chloride	ug/l	--	200000	282000	191000	173000	275000	146000	232000	221000	203000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1000	1340	910	860	1400	880	1240	1280	1140
Dissolved Inorganic Carbon	ug/l	--	37800	45900	24800	7000	63000	18000	63000	45000	33700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12800	9600	12190	11110	9700	9160	6630	10400	9800
Hardness, Calcium Carbonate	ug/l	--	312000	428000	263000	298000	427000	228000	362000	--	308000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	300	200	1300	600	1000	700	200	1300	300
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	810	760	610	560	1170	1090	620	1740	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.96	7.23	7.22	7.1	7.9	7.92	7.98	7.9
Phosphate	ug/l	--	90	80	30	40	160	70	30	220	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	40000	157000	80000	56000	140000	58000	68000	75000	56000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	594000	904000	600000	558000	700000	495000	810000	672000	570000
Total Organic Carbon	ug/l	--	12200	11800	15000	9000	12000	42000	18000	24000	10100
Total Suspended Solids	ug/l	--	40000	7000	13000	9000	75000	8000	3000	40000	18000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	1
Boron	ug/l	200 [12]	100	90	60	60	90	40	71	54	53
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	90500	131000	81200	91800	130000	70200	108000	92500	92300
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	**10**	2	**10**	1
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.5	3.5	2	<1	**6.4**	4	2	**15**	3
Iron	ug/l	300	**1600**	250	200	**380**	**1690**	**400**	147	**1810**	**344**
Lead	ug/l	-- [14]	1.2	0.2	0.2	<1	3.9	0.5	0.5	2.3	0.3
Magnesium	ug/l	--	21000	24400	14700	16700	24800	12900	22500	15900	18800
Manganese	ug/l	--	160	160	90	140	380	100	161	194	199
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	10	10	10
Potassium	ug/l	--	8400	19700	9500	12000	18300	11200	14400	24200	11200
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	107000	145000	96000	107000	152000	85300	138000	146000	125000
Zinc	ug/l	30 [11]	10	10	10	20	30	10	5	25	5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**50**	1	1	1	1	1	1	1	1

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Parameter	Unit	PWQO [1]	S15 21-Aug-2004	S15 18-Nov-2004	S15 25-May-2005	S15 09-Sep-2005	S15 09-Nov-2005	S15 24-May-2006	S15 15-Aug-2006	S15 16-Nov-2006	S15 08-May-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	332000	913000	366000	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	<5000	<5000	<5000	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	336000	250000	272000	748000	300000	95000	354000	121000	236000
Ammonia, unionized	ug/l	20	<10	<10	20	**340**	10	<10	<10	--	0.6242
Ammonia Nitrogen	ug/l	--	60	60	2160	8300	150	30	<10	80	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	21000	9000	<3000	<3000	<3000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	32000	32000	94000	212000	25000	44000	29000	41000	30000
Chloride	ug/l	--	207000	252000	194000	171000	341000	61000	281000	48300	181000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1160	1070	1550	1800	970	290	1550	320	800
Dissolved Inorganic Carbon	ug/l	--	28500	25400	73400	180000	61400	25400	85000	30300	56600
Dissolved Organic Carbon	ug/l	--	--	--	19800	99200	10600	21800	18600	15100	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	8700	8270	**4690**	**2700**	10100	8900	**1800**	9600	9990
Hardness, Calcium Carbonate	ug/l	--	410000	337000	363000	604000	453000	129000	410000	93000	290000
Hydrogen Sulfide	ug/l	2 [8]	--	--	<10	<300	**10**	--	--	--	--
Nitrate as N	ug/l	--	200	700	100	3400	800	300	300	500	400
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	830	730	5380	15600	760	870	580	1020	560
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.2	7.5	7.9	7	7.8	7.5	--	8.3
Phosphate	ug/l	--	20	40	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	**710**	**1130**	30	**60**	30	**180**	10
Sulphate	ug/l	--	67000	80000	45000	45000	101000	31000	80000	34000	57000
Temperature (Field)	deg c	-- [10]	--	--	19.1	18.2	0	11	17	8	17.6
Total Dissolved Solids	ug/l	--	580000	535000	665000	1050000	1020000	234000	904000	244000	614000
Total Organic Carbon	ug/l	--	10000	9800	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	13000	10000	12000	16000	3000	9000	58000	3000
Metals											
Arsenic	ug/l	100 [11]	1	1	<1	2	<1	<1	1.1	1	0.9
Boron	ug/l	200 [12]	78	48	65	109	65	27	73	32	52
Cadmium	ug/l	0.2 [11]	--	--	<0.1	0.2	<0.5	0.2	<0.1	**<0.5**	<0.1
Calcium	ug/l	--	119000	99800	110000	154000	136000	38800	120000	26800	84700
Chromium	ug/l	-- [13]	1	3	<2	3	<2	<2	<2	8	<2
Cobalt	ug/l	0.9	--	--	**24**	**4.3**	**1**	0.5	0.4	**1**	0.5
Copper	ug/l	5	3	3	<2	**13**	<2	<2	2	**40**	**20**
Iron	ug/l	300	283	**1070**	**1730**	**5190**	**525**	**790**	200	**1270**	**362**
Lead	ug/l	-- [14]	1.6	0.6	0.3	1.8	0.5	0.8	0.5	5	0.2
Magnesium	ug/l	--	27200	21200	21300	53300	27400	7770	26800	6390	19000
Manganese	ug/l	--	402	271	734	2120	517	102	246	185	336
Mercury, dissolved	ug/l	0.2 [15]	--	--	<0.05	<0.06	<0.06	--	--	--	--
Molybdenum	ug/l	40	--	--	5.1	0.9	<5	--	--	--	--
Nickel	ug/l	25	10	10	<10	<10	<10	--	--	--	--
Potassium	ug/l	--	11100	14000	28200	151000	15800	4100	11600	7000	8900
Selenium	ug/l	100	--	--	<1	<1	<1	--	--	--	--
Sodium	ug/l	--	146000	144000	125000	143000	231000	36800	183000	44900	120000
Zinc	ug/l	30 [11]	12	8	**127**	**49**	<5	8	<5	**48**	13
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**14**	<1	<1	<1	<1	<1	<1

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Parameter	Unit	PWQO [1]	S15 22-Aug-2007 [20]	S15 20-Nov-2007	S15 23-May-2008	S15 12-Aug-2008	S15 06-Nov-2008	S15 13-May-2009 S-2	S15 25-Aug-2009 A-6	S15 27-Nov-2009 S-8	S15 18-May-2010 S-2
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	202000	180000	339000	252000	212000	437000	177000	378000
Ammonia, unionized	ug/l	20	--	<10	<20	<20	<20	1.43	1.2	1.43	1
Ammonia Nitrogen	ug/l	--	--	50	<10	<10	70	50	50	80	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	3000	<3000	<3000	<3000	2000	<1000	2000	<1000
Chemical Oxygen Demand	ug/l	--	--	21000	38000	42000	23000	40000	60000	38000	30000
Chloride	ug/l	--	--	201000	111000	262000	193000	139000	199000	85000	209000
Conductivity	uS/cm	--	--	--	--	--	--	930	1520	719	1430
Conductivity (Field)	uS/cm	--	--	750	625	1500	1000	800	1226	697	1515
Dissolved Inorganic Carbon	ug/l	--	--	56600	42500	82000	60900	51300	108000	42800	77900
Dissolved Organic Carbon	ug/l	--	--	12400	11300	14000	6400	14500	15600	12600	13700
Dissolved Oxygen (Field)	ug/l	-- [7]	--	10820	11190	8730	6920	11130	9150	13530	12740
Hardness, Calcium Carbonate	ug/l	--	--	281000	193000	346000	306000	257000	417000	192000	393000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	600	200	200	400	480	290	290	240
Nitrite as N	ug/l	--	--	--	--	--	--	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	--	710	800	710	740	720	580	680	680
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	7.8	8.1	8.5	8.1	7.9	7.83	8.16	7.60
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**150**	**40**	10	20	**40**	30	**130**	<10
Sulphate	ug/l	--	--	75000	33000	49000	66000	40000	58000	49000	52000
Temperature (Field)	deg c	-- [10]	--	1.5	14.2	22.6	9.7	19.1	18.8	5.1	14.1
Total Dissolved Solids	ug/l	--	--	635000	396000	819000	660000	605000	988000	467000	930000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	58000	<3000	9000	4000	2000	5000	31000	9000
Metals											
Arsenic	ug/l	100 [11]	--	1.3	1.3	0.8	<0.5	<1	<1	<1	<1
Boron	ug/l	200 [12]	--	44	29	66	61	50	80	50	80
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	--	85100	58500	96300	94300	78000	124000	57000	116000
Chromium	ug/l	-- [13]	--	8	<2	<2	<2	4	6	6	5
Cobalt	ug/l	0.9	--	**2.1**	<0.5	<0.5	0.9	0.5	0.9	0.7	**1.0**
Copper	ug/l	5	--	**6**	<2	<2	2	2	2	2	2
Iron	ug/l	300	--	**3420**	**664**	263	**381**	**690**	**420**	**1730**	**410**
Lead	ug/l	-- [14]	--	**7.8**	<0.1	<0.1	<0.1	<1	<1	<1	<1
Magnesium	ug/l	--	--	16500	11400	25500	17100	15000	26000	12000	25000
Manganese	ug/l	--	--	506	234	73	476	330	1490	510	1460
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	9500	6100	9800	8500	7000	10000	7000	9000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	120000	68900	172000	127000	96000	145000	57000	152000
Zinc	ug/l	30 [11]	--	28	<5	<5	<5	<10	<10	<10	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	<1	**2**	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S15 18-Aug-2010 S-7	S15 14-Oct-2010 S-11	S15 19-May-2011 W-13	S15 16-Aug-2011 [2] N-7	S15 30-Nov-2011 [22] S15	S15 30-May-2012 S 15	S15 22-Aug-2012 S-15	S15 29-Nov-2012 S15	S15 28-May-2013 S3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	422000	332000	189000	413000	213000	370000	520000	420000	330000
Ammonia, unionized	ug/l	20	0.11	0.57	0.82	1.5	0.75	<1.44	<0.74	1.38	0.63
Ammonia Nitrogen	ug/l	--	40	70	70	60	80	<50	<50	360	200
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<1000	2000	1000	3000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	40000	33000	55000	50000	28000	54000	55000	33000	36000
Chloride	ug/l	--	169000	186000	80000	158000	114000	190000	190000	200000	220000
Conductivity	uS/cm	--	1560	1430	700	1370	968	--	--	--	--
Conductivity (Field)	uS/cm	--	1401	1174	672	1114	890	1358	1515	1506	1294
Dissolved Inorganic Carbon	ug/l	--	93200	78200	45200	95200	37400	94000	110000	95000	74000
Dissolved Organic Carbon	ug/l	--	16100	12500	16000	18000	9400	18000	21000	13000	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	8830	14430	7180	6970	11190	10160	**4640**	11760	**530**
Hardness, Calcium Carbonate	ug/l	--	527000	417000	223000	438000	283000	440000	650000	500000	440000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	260	290	220	230	630	150	270	660	430
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	16	12	<10	15
Nitrogen, Total Kjeldahl	ug/l	--	520	630	760	1030	870	1200	900	1600	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	160	280	660	450
pH (Field)	-	6.5 - 8.5	6.93	7.62	7.68	7.85	7.86	7.82	7.62	7.67	7.07
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	20	**60**	30	**80**	**64**	19	25	**42**
Sulphate	ug/l	--	157000	124000	40000	91000	88000	89000	160000	120000	81000
Temperature (Field)	deg c	-- [10]	16.9	10.7	13.7	18.8	5.6	21.7	18.8	0	14.9
Total Dissolved Solids	ug/l	--	1010000	930000	455000	890000	629000	872000	1130000	986000	820000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	3000	7000	26000	23000	5000	21000	6000	2000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<1	<10	<50	<1.0	<1.0	<1.0	<1.0
Boron	ug/l	200 [12]	100	60	40	70	100	84	110	73	55
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	**<10**	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	160000	129000	68000	126000	82000	140000	180000	170000	130000
Chromium	ug/l	-- [13]	5	6	3	7	**<50**	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.8	0.6	0.5	0.7	<10	0.53	0.79	0.68	0.55
Copper	ug/l	5	3	2	2	2	**<10**	3.1	2.4	2.6	2.4
Iron	ug/l	300	210	**310**	**740**	**600**	**2300**	**790**	**630**	**550**	**650**
Lead	ug/l	-- [14]	<1	<1	<1	<1	**<10**	<0.50	<0.50	<0.50	<0.50
Magnesium	ug/l	--	31000	23000	13000	30000	19000	30000	48000	39000	28000
Manganese	ug/l	--	1340	710	280	710	570	800	1500	1800	850
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	12000	10000	9000	11000	11000	15000	17000	11000	12000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	143000	135000	62000	122000	81000	170000	160000	170000	160000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<50	<5.0	<5.0	<5.0	<5.0
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0

Parameter	Unit	PWQO [1]	S15 15-Aug-2013 S15	S15 21-Nov-2013 SA-12	S15 28-May-2014 S15	S15 26-Aug-2014 S15	S15 13-Nov-2014 S-15	S15 27-May-2015 S-15	S15 25-Aug-2015 S-15	S15 25-Nov-2015 S-15	S15 24-May-2016 S-15
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	540000	360000	360000	480000	270000	353000	538000	411000	408000
Ammonia, unionized	ug/l	20	1.34	0.31	<0.31	2.43	0.28	1.06	4.22	1.55	2.74
Ammonia Nitrogen	ug/l	--	67	77	<50	100	110	120	30	290	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	<2000	<2000	<2000	18000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	54000	34000	38000	52000	32000	33000	45000	40000	38000
Chloride	ug/l	--	200000	190000	260000	220000	150000	325000	335000	280000	207000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1648	1370	1419	1674	945	1704	1888	1769	1364
Dissolved Inorganic Carbon	ug/l	--	130000	89000	78000	120000	64000	83600	115000	81900	82100
Dissolved Organic Carbon	ug/l	--	22000	12000	14000	18000	14000	16600	19700	13100	15300
Dissolved Oxygen (Field)	ug/l	-- [7]	**5150**	**3130**	11320	6830	11400	10240	**4570**	13590	10400
Hardness, Calcium Carbonate	ug/l	--	570000	480000	440000	540000	320000	416000	504000	620000	490000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	320	720	410	200	300	200	<100	200	200
Nitrite as N	ug/l	--	<10	<10	<10	<10	23	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	840	860	1000	730	700	900	1100	900
Nitrogen, Nitrate-Nitrite	ug/l	--	320	720	410	200	320	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.75	7.65	7.36	7.76	7.34	7.34	**8.69**	7.81	7.87
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	14	**33**	20	21	**32**	<10	20	30	<10
Sulphate	ug/l	--	58000	120000	74000	79000	57000	71000	77000	106000	101000
Temperature (Field)	deg c	-- [10]	18.8	1.1	15.0	21.2	4.3	20.4	17.7	0.1	22.6
Total Dissolved Solids	ug/l	--	1030000	908000	1010000	978000	636000	994000	1160000	987000	868000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<1000	31000	2000	6000	4000	<2000	3000	21000	2000
Metals											
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<1	<1	<1
Boron	ug/l	200 [12]	82	91	80	100	57	84	91	80	110
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	170000	140000	130000	150000	99000	117000	133000	191000	129000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<1	1	<1
Cobalt	ug/l	0.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5	0.5	0.6	<0.5
Copper	ug/l	5	1.4	2.2	2.1	1.4	1.6	<0.5	<0.5	<0.5	1.5
Iron	ug/l	300	<100	**650**	290	180	**860**	262	197	**527**	254
Lead	ug/l	-- [14]	<0.50	1.1	<0.50	<0.50	<0.50	<0.1	<0.1	0.1	<0.1
Magnesium	ug/l	--	45000	35000	30000	38000	23000	29800	41100	34900	40500
Manganese	ug/l	--	360	470	790	370	560	520	1370	1220	614
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	14000	12000	13000	13000	10000	11400	12900	10900	12300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	160000	150000	180000	170000	110000	169000	176000	205000	161000
Zinc	ug/l	30 [11]	<5.0	<5.0	<5.0	5.5	<5.0	<5	5	8	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	**3.8**	<1	**2**	<1	**6**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S15 18-Aug-2016 S-15	S15 16-Nov-2016 S-15	S15 18-May-2017 S-15	S15 28-Aug-2017 S-15	S15 28-Nov-2017 S-15	S15 23-May-2018 S-15	S15 30-Aug-2018 S-15	S15 28-Nov-2018 S-15	S15 20-Jun-2019 S-15
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	508000	417000	331000	520000	324000	343000	664000	323000	344000
Ammonia, unionized	ug/l	20	4.73	0.92	4.01	1.23	5.37	2.79	2.05	0.41	3.21
Ammonia Nitrogen	ug/l	--	190	180	100	60	280	160	70	120	210
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	3000	<2000	6000	<2000	<2000	2000	3000	<2000
Chemical Oxygen Demand	ug/l	--	67000	32000	39000	44000	24000	37000	75000	35000	43000
Chloride	ug/l	--	258000	346000	159000	250000	171000	162000	253000	214000	154000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1792	1981	1140	1288	1141	1124	1724	1213	1177
Dissolved Inorganic Carbon	ug/l	--	84600	75500	42500	97400	15300	70400	115000	62000	72300
Dissolved Organic Carbon	ug/l	--	45500	12100	25100	17000	53000	13400	29300	11800	10400
Dissolved Oxygen (Field)	ug/l	-- [7]	6340	11590	9890	7240	13660	10480	**2020**	14410	8880
Hardness, Calcium Carbonate	ug/l	--	580000	518000	324000	683000	341000	312000	647000	385000	345000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	100	200	200	500	200	400	1000	400
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1600	700	800	900	900	800	2400	1200	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.79	7.53	7.96	7.85	8.35	7.70	7.94	7.55	7.69
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	20	30	20	10	20	**40**	**90**	**50**
Sulphate	ug/l	--	204000	120000	80000	63000	70000	45000	13000	117000	113000
Temperature (Field)	deg c	-- [10]	20.6	7.5	22.0	16.0	0.7	18.5	18.2	2	17
Total Dissolved Solids	ug/l	--	1210000	1140000	708000	1010000	670000	666000	1040000	764000	712000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	7000	7000	3000	7000	4000	17000	6000	21000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<5 [17]	<1	<1	<1	<1	<1	<1
Boron	ug/l	200 [12]	134	94	**252**	87	76	76	61	83	100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	147000	150000	87600	211000	96600	92500	168000	102000	90700
Chromium	ug/l	-- [13]	<1	<1	<5 [17]	1	<1	<1	2	4	1
Cobalt	ug/l	0.9	<0.5	0.6	<2.5 [17]	0.6	0.6	<0.5	**1.1**	**1.0**	0.7
Copper	ug/l	5	0.7	0.8	**5.5**	<0.5	1.7	<0.5	1.4	**5.1**	2.2
Iron	ug/l	300	223	**328**	**647**	**325**	**894**	**634**	**1170**	**938**	**1730**
Lead	ug/l	-- [14]	<0.1	<0.1	<0.5 [17]	0.1	0.2	<0.1	0.4	0.4	0.5
Magnesium	ug/l	--	51600	34600	25600	38100	24100	19700	55200	31400	28700
Manganese	ug/l	--	488	1250	554	1100	956	503	1800	388	830
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	24200	14400	10300	15300	9660	8070	21800	14400	11000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	185000	186000	115000	171000	110000	94200	152000	161000	119000
Zinc	ug/l	30 [11]	<5	<5	<25 [17]	12	5	<5	6	8	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	**5**	<1	<1	<1	<1	**5**	<1	<1

Parameter	Unit	PWQO [1]	S15 28-Aug-2019 S-15	S15 21-Nov-2019 S-15	S15 14-May-2020 S-15	S15 26-Aug-2020 S-15	S15 25-Nov-2020 S-15	S15 27-May-2021 S-15	S15 24-Aug-2021 S-15	S15 24-Nov-2021 S-15
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	371000	377000	323000	526000	387000	298000	513000	446000
Ammonia, unionized	ug/l	20	1.77	3.01	2.54	2.95	2.05	1.93	1.04	1.73
Ammonia Nitrogen	ug/l	--	150	350	130	120	260	80	70	340
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	4000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	54000	32000	45000	57000	30000	34000	54000	39000
Chloride	ug/l	--	168000	308000	271000	259000	246000	86000	291000	224000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1149	1883	1382	1715	54	1297	1854	1651
Dissolved Inorganic Carbon	ug/l	--	125000	<500	65800	102000	80600	67400	103000	87900
Dissolved Organic Carbon	ug/l	--	27400	11000	29900	21000	11800	10600	17400	13600
Dissolved Oxygen (Field)	ug/l	-- [7]	7230	14600	10890	7640	12760	9220	**2690**	11680
Hardness, Calcium Carbonate	ug/l	--	385000	544000	374000	537000	454000	601000	543000	471000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	300	400	700	300	400	<100	400
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	900	600	1100	700	600	900	1000
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.55	8.00	7.86	7.92	7.98	7.96	7.49	7.68
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	20	10	20	20	<10	30	<10
Sulphate	ug/l	--	59000	92000	84000	47000	91000	317000	61000	129000
Temperature (Field)	deg c	-- [10]	17.8	0.6	15.1	16.4	-0.1	14.9	22.9	3.1
Total Dissolved Solids	ug/l	--	724000	976000	780000	948000	942000	892000	1110000	918000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	4000	5000	2000	2000	5000	3000	4000	<2000
Metals										
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1	<1	<1
Boron	ug/l	200 [12]	64	69	45	59	62	66	76	106
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	101000	150000	110000	145000	125000	179000	158000	132000
Chromium	ug/l	-- [13]	1	1	<1	1	<1	<1	1	<1
Cobalt	ug/l	0.9	0.8	**1.0**	0.5	0.8	<0.5	<0.5	0.7	0.6
Copper	ug/l	5	2.1	1.5	1.6	1.0	0.8	1.0	1.3	0.9
Iron	ug/l	300	**1070**	**1260**	**882**	**373**	**502**	**415**	**683**	**567**
Lead	ug/l	-- [14]	0.3	0.1	0.1	0.2	<0.1	0.2	0.2	<0.1
Magnesium	ug/l	--	31900	41000	24400	42600	34500	37100	36000	34500
Manganese	ug/l	--	1240	1670	775	1090	895	509	1480	1500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	12900	15800	10700	21800	12600	12200	11600	15100
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	96300	164000	127000	148000	144000	66000	177000	152000
Zinc	ug/l	30 [11]	5	5	<5	<5	<5	6	<5	9
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**6**	**10**	<1	**9**	<4 [19]	**2**	<1	**4**

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Parameter	Unit	PWQO [1]	S16 27-Sep-2001	S16 21-Nov-2001	S16 22-May-2002	S16 08-Nov-2002	S16 31-May-2003	S16 03-Jul-2003	S16 22-Oct-2003	S16 17-May-2004	S16 21-Aug-2004 [20]
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	153000	86000	176000	156000	103000	210000	93000	194000	--
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--	<10	--
Ammonia Nitrogen	ug/l	--	670	30	30	1070	180	240	30	50	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	4000	1000	2000	2000	7000	--
Chemical Oxygen Demand	ug/l	--	70000	29000	36000	31000	63000	44000	40000	55000	--
Chloride	ug/l	--	394000	63300	83000	300000	56000	340000	92500	158000	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1580	450	490	1400	480	1490	680	910	--
Dissolved Inorganic Carbon	ug/l	--	39700	12000	20000	39000	25000	57000	24000	37200	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	2920	7410	8200	3000	3860	2000	8400	7000	--
Hardness, Calcium Carbonate	ug/l	--	386000	191000	211000	303000	161000	292000	--	250000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	2600	600	200	600	200	1600	300	--
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2460	920	640	1980	1220	1500	850	1310	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.37	**6.4**	**6.15**	7.4	7.5	7.03	7.5	7.1	--
Phosphate	ug/l	--	280	70	40	130	60	150	130	160	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	154000	76000	37000	134000	42000	37000	75000	24000	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1050000	328000	340000	700000	266000	937000	347000	455000	--
Total Organic Carbon	ug/l	--	9600	15000	11000	10000	23000	15000	13000	12800	--
Total Suspended Solids	ug/l	--	186000	22000	2000	34000	3000	77000	6000	31000	--
Metals											
Arsenic	ug/l	100 [11]	2	1	1	1	1	2	1	1	--
Boron	ug/l	200 [12]	50	30	40	70	20	46	34	25	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	131000	57000	64700	104000	48300	96700	56300	76000	--
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	3	7	1	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**8.2**	2.1	<1	2.9	3	2	**11**	5	--
Iron	ug/l	300	**2400**	**410**	**650**	**1150**	**870**	**2970**	**437**	**4610**	--
Lead	ug/l	-- [14]	**8**	0.2	<1	3.9	0.5	3.6	1.8	1.1	--
Magnesium	ug/l	--	14400	11700	11800	10600	9740	12300	10300	14600	--
Manganese	ug/l	--	390	40	240	860	160	1060	60	1270	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10	10	--
Potassium	ug/l	--	7100	9000	7000	9100	5500	5600	11300	4800	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	208000	30300	50900	176000	38800	209000	49500	101000	--
Zinc	ug/l	30 [11]	30	**500**	20	20	10	13	16	15	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	1	1	--

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Parameter	Unit	PWQO [1]	S16 18-Nov-2004	S16 25-May-2005	S16 09-Sep-2005 [20]	S16 09-Nov-2005	S16 24-May-2006	S16 15-Aug-2006 [20]	S16 16-Nov-2006	S16 08-May-2007 [20]	S16 22-Aug-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	215000	--	327000	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	<5000	--	<5000	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	150000	180000	--	268000	183000	--	72000	--	452000
Ammonia, unionized	ug/l	20	<10	<10	--	20	<10	--	--	--	<10
Ammonia Nitrogen	ug/l	--	10	<10	--	570	60	--	20	--	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<3000	--	<3000	3000	--	<3000	--	9000
Chemical Oxygen Demand	ug/l	--	36000	52000	--	45000	48000	--	38000	--	200000
Chloride	ug/l	--	68500	73000	--	666000	147000	--	12800	--	1140000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	480	595	--	1600	550	--	160	--	3300
Dissolved Inorganic Carbon	ug/l	--	19700	50400	--	60000	40200	--	20200	--	108000
Dissolved Organic Carbon	ug/l	--	--	17700	--	11700	19200	--	18800	--	11900
Dissolved Oxygen (Field)	ug/l	-- [7]	6600	**4600**	--	**6700**	11050	--	7550	--	**4480**
Hardness, Calcium Carbonate	ug/l	--	196000	212000	--	395000	230000	--	49000	--	645000
Hydrogen Sulfide	ug/l	2 [8]	--	<10	--	<10	--	--	--	--	--
Nitrate as N	ug/l	--	300	200	--	400	600	--	300	--	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	680	1040	--	1200	970	--	900	--	7360
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.8	7.2	--	7.5	7.5	--	--	--	7.3
Phosphate	ug/l	--	60	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**70**	--	**50**	**60**	--	**160**	--	**3130**
Sulphate	ug/l	--	56000	23000	--	133000	52000	--	23000	--	158000
Temperature (Field)	deg c	-- [10]	--	16.8	--	3	9	--	8.1	--	14.7
Total Dissolved Solids	ug/l	--	240000	327000	--	1550000	489000	--	123000	--	2540000
Total Organic Carbon	ug/l	--	9500	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	13000	5000	--	13000	6000	--	94000	--	1160000
Metals											
Arsenic	ug/l	100 [11]	1	<1	--	<1	<1	--	1	--	6
Boron	ug/l	200 [12]	23	38	--	39	39	--	22	--	49
Cadmium	ug/l	0.2 [11]	--	<0.3	--	<0.5	<0.1	--	**<0.5**	--	<0.1
Calcium	ug/l	--	57900	60800	--	125000	70300	--	13900	--	195000
Chromium	ug/l	-- [13]	2	<2	--	<2	<2	--	6	--	**12**
Cobalt	ug/l	0.9	--	<3	--	0.7	0.7	--	0.6	--	**3.9**
Copper	ug/l	5	2	<2	--	<2	3	--	**28**	--	**11**
Iron	ug/l	300	**1400**	**1610**	--	**5060**	**748**	--	**894**	--	**10200**
Lead	ug/l	-- [14]	1.2	<0.6	--	1	0.8	--	2	--	**17.7**
Magnesium	ug/l	--	12400	14500	--	19800	13300	--	3580	--	38100
Manganese	ug/l	--	167	268	--	1710	212	--	68	--	1730
Mercury, dissolved	ug/l	0.2 [15]	--	<0.05	--	<0.06	--	--	--	--	--
Molybdenum	ug/l	40	--	4.5	--	<5	--	--	--	--	--
Nickel	ug/l	25	10	<10	--	<10	--	--	--	--	--
Potassium	ug/l	--	5900	6100	--	5000	8400	--	4600	--	6600
Selenium	ug/l	100	--	<1	--	<1	--	--	--	--	--
Sodium	ug/l	--	40000	47900	--	442000	92600	--	19800	--	726000
Zinc	ug/l	30 [11]	9	21	--	<5	7	--	**37**	--	**237**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	<1	--	<1	<1	--	<1	--	<1

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Parameter	Unit	PWQO [1]	S16 20-Nov-2007	S16 23-May-2008	S16 12-Aug-2008	S16 06-Nov-2008	S16 13-May-2009 S-10	S16 25-Aug-2009 [34] A-10	S16 27-Nov-2009 S-7	S16 18-May-2010 S-9	S16 18-Aug-2010 [2] S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	99000	435000	120000	128000	458000	93000	338000	415000
Ammonia, unionized	ug/l	20	<10	<20	<20	<20	0.44	2.15	<0.07	0.85	0.71
Ammonia Nitrogen	ug/l	--	60	<10	180	<10	50	340	<20	180	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	<3000	<3000	<3000	<1000	3000	2000	4000	2000
Chemical Oxygen Demand	ug/l	--	173000	55000	40000	33000	43000	73000	45000	28000	33000
Chloride	ug/l	--	222000	38600	790000	93900	79000	486000	25000	570000	593000
Conductivity	uS/cm	--	--	--	--	--	566	2520	342	2540	2780
Conductivity (Field)	uS/cm	--	875	320	3500	525	470	2018	335	2555	2485
Dissolved Inorganic Carbon	ug/l	--	54000	22300	107000	30100	31600	115000	23600	153000	90400
Dissolved Organic Carbon	ug/l	--	13200	18200	9400	13000	18400	16400	16100	11600	13200
Dissolved Oxygen (Field)	ug/l	-- [7]	8520	8220	**1070**	7230	**2780**	**180**	9730	**1800**	**1420**
Hardness, Calcium Carbonate	ug/l	--	271000	112000	432000	160000	164000	358000	114000	428000	437000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1000	200	100	600	250	<100	<100	<100	<100
Nitrite as N	ug/l	--	--	--	--	--	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	5120	1040	980	750	780	1940	540	1650	990
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.4	7.7	7.6	7.4	7.19	7.47	7.16	7.34
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**2450**	**80**	**40**	**40**	**90**	**400**	20	**110**	**130**
Sulphate	ug/l	--	97000	18000	84000	57000	25000	51000	31000	44000	79000
Temperature (Field)	deg c	-- [10]	2.8	15	22.2	8.7	18.3	20.5	5.0	17.5	18.9
Total Dissolved Solids	ug/l	--	713000	188000	1780000	357000	368000	1640000	222000	1650000	1810000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	432000	<3000	25000	5000	4000	43000	4000	49000	33000
Metals											
Arsenic	ug/l	100 [11]	1.6	1.5	2.2	<0.5	<1	<50	<1	1	<1
Boron	ug/l	200 [12]	56	20	48	34	30	<100	20	30	70
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	<0.1	<0.1	<0.1
Calcium	ug/l	--	86500	32700	134000	49900	49000	112000	34000	135000	142000
Chromium	ug/l	-- [13]	5	<2	<2	<2	3	**<50**	3	8	<5
Cobalt	ug/l	0.9	**1.5**	<0.5	<0.5	<0.5	0.6	<10	0.3	**1.9**	0.8
Copper	ug/l	5	**10**	<2	<2	3	1	**<10**	2	2	2
Iron	ug/l	300	**3430**	**866**	**1760**	**491**	**1480**	**16200**	**680**	**4040**	**1690**
Lead	ug/l	-- [14]	4.6	<0.1	<0.1	<0.1	<1	**<10**	<1	<1	<1
Magnesium	ug/l	--	13300	7440	23900	8610	10000	19000	7000	22000	20000
Manganese	ug/l	--	438	78	1840	187	220	3240	60	2540	1240
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7100	4300	4400	4900	4000	6000	6000	4000	6000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	159000	25800	477000	66800	52000	365000	22000	295000	408000
Zinc	ug/l	30 [11]	**138**	<5	<5	5	<10	<50	10	20	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	**3**	<1	<1	<1

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Parameter	Unit	PWQO [1]	S16 14-Oct-2010 S-14	S16 19-May-2011 [2] W-12	S16 16-Aug-2011 [2] N-10	S16 30-Nov-2011 [22] S16	S16 30-May-2012 S 16	S16 22-Aug-2012 [20] S-16	S16 29-Nov-2012 S16	S16 28-May-2013 S16	S16 15-Aug-2013 [20] S16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	151000	411000	97000	340000	--	370000	240000	--
Ammonia, unionized	ug/l	20	0.77	0.39	1.19	<0.16	4.56	--	0.77	1.09	--
Ammonia Nitrogen	ug/l	--	70	30	130	<20	230	--	530	160	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	1000	2000	4000	--	3000	<2000	--
Chemical Oxygen Demand	ug/l	--	38000	50000	45000	25000	58000	--	86000	140000	--
Chloride	ug/l	--	225000	48000	551000	58000	620000	--	480000	400000	--
Conductivity	uS/cm	--	1350	506	2650	477	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1038	496	1423	482	2451	--	1903	1607	--
Dissolved Inorganic Carbon	ug/l	--	55000	35900	33500	18600	85000	--	86000	53000	--
Dissolved Organic Carbon	ug/l	--	13500	18900	10800	7900	17000	--	9400	14000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	7240	6720	**3500**	9120	**1780**	--	**1200**	5330	--
Hardness, Calcium Carbonate	ug/l	--	261000	174000	468000	141000	480000	--	410000	360000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	260	640	<100	440	380	--	<100	<100	--
Nitrite as N	ug/l	--	<100	<100	<100	<100	56	--	<10	<10	--
Nitrogen, Total Kjeldahl	ug/l	--	780	1290	750	540	1300	--	1700	5600	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	430	--	<100	<100	--
pH (Field)	-	6.5 - 8.5	7.72	7.64	7.24	7.81	7.58	--	7.18	7.25	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**50**	30	**210**	**130**	--	**57**	**350**	--
Sulphate	ug/l	--	75000	28000	62000	42000	56000	--	70000	38000	--
Temperature (Field)	deg c	-- [10]	11.7	16.2	24.1	5.0	24.1	--	1.9	19.7	--
Total Dissolved Solids	ug/l	--	878000	329000	1720000	310000	1580000	--	1440000	942000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	25000	8000	11000	26000	73000	--	14000	120000	--
Metals											
Arsenic	ug/l	100 [11]	<1	<10	<10	<50	1.8	--	<1.0	2.6	--
Boron	ug/l	200 [12]	30	20	40	<100	50	--	32	17	--
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	**<10**	<0.10	--	<0.10	<0.10	--
Calcium	ug/l	--	83000	50000	146000	45000	170000	--	160000	110000	--
Chromium	ug/l	-- [13]	6	3	<5	**<50**	<5.0	--	<5.0	7.0	--
Cobalt	ug/l	0.9	0.7	0.4	0.6	<10	**1.9**	--	0.65	**2.8**	--
Copper	ug/l	5	2	2	1	**<10**	4.3	--	1.2	5.0	--
Iron	ug/l	300	**1370**	**600**	**580**	**6100**	**5000**	--	**8100**	**14000**	--
Lead	ug/l	-- [14]	<1	<1	<1	**<10**	3.0	--	<0.50	**5.2**	--
Magnesium	ug/l	--	13000	12000	25000	7000	24000	--	29000	19000	--
Manganese	ug/l	--	350	70	550	160	1700	--	2700	1300	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5000	4000	14000	6000	5300	--	4100	5000	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	170000	40000	183000	38000	440000	--	440000	250000	--
Zinc	ug/l	30 [11]	<10	10	<10	<50	26	--	10	**39**	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1.0	--	<1.0	<1.0	--

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Parameter	Unit	PWQO [1]	S16 21-Nov-2013 SA-3	S16 28-May-2014 S16	S16 26-Aug-2014 S16	S16 13-Nov-2014 S-16	S16 27-May-2015 S-16	S16 25-Aug-2015 S-16	S16 25-Nov-2015 S-16	S16 24-May-2016 S-16	S16 18-Aug-2016 S-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	330000	280000	390000	140000	255000	446000	392000	357000	430000
Ammonia, unionized	ug/l	20	0.56	1.2	14.2	0.29	0.35	**30.59**	0.5	2.1	5.22
Ammonia Nitrogen	ug/l	--	90	130	1500	62	120	440	180	120	350
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	<2000	9000	17000	3000	24000	18000
Chemical Oxygen Demand	ug/l	--	150000	48000	2000000	160000	86000	74000	80000	95000	90000
Chloride	ug/l	--	350000	560000	800000	88000	402000	1100000	288000	1010000	791000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1653	2054	3177	502	1782	3767	3549	3437	3144
Dissolved Inorganic Carbon	ug/l	--	85000	64000	100000	34000	62400	77800	76200	54900	22700
Dissolved Organic Carbon	ug/l	--	10000	13000	11000	18000	16600	19100	10000	32100	78500
Dissolved Oxygen (Field)	ug/l	-- [7]	10510	**4300**	**300**	9690	**110**	**60**	**1780**	**4630**	**2610**
Hardness, Calcium Carbonate	ug/l	--	330000	430000	470000	160000	67700	512000	733000	616000	651000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	250	<100	<100	<100	<100	<100	<100	300
Nitrite as N	ug/l	--	<10	21	21	<10	<50	<50	<50	<50	<250 [18]
Nitrogen, Total Kjeldahl	ug/l	--	3200	1600	65000	4400	2800	3100	3100	4400	1900
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	270	<100	<100	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.80	7.48	7.31	7.61	6.74	8.33	7.51	7.40	7.51
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1300**	**200**	**4800**	**2200**	**810**	**920**	**1400**	**1550**	**450**
Sulphate	ug/l	--	81000	41000	52000	25000	45000	55000	96000	58000	252000
Temperature (Field)	deg c	-- [10]	2.2	16.6	22.3	4.1	24.1	18.3	0.6	28.2	22.3
Total Dissolved Solids	ug/l	--	1130000	1360000	1770000	346000	982000	2220000	1840000	2130000	2150000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	1100000	410000	11000000	130000	363000	170000	203000	382000	99000
Metals											
Arsenic	ug/l	100 [11]	7.8	1.5	52	2.7	<1	7	3	2	6
Boron	ug/l	200 [12]	36	110	110	26	12	56	34	150	132
Cadmium	ug/l	0.2 [11]	**0.25**	0.13	**3.1**	0.18	<0.1	**0.4**	0.2	0.1	0.1
Calcium	ug/l	--	130000	150000	290000	54000	21800	160000	243000	196000	216000
Chromium	ug/l	-- [13]	**27**	<5.0	**250**	**11**	1	**23**	**12**	7	7
Cobalt	ug/l	0.9	**7.6**	**2.8**	**78**	**2.7**	<0.5	**6.5**	**2.8**	**2.4**	**2.7**
Copper	ug/l	5	**17**	3.5	**180**	**9.4**	<0.5	**12.6**	**7.7**	**5.7**	**5.3**
Iron	ug/l	300	**60000**	**6700**	**430000**	**14000**	**1560**	**42500**	**20100**	**10300**	**8310**
Lead	ug/l	-- [14]	**19**	3.9	**190**	**9.8**	1.0	**18.3**	**9.7**	**6.4**	**5.6**
Magnesium	ug/l	--	23000	22000	63000	12000	3230	27600	30700	30600	27200
Manganese	ug/l	--	1900	2200	11000	280	137	2020	1430	3490	3500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	6200	5200	22000	7600	917	7060	5260	5940	6760
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	290000	310000	530000	55000	52900	584000	663000	670000	503000
Zinc	ug/l	30 [11]	**130**	26	**1200**	**57**	7	**121**	**66**	**59**	**46**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**2.3**	<1.0	**4.8**	**11**	<1	**3**	<1	**16**	<2 [19]

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Parameter	Unit	PWQO [1]	S16 16-Nov-2016 S-16	S16 18-May-2017 S-16	S16 28-Aug-2017 S-16	S16 28-Nov-2017 S-16	S16 23-May-2018 S-16	S16 30-Aug-2018 S-16	S16 28-Nov-2018 S-16	S16 20-Jun-2019 S-16	S16 28-Aug-2019 S-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	369000	186000	468000	155000	164000	429000	246000	222000	227000
Ammonia, unionized	ug/l	20	2.3	0.76	3.34	0.47	0.76	6.16	0.35	1	2.27
Ammonia Nitrogen	ug/l	--	190	60	340	80	70	600	160	130	300
Biochemical Oxygen Demand, 5 Day	ug/l	--	16000	3000	16000	4000	<2000	<30000 [26]	<2000	<12000 [26]	4000
Chemical Oxygen Demand	ug/l	--	94000	51000	98000	48000	52000	169000	56000	67000	46000
Chloride	ug/l	--	815000	184000	802000	<1000	109000	995000	1410000	335000	505000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	3185	880	2483	609	717	3400	>3999	1322	1893
Dissolved Inorganic Carbon	ug/l	--	66100	15100	85100	10200	37300	67400	45900	45000	75700
Dissolved Organic Carbon	ug/l	--	10800	35600	14800	34900	18200	25800	8700	10700	14800
Dissolved Oxygen (Field)	ug/l	-- [7]	**4330**	**2860**	**990**	**7660**	**730**	**630**	7770	**430**	**280**
Hardness, Calcium Carbonate	ug/l	--	461000	205000	577000	145000	158000	605000	555000	310000	284000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	200	200	<100
Nitrite as N	ug/l	--	<50	<50	<250 [18]	<50	<50	<250 [18]	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	3400	900	2900	1000	1100	2400	700	1300	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.84	7.42	7.46	7.83	7.49	7.45	7.35	7.41	7.31
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1470**	**50**	**970**	**150**	**60**	**290**	**80**	**210**	**140**
Sulphate	ug/l	--	89000	27000	58000	36000	12000	31000	113000	43000	36000
Temperature (Field)	deg c	-- [10]	9.4	22.9	18.1	0.6	18.5	19.0	2.2	16.3	19.2
Total Dissolved Solids	ug/l	--	1790000	550000	1780000	340000	366000	2060000	2720000	832000	1130000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	44000	12000	970000	49000	11000	268000	11000	41000	62000
Metals											
Arsenic	ug/l	100 [11]	2	<5 [17]	2	<1	<1	3	<1	<1	<1
Boron	ug/l	200 [12]	93	166	49	24	34	34	27	36	24
Cadmium	ug/l	0.2 [11]	0.1	<0.5 [17]	0.1	<0.1	<0.1	**0.3**	<0.1	<0.1	<0.1
Calcium	ug/l	--	148000	61900	188000	43300	47700	189000	176000	99100	92900
Chromium	ug/l	-- [13]	7	<5 [17]	6	1	<1	**27**	**9**	3	5
Cobalt	ug/l	0.9	**1.9**	<2.5 [17]	**1.9**	<0.5	<0.5	**7.0**	**2.2**	**2.0**	**1.4**
Copper	ug/l	5	**5.9**	2.9	3.8	1.9	<0.5	**17.0**	**6.0**	**6.1**	4.8
Iron	ug/l	300	**10300**	**924**	**11100**	**1260**	**943**	**28800**	**3180**	**2670**	**3640**
Lead	ug/l	-- [14]	**7.3**	<0.5 [17]	**6.6**	0.6	0.3	**20.1**	1.7	4.3	2.9
Magnesium	ug/l	--	22300	12200	26300	9010	9460	32200	27900	15200	12700
Manganese	ug/l	--	1750	413	2030	190	233	2930	626	1020	843
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5630	4530	5560	4530	3980	8500	9200	3390	3750
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	504000	101000	497000	38400	58700	440000	883000	147000	268000
Zinc	ug/l	30 [11]	**58**	<25 [17]	**42**	12	11	**103**	24	22	22
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**11**	<1	**2**	<1	<1	**4**	<1	<1	**5**

Parameter	Unit	PWQO [1]	S16	S16	S16	S16	S16	S16	S16
			21-Nov-2019	14-May-2020	26-Aug-2020	25-Nov-2020	27-May-2021	24-Aug-2021 [35]	24-Nov-2021
			S-16	S-16	S-16	S-16	S-16	S16	S-16
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	352000	182000	350000	354000	256000	--	366000
Ammonia, unionized	ug/l	20	0.52	0.13	2.41	0.41	1.08	--	0.26
Ammonia Nitrogen	ug/l	--	300	40	550	130	60	--	180
Biochemical Oxygen Demand, 5 Day	ug/l	--	<30000 [26]	5000	9000	<40000 [26]	<2000	--	16000
Chemical Oxygen Demand	ug/l	--	70000	67000	213000	44000	28000	--	67000
Chloride	ug/l	--	1030000	260000	758000	1070000	35000	--	598000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	4110	1104	2924	2	1147	--	2670
Dissolved Inorganic Carbon	ug/l	--	<500	39400	69300	73600	56200	--	74300
Dissolved Organic Carbon	ug/l	--	11300	22300	10900	10100	9700	--	10500
Dissolved Oxygen (Field)	ug/l	-- [7]	**4420**	**1060**	**120**	**4200**	6710	--	**7000**
Hardness, Calcium Carbonate	ug/l	--	673000	271000	521000	556000	615000	--	733000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	100	<100	400	--	<100
Nitrite as N	ug/l	--	<50	<50	<50	<250 [18]	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	6600	2000	4200	1200	600	--	2800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.31	7.03	7.10	7.58	7.85	--	7.20
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**3660**	**640**	**1620**	**440**	30	--	**1750**
Sulphate	ug/l	--	114000	41000	23000	116000	370000	--	127000
Temperature (Field)	deg c	-- [10]	0.3	16.2	18.3	0	14.3	--	1.3
Total Dissolved Solids	ug/l	--	2080000	588000	828000	2380000	834000	--	1570000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	208000	171000	454000	292000	24000	--	896000
Metals									
Arsenic	ug/l	100 [11]	4	1	2	<1	<1	--	7
Boron	ug/l	200 [12]	30	16	31	18	69	--	25
Cadmium	ug/l	0.2 [11]	0.2	<0.1	<0.1	<0.1	<0.1	--	**0.3**
Calcium	ug/l	--	198000	82100	169000	167000	188000	--	234000
Chromium	ug/l	-- [13]	**28**	5	7	2	2	--	**46**
Cobalt	ug/l	0.9	**6.2**	**1.5**	**2.5**	**1.1**	**1.0**	--	**11.5**
Copper	ug/l	5	**18.3**	5.0	**5.2**	2.8	1.7	--	**38.3**
Iron	ug/l	300	**31700**	**3770**	**14400**	**3190**	**1260**	--	<100
Lead	ug/l	-- [14]	**12.8**	4.0	4.7	2.6	0.7	--	**44.4**
Magnesium	ug/l	--	43200	16100	24000	33500	35500	--	36300
Manganese	ug/l	--	2450	418	2430	1440	216	--	3240
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	10300	4480	6340	5980	10400	--	9330
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	544000	121000	479000	601000	30300	--	394000
Zinc	ug/l	30 [11]	**82**	23	26	15	6	--	**147**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**12**	**6**	**9**	<10 [19]	**2**	--	**6**

Parameter	Unit	PWQO [1]	S17 27-Sep-2001	S17 21-Nov-2001	S17 22-May-2002	S17 08-Nov-2002	S17 31-May-2003	S17 03-Jul-2003	S17 22-Oct-2003	S17 17-May-2004	S17 21-Aug-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	240000	151000	158000	186000	151000	234000	106000	196000	264000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--	<10	<10
Ammonia Nitrogen	ug/l	--	150	30	60	450	170	100	90	120	360
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	2000	1000	2000	3000	5000	6000
Chemical Oxygen Demand	ug/l	--	29000	25000	44000	23000	59000	45000	58000	59000	92000
Chloride	ug/l	--	83600	83300	90000	406000	75500	371000	66900	192000	337000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1230	510	580	1600	425	1320	640	1050	1410
Dissolved Inorganic Carbon	ug/l	--	59400	21100	17000	46000	39000	59000	26000	47200	42300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3550	10270	8350	9300	6020	3390	11800	4000	2700
Hardness, Calcium Carbonate	ug/l	--	367000	226000	221000	277000	187000	304000	--	260000	297000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1600	900	600	1600	900	1100	1100	1200	900
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1720	630	890	1070	1260	1210	1400	1450	3120
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.18	6.81	7.1	7.9	7.7	6.8	7.32	7.3	7.2
Phosphate	ug/l	--	190	40	50	60	50	190	350	100	740
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	430000	70000	37000	69000	38000	57000	56000	42000	63000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	842000	394000	362000	800000	334000	997000	294000	525000	705000
Total Organic Carbon	ug/l	--	10600	15000	12000	11000	22000	15000	16000	12300	9200
Total Suspended Solids	ug/l	--	11000	7000	14000	31000	3000	82000	20000	32000	148000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	3
Boron	ug/l	200 [12]	100	40	30	160	30	61	36	51	78
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	124000	65200	65600	92300	54700	100000	47100	81800	98000
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	3	**9**	2	6
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.2	1.9	<1	**39.7**	2	4	**25**	**16**	**84**
Iron	ug/l	300	**500**	220	**380**	**1370**	**460**	**1360**	**1540**	**1110**	129
Lead	ug/l	-- [14]	0.2	0.2	<1	**34.1**	0.5	3.2	3.4	0.8	**5.8**
Magnesium	ug/l	--	13900	15300	14000	11400	12300	13200	9500	13600	12600
Manganese	ug/l	--	140	20	90	290	40	344	70	341	528
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10	10	**90**
Potassium	ug/l	--	9300	5900	4800	9200	4800	7700	7600	6400	6800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	162000	56300	37200	240000	49700	230000	44500	146000	254000
Zinc	ug/l	30 [11]	20	10	20	**50**	20	26	29	**34**	**164**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	0.1	1	1	1

Parameter	Unit	PWQO [1]	S17 18-Nov-2004	S17 25-May-2005	S17 09-Sep-2005 [20]	S17 09-Nov-2005	S17 24-May-2006	S17 15-Aug-2006	S17 16-Nov-2006	S17 08-May-2007	S17 22-Aug-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	264000	--	237000	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	<5000	--	<5000	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	216000	--	190000	150000	260000	90000	212000	302000
Ammonia, unionized	ug/l	20	<10	<10	--	<10	<10	<10	--	<10	<10
Ammonia Nitrogen	ug/l	--	170	40	--	50	20	40	100	<10	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	6000	--	<3000	<3000	<3000	<3000	<3000	3000
Chemical Oxygen Demand	ug/l	--	35000	50000	--	60000	63000	28000	38000	38000	37000
Chloride	ug/l	--	122000	139000	--	174000	102000	434000	21200	252000	494000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	790	845	--	610	430	1700	210	1000	1450
Dissolved Inorganic Carbon	ug/l	--	25300	56100	--	40800	39700	62400	24300	50900	72300
Dissolved Organic Carbon	ug/l	--	--	14000	--	10500	20900	13800	15700	10100	10000
Dissolved Oxygen (Field)	ug/l	-- [7]	7200	7110	--	12500	8620	**800**	7880	8020	**1890**
Hardness, Calcium Carbonate	ug/l	--	245000	259000	--	290000	196000	314000	69000	279000	351000
Hydrogen Sulfide	ug/l	2 [8]	--	<10	--	<10	--	--	--	--	--
Nitrate as N	ug/l	--	1600	400	--	1800	900	1000	1100	1200	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	880	1160	--	730	860	640	1190	2110	1790
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.7	7.3	--	7.5	7.8	7.6	--	7.9	7.4
Phosphate	ug/l	--	60	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**80**	--	**120**	**40**	**50**	**230**	**70**	**310**
Sulphate	ug/l	--	68000	31000	--	79000	40000	63000	24000	47000	46000
Temperature (Field)	deg c	-- [10]	--	18.8	--	2	11	18	8.1	18	14
Total Dissolved Solids	ug/l	--	395000	485000	--	598000	370000	1030000	158000	700000	1190000
Total Organic Carbon	ug/l	--	9800	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	6000	4000	--	16000	3000	<3000	45000	4000	30000
Metals											
Arsenic	ug/l	100 [11]	1	<1	--	<1	<1	1.6	2	1.4	3.3
Boron	ug/l	200 [12]	39	39	--	34	23	47	24	41	41
Cadmium	ug/l	0.2 [11]	--	<0.5	--	<0.5	<0.1	<0.1	**<0.5**	**0.7**	<0.1
Calcium	ug/l	--	73700	75200	--	89800	59200	103000	18400	88400	115000
Chromium	ug/l	-- [13]	2	<2	--	<2	<2	<2	8	<2	<2
Cobalt	ug/l	0.9	--	**83**	--	0.6	0.2	0.4	0.5	0.5	**1.1**
Copper	ug/l	5	2	<2	--	<2	<2	<2	**39**	**20**	4
Iron	ug/l	300	**519**	**436**	--	**453**	**303**	**355**	**399**	**858**	**1740**
Lead	ug/l	-- [14]	1.2	<1	--	2.5	<0.5	0.5	2	0.7	1
Magnesium	ug/l	--	14900	17200	--	15900	11800	13800	5570	14000	15200
Manganese	ug/l	--	95	85	--	56	40	342	80	204	772
Mercury, dissolved	ug/l	0.2 [15]	--	<0.05	--	<0.06	--	--	--	--	--
Molybdenum	ug/l	40	--	8	--	<5	--	--	--	--	--
Nickel	ug/l	25	10	<10	--	<10	--	--	--	--	--
Potassium	ug/l	--	7100	5300	--	8400	4700	6900	4300	6600	8700
Selenium	ug/l	100	--	<1	--	<1	--	--	--	--	--
Sodium	ug/l	--	80600	90800	--	115000	62700	256000	25000	158000	323000
Zinc	ug/l	30 [11]	14	14	--	**56**	14	25	28	19	**49**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	<1	--	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S17 20-Nov-2007	S17 23-May-2008	S17 12-Aug-2008	S17 06-Nov-2008	S17 13-May-2009 S-11	S17 25-Aug-2009 A-9	S17 27-Nov-2009 S-9	S17 18-May-2010 S-10	S17 18-Aug-2010 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	180000	142000	280000	190000	165000	285000	152000	223000	283000
Ammonia, unionized	ug/l	20	<10	<20	<20	<20	1.72	3.39	1.08	1.17	1.06
Ammonia Nitrogen	ug/l	--	380	<10	110	20	60	500	100	60	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	<3000	<3000	<3000	<1000	<1000	2000	10000	4000
Chemical Oxygen Demand	ug/l	--	30000	19000	42000	22000	50000	50000	45000	53000	40000
Chloride	ug/l	--	193000	108000	455000	123000	113000	296000	80000	262000	277000
Conductivity	uS/cm	--	--	--	--	--	757	1620	660	1400	1630
Conductivity (Field)	uS/cm	--	750	550	1800	750	600	1291	795	1475	1487
Dissolved Inorganic Carbon	ug/l	--	48600	34900	70400	46500	40900	69600	37400	53700	63200
Dissolved Organic Carbon	ug/l	--	13200	15400	9800	8300	20000	12100	13900	18500	15600
Dissolved Oxygen (Field)	ug/l	-- [7]	9250	10540	**1780**	8710	8490	**2190**	10560	8840	**4010**
Hardness, Calcium Carbonate	ug/l	--	248000	148000	290000	252000	194000	260000	189000	267000	298000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1500	300	900	1100	750	880	950	1860	3710
Nitrite as N	ug/l	--	--	--	--	--	<100	130	<100	<100	170
Nitrogen, Total Kjeldahl	ug/l	--	1310	1130	1100	650	1300	1180	880	2600	1050
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.8	7.9	7.9	7.8	7.22	7.93	7.80	7.38
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**100**	**100**	**130**	**40**	**50**	**50**	**90**	**110**	**60**
Sulphate	ug/l	--	80000	21000	57000	74000	27000	45000	51000	51000	75000
Temperature (Field)	deg c	-- [10]	1.9	14.6	18.7	9.4	22.3	20.5	5.3	16.9	20.3
Total Dissolved Solids	ug/l	--	620000	341000	1070000	494000	492000	1050000	429000	910000	1060000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	40000	45000	4000	3000	11000	17000	67000	15000
Metals											
Arsenic	ug/l	100 [11]	1.6	1.9	1.1	0.9	1	1	<1	1	<1
Boron	ug/l	200 [12]	34	17	55	29	30	50	30	140	180
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	83300	42900	90600	76200	58000	86000	61000	87000	103000
Chromium	ug/l	-- [13]	3	<2	<2	<2	3	7	4	7	**9**
Cobalt	ug/l	0.9	**1.6**	<0.5	<0.5	0.8	0.4	0.6	0.8	0.7	0.6
Copper	ug/l	5	5	<2	<2	2	3	1	3	5	4
Iron	ug/l	300	**1260**	**726**	145	279	**430**	**1140**	**780**	**830**	**770**
Lead	ug/l	-- [14]	3.2	<0.1	<0.1	<0.1	<1	<1	2	1	<1
Magnesium	ug/l	--	9720	9900	15400	14900	12000	11000	9000	12000	10000
Manganese	ug/l	--	179	72	107	70	90	640	130	340	70
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8800	3200	7600	6900	4000	8000	6000	8000	10000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	126000	68900	277000	80400	81000	211000	69000	195000	212000
Zinc	ug/l	30 [11]	**50**	5	15	<5	10	<10	**40**	**60**	**70**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	**2**	<1

Parameter	Unit	PWQO [1]	S17 14-Oct-2010 S-13	S17 19-May-2011 W-10	S17 16-Aug-2011 [2] N-11	S17 30-Nov-2011 [22] S17	S17 30-May-2012 S 17	S17 22-Aug-2012 S-17	S17 29-Nov-2012 S17	S17 28-May-2013 S17	S17 15-Aug-2013 [20] S17
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	208000	107000	148000	97000	190000	250000	250000	180000	--
Ammonia, unionized	ug/l	20	0.42	<0.1	8.79	0.5	<5.18	2.31	0.52	2.57	--
Ammonia Nitrogen	ug/l	--	30	<20	420	60	<50	93	180	140	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	<1000	6000	3000	2000	3000	6000	4000	--
Chemical Oxygen Demand	ug/l	--	35000	55000	48000	30000	64000	40000	43000	44000	--
Chloride	ug/l	--	102000	36000	97000	41000	160000	290000	240000	140000	--
Conductivity	uS/cm	--	864	362	716	442	--	--	--	--	--
Conductivity (Field)	uS/cm	--	650	363	617	439	927	1357	1272	771	--
Dissolved Inorganic Carbon	ug/l	--	52000	25800	35400	18700	45000	55000	54000	40000	--
Dissolved Organic Carbon	ug/l	--	13000	20800	11500	8500	18000	12000	9500	17000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	11690	**3070**	**3610**	**4550**	6030	**3520**	**6940**	11360	--
Hardness, Calcium Carbonate	ug/l	--	228000	128000	174000	138000	230000	310000	300000	250000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	2210	<100	1010	1210	980	480	4400	900	--
Nitrite as N	ug/l	--	<100	<100	<100	<100	28	80	48	<10	--
Nitrogen, Total Kjeldahl	ug/l	--	820	1270	1800	1190	2400	1500	2700	1000	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	1000	560	4500	900	--
pH (Field)	-	6.5 - 8.5	7.84	7.26	7.61	7.83	8.26	7.72	7.51	7.77	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**80**	**190**	**200**	**320**	**160**	**280**	**56**	--
Sulphate	ug/l	--	52000	15000	50000	50000	43000	59000	65000	36000	--
Temperature (Field)	deg c	-- [10]	11.3	14.7	23.9	5.0	26.6	22.8	0.9	17.0	--
Total Dissolved Solids	ug/l	--	562000	235000	465000	287000	556000	852000	722000	462000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	3000	31000	13000	4000	12000	24000	<1000	--
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<10	<50	1.6	1.3	<1.0	<1.0	--
Boron	ug/l	200 [12]	30	20	60	<100	50	71	45	19	--
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	**<10**	<0.10	<0.10	<0.10	<0.10	--
Calcium	ug/l	--	70000	38000	58000	42000	78000	110000	110000	74000	--
Chromium	ug/l	-- [13]	4	2	7	**<50**	<5.0	<5.0	<5.0	<5.0	--
Cobalt	ug/l	0.9	0.4	0.5	0.8	<10	0.68	0.65	0.51	<0.50	--
Copper	ug/l	5	2	1	4	**<10**	4.4	3.1	4.4	1.8	--
Iron	ug/l	300	260	**1280**	**1370**	**900**	**920**	**990**	**620**	**410**	--
Lead	ug/l	-- [14]	<1	<1	4	**<10**	1.1	1.2	0.83	<0.50	--
Magnesium	ug/l	--	13000	8000	7000	8000	13000	12000	16000	13000	--
Manganese	ug/l	--	70	110	470	40	170	150	220	150	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7000	4000	11000	8000	6400	9700	8400	4900	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	63000	25000	70000	29000	120000	230000	190000	85000	--
Zinc	ug/l	30 [11]	20	<10	20	<50	30	15	**73**	21	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	**2.2**	<1.0	<1.0	<1.0	--

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Parameter	Unit	PWQO [1]	S17 21-Nov-2013 SA-2	S17 28-May-2014 S17	S17 26-Aug-2014 [20] S17	S17 13-Nov-2014 S-17	S17 27-May-2015 S-17	S17 25-Aug-2015 S-17	S17 25-Nov-2015 S-17	S17 24-May-2016 S-17	S17 18-Aug-2016 S-17
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	230000	210000	--	190000	244000	257000	245000	201000	119000
Ammonia, unionized	ug/l	20	<0.47	1.45	--	<0.31	0.3	19.16	0.51	4.47	1.86
Ammonia Nitrogen	ug/l	--	<50	69	--	<50	170	440	80	280	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<2000	--	<2000	3000	14000	16000	3000	4000
Chemical Oxygen Demand	ug/l	--	32000	45000	--	42000	60000	88000	63000	45000	47000
Chloride	ug/l	--	100000	240000	--	75000	654000	347000	246000	317000	154000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	862	1122	--	584	2387	1513	1272	1286	933
Dissolved Inorganic Carbon	ug/l	--	57000	48000	--	44000	58700	62000	52600	43600	4700
Dissolved Organic Carbon	ug/l	--	10000	16000	--	16000	22500	16000	15900	15500	36800
Dissolved Oxygen (Field)	ug/l	-- [7]	10550	8150	--	**6620**	**4980**	**730**	**6900**	**110**	7180
Hardness, Calcium Carbonate	ug/l	--	300000	290000	--	230000	375000	224000	363000	297000	191000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1800	580	--	770	<100	200	600	<100	200
Nitrite as N	ug/l	--	16	34	--	13	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	940	1000	--	960	1600	3000	1200	1300	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	1800	620	--	780	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.98	7.85	--	7.74	6.62	8.07	7.83	7.38	7.75
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**140**	**66**	--	**86**	**150**	**650**	**150**	**60**	**150**
Sulphate	ug/l	--	78000	37000	--	56000	20000	43000	55000	28000	144000
Temperature (Field)	deg c	-- [10]	2.2	16.4	--	3.8	20.9	19.7	1.8	27.5	25
Total Dissolved Solids	ug/l	--	554000	744000	--	394000	1410000	872000	667000	776000	592000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	10000	12000	--	230000	8000	61000	6000	11000	18000
Metals											
Arsenic	ug/l	100 [11]	1.4	1.1	--	<1.0	2	2	<1	1	3
Boron	ug/l	200 [12]	40	32	--	25	33	53	33	34	43
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	--	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	100000	97000	--	68000	108000	72300	119000	98700	61700
Chromium	ug/l	-- [13]	<5.0	<5.0	--	<5.0	2	6	3	1	1
Cobalt	ug/l	0.9	0.80	<0.50	--	<0.50	0.7	**1.6**	0.7	0.6	<0.5
Copper	ug/l	5	4.7	1.5	--	2.3	<0.5	0.7	0.8	1.7	1.6
Iron	ug/l	300	**1700**	**620**	--	**880**	**1110**	**4140**	**1330**	**970**	**864**
Lead	ug/l	-- [14]	3.2	<0.50	--	0.85	0.5	**5.4**	2.6	0.5	1.4
Magnesium	ug/l	--	20000	16000	--	18000	25800	10600	16100	12300	8850
Manganese	ug/l	--	74	320	--	110	753	542	137	641	109
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7300	5700	--	5400	7530	8850	6440	6310	5840
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	70000	160000	--	52000	306000	183000	159000	199000	87000
Zinc	ug/l	30 [11]	**47**	19	--	24	8	**48**	**39**	9	13
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**1.2**	<1.0	--	**5.7**	<1	**2**	<1	**9**	**7**

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Parameter	Unit	PWQO [1]	S17 16-Nov-2016 S-17	S17 18-May-2017 S-17	S17 28-Aug-2017 S-17	S17 28-Nov-2017 S-17	S17 23-May-2018 S-17	S17 30-Aug-2018 S-17	S17 28-Nov-2018 S-17	S17 20-Jun-2019 S-17	S17 28-Aug-2019 S-17
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	163000	246000	185000	183000	334000	133000	211000	86000
Ammonia, unionized	ug/l	20	2.93	3.96	3.73	0.73	1.89	11.14	0.06	2.28	0.97
Ammonia Nitrogen	ug/l	--	80	60	370	100	60	930	50	160	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<2000	25000	20000	<2000	3000	2000	<2000	4000
Chemical Oxygen Demand	ug/l	--	28000	49000	38000	79000	53000	56000	34000	65000	44000
Chloride	ug/l	--	183000	199000	273000	106000	274000	488000	151000	300000	192000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1104	907	1000	705	1225	1931	351	1256	884
Dissolved Inorganic Carbon	ug/l	--	39200	16000	50700	14800	41400	63000	23800	44800	27300
Dissolved Organic Carbon	ug/l	--	9300	30300	12200	43100	18600	13900	11900	13000	12900
Dissolved Oxygen (Field)	ug/l	-- [7]	8560	10440	**1690**	8240	11540	**1360**	12320	9810	**2950**
Hardness, Calcium Carbonate	ug/l	--	275000	193000	294000	216000	216000	400000	192000	285000	153000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	900	<100	400	1100	100	<100	1200	300	500
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<250 [18]	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	600	900	2400	1300	1100	2800	1000	1400	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.38	8.08	7.42	7.93	7.86	7.55	7.13	7.64	7.49
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	**50**	**490**	**220**	**60**	**510**	**150**	**70**	**150**
Sulphate	ug/l	--	68000	30000	43000	48000	19000	24000	54000	31000	101000
Temperature (Field)	deg c	-- [10]	8.0	25.5	19.7	0.6	21.7	18.0	1.0	17.6	20.1
Total Dissolved Solids	ug/l	--	598000	552000	738000	428000	710000	1090000	438000	770000	548000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	51000	10000	76000	63000	<2000	85000	3000	<2000	43000
Metals											
Arsenic	ug/l	100 [11]	<1	<5 [17]	1	<1	1	2	<1	1	<1
Boron	ug/l	200 [12]	125	141	158	29	33	32	26	32	34
Cadmium	ug/l	0.2 [11]	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	88900	58600	97200	64200	66100	131000	57100	86600	51700
Chromium	ug/l	-- [13]	2	<5 [17]	2	3	<1	5	2	<1	4
Cobalt	ug/l	0.9	0.6	<2.5 [17]	0.6	0.7	<0.5	**1.3**	0.6	0.7	**1.0**
Copper	ug/l	5	3.0	4.5	0.6	3.2	0.9	3.8	3.4	2.1	**6.8**
Iron	ug/l	300	**1130**	**811**	**2200**	**1330**	**738**	**5700**	**489**	**821**	**1550**
Lead	ug/l	-- [14]	1.5	<0.5 [17]	1.3	2.0	0.3	3.8	0.5	0.2	2.5
Magnesium	ug/l	--	13000	11300	12400	13600	12500	17500	11900	16600	5720
Manganese	ug/l	--	149	160	751	120	208	1380	125	484	140
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8600	4450	7590	4760	4340	11500	6310	5900	6120
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	121000	113000	181000	57600	145000	241000	86500	165000	101000
Zinc	ug/l	30 [11]	**42**	<25 [17]	18	24	10	27	21	13	27
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**6**	<1	<1	<1	<1	<1	<1	<1	**4**

Parameter	Unit	PWQO [1]	S17 21-Nov-2019 S-17	S17 14-May-2020 S-17	S17 26-Aug-2020 S-17	S17 25-Nov-2020 S-17	S17 27-May-2021 S-17	S17 24-Aug-2021 S-17	S17 24-Nov-2021 S-17
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	143000	224000	246000	247000	360000	258000
Ammonia, unionized	ug/l	20	0.21	2.35	1.62	0.31	2.47	0.6	0.21
Ammonia Nitrogen	ug/l	--	50	30	130	70	210	40	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	28000	<2000	4000	<2000	9000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	76000	33000	39000	38000	45000	38000	37000
Chloride	ug/l	--	275000	183000	339000	208000	533000	33000	60000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1499	836	1557	10	2199	1308	1244
Dissolved Inorganic Carbon	ug/l	--	1380	33100	46400	56300	56600	56600	58300
Dissolved Organic Carbon	ug/l	--	17600	16800	10600	12500	13700	13300	10900
Dissolved Oxygen (Field)	ug/l	-- [7]	10230	14450	**0** [16]	10070	6590	286000	9410
Hardness, Calcium Carbonate	ug/l	--	352000	194000	280000	293000	416000	704000	659000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	<100	<100	600	<100	<100	600
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	800	500	1300	600	1100	600	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.67	8.35	7.56	7.72	7.59	7.54	7.56
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	30	**300**	**70**	**90**	20	<10
Sulphate	ug/l	--	104000	48000	106000	69000	99000	376000	357000
Temperature (Field)	deg c	-- [10]	0.9	19.4	18.2	0.3	16.5	21.4	4.4
Total Dissolved Solids	ug/l	--	772000	426000	866000	688000	1300000	962000	826000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	3000	47000	11000	5000	59000	<2000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	1	<1	<1	<1	<1
Boron	ug/l	200 [12]	37	17	73	24	47	103	73
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	104000	59800	89100	88600	127000	221000	214000
Chromium	ug/l	-- [13]	1	1	2	1	1	1	<1
Cobalt	ug/l	0.9	0.6	<0.5	**1.0**	<0.5	0.6	0.6	0.7
Copper	ug/l	5	2.9	1.7	2.3	2.0	1.3	2.6	1.5
Iron	ug/l	300	**391**	**515**	**1660**	**575**	**844**	**841**	227
Lead	ug/l	-- [14]	0.3	0.3	1.3	0.7	0.3	0.5	0.1
Magnesium	ug/l	--	22400	10900	14000	17400	24100	37300	30100
Manganese	ug/l	--	169	158	292	88	438	154	108
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	8110	3620	9020	6720	9390	13700	11400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	152000	88000	201000	119000	300000	33600	45200
Zinc	ug/l	30 [11]	29	8	13	7	<5	13	11
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**9**	<1	**6**	<4 [19]	**5**	<1	**3**

Parameter	Unit	PWQO [1]	S18 16-Nov-2006
General Chemistry			
Alkalinity (Total as CaCO3)	ug/l	-- [5]	145000
Ammonia, unionized	ug/l	20	<10
Ammonia Nitrogen	ug/l	--	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000
Chemical Oxygen Demand	ug/l	--	28000
Chloride	ug/l	--	33400
Conductivity (Field)	uS/cm	--	300
Dissolved Inorganic Carbon	ug/l	--	37700
Dissolved Organic Carbon	ug/l	--	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	6800
Hardness, Calcium Carbonate	ug/l	--	147000
Nitrate as N	ug/l	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	780
pH (Field)	-	6.5 - 8.5	6.9
Phosphorus	ug/l	-- [9]	**40**
Sulphate	ug/l	--	35000
Temperature (Field)	deg c	-- [10]	6.2
Total Dissolved Solids	ug/l	--	262000
Total Suspended Solids	ug/l	--	13000
Metals			
Arsenic	ug/l	100 [11]	<1
Boron	ug/l	200 [12]	177
Cadmium	ug/l	0.2 [11]	<0.5
Calcium	ug/l	--	39000
Chromium	ug/l	-- [13]	**10**
Cobalt	ug/l	0.9	<0.5
Copper	ug/l	5	**37**
Iron	ug/l	300	**880**
Lead	ug/l	-- [14]	0.6
Magnesium	ug/l	--	12000
Manganese	ug/l	--	38
Potassium	ug/l	--	5300
Sodium	ug/l	--	49700
Zinc	ug/l	30 [11]	26
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	<1

Parameter	Unit	PWQO [1]	S19 16-Nov-2006
General Chemistry			
Alkalinity (Total as CaCO3)	ug/l	-- [5]	170000
Ammonia, unionized	ug/l	20	<10
Ammonia Nitrogen	ug/l	--	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000
Chemical Oxygen Demand	ug/l	--	34000
Chloride	ug/l	--	82600
Conductivity (Field)	uS/cm	--	450
Dissolved Inorganic Carbon	ug/l	--	42500
Dissolved Organic Carbon	ug/l	--	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	7930
Hardness, Calcium Carbonate	ug/l	--	197000
Nitrate as N	ug/l	--	1200
Nitrogen, Total Kjeldahl	ug/l	--	960
Phosphorus	ug/l	-- [9]	**200**
Sulphate	ug/l	--	38000
Temperature (Field)	deg c	-- [10]	8.6
Total Dissolved Solids	ug/l	--	379000
Total Suspended Solids	ug/l	--	82000
Metals			
Arsenic	ug/l	100 [11]	<1
Boron	ug/l	200 [12]	38
Cadmium	ug/l	0.2 [11;	<0.5
Calcium	ug/l	--	57100
Chromium	ug/l	-- [13]	8
Cobalt	ug/l	0.9	**1**
Copper	ug/l	5	**42**
Iron	ug/l	300	**1850**
Lead	ug/l	-- [14]	4
Magnesium	ug/l	--	13300
Manganese	ug/l	--	88
Potassium	ug/l	--	4900
Sodium	ug/l	--	73900
Zinc	ug/l	30 [11]	**40**
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	<1

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than PWQO
(1)	Provincial Water Quality Objectives (July 1994, reprinted February 1999)
(2)	Arsenic MRL elevated due to matrix interference.
(3)	TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated
(4)	Sampling location was slightly moved due to ditch alterations.
(5)	Alkalinity should not be decreased by more than 25% of the natural concentration.
(6)	PWQO is for free cyanide in an unfiltered water sample.
(7)	Objective depends on water temperature and biota. Dissolved oxygen concentrations should not be less than the values specified in the PWQO document for cold water biota (e.g. salmonid fish communities) and warm water biota (e.g. centrarchid fish communities).
(8)	Undissociated hydrogen sulphide.
(9)	guidelines which should be supplemented by site-specific studies: To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L; A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to all lakes naturally below this value; Excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L.
(10)	(1) General: The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed. (2) Waste Heat Discharge: (a) Ambient Temperature Changes: The temperature at the edge of a mixing zone shall not exceed the natural ambient water temperature at a representative control location by more than 10°C (18°F). However, in special circumstances, local conditions may require a significantly lower temperature difference than 10°C (18°F). Potential dischargers are to apply to the MOEE for guidance as to the allowable temperature rise for each thermal discharge. This ministry will also specify the nature of the mixing zone and the procedure for the establishment of a representative control location for temperature recording on a case-by-case basis. (b) Discharge Temperature Permitted: The maximum temperature of the receiving body of water, at any point in the thermal plume outside a mixing zone, shall not exceed 30°C (86°F) or the temperature of a representative control location plus 10°C (18°F) or the allowed temperature difference, which ever is the lesser temperature. These maximum temperatures are to be measured on a mean daily basis from continuous records. (c) Taking and Discharging of Cooling Water: Users of cooling water shall meet both the Objectives for temperature outlined above and the "Procedures for the Taking and Discharge of Cooling Water" as outlined in the MOEE publication Deriving Receiving-Water Based, Point-Source Effluent Requirements for Ontario Waters(1994).
(11)	An Interim PWQO also exists for this parameter. See Section 1.10 of the PWQO - Where both a PWQO and an Interim PWQO exist.
(12)	See Section 1.2.3. of PWQO. This Interim PWQO was set for emergency purposes based on the best information readily available. Employ due caution when applying this value.
(13)	PWQO values exist for Cr(III) and Cr(VI)
(14)	If alkalinity as CaCO3 < 20 mg/L, PWQO = 5 µg/L; if alkalinity as CaCO3 from 20 to 40 mg/L, PWQO = 10 µg/L; if alkalinity as CaCO3 from 40 to 80 mg/L, PWQO = 20 µg/L; if alkalinity as CaCO3 > 80 mg/L, PWQO = 25 ug/L. An Interim PWQO also exists for this parameter. See Section 1.10 of the PWQO - Where both a PWQO and an Interim PWQO exist.
(15)	In a filtered water sample.
(16)	Determined by the total reactive phenols test - the 4-AAP (4-amino-antipyrine) test. This objective should be used primarily as a screening tool. The isomer specific PWQOs for various phenolics should be employed where possible.
(17)	INOG12 Water sample required digestion for Total metals analysis, which resulted in elevated detection limits.
(18)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(19)	GEN02 Elevated Reporting Limit due to matrix interference.
(20)	Monitoring location was dry during this sampling event. No sample was collected.
(21)	Metals analysis performed on aqua-regia digest of sample material except for Boron.
(22)	Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.
(23)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

(24) Nitrite/Nitrate: Due to the colour interferences, some sample required dilution. Detection limits were adjusted accordingly.
(25) Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(26) BOD01 Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(27) Metals analysis performed on aqua-regia digest of sample material.
(28) TP MRL elevated due to matrix interference.
(29) Arsenic and TP MRL elevated due to matrix interference.
(30) Metals analysis performed on aqua-regia digest of sample material, except for Boron. Phenols MRL elevated due to matrix interference
(31) Metals analysis performed on aqua-regia digest of sample material except for Boron.
(32) Phenols MRL elevated due to matrix interference.
(33) GEN09 Elevated detection limits due to the nature of the sample matrix.
(34) TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material.
(35) Insufficient water at monitoring location to sample. No sample was collected.
(36) Parameter was not measured.
(37) Monitoring location was stagnant during sampling event. No sample was collected.
(38) Monitoring location was frozen during this sampling event. No sample was collected.
(39) Insufficient sample volume was collected for analysis.
(40) At pH 4.5 to 5.5 the Interim PWQO is 15 µg/L based on inorganic monomeric aluminum measure in clay-free samples; At pH > 5.5 to 6.5, no condition should be permitted which would increase the acid soluble inorganic aluminum concentration in clay-free samples to more than 10% above natural background concentrations for waters representative of that geological area of the Province that are unaffected by man-made inputs. At pH > 6.5 to 9.0, the Interim PWQO is 75 µg/L based on total aluminum measured in clay-free samples. If natural background aluminum concentrations in water bodies unaffected by man-made inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level. Note: pH values of < 6.5 and > 8.5 are outside the range considered acceptable by the PWQO for pH. See the Scientific Criteria Document for Development of Provincial Water Quality Objectives and Guidelines - Aluminum for a discussion of analytical procedures.
(41) Metals analysis performed on aqua-regia digest of sample material, except for Boron.
(42) TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated

Samuel Berube

From: Public Information Services <publicinformationservices@tssa.org>
Sent: October 29, 2021 3:07 PM
To: Samuel Berube
Subject: RE: PE4588 - TSSA Request - CORRECTED RESPONSE

Please refrain from sending documents to head office and only submit your requests electronically via email along with credit card payment. We are all working remotely and mailing in applications with cheques will lengthen the overall processing time.

NO RECORD FOUND

Hi Sam,

Thank you for your request for confirmation of public information. I sent the wrong email earlier, this is the correct response. My apologies for the confusion!

- We confirm that there are no records in our database of any fuel storage tanks at the subject addresses.

For a further search in our archives please complete our release of public information form found at https://www.tssa.org/en/about-tssa/release-of-public-information.aspx?_mid_=392 and email the completed form to publicinformationservices@tssa.org along with a fee of $56.50 (including HST) per location. The fee is payable with credit card (Visa or MasterCard).

Although TSSA believes the information provided pursuant to your request is accurate, please note that TSSA does not warrant this information in any way whatsoever.

Kind regards,

Mariah

Public Information Agent
Facilities and Business Services
345 Carlingview Drive
Toronto, Ontario M9W 6N9
Tel: +1-416-734-6222 | Fax: +1-416-734-3568 | E-Mail: publicinformationservices@tssa.org
www.tssa.org

From: Public Information Services
Sent: October 29, 2021 3:05 PM
To: Samuel Berube <SBerube@patersongroup.ca>
Subject: RE: PE4588 - TSSA Request

Please refrain from sending documents to head office and only submit your requests electronically via email along with credit card payment. We are all working remotely and mailing in applications with cheques will lengthen the overall processing time.

RECORD FOUND

Hello,

Thank you for your request for confirmation of public information.

- We confirm that there are records in our database of fuel storage tanks at the subject addresses.

For a further search in our archives please complete our release of public information form found at https://www.tssa.org/en/about-tssa/release-of-public-information.aspx?_mid_=392 and email the completed form to publicinformationservices@tssa.org along with a fee of $56.50 (including HST) per location. The fee is payable with credit card (Visa or MasterCard).

Although TSSA believes the information provided pursuant to your request is accurate, please note that TSSA does not warrant this information in any way whatsoever.

Kind regards,

Mariah

Public Information Agent
Facilities and Business Services
345 Carlingview Drive
Toronto, Ontario M9W 6N9
Tel: +1-416-734-6222 | Fax: +1-416-734-3568 | E-Mail: publicinformationservices@tssa.org
www.tssa.org

From: Samuel Berube <SBerube@patersongroup.ca>
Sent: October 29, 2021 2:06 PM
To: Public Information Services <publicinformationservices@tssa.org>
Subject: PE4588 - TSSA Request

[CAUTION]: This email originated outside the organisation.
Please do not click links or open attachments unless you recognise the source of this email and know the content is safe.

Good afternoon,

Can you please complete a search of your records for the following properties in the City of Ottawa, Ontario?

3225, 3237, 3241, 3252, 3253, 3270, 3317, 3342 – **Navan Road**

6049 - **Renaud Road**

Thank you,

Samuel Berube, B.Eng.

patersongroup
solution oriented engineering
over 60 years serving our clients

154 Colonnade Road South
Ottawa, Ontario, K2E 7J5
Tel: (613) 226-7381
Cell: 613-558-0932

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Samuel Berube

From: Public Information Services <publicinformationservices@tssa.org>
Sent: October 3, 2023 11:14 AM
To: Samuel Berube
Subject: RE: TSSA Request

Hello ,

RECORD FOUND IN CURRENT DATABASE:

- We confirm that there are records in our database of **fuel storage tanks** at the subject address(es).

Inventory Number	Address	City	Province	Postal Code	Status	Asset Class / Inventory Context
64645216	3354 NAVAN ROAD	OTTAWA (NAVAN)	ON	K1B 1H9	Active	Gaseous Fuels
64645217	3354 NAVAN ROAD	OTTAWA (NAVAN)	ON	K1B 1H9	Active	FS Appliance
64645266	3354 NAVAN ROAD	OTTAWA (NAVAN)	ON	K1B 1H9	Active	Gaseous Fuels
64645267	3354 NAVAN ROAD	OTTAWA (NAVAN)	ON	K1B 1H9	Active	FS Appliance

NO RECORDS FOUND IN CURRENT DATABASE:

- We confirm that there are NO records in our database of any **fuel storage tanks** at the subject address(es).

3225, 3252, 3270, 3320, 3241, 3237, 3318 – **Navan Road**

This is not a confirmation that there are no records in the archives. For a further search in our archives, please apply for release of public information (PI Form) through TSSA's new Service Prepayment Portal. The associated fee must be paid via credit card (Visa or MasterCard) through a secure site.
Please follow the steps below to access the applications and the Service Prepayment Portal:

Accessing the applications

1. Click Release of Public Information - TSSA and click "need a copy of a document"
2. Select the appropriate application, download it, complete it in full and save it (Note: you will have to

upload the application)
3. Proceed to page 3 of the application and click the “TSSA Service Prepayment Portal” link under payment options (the link will take you the secure site where you can pay for the request via credit card)

Accessing the Service Prepayment Portal

1. Select new or existing customer (*if you are an existing customer, you will need your account number & postal code to access your account)
2. Under “Program Area” select **Public Information** and click continue
3. Enter application form number (found on the bottom left corner of the application form) and click continue
4. Complete the primary contact information section
5. Complete the fee section
6. Upload your completed application
7. Upload supporting documents (if required) and click continue

Once all steps have been successfully completed you will receive your payment receipt via email.

TSSA does not make any representations or warranties with respect to the accuracy or completeness of any records released. The requestor assumes all risk in using or relying on the information provided.

If you have any questions or concerns, please do not hesitate to contact our Public Information Release team at publicinformationservices@tssa.org.

Although TSSA believes the information provided pursuant to your request is accurate, please note that TSSA does not warrant this information in any way whatsoever.

Kind Regards,

Melanie Fowler | Public Information Releases Agent
Legal
345 Carlingview Drive
Toronto, Ontario M9W 6N9
Tel: +1 416-734-3593 | Fax: +1 416-231-4903 | E-Mail: mfowler@tssa.org
www.tssa.org

Winner of 2023 5-Star Safety Cultures Award

From: Samuel Berube <SBerube@patersongroup.ca>
Sent: Tuesday, October 3, 2023 9:25 AM
To: Public Information Services <publicinformationservices@tssa.org>
Subject: PE6234 - TSSA Request

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Good afternoon,

Can you please complete a search of your records for the following properties in Ottawa, Ontario?

3225, 3252, 3270, 3320, 3241, 3237, 3318, 3354 – **Navan Road**

Thank you,

SAMUEL BERUBE, EIT
PROJECT MANAGER – ENVIRONMENTAL
TEL: (613) 226-7381 ext. 335
DIRECT: (613) 696-9651
9 AURIGA DRIVE
OTTAWA ON K2E 7T9
patersongroup.ca

TEMPORARY SHORING DESIGN SERVICES ARE NOW AVAILABLE, PLEASE CONTACT US TO SEE HOW WE CAN HELP!

NEW OFFICE OPEN IN THE GREATER TORONTO AREA WITH OUR EXPANSIVE LIST OF SERVICES NOW AVAILABLE!

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June 22, 2022
File: PE4588-HLUI

Consulting Engineers
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
Tel: (613) 226-7381

Geotechnical Engineering
Environmental Engineering
Hydrogeology
Materials Testing
Building Science
Rural Development Design
Retaining Wall Design
Noise and Vibration Studies

patersongroup.ca

City of Ottawa
110 Laurier Avenue W
Ottawa, Ontario
K1P 1J1

Subject: **Authorization Letter, HLUI**
Phase I-Environmental Site Assessment
3252 Navan Road
Ottawa, Ontario

Dear Sir or Madame,

Please consider this letter as confirmation that Paterson Group has been retained to conduct a Phase I-Environmental Site Assessment at the aforementioned property.

With this letter, the property owner authorizes the City of Ottawa and other regulatory bodies to release, to Paterson Group, information requested for the purpose of completing an environmental assessment of the property.

Name of Company/Property Owner:	2721336 Ontario Limited
Name of Representative	Vincent Denomme
Authorization of Representative	
Date	June 22,2022

File Number: D06-03-22-0119

September 9, 2022

Paterson Group

*Sent via email [*sberube@patersongroup.ca*]*

Dear Paterson Group,

Re: Information Request
3252 Navan Road**, Ottawa, Ontario ("Subject Property")**

Internal Department Circulation:

The Planning, Infrastructure and Economic Development Department has the following information in response to your request for information regarding the Subject Property:

- **Sewer Use Program:** The City's Sewer Use Program has found the following information pertaining to the subject property: No comments
- **Environment and Health Protection:** The City's Environment and Health Protection Branch has found the following information pertaining to the subject property: No comment
- **Solid Waste Services:** The subject property is within 250 metres of Huneault Waste Management, Waste Disposal

Documents Provided:

HLUI Summary Report and HLUI Map

The HLUI Summary Report Excel spreadsheet identifies HLUI area, point and line features within 250 metres of the Subject Property, as shown on the provided HLUI Map PDF. Within 500 metres of the Subject Property, landfills and Environmental Risk Management Area (ERMA) are also identified if applicable.

Additional information may be obtained by contacting:

Ontario's Environmental Registry

The Environmental Registry found at https://ero.ontario.ca/ contains "public notices" about environmental matters being proposed by all government ministries covered by the Environmental Bill of Rights. The public notices may contain information about proposed new laws, regulations, policies and programs or about proposals to change or eliminate existing ones. By using keys words i.e. name of proponent/owner and the address one can ascertain if there is any information on the proponent and address under the following

categories: Ministry, keywords, notice types, Notice Status, Acts, Instruments and published date (all years).

The Ontario Land Registry Office

Registration of real property is recorded in the Ontario Land Registry Office through the Land Titles Act or the Registry Act. Documents relating to title and other agreements that may affect your property are available to the public for a fee. It is recommended that a property search at the Land Registry Office be included in any investigation as to the historic use of your property. The City of Ottawa cannot comment on any documents to which it is not a party.

Court House
161 Elgin Street 4th Floor
Ottawa ON K2P 2K1
Tel: (613) 239-1230
Fax: (613) 239-1422

Please note, as per the HLUI Disclaimer, that the information contained in the HLUI database has been compiled from publicly available records and other sources of information. The HLUI may contain erroneous information given that the records used as sources of information may be flawed. For instance, changes in municipal addresses over time may introduce error. Accordingly, all information from the HLUI database is provided on an "as is" basis with no representation or warranty by the City with respect to the information's accuracy or exhaustiveness in responding to the request.

Furthermore, the HLUI database and the results of this search in no way confirm the presence or absence of contamination or pollution of any kind. This information is provided on the assumption that it will not be relied upon by any person for any purpose whatsoever. The City of Ottawa denies all liability to any persons attempting to rely on any information provided from the HLUI database.

Please note that in responding to your request, the City of Ottawa does not guarantee or comment on the environmental condition of the Subject Property. You may wish to contact the Ontario Ministry of Environment and Climate Change for additional information.

If you have any further questions or comments, please contact HLUI@ottawa.ca.

Sincerely,

Amya Martinov
Student Planner

Per:

Michael Boughton, MCIP, RPP
Senior Planner
Development Review East
Planning Services
Planning, Infrastructure and Economic Development Department

MB / AM

Enclosures: (2)
1. HLUI Map
2. HLUI Summary Report

cc: File no. D06-03-22-0119

DATABASE REPORT

Project Property:	*PE4588 - Phase I - ESA* *3252 Navan Road* *Navan ON K4B 1H9*
Project No:	*55013*
Report Type:	*Quote - Custom-Build Your Own Report*
Order No:	*22061700059*
Requested by:	*Paterson Group Inc.*
Date Completed:	*June 22, 2022*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

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Notice: IMPORTANT LIMITATIONS and YOUR LIABILITY

Reliance on information in Report: This report DOES NOT replace a full Phase I Environmental Site Assessment but is solely intended to be used as a database review of environmental records.

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Executive Summary

Property Information:

Project Property:	*PE4588 - Phase I - ESA* *3252 Navan Road Navan ON K4B 1H9*
Project No:	*55013*

Order Information:

Order No:	*22061700059*
Date Requested:	*June 17, 2022*
Requested by:	*Paterson Group Inc.*
Report Type:	*Quote - Custom-Build Your Own Report*

Historical/Products:

ERIS Xplorer	*ERIS Xplorer*

Executive Summary: Report Summary

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
AAGR	Abandoned Aggregate Inventory	Y	0	0	0
AGR	Aggregate Inventory	Y	0	0	0
AMIS	Abandoned Mine Information System	Y	0	0	0
ANDR	Anderson's Waste Disposal Sites	Y	0	0	0
AST	Aboveground Storage Tanks	Y	0	0	0
AUWR	Automobile Wrecking & Supplies	Y	0	0	0
BORE	Borehole	Y	0	0	0
CA	Certificates of Approval	Y	0	0	0
CDRY	Dry Cleaning Facilities	Y	0	0	0
CFOT	Commercial Fuel Oil Tanks	Y	0	0	0
CHEM	Chemical Manufacturers and Distributors	Y	0	0	0
CHM	Chemical Register	Y	0	0	0
CNG	Compressed Natural Gas Stations	Y	0	0	0
COAL	Inventory of Coal Gasification Plants and Coal Tar Sites	Y	0	0	0
CONV	Compliance and Convictions	Y	0	0	0
CPU	Certificates of Property Use	Y	0	0	0
DRL	Drill Hole Database	Y	0	0	0
DTNK	Delisted Fuel Tanks	Y	0	0	0
EASR	Environmental Activity and Sector Registry	Y	0	0	0
EBR	Environmental Registry	Y	0	1	1
ECA	Environmental Compliance Approval	Y	0	9	9
EEM	Environmental Effects Monitoring	Y	0	0	0
EHS	ERIS Historical Searches	Y	1	2	3
EIIS	Environmental Issues Inventory System	Y	0	0	0
EMHE	Emergency Management Historical Event	Y	0	0	0
EPAR	Environmental Penalty Annual Report	Y	0	0	0
EXP	List of Expired Fuels Safety Facilities	Y	0	0	0
FCON	Federal Convictions	Y	0	0	0
FCS	Contaminated Sites on Federal Land	Y	0	0	0
FOFT	Fisheries & Oceans Fuel Tanks	Y	0	0	0
FRST	Federal Identification Registry for Storage Tank Systems (FIRSTS)	Y	0	0	0
FST	Fuel Storage Tank	Y	0	0	0
FSTH	Fuel Storage Tank - Historic	Y	0	0	0
GEN	Ontario Regulation 347 Waste Generators Summary	Y	0	0	0
GHG	Greenhouse Gas Emissions from Large Facilities	Y	0	0	0
HINC	TSSA Historic Incidents	Y	0	0	0

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
IAFT	Indian & Northern Affairs Fuel Tanks	Y	0	0	0
INC	Fuel Oil Spills and Leaks	Y	0	1	1
LIMO	Landfill Inventory Management Ontario	Y	0	0	0
MINE	Canadian Mine Locations	Y	0	0	0
MNR	Mineral Occurrences	Y	0	0	0
NATE	National Analysis of Trends in Emergencies System (NATES)	Y	0	0	0
NCPL	Non-Compliance Reports	Y	0	0	0
NDFT	National Defense & Canadian Forces Fuel Tanks	Y	0	0	0
NDSP	National Defense & Canadian Forces Spills	Y	0	0	0
NDWD	National Defence & Canadian Forces Waste Disposal Sites	Y	0	0	0
NEBI	National Energy Board Pipeline Incidents	Y	0	0	0
NEBP	National Energy Board Wells	Y	0	0	0
NEES	National Environmental Emergencies System (NEES)	Y	0	0	0
NPCB	National PCB Inventory	Y	0	0	0
NPRI	National Pollutant Release Inventory	Y	0	0	0
OGWE	Oil and Gas Wells	Y	0	0	0
OOGW	Ontario Oil and Gas Wells	Y	0	0	0
OPCB	Inventory of PCB Storage Sites	Y	0	0	0
ORD	Orders	Y	0	0	0
PAP	Canadian Pulp and Paper	Y	0	0	0
PCFT	Parks Canada Fuel Storage Tanks	Y	0	0	0
PES	Pesticide Register	Y	0	0	0
PINC	Pipeline Incidents	Y	0	0	0
PRT	Private and Retail Fuel Storage Tanks	Y	0	0	0
PTTW	Permit to Take Water	Y	0	0	0
REC	Ontario Regulation 347 Waste Receivers Summary	Y	0	0	0
RSC	Record of Site Condition	Y	0	1	1
RST	Retail Fuel Storage Tanks	Y	0	0	0
SCT	Scott's Manufacturing Directory	Y	0	0	0
SPL	Ontario Spills	Y	0	0	0
SRDS	Wastewater Discharger Registration Database	Y	0	0	0
TANK	Anderson's Storage Tanks	Y	0	0	0
TCFT	Transport Canada Fuel Storage Tanks	Y	0	0	0
VAR	Variances for Abandonment of Underground Storage Tanks	Y	0	0	0
WDS	Waste Disposal Sites - MOE CA Inventory	Y	0	0	0
WDSH	Waste Disposal Sites - MOE 1991 Historical Approval Inventory	Y	0	0	0
WWIS	Water Well Information System	Y	0	2	2
	Total:		1	16	17

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev diff (m)	Page Number
1	EHS		3252 Navan Road Navan ON K4B 1H9	NNW/0.0	5.00	15

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
2	WWIS		3225 NAVAN ROAD lot 5 con 4 OTTAWA ON ***Well ID:*** 7254951	NNW/23.2	5.00	15
3	ECA	Ashcroft Homes - Eastboro Inc.	3253 Navan Rd part 4 , 4 Ottawa front Ottawa ON K2E 1A9	NNW/77.5	5.00	17
4	RSC	1561976 Ontario Inc.	3317 NAVAN RD, GLOUCESTER, ON, K4B 1H9 GLOUCESTER ON K4B 1H9	NNW/79.0	5.00	17
4	EHS		3317 Navan Rd Ottawa ON	NNW/79.0	5.00	18
5	ECA	Ashcroft Homes - Eastboro Inc.	Renaud Road Ottawa ON K2E 1A9	ESE/95.4	-1.05	18
5	ECA	Ashcroft Homes - Eastboro Inc.	Renaud Road Ottawa ON K2E 1A9	ESE/95.4	-1.05	18
5	ECA	Ashcroft Homes - Eastboro Inc.	Renaud Road Ottawa ON K2E 1A9	ESE/95.4	-1.05	19
5	ECA	Ashcroft Homes - Eastboro Inc.	Renaud Road Ottawa ON K2E 1A9	ESE/95.4	-1.05	19
6	EBR	Ashcroft Homes Inc.	3323 Navan Road, Ottawa, Ontario. CITY OF OTTAWA ON	NNE/175.4	6.00	19
7	ECA	Claridge Homes (Carson) Inc.	Ottawa ON K2P 0Y6	SSW/192.3	-8.03	20
7	ECA	Claridge Homes (Carson) Inc.	Ottawa ON K2P 0Y6	SSW/192.3	-8.03	20
7	ECA	Claridge Homes (Carson) Inc.	Ottawa ON K2P 0Y6	SSW/192.3	-8.03	20

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
7	ECA	Claridge Homes (Carson) Inc.	Ottawa ON K2P 0Y6	SSW/192.3	-8.03	21
8	EHS		Block 76, part of 3323 Navan Road Navan ON K4B 1H9	N/194.8	6.00	21
9	WWIS		lot 4 con 4 ON ***Well ID:*** 1516095	NE/206.0	5.97	21
10	INC		278 ROLLING MEADOWS CRES, OTTAWA ON	NW/224.9	4.00	25

Executive Summary: Summary By Data Source

EBR - Environmental Registry

A search of the EBR database, dated 1994 - May 31, 2022 has found that there are 1 EBR site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Ashcroft Homes Inc.	3323 Navan Road, Ottawa, Ontario. CITY OF OTTAWA ON	175.4	6

ECA - Environmental Compliance Approval

A search of the ECA database, dated Oct 2011- Apr 30, 2022 has found that there are 9 ECA site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Ashcroft Homes - Eastboro Inc.	3253 Navan Rd part 4 , 4 Ottawa front Ottawa ON K2E 1A9	77.5	3
Ashcroft Homes - Eastboro Inc.	Renaud Road Ottawa ON K2E 1A9	95.4	5
Ashcroft Homes - Eastboro Inc.	Renaud Road Ottawa ON K2E 1A9	95.4	5
Ashcroft Homes - Eastboro Inc.	Renaud Road Ottawa ON K2E 1A9	95.4	5
Ashcroft Homes - Eastboro Inc.	Renaud Road Ottawa ON K2E 1A9	95.4	5
Claridge Homes (Carson) Inc.	Ottawa ON K2P 0Y6	192.3	7

Site	Address	Distance (m)	Map Key
Claridge Homes (Carson) Inc.	Ottawa ON K2P 0Y6	192.3	7
Claridge Homes (Carson) Inc.	Ottawa ON K2P 0Y6	192.3	7
Claridge Homes (Carson) Inc.	Ottawa ON K2P 0Y6	192.3	7

EHS - ERIS Historical Searches

A search of the EHS database, dated 1999-Mar 31, 2022 has found that there are 3 EHS site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	3252 Navan Road Navan ON K4B 1H9	0.0	1
	3317 Navan Rd Ottawa ON	79.0	4
	Block 76, part of 3323 Navan Road Navan ON K4B 1H9	194.8	8

INC - Fuel Oil Spills and Leaks

A search of the INC database, dated Feb 28, 2022 has found that there are 1 INC site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	278 ROLLING MEADOWS CRES, OTTAWA ON	224.9	10

RSC - Record of Site Condition

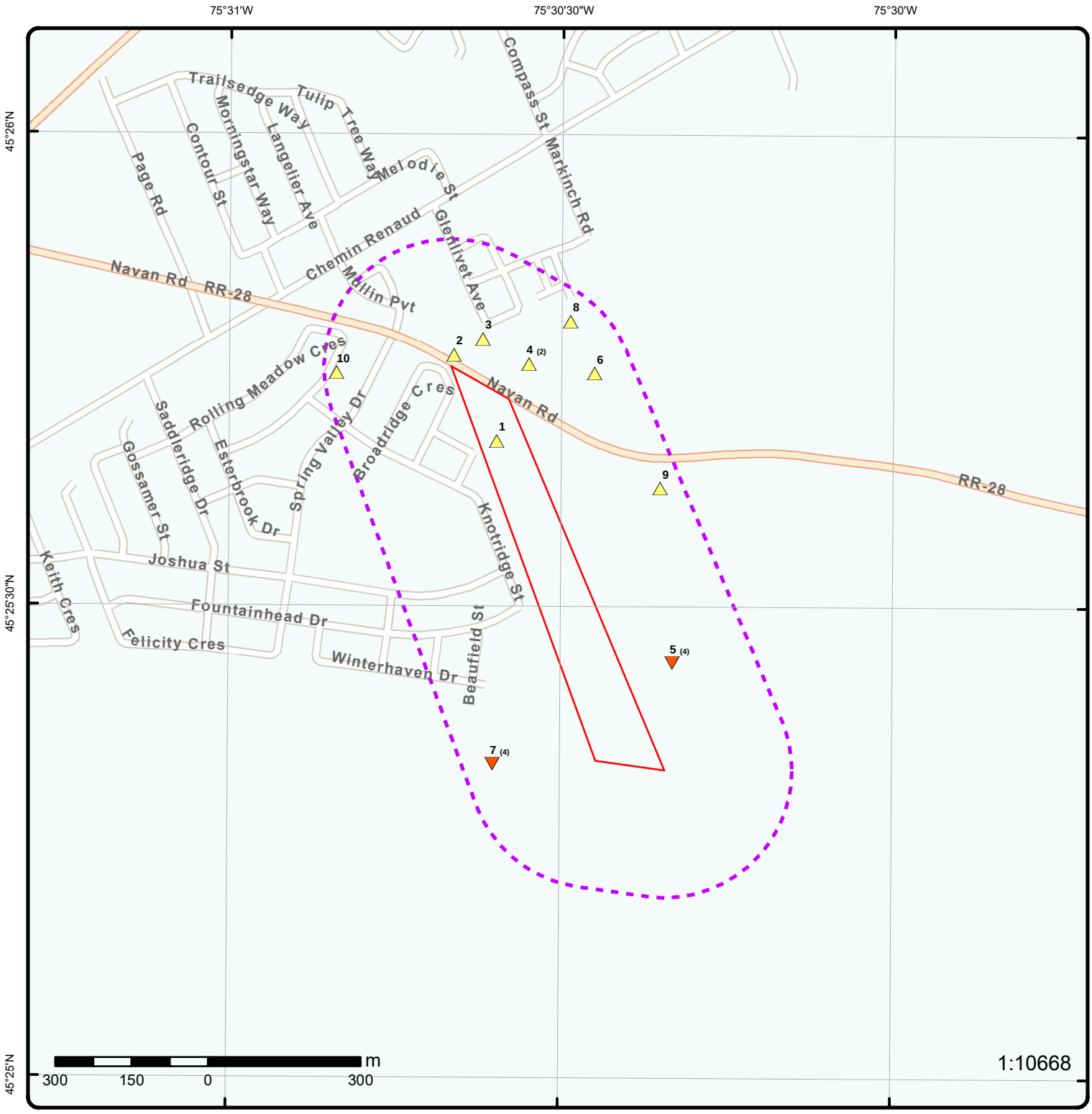
A search of the RSC database, dated 1997-Sept 2001, Oct 2004-May 2022 has found that there are 1 RSC site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
1561976 Ontario Inc.	3317 NAVAN RD, GLOUCESTER, ON, K4B 1H9 GLOUCESTER ON K4B 1H9	79.0	4

WWIS - Water Well Information System

A search of the WWIS database, dated Sep 30, 2021 has found that there are 2 WWIS site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	3225 NAVAN ROAD lot 5 con 4 OTTAWA ON ***Well ID:*** 7254951	23.2	2
	lot 4 con 4 ON ***Well ID:*** 1516095	206.0	9



Map: 0.25 Kilometer Radius

Order Number: 22061700059

Address: 3252 Navan Road, Navan, ON

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Freeways; Highways
- Traffic Circle; Ramp
- Major Arterial; Minor Arterial
- Local Road
- Service Road; Traffic Circle; Ramp
- Rail
- Beach
- Airport
- Industrial Area
- Military Base
- Aircraft Roads
- Native Reservation
- Hospital
- Shopping & Sports Area
- University/College
- Cemetery; Golf Course
- Parkt (National)
- Park (City/County)

Source: © 2021 ESRI StreetMap Premium.

© ERIS Information Limited Partnership

75°30'W

45°25'30"N

45°25'30"N

Aerial

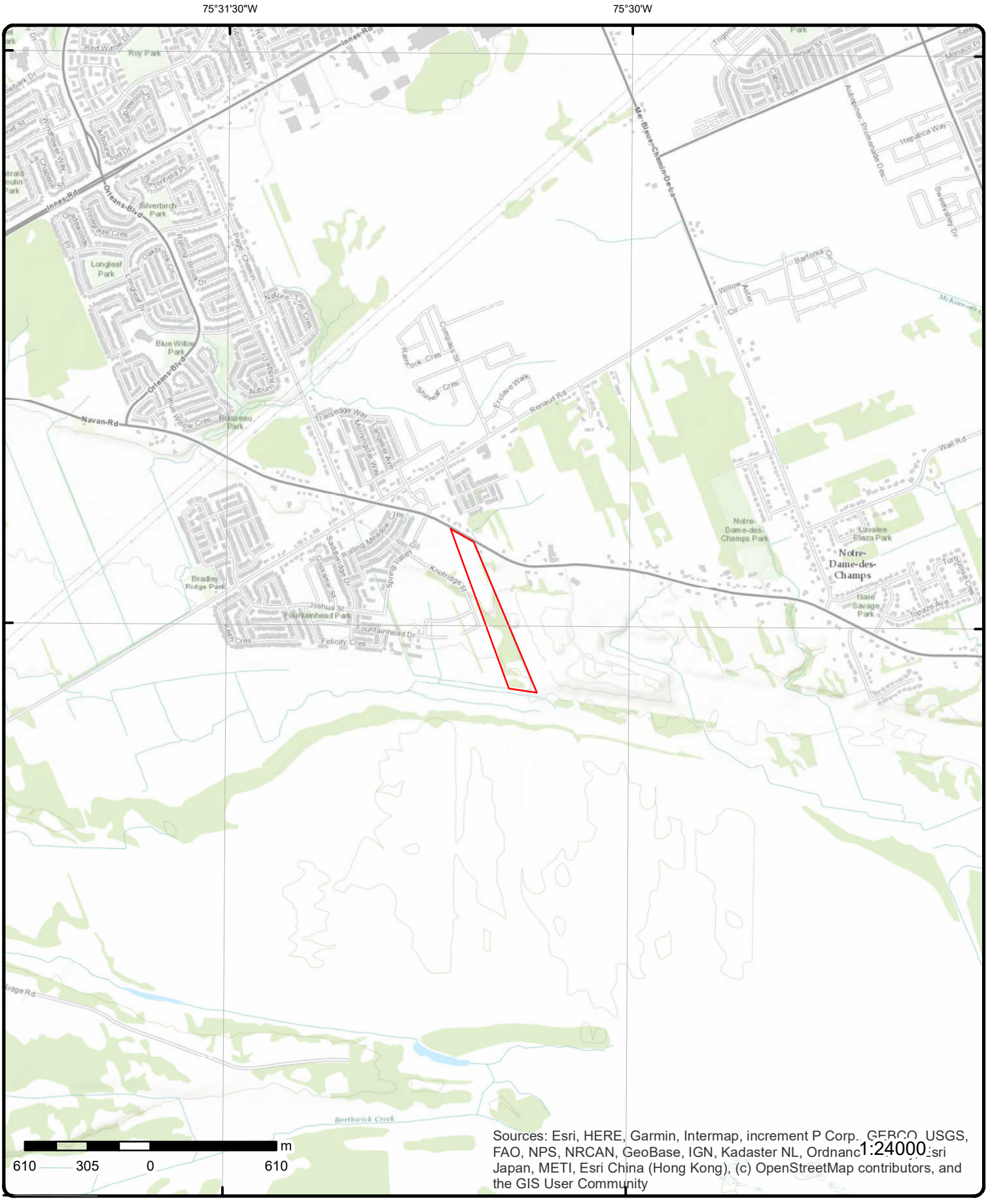
Year: 2021

Order Number: 22061700059

Address: 3252 Navan Road, Navan, ON

Source: ESRI World Imagery

© ERIS Information Limited Partnership



Topographic Map

Address: 3252 Navan Road, ON

Source: ESRI World Topographic Map

Order Number: 22061700059

© ERIS Information Limited Partnership

Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	1 of 1	NNW/0.0	80.9 / 5.00	3252 Navan Road Navan ON K4B 1H9	EHS

Order No:	20200501079	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Custom Report	**Client Prov/State:**	ON
Report Date:	06-MAY-20	**Search Radius (km):**	.25
Date Received:	01-MAY-20	**X:**	-75.5099434
Previous Site Name:		**Y:**	45.4279173
Lot/Building Size:			
Additional Info Ordered:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
2	1 of 1	NNW/23.2	80.9 / 5.00	3225 NAVAN ROAD lot 5 con 4 OTTAWA ON	WWIS

Well ID:	7254951	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Not Used	**Date Received:**	12/29/2015
Sec. Water Use:		**Selected Flag:**	TRUE
Final Well Status:	Abandoned-Other	**Abandonment Rec:**	Yes
Water Type:		**Contractor:**	4875
Casing Material:		**Form Version:**	7
Audit No:	Z220167	**Owner:**	
Tag:		**Street Name:**	3225 NAVAN ROAD
Construction Method:		**County:**	OTTAWA
Elevation (m):		**Municipality:**	GLOUCESTER TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	005
Well Depth:		**Concession:**	04
Overburden/Bedrock:		**Concession Name:**	OF
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/725\7254951.pdf

Additional Detail(s) (Map)

Well Completed Date:	2015/12/09
Year Completed:	2015
Depth (m):	
Latitude:	45.4294351183395
Longitude:	-75.5110303412974
Path:	725\7254951.pdf

Bore Hole Information

Bore Hole ID:	1005846525	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	460025.00

Code OB Desc:		***North83:***	5030784.00
Open Hole:		***Org CS:***	UTM83
Cluster Kind:		***UTMRC:***	4
Date Completed:	09-Dec-2015 00:00:00	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Annular Space/Abandonment Sealing Record

Plug ID:	1005954067
Layer:	1
Plug From:	0.0
Plug To:	
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	1005954066
Method Construction Code:	
Method Construction:	
Other Method Construction:	

Pipe Information

Pipe ID:	1005954058
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1005954063
Layer:	
Material:	
Open Hole or Material:	
Depth From:	
Depth To:	
Casing Diameter:	
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1005954064
Layer:	
Slot:	
Screen Top Depth:	
Screen End Depth:	
Screen Material:	
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	

Results of Well Yield Testing

Pump Test ID: 1005954059
Pump Set At:
Static Level: 11.300000190734863
Final Level After Pumping:
Recommended Pump Depth:
Pumping Rate:
Flowing Rate:
Recommended Pump Rate:
Levels UOM: m
Rate UOM: LPM
Water State After Test Code: 0
Water State After Test:
Pumping Test Method: 0
Pumping Duration HR:
Pumping Duration MIN:
Flowing: No

Water Details

Water ID: 1005954062
Layer:
Kind Code:
Kind:
Water Found Depth:
Water Found Depth UOM: m

Hole Diameter

Hole ID: 1005954061
Diameter: 12.199999809265137
Depth From: 0.0
Depth To: 32.70000076293945
Hole Depth UOM: m
Hole Diameter UOM: cm

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3 | ***1 of 1*** | ***NNW/77.5*** | ***80.9 / 5.00*** | ***Ashcroft Homes - Eastboro Inc.***
3253 Navan Rd part 4 , 4 Ottawa front
Ottawa ON K2E 1A9 | ***ECA***

Approval No: 7692-85VRBV
Approval Date: 2010-06-01
Status: Revoked and/or Replaced
Record Type: ECA
Link Source: IDS
SWP Area Name:
MOE District:
City:
Longitude:
Latitude:
Geometry X:
Geometry Y:
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: Ashcroft Homes - Eastboro Inc.
Address: 3253 Navan Rd part 4 , 4 Ottawa front
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/3864-85NRTL-14.pdf
PDF Site Location:

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4 | ***1 of 2*** | ***NNW/79.0*** | ***80.9 / 5.00*** | ***1561976 Ontario Inc.***
3317 NAVAN RD, GLOUCESTER, ON, K4B 1H9
GLOUCESTER ON K4B 1H9 | ***RSC***

RSC ID: 53713
RA No:
RSC Type:
Curr Property Use: Agriculture/Other
Cert Date: 7-May-09
Cert Prop Use No: No CPU
Intended Prop Use: Residential
Qual Person Name: David Choo

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Ministry District:	OTTAWA	**Stratified (Y/N):**	
Filing Date:	29-Jul-09	**Audit (Y/N):**	
Date Ack:		**Entire Leg Prop. (Y/N):**	Yes
Date Returned:		**Accuracy Estimate:**	0 to 1 meters
Restoration Type:		**Telephone:**	613-2267266x201
Soil Type:		**Fax:**	613-2267161
Criteria:		**Email:**	dchoo@ashcroft-homes.com
CPU Issued Sect 1686:	No		

Asmt Roll No: 061 460021 512100, 061 460021 510800 and 0614600 21512400
Prop ID No (PIN): Part of PIN 04352-1622
Property Municipal Address: 3317 NAVAN RD, GLOUCESTER, ON, K4B 1H9
Mailing Address: 18 ANTARES DR, OTTAWA, ON, K2E 1A9
Latitude & Latitude: 45.43118820N 75.50949930W (converted from UTM)
UTM Coordinates: NAD83 18-460146-5030978
Consultant:
Legal Desc: Part of Lots 3 and 4, Concession 4 (OF), Gloucester, being part 1 on Plan 4R-23678, Ottawa
Measurement Method: Digitized from a map
Applicable Standards: ESA Phase 1
RSC PDF:

4	2 of 2	NNW/79.0	80.9 / 5.00	**3317 Navan Rd** **Ottawa ON**	EHS

Order No:	20100305012	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Custom Report	**Client Prov/State:**	ON
Report Date:	3/17/2010	**Search Radius (km):**	0.25
Date Received:	3/5/2010	**X:**	-75.508503
Previous Site Name:		**Y:**	45.428
Lot/Building Size:			
Additional Info Ordered:			

5	1 of 4	ESE/95.4	74.8 / -1.05	**Ashcroft Homes - Eastboro Inc.** **Renaud Road** **Ottawa ON K2E 1A9**	ECA

Approval No:	8786-8BATXA	**MOE District:**	Ottawa
Approval Date:	2010-11-18	**City:**	
Status:	Approved	**Longitude:**	-75.5055
Record Type:	ECA	**Latitude:**	45.424
Link Source:	IDS	**Geometry X:**	
SWP Area Name:	Rideau Valley	**Geometry Y:**	

Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: Ashcroft Homes - Eastboro Inc.
Address: Renaud Road
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/7369-88PM5X-14.pdf
PDF Site Location:

5	2 of 4	ESE/95.4	74.8 / -1.05	**Ashcroft Homes - Eastboro Inc.** **Renaud Road** **Ottawa ON K2E 1A9**	ECA

Approval No:	2240-8ERLQE	**MOE District:**	Ottawa
Approval Date:	2011-03-14	**City:**	
Status:	Approved	**Longitude:**	-75.5055
Record Type:	ECA	**Latitude:**	45.424
Link Source:	IDS	**Geometry X:**	
SWP Area Name:	Rideau Valley	**Geometry Y:**	

Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: Ashcroft Homes - Eastboro Inc.
Address: Renaud Road
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/8886-8ECJJL-14.pdf
PDF Site Location:

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5 | **3 of 4** | **ESE/95.4** | **74.8 / -1.05** | **Ashcroft Homes - Eastboro Inc.**
Renaud Road
Ottawa ON K2E 1A9 | **ECA**

Approval No: 1462-8E5P3N
Approval Date: 2011-02-23
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name: Rideau Valley
MOE District: Ottawa
City:
Longitude: -75.5055
Latitude: 45.424
Geometry X:
Geometry Y:
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: Ashcroft Homes - Eastboro Inc.
Address: Renaud Road
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/6570-8E5HXP-14.pdf
PDF Site Location:

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5 | **4 of 4** | **ESE/95.4** | **74.8 / -1.05** | **Ashcroft Homes - Eastboro Inc.**
Renaud Road
Ottawa ON K2E 1A9 | **ECA**

Approval No: 7226-6GLJQM
Approval Date: 2011-06-24
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name: Rideau Valley
MOE District: Ottawa
City:
Longitude: -75.5055
Latitude: 45.424
Geometry X:
Geometry Y:
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: Ashcroft Homes - Eastboro Inc.
Address: Renaud Road
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/4039-8ECJQZ-14.pdf
PDF Site Location:

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6 | **1 of 1** | **NNE/175.4** | **81.9 / 6.00** | **Ashcroft Homes Inc.**
3323 Navan Road, Ottawa, Ontario. CITY OF OTTAWA
ON | **EBR**

EBR Registry No: 013-0286
Ministry Ref No: MNRF INST 29/17
Notice Type: Instrument Decision
Notice Stage:
Notice Date: September 01, 2017
Proposal Date: April 06, 2017
Year: 2017
Decision Posted:
Exception Posted:
Section:
Act 1:
Act 2:
Site Location Map:
Instrument Type: (ESA s.17(2) (c)) - Permit for activities with conditions to achieve overall benefit to the species
Off Instrument Name:
Posted By:
Company Name: Ashcroft Homes Inc.

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Site Address:
Location Other:
Proponent Name:
Proponent Address: 18 Antares Drive, Ottawa Ontario, Canada K2E1A9
Comment Period:
URL:

Site Location Details:

3323 Navan Road, Ottawa, Ontario. CITY OF OTTAWA

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7 ***1 of 4*** ***SSW/192.3*** ***67.8 / -8.03*** ***Claridge Homes (Carson) Inc.*** ***ECA***

Ottawa ON K2P 0Y6

Approval No:	9611-7PUSMB	***MOE District:***	Ottawa
Approval Date:	2009-03-09	***City:***	
Status:	Approved	***Longitude:***	-75.51
Record Type:	ECA	***Latitude:***	45.4222
Link Source:	IDS	***Geometry X:***	
SWP Area Name:	Rideau Valley	***Geometry Y:***	

Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: Claridge Homes (Carson) Inc.
Address:
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/3395-7PTPTW-14.pdf
PDF Site Location:

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7 ***2 of 4*** ***SSW/192.3*** ***67.8 / -8.03*** ***Claridge Homes (Carson) Inc.*** ***ECA***

Ottawa ON K2P 0Y6

Approval No:	5746-7PUSV9	***MOE District:***	Ottawa
Approval Date:	2009-03-09	***City:***	
Status:	Approved	***Longitude:***	-75.51
Record Type:	ECA	***Latitude:***	45.422200000000004
Link Source:	IDS	***Geometry X:***	
SWP Area Name:	Rideau Valley	***Geometry Y:***	

Approval Type: ECA-Municipal Drinking Water Systems
Project Type: Municipal Drinking Water Systems
Business Name: Claridge Homes (Carson) Inc.
Address:
Full Address:
Full PDF Link:
PDF Site Location:

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7 ***3 of 4*** ***SSW/192.3*** ***67.8 / -8.03*** ***Claridge Homes (Carson) Inc.*** ***ECA***

Ottawa ON K2P 0Y6

Approval No:	1961-6Z5TFX	***MOE District:***	Ottawa
Approval Date:	2007-04-17	***City:***	
Status:	Approved	***Longitude:***	-75.51
Record Type:	ECA	***Latitude:***	45.422200000000004
Link Source:	IDS	***Geometry X:***	
SWP Area Name:	Rideau Valley	***Geometry Y:***	

Approval Type: ECA-Municipal Drinking Water Systems
Project Type: Municipal Drinking Water Systems

Business Name: Claridge Homes (Carson) Inc.
Address:
Full Address:
Full PDF Link:
PDF Site Location:

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7 | **4 of 4** | **SSW/192.3** | **67.8 / -8.03** | **Claridge Homes (Carson) Inc.**
Ottawa ON K2P 0Y6 | **ECA**

Approval No:	8697-6Z5TCD	**MOE District:**	Ottawa
Approval Date:	2007-04-17	**City:**	
Status:	Approved	**Longitude:**	-75.51
Record Type:	ECA	**Latitude:**	45.4222
Link Source:	IDS	**Geometry X:**	
SWP Area Name:	Rideau Valley	**Geometry Y:**	

Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: Claridge Homes (Carson) Inc.
Address:
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/2229-6Z3TA7-14.pdf
PDF Site Location:

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8 | **1 of 1** | **N/194.8** | **81.9 / 6.00** | **Block 76, part of 3323 Navan Road**
Navan ON K4B 1H9 | **EHS**

Order No:	20200312026	**Nearest Intersection:**	
Status:	C	**Municipality:**	City of Ottawa
Report Type:	Standard Report	**Client Prov/State:**	ON
Report Date:	17-MAR-20	**Search Radius (km):**	.25
Date Received:	12-MAR-20	**X:**	-75.5081037
Previous Site Name:		**Y:**	45.4300365
Lot/Building Size:	approximately 77m x 105m		
Additional Info Ordered:			

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9 | **1 of 1** | **NE/206.0** | **81.8 / 5.97** | **lot 4 con 4**
ON | **WWIS**

Well ID:	1516095	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	8/16/1977
Sec. Water Use:	0	**Selected Flag:**	TRUE
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	1517
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	OTTAWA
Elevation (m):		**Municipality:**	GLOUCESTER TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	004
Well Depth:		**Concession:**	04
Overburden/Bedrock:		**Concession Name:**	OF
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/151\1516095.pdf

Additional Detail(s) (Map)

Well Completed Date: 1977/05/02
Year Completed: 1977
Depth (m): 45.72
Latitude: 45.4270909164062
Longitude: -75.5058345392118
Path: 151\1516095.pdf

Bore Hole Information

Bore Hole ID: 10038030
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 02-May-1977 00:00:00
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83: 460429.80
North83: 5030521.00
Org CS:
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: p4

Overburden and Bedrock Materials Interval

Formation ID: 931031147
Layer: 5
Color: 8
General Color: BLACK
Mat1: 09
Most Common Material: MEDIUM SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 120.0
Formation End Depth: 142.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931031146
Layer: 4
Color: 2
General Color: GREY
Mat1: 11
Most Common Material: GRAVEL
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 112.0
Formation End Depth: 120.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID:	931031145
Layer:	3
Color:	3
General Color:	BLUE
Mat1:	05
Most Common Material:	CLAY
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	15.0
Formation End Depth:	112.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931031144
Layer:	2
Color:	5
General Color:	YELLOW
Mat1:	08
Most Common Material:	FINE SAND
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	2.0
Formation End Depth:	15.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931031143
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	02
Most Common Material:	TOPSOIL
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	2.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931031148
Layer:	6
Color:	8
General Color:	BLACK
Mat1:	19
Most Common Material:	SLATE
Mat2:	12

Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 142.0
Formation End Depth: 150.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961516095
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10586600
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930066969
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 142.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 991516095
Pump Set At:
Static Level: 35.0
Final Level After Pumping: 70.0
Recommended Pump Depth: 125.0
Pumping Rate: 10.0
Flowing Rate:
Recommended Pump Rate: 8.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 20
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934379248
Test Type: Draw Down
Test Duration: 30
Test Level: 55.0
Test Level UOM: ft

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Draw Down & Recovery

Pump Test Detail ID: 934640344
Test Type: Draw Down
Test Duration: 45
Test Level: 63.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934898246
Test Type: Draw Down
Test Duration: 60
Test Level: 70.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934101637
Test Type: Draw Down
Test Duration: 15
Test Level: 45.0
Test Level UOM: ft

Water Details

Water ID: 933472326
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 142.0
Water Found Depth UOM: ft

10	1 of 1	NW/224.9	79.9 / 4.00	278 ROLLING MEADOWS CRES, OTTAWA ON	INC

Incident No: 1785504
Incident ID:
Instance No:
Status Code:
Attribute Category: FS-Perform L1 Incident Insp
Context:
Date of Occurrence: 2016/01/12 00:00:00
Time of Occurrence: 14:00:00
Incident Created On:
Instance Creation Dt:
Instance Install Dt:
Occur Insp Start Date: 2016/01/13 00:00:00
Approx Quant Rel:
Tank Capacity:
Fuels Occur Type: CO Release
Fuel Type Involved: Natural Gas
Enforcement Policy: NULL
Prc Escalation Req: NULL
Tank Material Type:
Tank Storage Type:
Tank Location Type:
Pump Flow Rate Cap:
Task No: 6005926
Notes:
Drainage System:
Sub Surface Contam.:

Any Health Impact: No
Any Enviro Impact: No
Service Interrupted: Yes
Was Prop Damaged: Yes
Reside App. Type:
Commer App. Type:
Indus App. Type:
Institut App. Type:
Venting Type:
Vent Conn Mater:
Vent Chimney Mater:
Pipeline Type:
Pipeline Involved:
Pipe Material:
Depth Ground Cover:
Regulator Location:
Regulator Type:
Operation Pressure:
Liquid Prop Make:
Liquid Prop Model:
Liquid Prop Serial No:
Liquid Prop Notes:
Equipment Type:
Equipment Model:
Serial No:
Cylinder Capacity:

Aff Prop Use Water:		***Cylinder Cap Units:***	
Contam. Migrated:		***Cylinder Mat Type:***	
Contact Natural Env:		***Near Body of Water:***	
Incident Location:	278 ROLLING MEADOWS CRES, OTTAWA - CO RELEASE		
Occurence Narrative:	furnace corrosion		
Operation Type Involved:	Private Dwelling		
Item:			
Item Description:			
Device Installed Location:			

Unplottable Summary

Total: 24 Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
CA	Ashcroft Homes - Eastboro Inc.	Ward 2	Ottawa ON	
CA	Claridge Homes (Carson) Inc.		Ottawa ON	
CA	Ashcroft Homes - Eastboro Inc.		Ottawa ON	
CA	Claridge Homes (Carson) Inc.		Ottawa ON	
CA	GLOUCESTER CITY	NAVAN RD.	GLOUCESTER CITY ON	
CA	HUNEAULT WASTE MANAGEMENT LTD.	NAVAN RD.,LEACHATE EFF. P.S.	GLOUCESTER ON	
CA	APEX CONST. (VAULTEX CONST.)	NAVAN RD.	GLOUCESTER CITY ON	
CA	HUNEAULT WASTE MANAGEMENT LTD.	NAVAN RD., LEACHATE EFF. P.S.	GLOUCESTER ON	
ECA	City of Ottawa	Navan Road	Ottawa ON	K1S 5K2
ECA	City of Ottawa	Navan Rd	Ottawa ON	K2G 6J8
ECA	Claridge Homes (Carson) Inc.		Ottawa ON	K2P 0Y6
ECA	Ashcroft Homes - Eastboro Inc.		Ottawa ON	K4B 1H9
RSC	CLARIDGE HOMES (CARSON) INC.	No Municipal Address	Ottawa ON	
SPL	NAVRO INC	ON MR. CALLAHAN PROPERTY NAVAN ROAD GLOUCESTER PLANT NAVAN ROAD	GLOUCESTER CITY ON	
WWIS		lot 5	ON	
WWIS		lot 5	ON	
WWIS		lot 5	ON	

WWIS	lot 5	ON
WWIS	lot 5	ON
WWIS	lot 4	ON
WWIS	lot 4	ON
WWIS	lot 5	ON
WWIS	con 4	ON
WWIS	lot 5	ON

Unplottable Report

Site: ***Ashcroft Homes - Eastboro Inc.***
Ward 2 Ottawa ON

Database: ***CA***

Certificate #: 7692-85VRBV
Application Year: 2010
Issue Date: 6/1/2010
Approval Type: Municipal and Private Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***Claridge Homes (Carson) Inc.***
Ottawa ON

Database: ***CA***

Certificate #: 8697-6Z5TCD
Application Year: 2007
Issue Date: 4/17/2007
Approval Type: Municipal and Private Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***Ashcroft Homes - Eastboro Inc.***
Ottawa ON

Database: ***CA***

Certificate #: 8786-8BATXA
Application Year: 2010
Issue Date: 11/18/2010
Approval Type: Municipal and Private Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***Claridge Homes (Carson) Inc.***
Ottawa ON

Database: ***CA***

Certificate #: 9611-7PUSMB

Application Year: 2009
Issue Date: 3/9/2009
Approval Type: Municipal and Private Sewage Works
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***GLOUCESTER CITY***
NAVAN RD. GLOUCESTER CITY ON

Database: ***CA***

Certificate #: 3-2067-87-
Application Year: 87
Issue Date: 11/17/1987
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***HUNEAULT WASTE MANAGEMENT LTD.***
NAVAN RD.,LEACHATE EFF. P.S. GLOUCESTER ON

Database: ***CA***

Certificate #: 3-0111-98-
Application Year: 98
Issue Date: 7/23/1998
Approval Type: Municipal sewage
Status: PE0
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***APEX CONST. (VAULTEX CONST.)***
NAVAN RD. GLOUCESTER CITY ON

Database: ***CA***

Certificate #: 3-1234-86-
Application Year: 86
Issue Date: 9/11/1986
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name:
Client Address:
Client City:
Client Postal Code:
Project Description:
Contaminants:
Emission Control:

Site: ***HUNEAULT WASTE MANAGEMENT LTD.***
NAVAN RD., LEACHATE EFF. P.S. GLOUCESTER ON

Database: ***CA***

Certificate #:	3-0111-98-
Application Year:	98
Issue Date:	3/3/1998
Approval Type:	Municipal sewage
Status:	PE0
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***City of Ottawa***
Navan Road Ottawa ON K1S 5K2

Database: ***ECA***

Approval No:	2148-5PNPTW	***MOE District:***	
Approval Date:	2003-07-25	***City:***	
Status:	Approved	***Longitude:***	
Record Type:	ECA	***Latitude:***	
Link Source:	IDS	***Geometry X:***	
SWP Area Name:		***Geometry Y:***	
Approval Type:	ECA-Municipal Drinking Water Systems		
Project Type:	Municipal Drinking Water Systems		
Business Name:	City of Ottawa		
Address:	Navan Road		
Full Address:			
Full PDF Link:			
PDF Site Location:			

Site: ***City of Ottawa***
Navan Rd Ottawa ON K2G 6J8

Database: ***ECA***

Approval No:	7659-ALUK3A	***MOE District:***	
Approval Date:	2017-05-11	***City:***	
Status:	Approved	***Longitude:***	
Record Type:	ECA	***Latitude:***	
Link Source:	IDS	***Geometry X:***	
SWP Area Name:		***Geometry Y:***	
Approval Type:	ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS		
Project Type:	MUNICIPAL AND PRIVATE SEWAGE WORKS		
Business Name:	City of Ottawa		
Address:	Navan Rd		
Full Address:			
Full PDF Link:	https://www.accessenvironment.ene.gov.on.ca/instruments/2093-ALCKN7-14.pdf		
PDF Site Location:			

Site: ***Claridge Homes (Carson) Inc.***
Ottawa ON K2P 0Y6

Database: ***ECA***

Approval No:	8741-AU3KP5	***MOE District:***	
Approval Date:	2017-12-20	***City:***	
Status:	Approved	***Longitude:***	
Record Type:	ECA	***Latitude:***	
Link Source:	IDS	***Geometry X:***	
SWP Area Name:		***Geometry Y:***	
Approval Type:	ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS		
Project Type:	MUNICIPAL AND PRIVATE SEWAGE WORKS		

Business Name: Claridge Homes (Carson) Inc.
Address:
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/1645-ATXMXA-14.pdf
PDF Site Location:

Site: ***Ashcroft Homes - Eastboro Inc.***
Ottawa ON K4B 1H9

Database: ***ECA***

Approval No: 2215-BBTP2H
Approval Date: 2019-05-12
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name:
MOE District:
City:
Longitude:
Latitude:
Geometry X:
Geometry Y:
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: Ashcroft Homes - Eastboro Inc.
Address:
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/9531-BBJRNK-14.pdf
PDF Site Location:

Site: ***CLARIDGE HOMES (CARSON) INC.***
No Municipal Address Ottawa ON

Database: ***RSC***

RSC ID: 223098
RA No:
RSC Type: Phase 1 and 2 RSC
Curr Property Use: Agricultural/Other
Ministry District: Ottawa District Office
Filing Date: 2017/03/24
Date Ack:
Date Returned:
Restoration Type:
Soil Type:
Criteria:
CPU Issued Sect 1686:
Cert Date:
Cert Prop Use No:
Intended Prop Use: Residential
Qual Person Name: ADRIAN MENYHART
Stratified (Y/N):
Audit (Y/N):
Entire Leg Prop. (Y/N):
Accuracy Estimate:
Telephone:
Fax:
Email:
Asmt Roll No: 061460021514215
Prop ID No (PIN): 04352-2077 (LT),
04352-2076 (LT),
04352-2075 (LT)
Property Municipal Address: No Municipal Address
Mailing Address:
Latitude & Latitude:
UTM Coordinates:
Consultant:
Legal Desc:
Measurement Method:
Applicable Standards:
RSC PDF: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=76631&fileName=BROWNFIELDS-E.pdf

Document(s) Detail

Document Heading: Supporting Documents
Document Name: APECTable.pdf
Document Type: Area(s) of Potential Environmental Concern
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=78676&fileName=APECTable.pdf

Document Heading: Supporting Documents
Document Name: LawyersLetter.pdf
Document Type: Lawyer's letter consisting of a legal description of the property

Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=78675&fileName=LawyersLetter.pdf

Document Heading: Supporting Documents
Document Name: Table of Current and Past Uses.pdf
Document Type: Table of Current and Past Property Use
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=76636&fileName=Table+of+Current+and+Past+Uses.pdf

Document Heading: Supporting Documents
Document Name: Phase II CSM Feb 2017.pdf
Document Type: Phase 2 Conceptual Site Model
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=76638&fileName=Phase+II+CSM+Feb+2017.pdf

Document Heading: Supporting Documents
Document Name: certificatestatus.pdf
Document Type: Certificate of Status
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=76632&fileName=certificatestatus.pdf

Document Heading: Supporting Documents
Document Name: Plan of Survey - January 2017.pdf
Document Type: A Current plan of Survey
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=76633&fileName=Plan+of+Survey+-+January+2017.pdf

Document Heading: Supporting Documents
Document Name: Transfer.pdf
Document Type: Copy of any deed(s), transfer(s) or other document(s)
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=78674&fileName=Transfer.pdf

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Site: ***NAVRO INC***
ON MR. CALLAHAN PROPERTY NAVAN ROAD GLOUCESTER PLANT NAVAN ROAD GLOUCESTER CITY ON

Database: ***SPL***

Ref No:	2118	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	4/5/1988	***Health/Env Conseq:***	
Year:		***Client Type:***	
Incident Cause:	OTHER CONTAINER LEAK	***Sector Type:***	
Incident Event:		***Agency Involved:***	
Contaminant Code:		***Nearest Watercourse:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site Postal Code:***	
Contaminant UN No 1:		***Site Region:***	
Environment Impact:		***Site Municipality:***	20105
Nature of Impact:		***Site Lot:***	
Receiving Medium:	LAND	***Site Conc:***	
Receiving Env:		***Northing:***	
MOE Response:		***Easting:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Accu:***	
MOE Reported Dt:	4/5/1988	***Site Map Datum:***	
Dt Document Closed:		***SAC Action Class:***	
Incident Reason:	UNKNOWN	***Source Type:***	
Site Name:			
Site County/District:			
Site Geo Ref Meth:			

Incident Summary: NAVRO INC - UNKNOWN AMOUNTH OF LATEX PAINT LEAK TO NEXT DOOR LAND
Contaminant Qty:

Site:
lot 5 ON

Database: ***WWIS***

Well ID:	1530296	***Data Entry Status:***	
Construction Date:		***Data Src:***	1

Primary Water Use: Domestic
Sec. Water Use:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 182440
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Date Received: 11/24/1998
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1119
Form Version: 1
Owner:
Street Name:
County: OTTAWA
Municipality: GLOUCESTER TOWNSHIP
Site Info:
Lot: 005
Concession:
Concession Name: LI
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10051831
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 11-Aug-1998 00:00:00
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931075086
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 27.0
Formation End Depth: 61.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075085
Layer: 1
Color:
General Color:
Mat1: 05
Most Common Material: CLAY
Mat2: 11
Mat2 Desc: GRAVEL
Mat3: 13

Mat3 Desc: BOULDERS
Formation Top Depth: 0.0
Formation End Depth: 27.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115431
Layer: 1
Plug From: 3.0
Plug To: 35.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530296
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 10600401
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930090317
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 35.0
Casing Diameter: 8.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930090318
Layer: 3
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 61.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930090316
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 33.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID:	991530296
Pump Set At:	
Static Level:	21.0
Final Level After Pumping:	50.0
Recommended Pump Depth:	50.0
Pumping Rate:	24.0
Flowing Rate:	
Recommended Pump Rate:	24.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934118297
Test Type:	Recovery
Test Duration:	15
Test Level:	21.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934662435
Test Type:	Recovery
Test Duration:	45
Test Level:	21.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934910979
Test Type:	Recovery
Test Duration:	60
Test Level:	21.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934392864
Test Type:	Recovery
Test Duration:	30
Test Level:	21.0
Test Level UOM:	ft

Water Details

Water ID:	933490363
Layer:	1
Kind Code:	5
Kind:	Not stated
Water Found Depth:	44.0
Water Found Depth UOM:	ft

Water Details

Water ID: 933490364
Layer: 2
Kind Code: 5
Kind: Not stated
Water Found Depth: 50.0
Water Found Depth UOM: ft

Water Details

Water ID: 933490365
Layer: 3
Kind Code: 5
Kind: Not stated
Water Found Depth: 52.0
Water Found Depth UOM: ft

Site:
lot 5 ON

Database:
WWIS

Well ID: 1530295
Construction Date:
Primary Water Use: Domestic
Sec. Water Use:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 192714
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 11/24/1998
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1119
Form Version: 1
Owner:
Street Name:
County: OTTAWA
Municipality: GLOUCESTER TOWNSHIP
Site Info:
Lot: 005
Concession:
Concession Name: LI
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10051830
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 11-Aug-1998 00:00:00
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931075083
Layer: 2
Color:
General Color:
Mat1: 28

Most Common Material: SAND
Mat2: 11
Mat2 Desc: GRAVEL
Mat3:
Mat3 Desc:
Formation Top Depth: 22.0
Formation End Depth: 30.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075082
Layer: 1
Color:
General Color:
Mat1: 05
Most Common Material: CLAY
Mat2: 13
Mat2 Desc: BOULDERS
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 22.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075084
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 30.0
Formation End Depth: 80.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115430
Layer: 1
Plug From: 2.0
Plug To: 38.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530295
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 10600400
Casing No: 1
Comment:

Alt Name:

Construction Record - Casing

Casing ID:	930090315
Layer:	3
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	80.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930090314
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	38.0
Casing Diameter:	8.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930090313
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	36.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	991530295
Pump Set At:	
Static Level:	25.0
Final Level After Pumping:	65.0
Recommended Pump Depth:	65.0
Pumping Rate:	18.0
Flowing Rate:	
Recommended Pump Rate:	18.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934392863
Test Type:	Recovery
Test Duration:	30
Test Level:	25.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID: 934662434
Test Type: Recovery
Test Duration: 45
Test Level: 25.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934118296
Test Type: Recovery
Test Duration: 15
Test Level: 25.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934910978
Test Type: Recovery
Test Duration: 60
Test Level: 25.0
Test Level UOM: ft

Water Details

Water ID: 933490361
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 66.0
Water Found Depth UOM: ft

Water Details

Water ID: 933490360
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 57.0
Water Found Depth UOM: ft

Water Details

Water ID: 933490362
Layer: 3
Kind Code: 1
Kind: FRESH
Water Found Depth: 74.0
Water Found Depth UOM: ft

Site:
lot 5 ON

Database: ***WWIS***

Well ID: 1530475
Construction Date:
Primary Water Use: Domestic
Sec. Water Use:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 197136
Tag:

Data Entry Status:
Data Src: 1
Date Received: 3/2/1999
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1119
Form Version: 1
Owner:
Street Name:

Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

County: OTTAWA
Municipality: GLOUCESTER TOWNSHIP
Site Info:
Lot: 005
Concession:
Concession Name: LI
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10052010
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 12-Nov-1998 00:00:00
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931075620
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 57.0
Formation End Depth: 80.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075618
Layer: 1
Color:
General Color:
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 32.0
Formation End Depth UOM: ft

Overburden and Bedrock

Materials Interval

Formation ID: 931075619
Layer: 2
Color:
General Color:
Mat1: 05
Most Common Material: CLAY
Mat2: 11
Mat2 Desc: GRAVEL
Mat3: 13
Mat3 Desc: BOULDERS
Formation Top Depth: 32.0
Formation End Depth: 57.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115622
Layer: 1
Plug From: 2.0
Plug To: 63.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530475
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 10600580
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930090700
Layer: 1
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 61.0
Casing Diameter: 8.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930090702
Layer: 3
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 80.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID:	930090701
Layer:	2
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	63.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	991530475
Pump Set At:	
Static Level:	21.0
Final Level After Pumping:	70.0
Recommended Pump Depth:	70.0
Pumping Rate:	13.0
Flowing Rate:	
Recommended Pump Rate:	13.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934902180
Test Type:	Recovery
Test Duration:	60
Test Level:	21.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934385047
Test Type:	Recovery
Test Duration:	30
Test Level:	21.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934663010
Test Type:	Recovery
Test Duration:	45
Test Level:	21.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934118871
Test Type:	Recovery
Test Duration:	15
Test Level:	21.0
Test Level UOM:	ft

Water Details

Water ID:	933490624
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	70.0
Water Found Depth UOM:	ft

Site:
lot 5 ON

Database:
WWIS

Well ID:	1530720	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	9/22/1999
Sec. Water Use:		***Selected Flag:***	TRUE
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	1119
Casing Material:		***Form Version:***	1
Audit No:	210452	***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	OTTAWA
Elevation (m):		***Municipality:***	GLOUCESTER TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	005
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	LI
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10052254	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	29-Jul-1999 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931076390
Layer:	2
Color:	
General Color:	
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	28.0
Formation End Depth:	34.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID: 931076389
Layer: 1
Color:
General Color:
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 28.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931076391
Layer: 3
Color: 2
General Color: GREY
Mat1: 18
Most Common Material: SANDSTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 34.0
Formation End Depth: 80.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115862
Layer: 1
Plug From: 2.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530720
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 10600824
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930091188
Layer: 3
Material: 4

Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 80.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930091186
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 38.0
Casing Diameter: 9.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930091187
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 40.0
Casing Diameter: 9.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 991530720
Pump Set At:
Static Level: 25.0
Final Level After Pumping: 70.0
Recommended Pump Depth: 70.0
Pumping Rate: 20.0
Flowing Rate:
Recommended Pump Rate: 20.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934120065
Test Type: Recovery
Test Duration: 15
Test Level: 25.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903241
Test Type: Recovery
Test Duration: 60
Test Level: 25.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID:	934385686
Test Type:	Recovery
Test Duration:	30
Test Level:	25.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934664204
Test Type:	Recovery
Test Duration:	45
Test Level:	25.0
Test Level UOM:	ft

Water Details

Water ID:	933490946
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	73.0
Water Found Depth UOM:	ft

Site:
lot 5 ON

Database:
WWIS

Well ID:	1530916	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	12/17/1999
Sec. Water Use:		***Selected Flag:***	TRUE
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	1119
Casing Material:		***Form Version:***	1
Audit No:	210553	***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	OTTAWA
Elevation (m):		***Municipality:***	GLOUCESTER TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	005
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	LI
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10052450	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	18-Oct-1999 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			

Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 931076939
Layer: 1
Color:
General Color:
Mat1: 05
Most Common Material: CLAY
Mat2: 13
Mat2 Desc: BOULDERS
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 37.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931076940
Layer: 2
Color:
General Color:
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 37.0
Formation End Depth: 60.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116087
Layer: 1
Plug From: 2.0
Plug To: 46.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530916
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 10601020
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930091616

Layer: 1
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 44.0
Casing Diameter: 8.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930091618
Layer: 3
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 60.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930091617
Layer: 2
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 46.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 991530916
Pump Set At:
Static Level: 23.0
Final Level After Pumping: 50.0
Recommended Pump Depth: 50.0
Pumping Rate: 21.0
Flowing Rate:
Recommended Pump Rate: 21.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934664639
Test Type: Recovery
Test Duration: 45
Test Level: 23.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934119528
Test Type: Recovery
Test Duration: 15

Test Level: 23.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934386266
Test Type: Recovery
Test Duration: 30
Test Level: 23.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903818
Test Type: Recovery
Test Duration: 60
Test Level: 23.0
Test Level UOM: ft

Water Details

Water ID: 933491217
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 50.0
Water Found Depth UOM: ft

Site:
lot 4 ON

Database: ***WWIS***

Well ID: 1530022
Construction Date:
Primary Water Use: Domestic
Sec. Water Use:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 180720
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 6/11/1998
Selected Flag: TRUE
Abandonment Rec:
Contractor: 6455
Form Version: 1
Owner:
Street Name:
County: OTTAWA
Municipality: GLOUCESTER TOWNSHIP
Site Info:
Lot: 004
Concession:
Concession Name: LI
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10051557
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 22-May-1998 00:00:00
Remarks:
Elevrc Desc:
Location Source Date:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 931074228
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 81
Mat2 Desc: SANDY
Mat3: 88
Mat3 Desc: THICK
Formation Top Depth: 0.0
Formation End Depth: 25.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931074231
Layer: 4
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 78
Mat2 Desc: MEDIUM-GRAINED
Mat3: 73
Mat3 Desc: HARD
Formation Top Depth: 54.0
Formation End Depth: 70.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931074229
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 88
Mat2 Desc: THICK
Mat3:
Mat3 Desc:
Formation Top Depth: 25.0
Formation End Depth: 36.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931074230
Layer: 3
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY

Mat2: 28
Mat2 Desc: SAND
Mat3: 14
Mat3 Desc: HARDPAN
Formation Top Depth: 36.0
Formation End Depth: 54.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115138
Layer: 1
Plug From: 0.0
Plug To: 21.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530022
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10600127
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930089820
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 54.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930089821
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 70.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 991530022
Pump Set At:
Static Level: 17.0
Final Level After Pumping: 26.0
Recommended Pump Depth: 40.0
Pumping Rate: 50.0

Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 12
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934909911
Test Type:
Test Duration: 60
Test Level: 26.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934392215
Test Type:
Test Duration: 30
Test Level: 26.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934661373
Test Type:
Test Duration: 45
Test Level: 26.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934117237
Test Type:
Test Duration: 15
Test Level: 26.0
Test Level UOM: ft

Water Details

Water ID: 933490035
Layer: 1
Kind Code: 4
Kind: MINERIAL
Water Found Depth: 66.0
Water Found Depth UOM: ft

Site:
lot 4 ON

Database: ***WWIS***

Well ID: 1524123
Construction Date:
Primary Water Use: Domestic
Sec. Water Use:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 56300
Tag:

Data Entry Status:
Data Src: 1
Date Received: 1/26/1990
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3644
Form Version: 1
Owner:
Street Name:

Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

County: OTTAWA
Municipality: GLOUCESTER TOWNSHIP
Site Info:
Lot: 004
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10045895
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 14-Sep-1989 00:00:00
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931056933
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 56.0
Formation End Depth: 84.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931056931
Layer: 1
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 28.0
Formation End Depth UOM: ft

Overburden and Bedrock

Materials Interval

Formation ID:	931056932
Layer:	2
Color:	2
General Color:	GREY
Mat1:	14
Most Common Material:	HARDPAN
Mat2:	13
Mat2 Desc:	BOULDERS
Mat3:	
Mat3 Desc:	
Formation Top Depth:	28.0
Formation End Depth:	56.0
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	961524123
Method Construction Code:	5
Method Construction:	Air Percussion
Other Method Construction:	

Pipe Information

Pipe ID:	10594465
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930080344
Layer:	2
Material:	3
Open Hole or Material:	CONCRETE
Depth From:	
Depth To:	84.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930080343
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	59.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	991524123
Pump Set At:	
Static Level:	20.0
Final Level After Pumping:	75.0
Recommended Pump Depth:	75.0
Pumping Rate:	7.0
Flowing Rate:	
Recommended Pump Rate:	7.0

Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934391933
Test Type:
Test Duration: 30
Test Level: 75.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934107704
Test Type:
Test Duration: 15
Test Level: 75.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934910103
Test Type:
Test Duration: 60
Test Level: 75.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934652483
Test Type:
Test Duration: 45
Test Level: 75.0
Test Level UOM: ft

Water Details

Water ID: 933482665
Layer: 1
Kind Code: 3
Kind: SULPHUR
Water Found Depth: 78.0
Water Found Depth UOM: ft

Site:
lot 5 ON

Database:
WWIS

Well ID: 1500377
Construction Date:
Primary Water Use: Domestic
Sec. Water Use: 0
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Construction Method:
Elevation (m):

Data Entry Status:
Data Src: 1
Date Received: 2/26/1948
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1107
Form Version: 1
Owner:
Street Name:
County: OTTAWA
Municipality: OTTAWA CITY (GLOUCESTER)

Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Site Info:
Lot: 005
Concession:
Concession Name: JG
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10022422
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 24-Jul-1947 00:00:00
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 930989112
Layer: 1
Color: 2
General Color: GREY
Mat1: 09
Most Common Material: MEDIUM SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 15.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 930989113
Layer: 2
Color:
General Color:
Mat1: 11
Most Common Material: GRAVEL
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 15.0
Formation End Depth: 28.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 930989114
Layer: 3
Color: 2
General Color: GREY
Mat1: 19
Most Common Material: SLATE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 28.0
Formation End Depth: 89.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961500377
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10570992
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930037778
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 89.0
Casing Diameter: 4.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930037777
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 28.0
Casing Diameter: 4.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 991500377
Pump Set At:
Static Level: 12.0
Final Level After Pumping: 24.0
Recommended Pump Depth:
Pumping Rate: 8.0
Flowing Rate:
Recommended Pump Rate: 8.0
Levels UOM: ft
Rate UOM: GPM

Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 0
Pumping Duration MIN: 30
Flowing: No

Water Details

Water ID: 933452894
Layer: 1
Kind Code: 4
Kind: MINERIAL
Water Found Depth: 89.0
Water Found Depth UOM: ft

Site:
con 4 ON

Database:
WWIS

Well ID: 1517523
Construction Date:
Primary Water Use: Domestic
Sec. Water Use:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 3/20/1981
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1558
Form Version: 1
Owner:
Street Name:
County: OTTAWA
Municipality: GLOUCESTER TOWNSHIP
Site Info:
Lot:
Concession: 04
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10039395
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 24-Feb-1981 00:00:00
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931035451
Layer: 3
Color: 2
General Color: GREY
Mat1: 28

Most Common Material: SAND
Mat2: 11
Mat2 Desc: GRAVEL
Mat3: 79
Mat3 Desc: PACKED
Formation Top Depth: 175.0
Formation End Depth: 185.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931035450
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 77
Mat2 Desc: LOOSE
Mat3:
Mat3 Desc:
Formation Top Depth: 10.0
Formation End Depth: 175.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931035449
Layer: 1
Color: 7
General Color: RED
Mat1: 28
Most Common Material: SAND
Mat2: 79
Mat2 Desc: PACKED
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 10.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961517523
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10587965
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930068901
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:

Depth To: 184.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930068902
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 185.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 991517523
Pump Set At:
Static Level: 40.0
Final Level After Pumping: 105.0
Recommended Pump Depth: 120.0
Pumping Rate: 7.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 3
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934102054
Test Type: Draw Down
Test Duration: 15
Test Level: 105.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934895056
Test Type: Draw Down
Test Duration: 60
Test Level: 105.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934645364
Test Type: Draw Down
Test Duration: 45
Test Level: 105.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934384288
Test Type: Draw Down

Test Duration: 30
Test Level: 105.0
Test Level UOM: ft

Water Details

Water ID: 933474010
Layer: 1
Kind Code: 2
Kind: SALTY
Water Found Depth: 184.0
Water Found Depth UOM: ft

Site:
lot 5 ON

Database:
WWIS

Well ID: 1520605
Construction Date:
Primary Water Use: Domestic
Sec. Water Use:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: NA
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 8/12/1986
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3644
Form Version: 1
Owner:
Street Name:
County: OTTAWA
Municipality: GLOUCESTER TOWNSHIP
Site Info:
Lot: 005
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10042447
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 25-Jun-1986 00:00:00
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931045292
Layer: 3
Color: 2
General Color: GREY
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:

Mat3:
Mat3 Desc:
Formation Top Depth: 50.0
Formation End Depth: 63.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045293
Layer: 4
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 63.0
Formation End Depth: 84.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045291
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 10.0
Formation End Depth: 50.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045290
Layer: 1
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 10.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961520605
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID:	10591017
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930074087
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	63.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930074088
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	84.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	991520605
Pump Set At:	
Static Level:	20.0
Final Level After Pumping:	50.0
Recommended Pump Depth:	50.0
Pumping Rate:	30.0
Flowing Rate:	
Recommended Pump Rate:	15.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934387354
Test Type:	
Test Duration:	30
Test Level:	50.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934648377
Test Type:	
Test Duration:	45
Test Level:	50.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID: 934906159
Test Type:
Test Duration: 60
Test Level: 50.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934112491
Test Type:
Test Duration: 15
Test Level: 50.0
Test Level UOM: ft

Water Details

Water ID: 933477897
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 78.0
Water Found Depth UOM: ft

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ***Note:*** *Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Abandoned Aggregate Inventory: Provincial AAGR

The MAAP Program maintains a database of abandoned pits and quarries. Please note that the database is only referenced by lot and concession and city/town location. The database provides information regarding the location, type, size, land use, status and general comments.*

Government Publication Date: Sept 2002*

Aggregate Inventory: Provincial AGR

The Ontario Ministry of Natural Resources maintains a database of all active pits and quarries. The database provides information regarding the registered owner/operator, location name, operation type, approval type, and maximum annual tonnage.

Government Publication Date: Up to Nov 2021

Abandoned Mine Information System: Provincial AMIS

The Abandoned Mines Information System contains data on known abandoned and inactive mines located on both Crown and privately held lands. The information was provided by the Ministry of Northern Development and Mines (MNDM), with the following disclaimer: "the database provided has been compiled from various sources, and the Ministry of Northern Development and Mines makes no representation and takes no responsibility that such information is accurate, current or complete". Reported information includes official mine name, status, background information, mine start/end date, primary commodity, mine features, hazards and remediation.

Government Publication Date: 1800-Mar 2022

Anderson's Waste Disposal Sites: Private ANDR

The information provided in this database was collected by examining various historical documents which aimed to characterize the likely position of former waste disposal sites from 1860 to present. The research initiative behind the creation of this database was to identify those sites that are missing from the Ontario MOE Waste Disposal Site Inventory, as well as to provide revisions and corrections to the positions and descriptions of sites currently listed in the MOE inventory. In addition to historic waste disposal facilities, the database also identifies certain auto wreckers and scrap yards that have been extrapolated from documentary sources. Please note that the data is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1860s-Present

Aboveground Storage Tanks: Provincial AST

Historical listing of aboveground storage tanks made available by the Department of Natural Resources and Forestry. Includes tanks used to hold water or petroleum. This dataset has been retired as of September 25, 2014 and will no longer be updated.

Government Publication Date: May 31, 2014

Automobile Wrecking & Supplies: Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-Sep 30, 2021

Borehole: Provincial BORE

A borehole is the generalized term for any narrow shaft drilled in the ground, either vertically or horizontally. The information here includes geotechnical investigations or environmental site assessments, mineral exploration, or as a pilot hole for installing piers or underground utilities. Information is from many sources such as the Ministry of Transportation (MTO) boreholes from engineering reports and projects from the 1950 to 1990's in Southern Ontario. Boreholes from the Ontario Geological Survey (OGS) including The Urban Geology Analysis Information System (UGAIS) and the York Peel Durham Toronto (YPDT) database of the Conservation Authority Moraine Coalition. This database will include fields such as location, stratigraphy, depth, elevation, year drilled, etc. For all water well data or oil and gas well data for Ontario please refer to WWIS and OOGW.

Government Publication Date: 1875-Jul 2018

Certificates of Approval: Provincial CA

This database contains the following types of approvals: Air & Noise, Industrial Sewage, Municipal & Private Sewage, Waste Management Systems and Renewable Energy Approvals. The MOE in Ontario states that any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste, must have a Certificate of Approval before it can operate lawfully. Fields include approval number, business name, address, approval date, approval type and status. This database will no longer be updated, as CofA's have been replaced by either Environmental Activity and Sector Registry (EASR) or Environmental Compliance Approval (ECA). Please refer to those individual databases for any information after Oct.31, 2011.

Government Publication Date: 1985-Oct 30, 2011*

Dry Cleaning Facilities: Federal CDRY

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2019

Commercial Fuel Oil Tanks: Provincial CFOT

Locations of commercial underground fuel oil tanks. This is not a comprehensive or complete inventory of commercial fuel tanks in the province; this listing is a copy of records of registered commercial underground fuel oil tanks obtained under Access to Public Information.
Note that the following types of tanks do not require registration: waste oil tanks in apartments, office buildings, residences, etc.; aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Chemical Manufacturers and Distributors: Private CHEM

This database includes information from both a one time study conducted in 1992 and private source and is a listing of facilities that manufacture or distribute chemicals. The production of these chemical substances may involve one or more chemical reactions and/or chemical separation processes (i.e. fractionation, solvent extraction, crystallization, etc.).

Government Publication Date: 1999-Jan 31, 2020

Chemical Register: Private CHM

This database includes a listing of locations of facilities within the Province or Territory that either manufacture and/or distributes chemicals.

Government Publication Date: 1999-Sep 30, 2021

Compressed Natural Gas Stations: Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 -Apr 2022

Inventory of Coal Gasification Plants and Coal Tar Sites: Provincial COAL

This inventory includes both the "Inventory of Coal Gasification Plant Waste Sites in Ontario-April 1987" and the Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario-November 1988) collected by the MOE. It identifies industrial sites that produced and continue to produce or use coal tar and other related tars. Detailed information is available and includes: facility type, size, land use, information on adjoining properties, soil condition, site operators/occupants, site description, potential environmental impacts and historic maps available. This was a one-time inventory.*

Government Publication Date: Apr 1987 and Nov 1988*

Compliance and Convictions: Provincial CONV

This database summarizes the fines and convictions handed down by the Ontario courts beginning in 1989. Companies and individuals named here have been found guilty of environmental offenses in Ontario courts of law.

Government Publication Date: 1989-Mar 2022

Certificates of Property Use: Provincial CPU

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all CPU's on the registry such as (EPA s. 168.6) - Certificate of Property Use.

Government Publication Date: 1994 - May 31, 2022

Drill Hole Database: Provincial DRL

The Ontario Drill Hole Database contains information on more than 113,000 percussion, overburden, sonic and diamond drill holes from assessment files on record with the department of Mines and Minerals. Please note that limited data is available for southern Ontario, as it was the last area to be completed. The database was created when surveys submitted to the Ministry were converted in the Assessment File Research Image Database (AFRI) project. However, the degree of accuracy (coordinates) as to the exact location of drill holes is dependent upon the source document submitted to the MNDM. Levels of accuracy used to locate holes are: centering on the mining claim; a sketch of the mining claim; a 1:50,000 map; a detailed company map; or from submitted a "Report of Work".

Government Publication Date: 1886 - Sep 2020

Delisted Fuel Tanks: Provincial DTNK

List of fuel storage tank sites that were once found in - and have since been removed from - the list of fuel storage tanks made available by the regulatory agency under Access to Public Information.

Government Publication Date: Feb 28, 2022

Environmental Activity and Sector Registry: Provincial EASR

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. The EASR allows businesses to register certain activities with the ministry, rather than apply for an approval. The registry is available for common systems and processes, to which preset rules of operation can be applied. The EASR is currently available for: heating systems, standby power systems and automotive refinishing. Businesses whose activities aren't subject to the EASR may apply for an ECA (Environmental Compliance Approval), Please see our ECA database.

Government Publication Date: Oct 2011- Apr 30, 2022

Environmental Registry: Provincial EBR

The Environmental Registry lists proposals, decisions and exceptions regarding policies, Acts, instruments, or regulations that could significantly affect the environment. Through the Registry, thirteen provincial ministries notify the public of upcoming proposals and invite their comments. For example, if a local business is requesting a permit, license, or certificate of approval to release substances into the air or water; these are notified on the registry. Data includes: Approval for discharge into the natural environment other than water (i.e. Air) - EPA s. 9, Approval for sewage works - OWRA s. 53(1), and EPA s. 27 - Approval for a waste disposal site. For information regarding Permit to Take Water (PTTW), Certificate of Property Use (CPU) and (ORD) Orders please refer to those individual databases.

Government Publication Date: 1994 - May 31, 2022

Environmental Compliance Approval: Provincial ECA

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. In the past, a business had to apply for multiple approvals (known as certificates of approval) for individual processes and pieces of equipment. Today, a business either registers itself, or applies for a single approval, depending on the types of activities it conducts. Businesses whose activities aren't subject to the EASR may apply for an ECA. A single ECA addresses all of a business's emissions, discharges and wastes. Separate approvals for air, noise and waste are no longer required. This database will also include Renewable Energy Approvals. For certificates of approval prior to Nov 1st, 2011, please refer to the CA database. For all Waste Disposal Sites please refer to the WDS database.

Government Publication Date: Oct 2011- Apr 30, 2022

Environmental Effects Monitoring: Federal EEM

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

Government Publication Date: 1992-2007*

ERIS Historical Searches: Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Mar 31, 2022

Environmental Issues Inventory System: Federal EIIS

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Emergency Management Historical Event: Provincial EMHE

List of locations of historical occurrences of emergency events, including those assigned to the Ministry of Natural Resources by Order-In-Council (OIC) under the Emergency Management and Civil Protection Act, as well as events where MNR provided requested emergency response assistance. Many of these events will have involved community evacuations, significant structural loss, and/or involvement of MNR emergency response staff. These events fall into one of ten (10) type categories: Dam Failure; Drought / Low Water; Erosion; Flood; Forest Fire; Soil and Bedrock Instability; Petroleum Resource Center Event, EMO Requested Assistance, Continuity of Operations Event, Other Requested Assistance. EMHE record details are reproduced by ERIS under License with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2017.

Government Publication Date: Dec 31, 2016

Environmental Penalty Annual Report: Provincial EPAR

This database contains data from Ontario's annual environmental penalty report published by the Ministry of the Environment and Climate Change. These reports provide information on environmental penalties for land or water violations issued to companies in one of the nine industrial sectors covered by the Municipal Industrial Strategy for Abatement (MISA) regulations.

Government Publication Date: Jan 1, 2011 - Dec 31, 2021

List of Expired Fuels Safety Facilities: Provincial EXP

List of facilities and tanks for which there was once a fuel registration. This is not a comprehensive or complete inventory of expired tanks/tank facilities in the province; this listing is a copy of previously registered tanks and facilities obtained under Access to Public Information. Includes private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc; includes tanks which have been removed from the ground.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Federal Convictions: Federal FCON

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land: Federal FCS

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government. Includes fire training sites and sites at which Per- and Polyfluoroalkyl Substances (PFAS) are a concern.

Government Publication Date: Jun 2000-Apr 2022

Fisheries & Oceans Fuel Tanks: Federal FOFT

Fisheries & Oceans Canada maintains an inventory of aboveground & underground fuel storage tanks located on Fisheries & Oceans property or controlled by DFO. Our inventory provides information on the site name, location, tank owner, tank operator, facility type, storage tank location, tank contents & capacity, and date of tank installation.

Government Publication Date: 1964-Sep 2019

Federal Identification Registry for Storage Tank Systems (FIRSTS): Federal FRST

A list of federally regulated Storage tanks from the Federal Identification Registry for Storage Tank Systems (FIRSTS). FIRSTS is Environment and Climate Change Canada's database of storage tank systems subject to the Storage Tank for Petroleum Products and Allied Petroleum Products Regulations. The main objective of the Regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and aboriginal lands. Storage tank systems that do not have a valid identification number displayed in a readily visible location on or near the storage tank system may be refused product delivery.

Government Publication Date: May 31, 2018

Fuel Storage Tank: Provincial FST

List of registered private and retail fuel storage tanks. This is not a comprehensive or complete inventory of private and retail fuel storage tanks in the province; this listing is a copy of registered private and retail fuel storage tanks, obtained under Access to Public Information.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Fuel Storage Tank - Historic: Provincial FSTH

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks. Public records of private fuel storage tanks are only available since the registration became effective in September 1989. This information is now collected by the Technical Standards and Safety Authority.

Government Publication Date: Pre-Jan 2010*

Ontario Regulation 347 Waste Generators Summary: Provincial GEN

Regulation 347 of the Ontario EPA defines a waste generation site as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number, company name and address of registered generators including the types of hazardous wastes generated. It includes data on waste generating facilities such as: drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution etc. This information is a summary of all years from 1986 including the most currently available data. Some records may contain, within the company name, the phrase "See & Use..." followed by a series of letters and numbers. This occurs when one company is amalgamated with or taken over by another registered company. The number listed as "See & Use", refers to the new ownership and the other identification number refers to the original ownership. This phrase serves as a link between the 2 companies until operations have been fully transferred.

Government Publication Date: 1986-Feb 28, 2022

Greenhouse Gas Emissions from Large Facilities: Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2019

TSSA Historic Incidents: Provincial HINC

List of historic incidences of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen recorded by the TSSA in their previous incident tracking system. The TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, the TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of historical fuel spills and leaks in the province. This listing is a copy of the data captured at one moment in time and is hence limited by the record date provided here.

Government Publication Date: 2006-June 2009*

Indian & Northern Affairs Fuel Tanks: Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

Fuel Oil Spills and Leaks: Provincial INC

Listing of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen reported to the Spills Action Centre (SAC). This is not a comprehensive or complete inventory of fuel-related leaks, spills, and incidents in the province; this listing in a copy of incidents reported to the SAC, obtained under Access to Public Information. Includes incidents from fuel-related hazards such as spills, fires, and explosions. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Landfill Inventory Management Ontario: Provincial LIMO

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the Ministry of the Environment, Conservation and Parks compiles new and updated information. Includes small and large landfills currently operating as well as those which are closed and historic. Operators of larger landfills provide landfill information for the previous operating year to the ministry for LIMO including: estimated amount of total waste received, landfill capacity, estimated total remaining landfill capacity, fill rates, engineering designs, reporting and monitoring details, size of location, service area, approved waste types, leachate of site treatment, contaminant attenuation zone and more. The small landfills include information such as site owner, site location and certificate of approval # and status.

Government Publication Date: Feb 28, 2019

Canadian Mine Locations: Private MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Mineral Occurrences: Provincial MNR

In the early 70's, the Ministry of Northern Development and Mines created an inventory of approximately 19,000 mineral occurrences in Ontario, in regard to metallic and industrial minerals, as well as some information on building stones and aggregate deposits. Please note that the "Horizontal Positional Accuracy" is approximately +/- 200 m. Many reference elements for each record were derived from field sketches using pace or chain/tape measurements against claim posts or topographic features in the area. The primary limiting factor for the level of positional accuracy is the scale of the source material. The testing of horizontal accuracy of the source materials was accomplished by comparing the plan metric (X and Y) coordinates of that point with the coordinates of the same point as defined from a source of higher accuracy.

Government Publication Date: 1846-Feb 2022

National Analysis of Trends in Emergencies System (NATES): Federal NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

Non-Compliance Reports: Provincial NCPL

The Ministry of the Environment provides information about non-compliant discharges of contaminants to air and water that exceed legal allowable limits, from regulated industrial and municipal facilities. A reported non-compliance failure may be in regard to a Control Order, Certificate of Approval, Sectoral Regulation or specific regulation/act.

Government Publication Date: Dec 31, 2020

National Defense & Canadian Forces Fuel Tanks: Federal NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills: Federal NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Apr 2018

National Defence & Canadian Forces Waste Disposal Sites: Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents: Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the Canada Energy Regulator (CER) - previously the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Jun 30, 2021

National Energy Board Wells: Federal NEBP

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES): Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory: Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory: Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-May 2017

Oil and Gas Wells: Private OGWE

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-Feb 28, 2022

Ontario Oil and Gas Wells: Provincial OOGW

In 1998, the MNR handed over to the Ontario Oil, Gas and Salt Resources Corporation, the responsibility of maintaining a database of oil and gas wells drilled in Ontario. The OGSR Library has over 20,000+ wells in their database. Information available for all wells in the ERIS database include well owner/operator, location, permit issue date, and well cap date, license No., status, depth and the primary target (rock unit) of the well being drilled. All geology/stratigraphy table information, plus all water table information is also provide for each well record.

Government Publication Date: 1800-Jan 2021

Inventory of PCB Storage Sites: Provincial OPCB

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of PCB storage sites within the province. Ontario Regulation 11/82 (Waste Management - PCB) and Regulation 347 (Generator Waste Management) under the Ontario EPA requires the registration of inactive PCB storage equipment and/or disposal sites of PCB waste with the Ontario Ministry of Environment. This database contains information on: 1) waste quantities; 2) major and minor sites storing liquid or solid waste; and 3) a waste storage inventory.

Government Publication Date: 1987-Oct 2004; 2012-Dec 2013

Orders: Provincial ORD

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all Orders on the registry such as (EPA s. 17) - Order for remedial work, (EPA s. 18) - Order for preventative measures, (EPA s. 43) - Order for removal of waste and restoration of site, (EPA s. 44) - Order for conformity with Act for waste disposal sites, (EPA s. 136) - Order for performance of environmental measures.

Government Publication Date: 1994 - May 31, 2022

Canadian Pulp and Paper: Private PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009-2014

Parks Canada Fuel Storage Tanks: Federal PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Pesticide Register: Provincial PES

The Ontario Ministry of the Environment and Climate Change maintains a database of licensed operators and vendors of registered pesticides.

Government Publication Date: Oct 2011- Apr 30, 2022

Pipeline Incidents: Provincial PINC

List of pipeline incidents (strikes, leaks, spills). This is not a comprehensive or complete inventory of pipeline incidents in the province; this listing in an historical copy of records previously obtained under Access to Public Information. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2021

Private and Retail Fuel Storage Tanks: Provincial PRT

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks and licensed retail fuel outlets. This database includes an inventory of locations that have gasoline, oil, waste oil, natural gas and/or propane storage tanks on their property. The MCCR no longer collects this information. This information is now collected by the Technical Standards and Safety Authority (TSSA).

Government Publication Date: 1989-1996*

Permit to Take Water: Provincial PTTW

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all PTTW's on the registry such as OWRA s. 34 - Permit to take water.

Government Publication Date: 1994 - May 31, 2022

Ontario Regulation 347 Waste Receivers Summary: Provincial REC

Part V of the Ontario Environmental Protection Act ("EPA") regulates the disposal of regulated waste through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. Regulation 347 of the Ontario EPA defines a waste receiving site as any site or facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by registration number, company name and address, and includes receivers of waste such as: landfills, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants. This information is a summary of all years from 1986 including the most currently available data.

Government Publication Date: 1986-1990, 1992-2019

Record of Site Condition: Provincial RSC

The Record of Site Condition (RSC) is part of the Ministry of the Environment's Brownfields Environmental Site Registry. Protection from environmental cleanup orders for property owners is contingent upon documentation known as a record of site condition (RSC) being filed in the Environmental Site Registry. In order to file an RSC, the property must have been properly assessed and shown to meet the soil, sediment and groundwater standards appropriate for the use (such as residential) proposed to take place on the property. The Record of Site Condition Regulation (O. Reg. 153/04) details requirements related to site assessment and clean up.
RSCs filed after July 1, 2011 will also be included as part of the new (O.Reg. 511/09).

Government Publication Date: 1997-Sept 2001, Oct 2004-May 2022

Retail Fuel Storage Tanks: Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-Sep 30, 2021

Scott's Manufacturing Directory: Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Ontario Spills: Provincial SPL

List of spills and incidents made available the Ministry of the Environment, Conservation and Parks. This database identifies information such as location (approximate), type and quantity of contaminant, date of spill, environmental impact, cause, nature of impact, etc. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X. The Ministry of the Environment, Conservation and Parks cites the coronavirus pandemic as an explanation for delays in releasing data pursuant to requests.

Government Publication Date: 1988-Sep 2020; Dec 2020-Mar 2021

Wastewater Discharger Registration Database: Provincial SRDS

Information under this heading is combination of the following 2 programs. The Municipal/Industrial Strategy for Abatement (MISA) division of the Ontario Ministry of Environment maintained a database of all direct dischargers of toxic pollutants within nine sectors including: Electric Power Generation; Mining; Petroleum Refining; Organic Chemicals; Inorganic Chemicals; Pulp & Paper; Metal Casting; Iron & Steel; and Quarries. All sampling information is now collected and stored within the Sample Result Data Store (SRDS).

Government Publication Date: 1990-Dec 31, 2020

Anderson's Storage Tanks: Private TANK

The information provided in this database was collected by examining various historical documents, which identified the location of former storage tanks, containing substances such as fuel, water, gas, oil, and other various types of miscellaneous products. Information is available in regard to business operating at tank site, tank location, permit year, permit & installation type, no. of tanks installed & configuration and tank capacity. Data contained within this database pertains only to the city of Toronto and is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1915-1953*

Transport Canada Fuel Storage Tanks: Federal TCFT

List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.

Government Publication Date: 1970 - Dec 2020

Variances for Abandonment of Underground Storage Tanks: Provincial VAR

Listing of variances granted for storage tank abandonment. This is not a comprehensive or complete inventory of tank abandonment variances in the province; this listing is a copy of tank abandonment variance records previously obtained under Access to Public Information. In Ontario, registered underground storage tanks must be removed within two years of disuse; if removal of a tank is not feasible, an application may be sought for a variance from this code requirement.
Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Waste Disposal Sites - MOE CA Inventory: Provincial WDS

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of known open (active or inactive) and closed disposal sites in the Province of Ontario. Active sites maintain a Certificate of Approval, are approved to receive and are receiving waste. Inactive sites maintain Certificate(s) of Approval but are not receiving waste. Closed sites are not receiving waste. The data contained within this database was compiled from the MOE's Certificate of Approval database. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number. All new Environmental Compliance Approvals handed out after Oct 31, 2011 for Waste Disposal Sites will still be found in this database.

Government Publication Date: Oct 2011- Apr 30, 2022

Waste Disposal Sites - MOE 1991 Historical Approval Inventory: Provincial WDSH

In June 1991, the Ontario Ministry of Environment, Waste Management Branch, published the "June 1991 Waste Disposal Site Inventory", of all known active and closed waste disposal sites as of October 30st, 1990. For each "active" site as of October 31st 1990, information is provided on site location, site/CA number, waste type, site status and site classification. For each "closed" site as of October 31st 1990, information is provided on site location, site/CA number, closure date and site classification. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number.

Government Publication Date: Up to Oct 1990*

Water Well Information System: Provincial WWIS

This database describes locations and characteristics of water wells found within Ontario in accordance with Regulation 903. It includes such information as coordinates, construction date, well depth, primary and secondary use, pump rate, static water level, well status, etc. Also included are detailed stratigraphy information, approximate depth to bedrock and the approximate depth to the water table.

Government Publication Date: Sep 30, 2021

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

APPENDIX 3

QUALIFICATIONS OF ASSESSORS

JESSE ANDRECHEK

P.ENG., QP$_{ESA}$

PROJECT MANAGER - ENVIRONMENTAL

JESSE JOINED PATERSON GROUP IN 2019 AS PART OF THE ENVIRONMENTAL AND GEOTECHNICAL DIVISION. JESSE HAS RECEIVED HIS ADVANCED DIPLOMA IN CIVIL ENGINEERING TECHNOLOGY FROM ST. LAWRENCE COLLEGE IN 2016, AS WELL AS HIS BACHELOR OF APPLIED SCIENCE IN CIVIL ENGINEERING FROM QUEEN'S UNIVERSITY IN 2019. IN HIS TIME WITH PATERSON, JESSE HAS BEEN INVOLVED PRIMARILY IN RESIDENTIAL AND COMMERCIAL DEVELOPMENTS ACROSS ONTARIO, WHERE HE CONDUCTED PHASE I AND II ENVIRONMENTAL SITE ASSESSMENTS (ESAS) TO MECP AND CSA STANDARDS, ASSISTED IN THE FILING OF RECORDS OF SITE CONDITION (RSCs), MANAGED EXCESS SOILS INVESTIGATIONS, SUPERVISED ENVIRONMENTAL REMEDIATION PROGRAMS TO CSA, CCME, AND MECP STANDARDS, AND CONDUCTED ENVIRONMENTAL AND GEOTECHNICAL SUBSURFACE INVESTIGATIONS. HIS SCOPE OF WORK CONSISTS OF ENVIRONMENTAL INVESTIGATION, REPORTING, AND RECOMMENDATIONS, PREPARATION OF PROPOSALS AND WORK PLANS, MANAGEMENT OF FIELD PERSONNEL, COMMUNICATION WITH STAKEHOLDERS, CONDUCTING SOIL AND GROUNDWATER SAMPLING PROGRAMS, SUPERVISING THE REMEDIATION OF CONTAMINATED SITES, AND ENSURING COMPLIANCE TO APPLICABLE REGULATORY STANDARDS.

YEARS OF EXPERIENCE

- WITH PATERSON: 6

LICENCE/ PROFESSIONAL AFFLILATIONS

- Professional Engineers of Ontario

EDUCATION

- BACHELOR OF APPLIED SCIENCE IN CIVIL ENGINEERING, 2019 QUEEN'S UNIVERSITY KINGSTON, ONTARIO
- CIVIL ENGINEERING TECHNOLOGY, ADVANCED DIPLOMA, 2016 ST. LAWRENCE COLLEGE KINGSTON, ONTARIO

OFFICE LOCATION

9 AURIGA DRIVE, OTTAWA, ONTARIO, K2E 7T9

SELECT LIST OF PROJECTS

- 930 CARLING AVENUE (FEDERAL PROPERTY) – FORMER SIR JOHN CARLING BUILDING (OTTAWA HOSPITAL NEW CIVIC CAMPUS) - SUPPLEMENTAL PHASE II ESAs, SITE REMEDIATION, EXCESS SOIL MANAGEMENT, AND RSC (ONGOING)
- 1040 SOMERSET STREET WEST, OTTAWA, ON – PHASE I ESA, PHASE II ESAs, SITE REMEDIATION, EXCESS SOIL MANAGEMENT AND RSC
- 52 SCARSDALE ROAD, TORONTO, ON – SUPPLEMENTAL PHASE II ESA AND SITE REMEDIATION
- CANTERBURY AVENUE AND ARCH STREET INTEGRATED ROAD AND SEWER, OTTAWA, ON – REGULATORY EXCESS SOIL MANAGEMENT AND REPORTING
- 200 BARIBEAU STREET, OTTAWA, ON - PHASE I ESA, PHASE II ESA, SITE REMEDIATION, AND RSC
- 11610 COUNTY ROAD 2, MORRISBURG, ON – REUSE SITE ASSESSMENT AND QP OVERSIGHT
- CAIVAN COMMUNITIES: THE RIDGE, OTTAWA, ON - ENVIRONMENTAL AND GEOTECHNICAL SUBSURFACE INVESTIGATIONS, SOIL AND GROUNDWATER SAMPLING, AND SITE REMEDIATION.
- TAGGART RESIDENTIAL DEVELOPMENT, GARDINERS ROAD, KINGSTON, ON – PHASE II ESA SUPERVISION, GROUNDWATER MONITORING, REMEDIATION SUPERVISION, AND RSC ASSISTANCE
- 5501 BANK STREET, OTTAWA, ON – RETAIL FUEL OUTLET DECOMMISSIONING AND SITE REMEDIATION
- 668 REGIONAL ROAD 17, CLARINGTON, ON – GEOTECHNICAL INVESTIGATION

PATERSON GROUP

PROFESSIONAL EXPERIENCE

2019 TO PRESENT, PROJECT MANAGER - ENVIRONMENTAL, PATERSON GROUP, OTTAWA, ONTARIO

CONDUCT PHASE I - ENVIRONMENTAL SITE ASSESSMENTS (ESAs) TO CSA AND O.REG. 153/04 STANDARDS ACTING AS A QUALIFIED PERSON.

CONDUCT PHASE II - ENVIRONMENTAL SITE ASSESSMENTS (ESAs) AND SUPPLEMENTAL PHASE II ESAs TO CSA, CCME, AND O.REG. 153/04 STANDARDS ACTING AS A QUALIFIED PERSON;

SUPERVISE SOIL AND GROUNDWATER REMEDIATION PROGRAMS TO CSA, CCME, AND O.REG. 153/04 STANDARDS ACTING AS A QUALIFIED PERSON;

PREPARATION OF RECORDS OF SITE CONDITION TO O.REG. 153/04 STANDARDS ACTING AS A QUALIFIED PERSON;

CONDUCT EXCESS SOIL INVESTIGATIONS TO O.REG. 406/19 STANDARDS, AND OVERSEE SOIL TRANSPORT AND REGULATORY REPORTING ACTING AS A QUALIFIED PERSON;

MANAGE EXCAVATION CONTRACTORS AND FIELD PERSONNEL TO ENSURE SOIL AND GROUNDWATER QUALITY CONTROL;

PRESENT ANALYTICAL TEST RESULTS, INTERPRETATIONS, ASSESSMENTS, RECOMMENDATIONS AND/OR CONCLUSIONS IN TECHNICAL REPORTS AS WELL AS VERBAL AND WRITTEN COMMUNICATION WITH STAKEHOLDERS;

TRAIN AND MENTOR JUNIOR STAFF, AND ASSIST AND SUPPORT INTERMEDIATE AND SENIOR STAFF;

OVERSEE GEOTECHNICAL, ENVIRONMENTAL, AND HYDROGEOLOGICAL SUBSURFACE INVESTIGATIONS INCLUDING BOREHOLE DRILLING AND TEST PIT EXCAVATION ON NUMEROUS PROPOSED DEVELOPMENTS;

CONDUCT SETTLEMENT SURCHARGE SURVEYS, SETTLEMENT PLATE INSTALLATIONS, SLOPE STABILITY SURVEYS, SEISMIC SHEAR-WAVE VELOCITY SURVEYS, TOPOGRAPHIC SURVEYS, AND GEOTECHNICAL SUBSURFACE INVESTIGATIONS, INCLUDING IN SENSITIVE CLAY DEPOSITS;

FACILITATE LABORATORY TESTING FOR SOIL, WATER, AND SEDIMENT SAMPLES AND PROVIDE DETAILED RECOMMENDATIONS BASED ON THE RESULTS;

PROBLEM SOLVING TO COMPLETE ANALYSIS REQUIRED WITHIN REGULATORY FRAMEWORK;

ADAPT TO UNFORESEEN ON-SITE CHALLENGES AND PROVIDE FIRST-HAND INSIGHTS TO HELP COLLABORATE TOWARD A SOLUTION;

PROVIDE OVERSIGHT AND RECOMMENDATIONS FOR LARGE-SCALE REMEDIATION PROJECTS;

MONITOR AND SAMPLE MULTIPLE GROUNDWATER WELLS WITH A HIGH DEGREE OF PRECISION REGARDING THE QUALITY AND PARAMETERS OF THE SAMPLE;

MICHAEL BEAUDOIN

P.ENG., QPESA

SENIOR PROJECT MANAGER

MICHAEL RECEIVED HIS BACHELOR OF ENGINEERING FROM CARLETON UNIVERSITY IN 2010 IN ENVIRONMENTAL ENGINEERING. MICHAEL JOINED THE PATERSON GROUP IN THE ENVIRONMENTAL DIVISION. MICHAEL HAS WORKED FOR PATERSON FOR APPROXIMATELY 14 YEARS AND HAS ACCRUED EXTENSIVE FIELD AND OFFICE EXPERIENCE. MICHAEL'S EXPERIENCE WORKING IN THE FIELD RANGES FROM PHASE I SITE REVIEWS, PHASE II INVESTIGATIONS, REMEDIATION SITE INSPECTIONS AND DESIGNATED SUBSTANCE SURVEYS. THROUGH HIS YEARS OF FIELD EXPERIENCE, MICHAEL HAS OBTAINED INVALUABLE KNOWLEDGE ON CONTRACTOR RELATIONSHIPS, BUDGETS, TIME MANAGEMENT, CONSULTANT/OWNER RELATION, QUALITY DATA AND INFORMATION, AND WORKING WITH A VARIETY OF DIFFERENT PERSONNEL AND SITUATIONS. MICHAEL HAS MOVED INTO A MORE SENIOR ROLE BY BECOMING A QUALIFIED PERSON FOR ENVIRONMENTAL ASSESSMENTS, OVERSEEING SMALL TO LARGE SCALE ENVIRONMENTAL PROJECTS, WHICH INCLUDE, PHASE I AND II REPORTS, RECORD OF SITE CONDITIONS AND BROWNFIELD APPLICATIONS. MICHAEL HAS ASSISTED WITH MARK D'ARCY IN THE DEVELOPMENT OF YOUNG STAFF AND CONTINUOUS IMPROVEMENT OF PATERSON INTERNAL SYSTEMS.

YEARS OF EXPERIENCE

- WITH PATERSON: 14

LICENCE/ PROFESSIONAL AFFLILATIONS

- PROFESSIONAL ENGINEERS OF ONTARIO

EDUCATION

- B.ENG. 2010, ENVIRONMENTAL ENGINEERING CARLETON UNIVERSITY OTTAWA, ON

OFFICE LOCATION

9 AURIGA DRIVE, OTTAWA, ONTARIO, K2E 7T9

SELECT LIST OF PROJECTS

- RIDEAU STREET RECONSTRUCTION, OTTAWA, ON PHASE I ESA, PHASE II ESA, (FIELD MANAGER)
- MAIN STREET RECONSTRUCTION, OTTAWA, ON PHASE I ESA, PHASE II ESA, (FIELD MANAGER)
- WOODROFFE AVENUE RECONSTRUCTION, OTTAWA, ON PHASE I ESA, PHASE II ESA, (FIELD MANAGER)
- WESTBORO CONNECTION DEVELOPMENT, OTTAWA ON, PHASE II ESA, REMEDIATION SUPERVISION (FIELD MANAGER)
- RIVERVIEW DEVELOPMENT – KINGSTON, ON, PHASE I ESA, PHASE II ESA, AND FILING OF MULTIPLE RSCS IN THE MECP ENVIRONMENTAL SITE REGISTRY (PROJECT MANAGER)
- WEST VILLAGE DEVELOPMENT – KINGSTON, ON, PHASE I ESA, PHASE II ESA, AND FILING OF MULTIPLE RSCS IN THE MECP ENVIRONMENTAL SITE REGISTRY (PROJECT MANAGER)
- MOON DEVELOPMENT – 245 RIDEAU STREET, OTTAWA, ON, PHASE I ESA, PHASE II ESA, AND RSC FILING (PROJECT MANAGER)
- ESAP PROJECT, OTTAWA, ON
- RECORD OF SITE CONDITION FILINGS – RESIDENTIAL AND COMMERCIAL DEVELOPMENT PROPERTIES, VARIOUS SITES, OTTAWA, KINGSTON ON.
- DESIGNATED SUBSTANCE SURVEYS, OTTAWA, ON
- PHASE I AND PHASE II INVESTIGATIONS IN ACCORDANCE WITH CSA STANDARDS AND O.REG 153/04

PATERSON GROUP

PROFESSIONAL EXPERIENCE

NOVEMBER 2010 TO PRESENT, ENVIRONMENTAL ENGINEER, PATERSON GROUP, OTTAWA, ONTARIO

PROVIDE ON-SITE ENVIRONMENTAL EXPERTISE FOR VARIOUS SOIL AND GROUNDWATER REMEDIATION PROJECTS INCLUDING BUT NOT LIMITED TO THE FOLLOWING: RIVERVIEW DEVELOPMENT, WEST VILLAGE, WESTBORO CONNECTION, ESAP PROJECT, AND 405 TERMINAL AVENUE.

OVERSEE PHASE I AND PHASE II INVESTIGATIONS IN ACCORDANCE WITH CSA STANDARDS AND O.REG 153/04 ON A VARIETY OF RESIDENTIAL AND COMMERCIAL DEVELOPMENTS.

RESPONSIBLE FOR FILING RECORDS OF SITE CONDITION WITH THE MECP ENVIRONMENTAL SITE REGISTRY.

COMPLETING DESIGNATED SUBSTANCE SURVEYS (INCLUDING AIR QUALITY TESTING)

PROBLEM SOLVING TO HELP ADVANCE OR MAINTAIN PROJECT SCHEDULES.

COMPLETE ENVIRONMENTAL REPORTS WITH RECOMMENDATIONS FOR ENVIRONMENTAL CONCERNS.

LIAISING WITH CONTRACTORS, CONSULTANTS AND GOVERNMENT OFFICIALS.

PROVIDE COST ESTIMATES FOR ENVIRONMENT FIELD PROGRAMS AND CONSTRUCTION COSTS.

REVIEW RFI'S, SUBMITTALS, MONTHLY PROGRESS REPORTS AND OTHER VARIOUS CONSTRUCTION RELATED WORK.

PATERSON GROUP